STORMWATER DRAINAGE SPECIFICATION FOR BUILDING DEVELOPMENTS

THE DRAFT AMENDMENT PROPOSES CHANGES TO THESE DCP CHAPTERS:

C3 WATER MANAGEMENT
C6 LANDSCAPE DESIGN
C13 INFRASTRUCTURE AND SERVICES
APPENDIX F3 DA SUBMISSION REQUIREMENTS

COUNCIL REPORTS AND MINUTES ARE INCLUDED IN THIS SECTION

NOTE:

Amendments to the DCP are marked in red.

Penrith City Council
PO Box 60, Penrith
NSW 2751 Australia
T 4732 7777
F 4732 7958
penrithcity.nsw.gov.au

PENRITH
CITY COUNCIL

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C3 Water Management

General Objectives

a) To adopt an integrated approach that takes into account all aspects of the water cycle in determining impacts and enhancing water resources;

b) To promote sustainable practices in relation to the use of water resources for human activities;

c) To minimise water consumption for human uses by using best practice site planning, design and water efficient appliances;

d) To address water resources in terms of the entire water catchment;

e) To protect water catchments and environmental systems from development pressures and potential pollution sources;

f) To protect and enhance natural watercourses, riparian corridors, wetlands and groundwater dependent ecosystems;

g) To protect, conserve and enhance surface and groundwater resources;

h) To integrate water management with stormwater, drainage and flood conveyance requirements; and

i) To utilise principles of Water Sensitive Urban Design in designing new developments or infill development in existing areas.

3.1. The Water Cycle/Water Conservation

A. Background

Key Issues

Key issues for preserving the quality of water supplies and minimising impact on the water cycle include:

a) Pursuing more sustainable consumption practices for water;

b) Regulating the pumping of water from ground water and surface water systems;

c) Promoting the trapping of surface run-off in dams and storage areas, where appropriate;

d) Minimising water consumption for new developments; and

e) Recycling grey-water and stormwater, including rain water collection.

Relevant Water Conservation Policies

For residential development, the current water conservation requirements are set out in *State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004* (BASIX). Other building types do not currently have any legislative requirements for water conservation. However, there are a number of tools available for testing the water conservation initiatives of a range of developments (e.g. the Greenstar and NABERS rating tools). The following controls supplement the existing legislative requirements for all developments.

All naturally occurring water (both surface and ground water) in NSW that is capable of being used for irrigation or for watering stock is regulated by the provisions of the *Water*

Management Act 2000 or the *Water Act 1912*. Any 'work' (which includes any dam, pump, weir, regulator, race, channel, cutting, well, excavation, etc.), which affects the quantity of water flowing to or from, or contained in, a river, stream or lake comes within the provisions of the *Water Management Act 2000* in areas where water sharing plans have commenced (includes Penrith LGA). Licences are issued to authorise (construct/install and use) such works. In relation to groundwater, the construction of any bore (which includes any bore, spear point or excavation) requires authorisation under the *Water Management Act 2000*.

B. Objectives

a) To minimise impacts on the water cycle and natural ecosystems from redirection of water for human land uses and activities; and

b) Where possible, to recycle water for non-drinking uses.

C. Controls

1) Alterations/Additions to Existing Buildings

Extensions to existing residential buildings will, in most cases, need to comply with the requirements of BASIX, the sustainability tool developed by the State Government.

For extensions to non-residential buildings or residential extensions that do not trigger BASIX, the following controls apply:

a) Water saving devices must be incorporated into any internal renovation (taps, toilets, etc.).

b) Rainwater tank(s) and gutter systems shall be installed to capture rainwater and reuse for irrigation, toilet flushing and other non-drinking purposes. Installation of rainwater tanks shall comply with the relevant standards established by Sydney Water.

c) If water saving devices and/or rainwater tanks are not to be installed, the applicant will need to submit a statement explaining why the installation of these measures is not economically feasible or is technically difficult.

2) Pools, Spas and Water Features

Any proposal for a permanent residential swimming pool, spa pool or water feature with a capacity of greater than 40,000 litres must consider the following:

a) Provision of shading or covers to minimise evaporation; and

b) Other mechanisms to reduce water consumption.

3) Proposed Industrial Land Uses

Any new industrial development or significant alteration and/or addition to an industrial building needs to reduce water consumption by a combination of careful site planning, design and water efficient appliances.

Significant alterations/ additions are those where the roof or hard surface area is increased to the minimum standard AND those additions are not less than 25% of the existing roof area.

The minimum standard is:

a) 200m^2 in clause 3 a)

b) 1,000m^2 in clause 3 b)

c) 600m^2 in clause 3 c).

The following controls apply to new industrial buildings and significant alterations/additions to industrial buildings:

a) All proposed industrial buildings with a roof area greater than 200m^2 are required to install a rainwater tank of minimum capacity of 100,000 litres on the site for re-use of water in irrigation, industrial processes, toilet flushing or for other non-drinking purposes through a separate reticulated water supply system.

b) All proposed industrial sites with a hard surface area (including roof area, driveways, parking areas, loading bays, covered storage areas, etc.) greater than 1,000m^2 shall submit a water management plan which estimates required water needs, and includes an investigation into the feasibility of the measures listed below, outlines those to be adopted on the site and explains why any measures not adopted were unable to be implemented:

   i) Rainwater tanks connected to roof and gutter systems and installed to enable reuse of rainwater for irrigation, industrial processes, toilet flushing or other non-drinking purposes;

   ii) Stormwater detention systems installed and maintained to enable the reuse of stored water for irrigation, industrial processes, toilet flushing or other non-drinking purposes, and to minimise the impact of runoff from the site;

   iii) Roof gardens, either for recreational purposes or as a means to reduce hard stand area.

c) Any proposed industrial development with a roof area greater than 600m^2 must submit a documented investigation into the feasibility of a roof garden to reduce hard surface area and associated run off.

4) Proposed Rural Land Uses

a) Any application for a new rural land use that requires the consent of Council and will increase the water needs of a particular rural area must submit a water management plan which:

   i) Estimates future water needs of the proposed development;

   ii) Indicates the proposed water source to meet those needs; and

   iii) Outlines water conservation measures to be implemented.

b) Where new rural dwellings are proposed and reticulated water supplies are not available, each allotment or dwelling should demonstrate that it has an adequate and self sufficient water supply without having to pump from streams or groundwater sources.

5) Requirements for Extraction of Water

Rural landholders have rights to access water for some basic purposes, such as domestic and stock water, harvestable rights from farm dams and native title rights (see other provisions in this section).

Whether or not you need a licence (or other approval) from the Office of Water to access surface water (water from rivers, lakes etc.) depends on how and why you want to use the water. Please consult with the Office of Water regarding any proposed water extraction.

Access to groundwater for any purpose requires a licence or approval from the Office of Water (see other provisions in this section).

If you want to extract water from rivers or aquifers and use it for commercial purposes, you must hold a water access licence and an approval from the Office of Water.

D. Lifting the Bar

The following represent some ways in which applicants can demonstrate additional commitment to the water conservation principles expressed in this Plan. Demonstration of this commitment may lead to Council considering variation of development controls. Applications that vary the development controls listed in this section will need to demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) Exceeding BASIX for proposed residential dwellings: Whilst BASIX sets the minimum requirement for reduction in water consumption for new residential dwellings (depending on location), Council recommends that an additional 10% water reduction is sought for any residential developments over 3 dwellings.

b) Recycling of grey-water / stormwater: Where possible, any new developments or substantial re-developments of a site should seek to include opportunities for recycling of grey-water and stormwater on the site to minimise use of potable (drinking) water.

a) Reticulated recycling systems: New large scale developments resulting in 5 or more dwellings should seek to provide a reticulated water system that enables on-site treatment and re-use of grey water from the site.

E. Other Information

People seeking further information on water management may wish to refer to the following:

- Penrith City Council's *Stormwater Drainage Specification for Building Developments*
- BASIX – the on-line program that assesses a house or unit design and compares it against energy and water reduction targets. A BASIX Certificate must be submitted with every development application for a new home. The design must meet these targets before a BASIX Certificate can be provided (www.basix.nsw.gov.au)
- Greenstar rating tool for commercial and other developments (www.gbcaus.org)
- National Australian Built Environment Rating System (NABERS) water tool for commercial and other developments (www.nabers.com.au)
- *Australian Drinking Water Guidelines* (2011) National Health and Medical Research Council (NHMRC) (compliance regulated by NSW Health)
- *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1)* (2006) Environment Protection and Heritage Council, Natural Resource Management Ministerial Council and Australian Health Ministers' Conference
- *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) - Augmentation of Drinking Water Supplies* (2008) Environment Protection and Heritage Council, Natural Resource Management Ministerial Council and Australian Health Ministers' Conference
- *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) - Stormwater Harvesting and Reuse* (2009) Environment Protection and Heritage Council, Natural Resource Management Ministerial Council and Australian Health Ministers' Conference
- *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) - Managed Aquifer Recharge* (2009) Environment Protection and Heritage

Council, Natural Resource Management Ministerial Council and Australian Health Ministers' Conference

- *Management of Private Recycled Water Schemes (Interim NSW Guidelines)* (2007) NSW Department of Water and Energy
- Penrith City Council's *Sustainability Blueprint for urban release areas* (June 2005)
- *NSW Water Conservation Strategy* (Oct 2000) NSW Department of Land and Water Conservation
- *Sydney Metropolitan Water Plan* (reviewed 2010) NSW Department of Water and Energy
- *Water for Life* (www.waterforlife.nsw.gov.au).

3.2. Catchment Management and Water Quality

A. Background

Catchment management requires protecting water systems from:

- Chemicals (including pesticides and insecticides);
- Untreated sewage from on-site effluent treatment and disposal systems;
- Nutrient run-off from application of fertilisers and animal manure;
- Soil erosion and sedimentation from poor construction/land use practices;
- Removal of natural vegetation around watercourses that could trap sediment and provide treatment of surface run-off to reduce pollution entering water systems; and
- Stormwater run-off and surface pollution.

Water Sensitive Urban Design (WSUD) involves adopting design and management practices that take advantage of natural site features and seek to minimise impacts on the water cycle. WSUD requires consideration of issues such as water conservation, water quality and stormwater management. It seeks to minimise the extent of impervious surfaces and mitigate changes to the natural water balance through on-site re-use of water as well as through temporary storage.

WSUD relies on an integrated approach to both water and stormwater management. This integrated approach regards stormwater as a resource and involves considering all aspects of runoff within a development, including environmental and social issues. For example, the inclusion of a multi-purpose corridor in an integrated stormwater management system may provide water features, stormwater treatment, habitat protection and recreation.

Council's Water Sensitive Urban Design Policy (2013) was prepared to improve water conservation, quality and quantity in both new developments and some redevelopments. The Policy sought to clarify which developments needed to achieve water conservation, quality and quantity outcomes. The Policy has now been incorporated into this section of the DCP.

B. Objectives

Catchment Management

a) To adopt a total catchment management approach to water quality and protection of water systems;

b) To prevent direct pollution of existing groundwater or surface water systems;

c) To ensure appropriate management of land uses and activities to minimise the risk of indirect water pollution;

d) To improve the water quality of the Hawkesbury-Nepean River system and tributaries;

e) To ensure the high quality of discharge to sewer and drainage systems; and

f) To protect the aquatic environment through the use of ecologically sustainable development principles.

Water Sensitive Urban Design

g) To protect and enhance natural land and water systems such as creeks and rivers, particularly water quality.

h) To maintain and restore the natural water balance;

i) To make more efficient use of water resources by conserving water, particularly potable (drinking) water;

j) To reduce flood risk in urban areas;

k) To reduce erosion of waterways, slopes and banks;

l) To control stormwater pollution and improve water quality in waterways and groundwater;

m) To integrate stormwater management with water supply and waste water treatment; and

n) To integrate stormwater treatment into the landscape so as to maximise the visual and recreational amenity of urban development.

C. Controls

1) Approval to Discharge Contaminants

Water discharge from any development must not contain contaminants, unless necessary licences and/or approvals are obtained from relevant government authorities.

All liquids (including water) produced and/or discharged from the site shall not contain pollutants above acceptable levels. Acceptable levels will be determined at the time of consideration of individual proposals by Council, the Office of Environment and Heritage and, if required, Sydney Water.

2) Addressing Potential Catchment Impacts

All applications to Council, where there is the potential to impact upon a water system, are required to identify in the application the relevant water systems in the catchment area of the site that may be affected and address how any potential impacts will be mitigated/avoided.

3) Water Quality for all Land Uses

Council's Water Sensitive Urban Design (WSUD) Policy (2013) has been prepared to improve water conservation, quality and quantity in both new development and some redevelopments. The policy seeks to clarify which developments need to achieve the targets for water conservation, quality and quantity.

Where any development could result in water quality impacts in nearby surface water systems, the water quality at that system is to be monitored for pollutants prior to the commencement of works, and at regular intervals during construction and/or operation.

Water quality entering natural areas shall either maintain or improve on pre-development levels.

All monitoring is to be undertaken in accordance with any relevant guidelines of the Office of Environment and Heritage (or any other applicable guidelines).

4) Council Approval Requirements for WSUD Systems

Development types required to meet water conservation and stormwater quality and quantity targets are defined in Table C3.1. The performance criteria required to be met are listed below under subsection '5) WSUD Development Controls'. Affected developments must submit a WSUD Strategy (report dealing with measures to be implemented as part of the development) with a Development Application.

A WSUD Strategy is a written report detailing potable water savings and stormwater quality and quantity control measures to be implemented as part of a development. The required content of the Strategy is outlined in Council's WSUD Technical Guidelines. The WSUD Technical Guidelines must be considered when undertaking certain developments within the City. The guidelines outline the information to be submitted with development applications and construction certificates, in order to demonstrate compliance with the objectives and performance criteria outlined below. The WSUD Technical Guidelines provide a list of:

- Council's requirements for the location, ownership and ongoing maintenance responsibilities of WSUD measures;
- What is to be submitted with a development application or construction certificate application;
- What is required to be included in a WSUD Strategy;
- Parameters to be used in MUSIC modelling;
- Where to get further information on the design, construction, operation and maintenance of stormwater treatment measures; and
- Council's expectations in relation to the proposed WSUD measures.

The Technical Guidelines should be read in conjunction with a number of referenced industry best practice guidelines/documents including the following:

- Draft NSW Music Modelling Guidelines (prepared for the Sydney Metropolitan CMA);
- WSUD Conceptual Design Information (prepared by Water by Design);
- WSUD Technical Design Guidelines (prepared by Water by Design);
- Typical Drawings (prepared for the Sydney Metropolitan CMA).

When preparing supporting documentation for a development application or construction certificate application, Council requires applicants and developers to engage appropriately qualified and experienced practitioners for the development of appropriate WSUD designs and strategies. Discussion with Council is encouraged at an early stage of a development proposal to agree on a general design approach before a detailed WSUD Strategy is prepared.

Nothing in this section is to be construed as limiting, in any way, Council's right to impose differing conditions when approving development proposals, or limiting the discretion of Council's nominated representative to vary any necessary requirements in respect of a particular development or Council project, having regard to potential site restrictions and best practice.

The WSUD Technical Guidelines will be periodically reviewed and updated to reflect changes in industry best practice and are available on Council's website.

Table C3.1: Developments Required to Consider Water Sensitive Urban Design

Land Use	Development Type	Water Conservation 5(a)	Stormwater Quality 5(b)	Water Quantity Flow 5(c)
Residential	Alterations and additions, detached dwellings and residential land uses not addressed below	√ - BASIX	No	No
	New single dwellings and dual occupancy	√ - BASIX	No	No
	Existing residential villas, flats and townhouses with additional impervious area greater than 250m^2	√ - BASIX	No	No
	Residential development of 5 or more dwellings including multi dwelling housing, residential housing, residential flat buildings and mixed use development	√ - BASIX	√	√
Commercial and Industrial	All new commercial, retail, mixed use and industrial development greater than 2,500m^2 total site area	√ - WELS	√	√
	Alterations and additions where the increase in roof area and impervious area* is equal to or greater than 250m^2.	√ - WELS	√	√
	Commercial, retail, mixed use and industrial development not	√ - WELS	No	No

Land Use	Development Type	Water Conservation 5(a)	Stormwater Quality 5(b)	Water Quantity Flow 5(c)
	addressed above			
Subdivision (where new road and or carriageway works are involved)	Residential (5 or more lots) or commercial and industrial subdivision	N/A	√	√
Other development not listed above	Any development which results in an increase of the existing impervious area by greater than 250m^2. Development includes but not limited to additional roads, driveways, vehicle parking areas, manoeuvring areas, loading and storage areas	√ - WELS (as required)	√	√

Note: √ means performance criteria detailed in subsection '5) WSUD Development Controls' apply.

*Additional impervious area includes building footprint (including roof area), vehicle access ways and parking spaces.

5) WSUD Development Controls

A. Water conservation

Water conservation seeks to reduce the demand for potable water. Reduced potable mains water demand is a key commitment of the NSW Government as outlined in the Metropolitan Water Plan (see http://www.waterforlife.nsw.gov.au). The NSW Government's BASIX Scheme requires all new residential development to incorporate water savings measures (http://www.basix.nsw.gov.au). There are, however, no such requirements for other development types (e.g. commercial or industrial), which are addressed by these controls.

Objectives

a) To reduce consumption of potable water for all development types within the City;

b) To use harvested rainwater, treated urban stormwater or treated wastewater for non-potable substitution where appropriate.

Performance Criteria

Water conservation requirements for development types identified in Table C3.1 are:

a) All residential buildings are to demonstrate compliance with State Environmental Planning Policy – Building Sustainability Index (BASIX), as required.

b) All buildings not covered by the State Environmental Planning Policy – BASIX:

   i) That are installing any water use fittings must demonstrate minimum standards defined by the Water Efficiency Labelling and Standards (WELS) Scheme. Minimum WELS ratings are 4 star dual-flush toilets, 3 star showerheads, 4 star taps (for all taps other than bath outlets and garden taps) and 3 star urinals. Water efficient washing machines and dishwashers are to be used wherever possible.

   ii) To install rainwater tanks to meet 80% of non-potable demand including outdoor use, toilets and laundry;

   iii) To incorporate passive cooling methods that rely on improved natural ventilation to supplement or preclude mechanical cooling.

c) Where cooling towers are used, they are:

   i) To be connected to a conductivity meter to ensure optimum circulation before discharge;

   ii) To include a water meter connected to a building energy and water metering system to monitor water usage;

   iii) To employ alternative water sources for cooling towers where practical and in accordance with the Public Health Act and NSW Health Guidelines.

d) Water use within public open space (for uses such as irrigation, pools, water features, etc.) should be supplied from sources other than potable mains water (e.g. treated stormwater or greywater) to meet 80% water use demand.

B. Stormwater Quality

Urban development increases the pollution load entering receiving environments. Stormwater quality controls have been derived through the modelling of numerous combinations of WSUD elements for a range of urban development types. They reflect a cost-effective level of stormwater treatment considered to be technically feasible in terms of land-take (or footprint) of stormwater and WSUD measures. Stormwater quality elements are to be sized using MUSIC modelling (the model for Urban Stormwater Improvement Conceptualisation, or equivalent) using Penrith data, which is available in the associated WSUD Technical Guidelines.

Objectives

a) To safeguard the environment by improving the quality of stormwater run-off entering receiving waters.

Performance Criteria

Stormwater quality requirements for all development types identified in Table C3.1 are:

a) Pollution load reductions:

   i) 90% reduction in the post development mean annual load total gross pollutant (greater than 5mm);

   ii) 85% reduction in the post development mean annual load of Total Suspended Solids (TSS);

   iii) 60% reduction in the post development mean annual load of Total Phosphorus (TP);

   iv) 45% reduction in the post development mean annual load of Total Nitrogen (TN);

   v) 90% Free Oils and Grease with no visible discharge.

b) Modelling for the determination of the mean annual loads of land uses must be undertaken in MUSIC and in accordance with the associated WSUD Technical Guidelines.

c) Any changes to the flow rate and flow duration within the receiving watercourses as a result of the development shall be limited as far as practicable. Natural flow paths, discharge point and runoff volumes from the site should also be retained and maintained as far as practicable.

d) Impervious areas directly connected to the stormwater system shall be minimised. Runoff from impervious areas such as roofs, driveways and rainwater tank overflows shall be directed onto grass and other landscaped areas designed to accept such flows.

C. Stormwater Quantity – Stream Forming Flows

Urban development has the potential to significantly increase surface runoff flow rates and volumes leading to impacts on steam stability, receiving water ecology and flooding in receiving waters.

Objectives

a) To manage the volume and duration of stormwater flows entering local waterways so as to protect the geomorphic values of those waterways.

Performance Criteria

a) The post development duration of stream forming flows shall be no greater than 3.5 times the pre developed duration of stream forming flows. The comparison of post development and pre development stream flows is commonly referred to as the Stream Erosion Index (SEI). The approach to evaluating the SEI is outlined in the associated WSUD Technical Guidelines.

6) Use and Storage of Chemicals/Pesticides/Fertilisers

a) Any application for a land use/activity that involves significant use of chemicals/fertilisers must demonstrate what measures are proposed to minimise and control nutrients or chemicals entering watercourses, water bodies or groundwater.

b) All land uses, particularly rural land uses, should avoid use of chemicals and pesticides in areas or situations where they are likely to enter surface water or ground water sources.

c) Chemicals and pesticides must be stored in such a way as to prevent accidental leakage into water systems or the on-site stormwater system. This may include:

   i) Secure storage in a bunded area; and

   ii) Secure storage in water proof/spill proof containers.

7) Other relevant areas of this DCP

Provisions relating to on-site effluent disposal, soil erosion and sedimentation and protection of vegetation near watercourses are all highly relevant to water quality. Applicants should refer to these and other relevant sections of this DCP for more information.

D. Lifting the Bar

The following represent some ways in which applicants can demonstrate additional commitment to the catchment management/water quality principles expressed in this Plan. Demonstration of this commitment may lead to Council considering variation of development controls. Applications that vary the development controls listed in this section will need to

demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) On-site water monitoring for water pollutants to identify practices/activities impacting on the water systems; and

b) Best-practice farming practices including minimising the use of chemicals and fertilisers (where possible).

E. Other Information

People seeking further information on water quality may wish to refer to the following:

- Penrith City Council's *Stormwater Drainage Specification for Building Developments*
- *ANZECC Guidelines and Water Quality Objectives in NSW* (2000) Department of Environment (Australian Government)
- Office of Environment and Heritage's website – www.environment.nsw.gov.au
- Sydney Catchment Authority's website - www.sca.nsw.gov.au
- Sydney Water Corporation's website - www.sydneywater.com.au
- Penrith City Council's *Sustainability Blueprint for urban release areas* (June 2005)
- Penrith City Council's *Water Sensitive Urban Design Technical Guidelines,* (December 2013)
- www.wsud.org

3.3. Watercourses, Wetlands and Riparian Corridors

A. Background

A riparian corridor is the land directly adjacent to (or surrounding) a natural or artificial waterway and provides a crucial link between terrestrial and stream ecosystems.

Wetlands and riparian corridors help purify water, improving the quality of larger water bodies. As runoff from surrounding land is critical to the performance of a wetland or riparian corridor, buffer areas are needed around wetlands and riparian corridors to minimise the entry of pollutants.

In addition to the water catchment management issues above, the following issues need to be addressed in relation to land uses and activities which can impact on watercourses, wetlands and riparian corridors:

- Preserving the natural alignment of watercourses;
- Avoiding disturbance to the watercourse banks and channels;
- Retaining native vegetation along creek corridors to stabilise banks and treat surface water run-off;
- Protecting wetland and riparian corridor flora and fauna;
- Providing setbacks to development in proximity to watercourses, wetlands and riparian corridors; and
- Protecting the watercourses natural stream flow regimes.

B. Objectives

a) To protect water quality and terrestrial and aquatic life forms by identifying a riparian corridor along identified waterways and establishing specific planning controls for land within those corridors;

b) To minimise disturbance and/or impacts on natural waterbodies;

c) To rehabilitate existing riparian corridors and ensure that width, buffers to development, quality of landscape and diversity of vegetation to support principles of ecological sustainability are provided.

C. Controls

1) Controlled Activity Approval under the Water Management Act 2000

If any activities/land uses are proposed near a watercourse, the *Water Management Act 2000* may apply and you may be required to seek a Controlled Activity Approval from the Office of Water. Please consult with this Office regarding your proposal. Except for certain exemptions, you are likely to need a controlled activity approval for:

a) The erection of a building or the carrying out of a work (within the meaning of the *Environmental Planning and Assessment Act 1979)* on the bank or shore of any river, estuary or lake or within 40m from the top of its bank or shore;

b) Excavation in a river, estuary or lake, or within 40m from the top of its bank or shore;

c) Removal of material (including vegetation) from the bank or shore of any river, estuary or lake or from within 40m from the top of the bank or shore;

d) Deposition of material, whether by way of landfill operations or otherwise on or within the bank or shore of any river, estuary or lake or within 40m from the top of the bank or shore;

e) Anything which affects the quantity or flow of water in a water source, or is likely to do so.

Even if there is an exemption from the requirement for an approval from this Office, you may still require the approval of Council. You may also require approval from Fisheries (NSW).

2) Preserving Alignment of Watercourses

a) Where possible, the natural (or historic) alignment of an existing wetland or watercourse should be retained along with its natural dimensions and flow regimes.

b) Watercourses should not be straightened to reduce the natural meander or flow path or to improve flood conveyance.

c) The alignment of major overland flow paths should be recognised in site planning and development design.

3) Avoiding Modifications to Natural Waterbodies

a) There should be no modifications to a natural (or historic) waterbody in its dimensions, depth or bank height unless it seeks to enhance the ecological outcomes of the waterbody.

b) Watercourses should not be modified to maximise flood conveyance unless there are no other means to avoid damage to existing dwellings or infrastructure that cannot be relocated.

c) Natural hydrological processes are to be maintained where possible, including natural vegetation and the flow regimes to maintain creek line stability and the health of terrestrial and aquatic plant communities.

4) Protection and Enhancement of Riparian Corridors

a) All riparian corridors should comprise a vegetated riparian zone along each side of the waterway (see Figure C3.1).

b) The vegetated riparian zone should retain or be vegetated with, fully structured native vegetation (trees, shrubs and groundwater species).

c) In relation to activities within the vegetated riparian zone, such as cycleways and paths, detention basins, stormwater management devices and essential services, compliance is required with the 'riparian corridor matrix' in the NSW Office of Water's Guidelines for riparian corridors on waterfront land (July 2012).

d) A managed buffer zone outside the vegetated riparian zone should be provided (where possible), to provide an additional buffer between development and the vegetated riparian zone. Land uses within the managed buffer zone could include roads, paths, playgrounds and stormwater management devices.

e) Asset protection zones should be located outside the vegetated riparian zones.

f) Appropriate widths for vegetated riparian zones will depend on the specific ecosystems being managed. Council's approach to determining the Order of Stream is based on the Strahler methodology, which is consistent with the NSW Office of Water.

Council reserves the right to assess each riparian corridor and each development on its merits. In general, however, the width will depend on the order of the stream/watercourse (see Figure C3.2) which provides an indication. The width should be measured from the top of the highest bank on both sides of the stream/watercourse, excluding any managed buffer zone, and shall comply with the requirements outlined in Table C3.3.

Figure C3.1

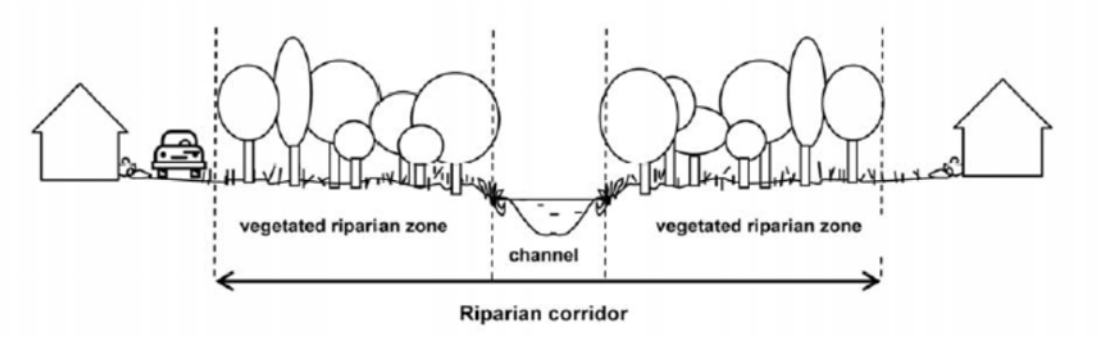

Figure C3.2: Stream Classification

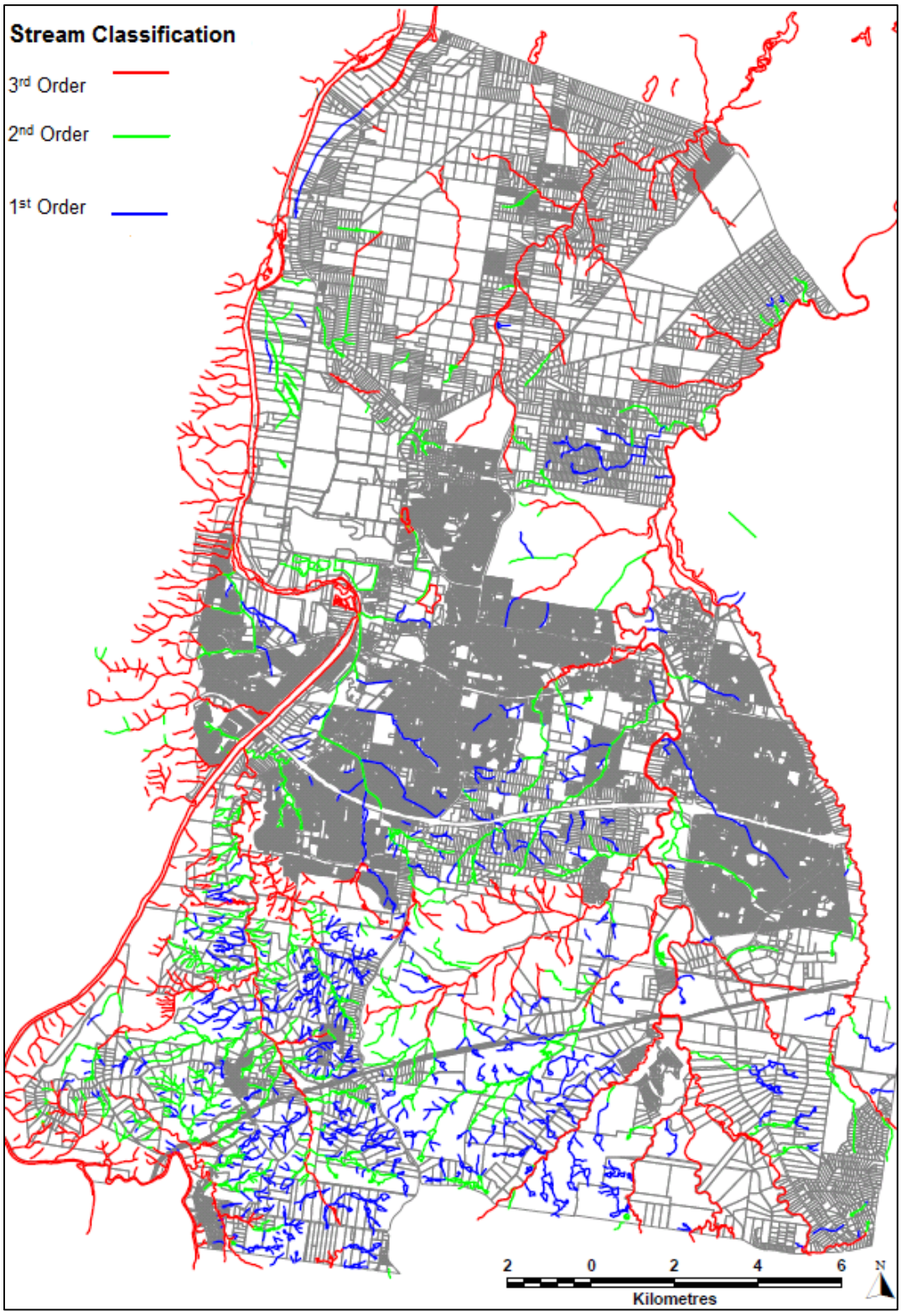

Table C3.3

Water Course Type	Vegetated Riparian Zone Width	Total Riparian Corridor Width
1st Order (Blue)	10m	20m + channel width
2nd Order (Green)	20m	40m + channel width
3rd Order (Red) except Nepean River	30m	60m + channel width
Nepean River	90m	
Wetland	40m	80m + channel width

Where, a watercourse has had a gabion wall or channellisation constructed, this should be removed to restore a natural meander for ecological purposes, except where:

i) The length of the watercourse through the development site is less than 50m; or

ii) The watercourse through the development site is a middle section of the overall watercourse, and it is technically unfeasible to reverse the channellisation; or

iii) Restoring the natural meander will create a hazard.

Enhancement of riparian corridors should, where possible:

i) Mimic natural hydrological regimes for watercourse treatments;

ii) Replicate the natural watercourse through creation of a meandering channel, rather than straight channels;

iii) Simulate natural roughness having regard to riparian requirements and flow velocities to sustain vegetation groupings;

Roughness: A watercourse's shape, smoothness of its channel and amount of vegetation in the channel all affect the 'roughness' of that watercourse and the speed of water conveyed in the channel.

iv) Minimise ongoing maintenance requirements through channel design;

v) Establish a functional riparian zone and natural channel section;

vi) Maintain or create a full assemblage of vegetation with likely natural obstructions;

vii) Create variations in channel cross-section and provide an opportunity for meandering of the channel within the flood plain;

viii) Minimise likely damage to channel banks and vegetation from storm flow through channel design; and

ix) Ensure that the channel has the capacity for appropriate flood flows having regard to the steepness of the catchment; channel modifications and future liability for land owners, Council and government agencies.

There may be a need for a sensitivity analysis for a range of flood hydrology and design flows having regard to supporting flood studies for development.

D. Lifting the Bar

The following represent some ways in which applicants can demonstrate additional commitment to the protection of watercourses, wetlands and riparian corridors expressed in this Plan. Demonstration of this commitment may lead to Council considering variation of development controls. Applications that vary the development controls listed in this section will need to demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) No development or site disturbance occurs:

   i) Within 40m on either side, measured from the top of the bank, of a 2nd Order stream/watercourse; or

   ii) Within 20m on either side, measured from the top of the bank, of a 1st Order stream/watercourse or significant natural drainage line; and

   iii) Where riparian corridors are also acting as a significant wildlife corridor (subject to Council's review), the minimum area to be protected or revegetated is 40m on either side of the watercourse. This may be increased to up to 60m if the wildlife corridor is significant, or if it forms a major link to an extensive area of natural bushland (e.g. nature reserve or national park).

E. Other Information

People seeking further information on watercourses, wetlands and riparian corridors may wish to refer to the following:

- Penrith City Council's *Stormwater Drainage Specification for Building Developments*
- *Guidelines for riparian corridors on waterfront land* (2012) (Office of Water)
- *NSW Wetlands Policy* (2010) (Office of Water)
- *NSW Rivers and Estuaries Policy* (1993) (Office of Water)
- Penrith City Council's *Sustainability Blueprint for urban release areas* (June 2005)
- *Rehabilitation Manual for Australian Streams* (1999) Rutherford et al
- *Natural Channel Design Guidelines* (2003) (Brisbane City Council)
- *Stream Corridor Restoration: Principles Processes and Practices* (2000) United States Department of Agriculture
- Fairfull, S. and Witheridge, G. (2003) *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings.* NSW Fisheries, Cronulla, 16pp
- NSW Fisheries (2013) *Policy and Guidelines for Fish Habitat Conservation* NSW Department of Primary Industries*, Policy and Guidelines for Fish Friendly Waterway Crossings.*

3.4. Groundwater

A. Background

Groundwater is water located beneath the ground surface in soil pore spaces and in the fractures of rock formations. Water can become trapped in aquifers which provide useable quantities of water. The depth at which soil pore spaces or fractures and voids in rock become fully saturated with water is called the water table. Groundwater is recharged from,

and eventually flows to, the surface naturally. Natural discharge often occurs at springs and streams, and may also form oases or wetlands.

Groundwater is often withdrawn for agricultural, residential, construction (i.e. dewatering where construction is below the water table) and industrial use. However, due to demand for water, there are increasing pressures on groundwater and aquifer supplies and groundwater dependent ecosystems which need to be managed. Most controls relating to groundwater use are governed by State Government and not Council. A summary of the key issues is set out below to guide any developments that may impact on groundwater.

B. Objectives

a) To protect groundwater supplies against excessive water extraction;

b) To protect groundwater supplies against pollution and contaminants;

c) To provide equity in access to groundwater supplies.

C. Controls

1) Utilising Groundwater/Bores

Where groundwater is proposed to be accessed, satisfactory arrangements for the proper utilisation and protection of the groundwater resource must be made with the Office of Water. All piezometers or bores must be licensed by the Office of Water.

A bore must be at least:

a) 40m from the nearest bank of any river or creek;

b) 500m from any town water supply bore;

c) 400m from any irrigation bore on an adjoining property;

d) 50 – 100m from a property boundary; and

e) 200 – 400m from any Office of Water observation bores.

For distance rules, applicants are advised to consult the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources – Part 9 – Rules for Water Supply Work Approvals.

2) Protecting Groundwater

a) Applicants are required to consider the impact of the proposed development on underlying and surrounding groundwater resources and adopt appropriate measures to avoid these impacts.

b) The following matters should be considered:

   i) The design of the development and the potential for its below-ground extent to impede, dam or otherwise obstruct the passage of groundwater flow;

   ii) The management of stormwater or roof runoff within and around the development and any potential degradation or deterioration of local groundwater quality that may occur as a result;

   iii) The management of greywater or wastewater generated from the development and any potential degradation or deterioration of local groundwater quality that may occur as a result;

   iv) The existence of groundwater users in the vicinity of the development and the potential for them to be adversely impacted by the proposed development;

v) The vulnerability of groundwater locally and the pollution potential of the development; and

vi) The presence and distribution of groundwater dependent systems (environmental attributes having a dependence on groundwater) in the vicinity and the potential for adverse impacts to occur as a result of the development.

c) Groundwater shall not generally be pumped or extracted without specific licensed approval for any purpose other than temporary construction dewatering at the site identified in the development application.

d) Where construction is proposed below the water table:

i) The volume of any groundwater abstracted for the purposes of temporary dewatering should be minimised, e.g. by minimising the length of time that any basement excavations below the water table are left open. In general, the Office of Water will not authorise temporary construction dewatering for periods of more than 12 months.

ii) The design and construction of the building should prevent any long–term take of groundwater by making any below–water table levels watertight for the anticipated life of the building. Waterproofing of below–ground levels must be sufficiently extensive to incorporate adequate provision for unforeseen high water table elevations to prevent potential future inundation.

iii) A reasonable estimate of the total volume of groundwater to be extracted shall be calculated and a report provided to the NSW Office of Water. Details of the calculation method shall be included in the report.

D. Other Information

People seeking further information on groundwater may wish to refer to the following:

- *NSW State Groundwater Policy Framework Document* (1997) NSW Government
- *NSW State Groundwater Quality Protection Policy* (1998) NSW Government
- *NSW State Groundwater Dependent Ecosystems Policy* (2002) NSW Government
- *Hawkesbury-Nepean Catchment Groundwater Vulnerability Map* (1998) Department of Land and Water Conservation
- *Hawkesbury-Nepean Catchment Groundwater Availability Map* (1998) Department of Land and Water Conservation.

3.5 Flood Planning

A. Background

Impact of Flooding

The Hawkesbury/Nepean River system has one of the most dramatic flood behaviours in the world. The geography and topography of the area mean that flood waters are contained in the Nepean Gorge until they reach the floodplains at Penrith, resulting in unusually rapid rises in water levels. These floods continue to modify the physical environment of the valley as well as causing social and economic challenges to the valley's inhabitants.

Relevant Policies

Local government is the primary authority responsible for both flood risk management and land use planning in NSW. However, the State Government has introduced the *Flood Prone*

Land Policy and the associated *Floodplain Development Manual* (2005) (FDM) to reduce the impacts of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible. To achieve this objective, the supporting FDM acknowledges a broad risk management hierarchy of:

- avoidance of flood risk;
- minimisation of flood risk using appropriate planning controls; and
- flood risk mitigation.

Generally, the Flood Prone Land Policy adopts the following approach:

- The impact of flooding and flood liability on existing developed areas shall be reduced by flood mitigation works and measures, appropriate development and building controls and the voluntary acquisition of property in hazardous areas;
- The potential for flood losses in all new developed areas shall be contained by the application of effective planning and development controls;
- A merit approach to all development and building decisions which takes account of social, economic factors, as well as flooding considerations, should be followed.

Local Environmental Plan

The LEP contains provisions for development on land at or below the flood planning level, defined in the LEP as the level of a 1:100 Average Recurrence Interval (ARI) (1% AEP (100 year ARI)) flood event plus 0.5m freeboard.

The 1% AEP (100 year ARI) flood event is a tool for broadly assessing the suitability of land for development. It is not an assessment of flood risk, nor does reference to the 1% AEP (100 year ARI) flood event mean that properties and development above this level are not subject to flood risk.

Average Recurrence Interval (ARI) is the long term average number of years between the occurrence of a flood as big as or larger than the selected event. For example, floods with a discharge as great as or greater than the 100 year ARI flood event will occur on average once every 100 years.

Consideration of Floods Larger than the 1% AEP (100 year ARI) Flood Event

The 1% AEP (100 year ARI) flood is not, in most cases, the largest flood that can occur. There have been documented floods which exceeded this level for the Nepean River on a number of occasions over the last 200 years. The highest flood event at Penrith occurred in June 1867 and is estimated at greater than the 1:200 ARI event. Floodwaters reached a peak height of 27.5m above Australian Height Datum and covered most of the present day Emu Plains and large parts of Penrith. The 1967 flood for Ropes Creek and the 1956 and 1988 floods for South Creek were also major flood events.

For this reason, developments that may have a significant impact on the extent of flooding experienced by nearby or downstream properties may be asked to consider floods larger that the 1% AEP (100 year ARI) flood event. Significant areas of Penrith are affected by the Probable Maximum Flood (PMF) and in some cases this will need to be considered in determining flood hazard.

Probable Maximum Flood (PMF) is the largest flood that could conceivably occur at a particular location.

Flood Hazard Classifications

In order to determine what development may occur in areas subject to partial or full flooding, it is necessary to classify land according to flood hazard.

The greatest flood hazard occurs in land that is a 'floodway'. They are often aligned with obvious naturally defined channels.

Floodway is defined as those areas of the floodplain where a significant discharge of water occurs during floods.

In addition, there are significant risks in 'flood storage areas'.

Flood storage areas are defined as those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood.

Floodplain is defined as the area of land which is subject to inundation by floods up to and including the PMF event.

The remaining area of land affected by flooding after floodway and flood storage areas have been defined is the 'flood fringe area'.

Alterations to Land at or below the Flood Planning Level/Watercourses

One key issue with the development of land at or below the flood planning level is that some developments have the potential to adversely affect flood behaviour (including flow distributions and velocities). This can result in detrimental increases in the potential flood impacts on other development or properties and/or impacts on the floodplain environment that could cause erosion, siltation, destruction of riparian vegetation or a reduction in the stability of the river bank/watercourse.

Developments that would partially or fully block floodways or flood storage areas may result in redistribution of flood flows or impacts. The greatest impact comes from filling land at or below the flood planning level in order to raise development above the flood planning level. Therefore, these impacts must be minimised in the location and design of any structures on the land.

Minimising Flood Impacts on Property

Flood impacts on property can be reduced not only by appropriate location of development but also by design, layout and structure. This Plan provides controls for appropriate levels for 'habitable rooms' or 'flood proofing' of buildings.

Habitable rooms are defined as a living area such as a lounge room, dining room, rumpus room, kitchen and bedroom and excluding garages.

Flood proofing refers to the combination of measures incorporated in the design, construction and alteration of individual buildings or structures subject to flooding to reduce or eliminate flood damages.

B. Objectives

a) To ensure floodplain risk management minimises the potential impact of development and other activity upon the aesthetic, recreational and ecological value of the waterway corridors;

b) To maintain the existing flood regime and flow conveyance capacity and avoid significant adverse impacts on flood behaviour;

c) To avoid significant adverse effects on the floodplain environment that would cause erosion, siltation, destruction of riparian vegetation or a reduction in the stability of the river bank/watercourse;

d) To reduce the impact of flooding and flood liability on individual owners and occupiers;

e) To limit the potential risk to life and property resulting from flood events;

f) To contain the potential for flood losses in all new developed areas by the application of effective planning and development controls;

g) To apply a "merit approach" to all development and building decisions, which takes account of social, economic and ecological factors as well as flooding considerations;

h) To prevent the introduction of unsuitable land uses on land subject to the flood planning provisions of the LEP; and

i) To deal equitably and consistently (where possible) with applications for development on land affected by potential floods, in accordance with the principles contained in the Floodplain Development Manual, issued by the NSW Government.

C. Controls

The following controls only apply to land subject to the flood planning provisions of the LEP.

1) Submission Requirements

a) Where relevant, a comprehensive flood study, incorporating:

i) a survey of the main watercourse;

ii) a survey of the site; and

iii) a detailed flood and drainage investigation which establishes the estimated 1% AEP (100 year ARI) flood level;

is to be submitted with any development application on land identified as fully or partially flood affected. The levels on the survey are required to be verified during construction by a survey certificate.

b) The applicant shall be required to demonstrate to the satisfaction of Council (on the basis of a qualified consultant report) that:

i) The development will not increase the flood hazard or risk to other properties;

ii) The structure of the proposed building works shall be adequate to deal with flooding situations;

iii) The proposed building materials are suitable;

iv) The buildings are sited in the optimum position to avoid flood waters and allow safe flood access for evacuation;

v) The proposed redevelopment will not expose any resident to unacceptable levels of risk or any property to unreasonable damage; and

vi) Compliance of any existing buildings with the *Standard - Construction of Buildings in Flood Hazard Area* and the accompanying handbook developed by the Australian Building Codes Board (2012).

2) Flood Hazard Classifications

a) Council will consider development on land subject to the flood planning provisions of the LEP but will not grant consent to new development in floodways or in high hazard areas.

Flood hazard (high) or high flood hazard occurs when there is possible danger to life and limb; evacuation by trucks is difficult; there is potential for structural damage; and social disruption and financial losses could be high.

b) Consideration will be given to such matters as depth and nature of flood waters, whether the area forms flood storage, the nature and risk posed to the development by flood waters, the velocity of floodwaters and the speed of inundation, and whether the development lies in an area classed as a 'floodway', 'flood fringe area' or 'flood storage area'.

3) Residential - New Developments - Single Dwellings

b) Residential – upper storey additions will not be considered as 'New Development' provided; the first floor additions are above the Flood Planning level and the additions and alterations do not increase the building footprint at ground level beyond 35m^2. (Ground floor additions include all non-habitable buildings such as garages, storage areas, carports and the like).

c) Floor levels of habitable rooms shall be at least 0.5m above the 1% AEP (100 year ARI) flood; i.e. the flood planning level.

d) The lowest floor level of habitable rooms shall be not more than 3.0m above ground level.

e) Any portion of buildings subject to inundation shall be built from flood compatible materials.

f) Flood safe access and emergency egress shall be provided to all new developments and for dwelling replacements where practicable.

Flood safe access means access that is generally considered satisfactory when the depth of flooding over vehicular driveways and roads is limited to approximately 0.25m with low velocities.

g) All services associated with the development shall be adequately flood proofed.

h) A certificate, prepared by a registered surveyor to verify the lowest floor level of a habitable room of a residential building to the required Australian Height Datum (AHD) level, shall be submitted to the Council upon completion of the building to that level. The building shall not be further constructed until approval is given by Council to proceed with construction works.

4) Residential - Minor Extensions

a) This section does not apply to minor extensions for the purpose of dual occupancy development, an existing single storey home which retains essentially the outer walls of the existing dwelling and proposes an upper floor addition, a knockdown rebuild that retains exactly the same building footprint, or a building burnt down and replaced with the same building footprint. These shall be treated as new development.

b) Once only extensions with a floor area up to 30m^2 may be approved with floor levels below the 1% AEP (100 year ARI) flood, if the applicant can demonstrate that no practical alternatives exists for constructing the extension above the 1% AEP (100 year ARI) flood.

c) Once only extensions which increase the existing floor area by between 30 and 35m^2 may be approved with floor levels at or above the 1% AEP (100 year ARI) flood.

d) Extensions greater than 35m^2 will be treated as a new development.

5) Non-Habitable Extensions or Alterations, Outbuildings and Swimming Pools

a) All electrical services shall be adequately flood proofed.

b) All flood sensitive equipment (including electric motors and switches) shall be located above the 1% AEP (100 year ARI) flood.

6) Industrial/Commercial - New Development

a) Floor levels shall be at least 0.5m above the 1% AEP (100 year ARI) flood or the buildings shall be flood-proofed to a least 0.5m above the 1% AEP (100 year ARI) flood. If floor levels are below the 1% AEP (100 year ARI) flood the matters listed in section 7 i) – vii) shall be addressed.

b) Flood safe access and emergency egress shall be provided to all new developments.

7) Industrial/Commercial - Extensions and Infill Development

a) Where the application is for an extension to an existing building on land at or below the flood planning level or for new development that can be classed as infill development, Council may approve of the development with floor levels below the 1% AEP (100 year ARI) flood if it can be demonstrated by the applicant that all practical measures will be taken to prevent or minimise the impact of flooding. In considering such applications and determining the required floor level, Council shall take into account such matters as:

i) The nature of the business to be carried out;

ii) The frequency and depth of flooding;

iii) The potential for personal and property loss;

iv) The utility of the building for its proposed use;

v) Whether the filling of the site or raising of the floor levels would render the development of the property unworkable or uneconomical;

vi) Whether the raising of the floor levels would be out of character with adjacent buildings; and

vii) Any risk of pollution of water from storage or use of chemicals within the building.

b) Any portion of the proposed building extension subject to inundation shall be built from flood compatible materials.

8) Change of Use of Existing Buildings

a) Development consent for change of use of an existing building with floor levels below the 1% AEP (100 year ARI) flood will only be given where it can be demonstrated by the applicant that:

i) There is no foreseeable risk of pollution associated with the proposed use of the building in the event that the 1% AEP (100 year ARI) flood occurs;

ii) All practical measures shall be taken to minimise the risk of flood damage to the property within the building by the 1% AEP (100 year ARI) flood. These measures could include:

- Flood proofing the building to the level of the 1% AEP (100 year ARI) flood by either construction of a wall or levee bank or some other means of preventing water entry;

- Raising the floor level of the building to the level of the 1% AEP (100 year ARI) flood; and/or
- Storing all equipment, machinery and stock above the 1% AEP (100 year ARI) flood level.

9) Rural Uses

a) Applications for minor extensions to existing buildings and new buildings associated with rural uses that are below the 1% AEP (100 year ARI) flood (other than residential buildings) will be considered on their merits having regard to the proposed use and the potential for property loss.

10) Subdivision

a) Generally, subdivision of land below the flood planning level will not be supported. Further provisions relating to the proposed subdivision of such land can be found in the Subdivision Section of this Plan.

11) Residential Accommodation and Caravan Parks

a) Applications for residential accommodation, defined in the LEP, with the exception of dwelling houses, will be treated as per subdivisions. Applications for caravan parks will also be treated as per subdivisions. Other land uses which may attract large numbers of people.

b) Council will generally not support an application for any land use which may attract large numbers of people (including schools, function centres, child care centres, hostels, etc.) on land below the flood planning level and on land that cannot be safely and effectively evacuated during a 1% AEP (100 year ARI) flood event.

12) Storage of Potential Pollutants above 1% AEP (100 year ARI) Flood

a) All potential pollutants that are stored or detained on-site (such as on-site effluent treatment plants, pollutant stores or on-site water treatment facilities) should be stored above the 1% AEP (100 year ARI) flood. Details must be provided as part of any application to Council.

13) Overland Flow Flooding

a) Council has undertaken a Penrith Overland Flow Flood 'Overview' Study. Consideration must be given to the impact on any overland flow path. Generally, Council will not support development obstructing overland flow paths. Development is required to demonstrate that any overland flow is maintained for the 1% AEP (100 year ARI) overland flow. A merit based approach will be taken when assessing development applications that affect the overland flow.

~~a)~~b) Council's *Stormwater Drainage Specification for Building Developments* provides information on the details required in the preparation of an overland flow study.

14) Filling of Land At or Below the Flood Planning Level

a) Council will not grant consent to filling of floodways or high hazard areas. The filling of other land at or below the flood planning level will generally not be supported; however, Council will adopt a merits based approach. In particular, an application to fill land shall also

describe the purpose for which the filling is to be undertaken. Council may consider such an application when the following criteria are met:

i) Flood levels are not increased by more than 0.1m by the proposed filling;

ii) Downstream velocities are not increased by more than 10% by the proposed filling;

iii) Proposed filling does not redistribute flows by more than 15%;

iv) The potential for cumulative effects of possible filling proposals in that area is minimal;

v) There are alternative opportunities for flood storage;

vi) The development potential of surrounding properties is not adversely affected by the filling proposal;

vii) The flood liability of buildings on surrounding properties is not increased;

viii) No local drainage flow/runoff problems are created by the filling; and

ix) The filling does not occur within the drip line of existing trees.

b) The above criteria can only be addressed and satisfied by the submission of a detailed flood study report by an appropriate consulting engineer. The flood study report would involve both hydrologic and hydraulic analysis of the watercourse and the effects of the proposed filling on flood levels, flow velocities and distribution of flows as listed in i) to iii) above. In addition, the report needs to address items iv) to ix) listed above. Any filling of land also needs to be in accordance with the other provisions in this Plan.

15) Rezoning of Land

a) Council will not support the rezoning of any land located in a floodway or high hazard area.

b) Council will generally not support the rezoning of rural land situated below the 1% AEP (100 year ARI) flood where the development of that land may require or permit the erection of buildings or works even if the surface of the land can be raised to a level above the 1% AEP (100 year ARI) flood by means of filling.

c) Where land below the flood planning level is currently zoned to permit urban development, Council will generally not support the rezoning of land to permit a higher economic use or an increase in the density of development.

D. Other Information

People seeking further information on flood planning lands or preparing development applications may wish to refer to the following:

- Penrith City Council's *Stormwater Drainage Specification for Building Developments*
- NSW Government's *Flood Prone Land Policy* and associated *Floodplain Development Manual* (2005)
- Penrith City Council's *Sustainability Blueprint for urban release areas* (June 2005)
- *Standard - Construction of Buildings in Flood Hazard Areas* and accompanying handbook, developed by the Australian Building Codes Board (2012).

3.6. Stormwater Management and Drainage

A. Background

Stormwater is a term used to describe water that originates primarily from rainfall or from runoff water that enters the stormwater system. Stormwater that does not soak into the ground becomes surface runoff, which either flows into surface waterways or is channelled into ~~storm sewers~~ stormwater systems. In Penrith, stormwater generally drains to the street ~~sewers~~ drainage system or drainage easements in urban areas.

There are two main issues in relation to stormwater - one related to the volume and timing of runoff water (flood control and water supplies) and the other related to potential contaminants that the water is carrying (water pollution).

Because impervious surfaces (parking lots, roads, buildings) do not allow rain to infiltrate into the ground, more runoff is generated than in the undeveloped condition. This additional runoff can erode watercourses as well as cause flooding when the stormwater collection system is overwhelmed. Excess water can also infiltrate soils and raise water tables resulting in additional salinity issues.

One solution to address stormwater issues is on-site detention. On-site detention is the provision of depressed areas or specific storage in paved or landscaped areas, with relatively small stormwater outlets, that detain a volume of water for a short duration during more intense storms. This prevents or mitigates any increase in peak stormwater flow rates from development and delays the peak volume of runoff. It is important to note that on-site detention systems are required to release water after the peak storm event to provide capacity for future events. Therefore, on-site detention systems do not include rainwater tanks, water retention basins or dams. These are dealt with later in this section of the DCP.

In addition, to help address stormwater issues, drainage structures off-site may need to be upgraded as a result of new development. Generally, the developer is responsible for the full or partial cost of upgrading structures where it can be demonstrated that the proposed development overloads the existing drainage system.

The aim of these controls is to ensure that developments minimise their impact on the water cycle by minimising impervious surfaces, providing on-site storage for stormwater to reduce peak events and ensuring that stormwater systems are upgraded to manage any additional stormwater flows.

Relevant Stormwater Drainage Policy

Council has adopted the Stormwater Drainage Specification for Building Developments. This policy provides guidance to ensure that stormwater drainage for building developments is designed to provide a robust, safe and low maintenance system to manage stormwater impacts on the drainage network and surrounding properties in a holistic manner that is incorporated aesthetically with the overall development.

This policy sets out Council's minimum requirements for the provision of stormwater drainage principally to building development sites, and should be used in conjunction with the Penrith DCP and other policies referred to in the Stormwater Drainage Specification for Building Developments.

B. Objectives

a) To prevent damage by stormwater to the built and natural environment;

b) To ensure that new development does not generate stormwater discharges that exceed the capacity of the existing drainage network;

c) To ensure that an adequate and environmentally acceptable method of removing surface water and stormwater is implemented;

d) To minimise nuisance flows of stormwater from one property to adjoining properties;

e) To maximise reasonable on-site detention, to provide opportunities for rainwater re-use;

f) To minimise hardstand and impervious areas on developed land to minimise run off;

g) To provide a stormwater system which can be maintained economically;

h) To provide a stormwater system which utilises open space in a manner compatible with other uses;

i) To control flooding and enable access to allotments, stabilise the land form and control erosion; and

j) To minimise urban runoff pollutants to watercourses.

C. Controls

1) Natural Environment

a) Runoff must not be discharged into bushland areas, including threatened ecological communities.

b) Pipe outlets shall be treated with measures to dissipate stormwater velocity, except where waters enter a formed channel or similar structure that is unlikely to be damaged by water flowing in at high velocity.

c) Permeable ground surfaces are to be maintained as far as possible, and where suitable conditions exist, stormwater is to be infiltrated on-site.

2) Drainage

a) Council's Stormwater Drainage Specification for Building Developments provides details on drainage requirements including on-site detention, new drainage systems and the like.

~~a)~~b) The development of any lot should take into account the existing drainage patterns of the area, including any localised ponding, and whether the proposed development is likely to affect:

i) Access to the site;

ii) Drainage on adjoining properties;

iii) Localised nuisance flooding on adjoining properties; and

iv) Natural overland flow or drainage paths.

~~b)~~c) In areas where there are no defined drainage patterns, Council may require the applicant to liaise with the adjoining owners regarding the construction of a drain or channel to an existing watercourse. This may include the provision of drainage easements.

~~c)~~d) Depending on the scale of the proposed development, the applicant may be required to address the following matters in their application:

i) The drainage capacity available for the site (e.g. if the site is connected to a centralised stormwater system, the existing drainage network capacity);

ii) Where capacity may be limited, appropriate drainage measures, including possible on-site detention (determined by liaising with Council's Development ~~Services~~ Engineering Unit and receiving detailed advice from a qualified engineering consultant);

iii) If the site is affected by drainage constraints, the current stormwater discharge and likely future discharge. In this regard, a report prepared by a qualified engineer will be required and should demonstrate that the development will not overload trunk drains during peak storm events or cause localised flooding;

iv) If the proposed development will result in additional pollutant loading (and the appropriate licences have been obtained from the relevant government authorities), details demonstrating that the drainage systems have adequate capacity for those pollutants and runoff will comply with the water quality requirements referred to in this Plan; and

v) Any required easements across neighbouring properties. Where easements are required, Council requires the submission of the adjoining owner's consent with the development application.

~~d)~~e) If the site does not have access to Council's stormwater drainage system, all drainage should be designed to ensure that the intensity, quantity and quality of surface runoff is not detrimental to downstream properties and watercourses. A legal point of discharge will be required.

~~e)~~f) If the site has access to Council's stormwater drainage system, all roof and surface water that is not recycled for use on the site must be discharged into Council's stormwater drainage system. No surface drainage will be permitted to discharge across Council's footways or reserves or enter adjoining land.

~~f)~~g) The applicant should demonstrate how existing soil type and associated constraints (e.g. salinity and poor percolation) have been considered in the drainage design).

On-Site Stormwater Detention (OSD)

a) Council's *Stormwater Drainage Specification for Building Developments* provides details on drainage requirements for on-site detention.

~~a)~~b) Adequate stormwater systems shall be designed and constructed to ensure that, for all rainwater events up to and including the 1:100 Average Recurrence Interval (ARI) event, new developments and redevelopments do not increase stormwater peak flows in any downstream areas.

~~b)~~c) On-site stormwater detention systems must release water after any rainfall event to maximise future capacity and, therefore, cannot include rainwater tanks, water retention basins or dams.

~~c)~~d) Detention storage is to be located at a level that is above the 1:5 ARI flood level.

~~d)~~e) On-site detention systems are to be designed using a catchment wide approach. Advice should be sought from Council's Development Engineering ~~Services~~ Unit in this regard.

~~e) For developments above 2 hectares, designs shall be prepared by a suitably qualified civil engineer.~~

f) On-site stormwater detention mechanisms should have a maintenance program in place.

g) On-site stormwater detention mechanisms should be placed on the title of the relevant allotment/property to ensure their retention and maintenance.

New Drainage Design

a) Any new piped drainage system shall be designed to control minor stormwater flows under normal operating conditions for an ARI of 5 years.

b) Any new drainage system shall be designed to control major stormwater flows under normal operating conditions for an ARI of 100 years.

~~b)~~c) Council's *Stormwater Drainage Specification for Building Developments* provides details on drainage requirements for on-site detention.

D. Lifting the Bar

The following represent some ways in which applicants can demonstrate additional commitment to the stormwater management principles expressed in this Plan. Demonstration of this commitment may lead to Council considering variation of development controls. Applications that vary the development controls listed in this section will need to demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) Stormwater detention on site should have capacity to improve the quality of water leaving the site from pre-development state. This may involve treatment of water flowing into the site from upstream properties.

E. Other Information

People seeking further information on stormwater management and drainage or preparing development applications may wish to refer to the following:

- Penrith City Council's *Stormwater Drainage Specification for Building Developments*
- *Australian and New Zealand guidelines for fresh and marine water quality* (2000) Australian and New Zealand Environment Conservation Council
- National Water Quality Management Strategy No 10: *Australian Guidelines for Urban Stormwater Management* (2000)
- *Penrith City Council's Water Sensitive Urban Design Policy,* (December 2013)
- Penrith City Council's *Water Sensitive Urban Design Technical Guidelines,* (December 2013).

3.7. Water Retention Basins/Dams

A. Background

Relevant Policies for Water Harvesting

The NSW Farm Dams Policy (harvestable right dams' policy) allows rural landholders to harvest a basic volume of water (10% of runoff), store and use that water for any purpose without the need to obtain a licence under the *Water Management Act 2000*. The policy has a number of exceptions, exemptions and location variations and advice from the Office of Water should be sought. Any take of water over and above 10% runoff would require a water access licence and an approval.

Information on water sharing and how to calculate harvestable rights can be found on the Office of Water website http://www.water.nsw.gov.au/.

Relevant Policies for Dam Construction and Safety

Dams that are classified as prescribed under the *Dams Safety Act 1978* need to be registered with the Dam Safety Committee. Prescribed dams are those dams that have a significant impact on community interests in the event of dam failure. All dams higher than 15m are prescribed. For smaller dams, the Dam Safety Committee determines whether prescription is necessary based on the consequence of dam failure occurring in the:

- event of a natural flood (Flood Consequence Category); and
- absence of a natural flood (Sunny Day Consequence Category).

Although registration is required for very few dams, proposed dams should be checked with the Dam Safety Committee.

Dam safety can be a major issue depending on the stability of the geology/soils, the size of the dam and the size and characteristics of the dam's catchment. Specific advice on the construction of dams can be obtained from the Office of Water.

Factors to be considered include:

a) The location of the dam in relation to local water flows;

b) Dam construction – wall design, heights, method of construction, etc;

c) Volume of water and extent of the land inundated when the dam is at capacity;

d) The relative height and dimensions of the by-wash to control the dam's capacity or the provisions to ensure that inundation of land does not exceed the specified extent; and

e) Provision for passing flows.

Information on the type, size, location and consequence category (i.e. failure consequences) of new dams is critical for the Dam Safety Committee's consideration to determine the need, or otherwise, to prescribe the dam. The Dam Safety Committee's website provides a form to assist with enquiries. Once approved, the dam design or location should not be altered without the agreement of the Dam Safety Committee.

B. Objectives

a) To provide controls for water harvesting to limit the impacts on the natural water cycle and ensure water flows to natural waterways and river systems;

b) To allow water harvesting to support essential rural land uses, especially agricultural uses;

c) To ensure that water retention basins and dams are designed and constructed in accordance with the relevant State policies and guidelines for safety.

C. Controls

1) Council's consent is required to construct or form a dam, pond, lake or water retention basin where it will collect more than 10% of surface run-off (as determined by a hydraulic engineer and/or by Council).

2) The design and location of any water retention basin/dam should be carefully considered within the catchment area of the site to protect natural flows to natural waterways and river systems.

3) Dams need to be appropriately constructed to ensure they will not have an adverse impact on surrounding properties either by ponding water back up onto upstream properties or by concentrating water to any downstream properties.

4) Where possible, water retention basins/dams should seek to minimise disturbance to existing vegetation. Where possible, they should also be landscaped to minimise visual impact and provide shade to minimise evaporation losses and reduce algae growth.

5) If a dam is to be breached intentionally, an analysis of the sediment in the dam must be carried out prior to breaching to identify potential pollutants. If necessary, a remediation action plan or plan for disposal of contaminated sediment must be developed. Dam breaching must be carried out in a manner which does not impact on downstream properties.

3.8. Rainwater / Storage Tanks

A. Background

This section aims to ensure that the location, types, materials and colours for any rainwater or other storage tanks are considered as part of the entire site design and are sympathetic to the rural and landscape character of the area. Use of rainwater tanks is consistent with the NSW State Government's objective of reducing the amount of potable (drinking) water consumed for non-potable uses, like flushing toilets and in gardens. Therefore, provision of a rainwater tank can form part of a BASIX commitment listed within the BASIX certificate to meet reduced water consumption targets.

If water in rainwater tanks is intended for human consumption, the tank must be appropriately maintained. Refer to the Australian Government's *Guidance on use of rainwater tanks* (2010) produced by the Environmental Health Committee for further information.

B. Objectives

To ensure that rainwater or other water storage tanks and associated structures are:

a) Appropriately located and designed (with appropriate types, materials and colours) to minimise the visual impact on any rural, scenic or landscape character of any area;

b) Integrated into the design of any cluster of buildings or as part of the primary dwelling during the site planning and design process;

c) Designed and/or constructed in accordance with the necessary guidelines to ensure safety and structural stability;

d) Designed to minimise the entry of contaminants into any water that may be harvested for drinking purposes.

C. Controls

1) General Requirements

In many cases, rainwater tanks may be exempt development under *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* and development consent may not be required. Where development consent is necessary, the following additional requirements apply:

a) Rainwater tanks must not exceed 3m in height above ground level (including stand).

b) Rainwater tanks must not collect water from a source other than gutters or down pipes on a building or a water supply service pipe.

c) Rainwater tanks must be structurally sound.

d) The rainwater tank, and any stand for the tank, must:

   i) Be assembled and installed in accordance with the manufacturer's specifications; and

   ii) Not rest on a footing of any building or other structure on the property including a retaining wall.

e) Rainwater tanks must utilise prefabricated materials or be constructed from prefabricated elements designed and manufactured for the purpose of construction of a rainwater tank.

f) A rainwater tank must be enclosed and inlets screened or filtered to prevent the entry of foreign matter or creatures.

g) A rainwater tank must utilise a non-reflective finish. Materials and colours should complement those used on the dwelling house and any other buildings on the land.

h) Plastic rainwater tanks are not to be used in bushfire prone areas.

i) Rainwater tanks on land zoned E3 Environmental Management or E4 Environmental Living must have a maximum total capacity for the entire property of:

   i) 90,000 litres (where the property has an area of 10 hectares or greater); or

   ii) 45,000 litres (where the property has an area of less than 10 hectares).

D. Other Relevant Information

People seeking further information on rainwater/storage tanks may wish to refer to the following:

Penrith City Council's Stormwater Drainage Specification for Building Developments

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C6 Landscape Design

A. Background

Landscaping can have an impact on the scenic quality of an area. It can complement built forms and enhance the amenity of adjacent spaces and buildings. It can also improve a development's environmental performance in terms of managing water and land impacts.

The process for preparing and submitting landscape designs for development is described in Table C6.1 below. The table also describes the process for the implementation and approval of landscaping works, including the role of landscape design professionals in overseeing and reporting on such works.

Table C6.1

Step No.	Summary	Detail
1	Decision to develop	Determine what landscaping category the proposal falls within.
2	Employment of appropriate landscape professional	Landscape design consultant undertakes design in accordance with the controls outlined in this Section.
3	Lodgement of DA	Development application, including required landscaping information, is lodged with Council.
4	Determination of DA	Council approves or refuses DA.
5	Conditions of consent	If approval is granted, the consent may include conditions relating to one or all of the following issues: • Requirement for various post approval landscaping reports. • Requirement for a landscaping bank guarantee to be paid.
6	Employment of appropriate landscape contractor to implement proposal.	Approved landscaping works are constructed and implemented in accordance with the consent.
7	Implementation Report	On completion of the landscaping works, an implementation report is to be provided to and approved by Council. This will provide written certification that the works have been completed in accordance with the consent and this section .
8	Occupation certificate	On receipt of an acceptable implementation report and any other non-landscape requirements of Council, the occupation certificate may be issued.

Step No.	Summary	Detail
9	Maintenance Report	A maintenance report is to be provided 12 months after the occupation certificate date. This is to certify that the landscaping works are still in accordance with the consent and that the plant material has established and is thriving.
10	3 year landscaping report	Council may place a condition on consents for larger and more visually prominent developments requiring that a 3 year landscaping report be provided. This report is to be provided 3 years after the issuing of an occupation certificate and is to certify the following: • That landscaping has matured and is in accordance with the original landscape approval, or • That landscaping has not matured and is in accordance with the original design philosophy and requires significant restoration. If the latter is the case, restoration plans are to be submitted to Council for approval and implemented at the expense of the property owners.

Legal Qualifier: This Section provides guidance and advice on landscaping and the development process and in some cases minimum acceptable standards which must be met. The provision of this advice, minimum standards and the approval of landscape information with a development application in no way results in Council being legally responsible for the damage that a plant species or landscape element may cause to property or person.

B. Objectives

a) To promote landscape design and planning as part of a fully integrated approach to site development;

b) To ensure landscape design takes into account the site's context, landscape and visual character, existing landscape features and amenity, both at the local and regional scale;

c) To encourage the development of quality landscape design associated with new development that is consistent with industry best-practice;

d) To encourage the retention of existing trees and vegetation to enhance landscape character;

e) To ensure landscape design adequately complements the proposed built form and minimises the impacts of scale, mass and bulk of the development in its context;

f) To encourage landscape design that can be effectively maintained to a high standard for the life of that development; and

g) To establish a framework for allowing "Controlled Private Certification" of the landscape design components of new developments.

6.1 Controls

6.1.1. Development Process

1) Development Categories

This section classifies all development in the Penrith local government area into 3 categories (see Table C6.2 below). Each of these categories has different requirements in relation to the landscape design component of the development (i.e. different parts of this section apply to different types of developments).

Table C6.2

Category	Definition
Category 1	• New single dwelling houses • Alterations and additions to single dwelling houses • Minor alterations and additions to commercial and industrial development as determined by Council • Complying development • Other minor development that in the opinion of Council would not have a significant impact on the amenity of the locality.
Category 2	• All work below $2 million that is not listed in category 1 • Any development in category 1 which in the opinion of Council would have a significant impact on the amenity of the locality.
Category 3	• All developments that are above $2 million in value • Any development that is on a site with significant environmental considerations as determined by Council. • Any development that will have a significant public domain impact as determined by Council. • Any development that involves the alteration or addition to a heritage item or a property in a heritage conservation area.

In Table C6.2, there are several parameters that require an opinion or determination from Council to determine which category applies. In this regard, applicants will need to contact Council's Development Services Department for advice.

2) Submission Requirements

Depending on the type of development proposed, different types of vegetation and landscaping information will be required as part of the development application. Table C6.3 below lists the type of information to be submitted for the various categories of development.

Note: Applicants should also refer to the 'Vegetation Management' section of this Plan where landscaping works involve ringbarking, cutting down, topping, lopping, removing, injuring or wilfully destroying any tree or other vegetation prescribed under that section.

Table C6.3

Required Information	Category 1	Category 2	Category 3
Site Analysis	✓	✓	✓
Tree Survey and Assessment Report/Arboricultural Survey Report	❖	❖	✓
Tree Management Plan	❖	❖	❖
Landscape Concept Plan	❖	✓	✓
Landscape Detail Plan and additional details		❖	✓

✓ Required Information

❖ Information may be required depending on the scale of the project, the site conditions and location. (Please discuss with Council).

a) Detailed requirements for the information that must be addressed by these reports is set out in Appendix F3 of this DCP. All applicants should review and address these information requirements in their submissions.

b) If more than one type of information is to be submitted with the development application, it may be appropriate for the information to be combined in the one plan or document. This depends on the scale and complexity of the proposal, and its potential impact on the environment and amenity.

c) Landscape plans must be prepared by a suitably qualified consultant. Landscape design consultants who are members of accredited organisations should be engaged to ensure professional standards are achieved. Accredited organisations include: Australian Institute of Landscape Architects and Australian Institute of Landscape Designers and Managers.

d) Landscape construction should be carried out by a qualified landscape contractor to ensure that adequate standards of workmanship are achieved. Landscape contractors who are members of the Landscape Contractors Association of NSW should be engaged where possible.

e) Development that falls into Category 1 will generally not be required to submit landscaping information; however, landscaping of such development should be designed in accordance with the landscape requirements of this section. In some cases, Council may consider that a proposal in Category 1 warrants a *tree survey and assessment report* (see the 'Vegetation Management' section of this Plan) and/or *Landscape Concept Plan*. If this is the case, this information may be prepared by anyone provided it is of a suitable standard.

f) On completion of the landscaping works (and prior to an occupation certificate being issued by Council), an *Implementation Report* is to be submitted to Council. This is to provide written certification that the works have been completed in accordance with the consent and the provisions of this DCP (See Appendix F3 for further details).

g) Twelve months after the date of the occupation certificate, the Implementation Report and the approved landscape design must be submitted with a *Maintenance Report*. This is to certify that the landscaping works are still in accordance with the consent and that the plant material has established and is thriving (See Appendix F3 for further details).

h) Council may place on consents for larger and more visually prominent developments, a condition requiring that three years after the date of the occupation certificate, an Implementation Report and Maintenance Report and 3 Year Landscaping Report must be submitted (see Appendix F3 for further details). This is to certify one of the following:

   i) The landscaping has matured and is in accordance with the original landscape approval. (This includes retained vegetation being in good condition); or

   ii) The landscaping has not matured in accordance with the original design philosophy and requires significant restoration. (This includes retained vegetation declining in condition or has died). If this is the case, restoration plans are to be submitted to Council for approval and implemented at the expense of the property owners.

6.1.2. Protection of the Environment

1) Environmentally Sustainable Design

Council requires that all landscape designs promote best practice Environmentally Sustainable Development principles. Some of these measures are addressed in the controls below and include the following:

a) Planting deciduous trees - These are best planted on northern and western aspects. This will allow the sun in during winter, and provide shelter from the sun in summer and morning sun year round adding to energy efficiency;

b) Selecting low water/low maintenance plants, including drought tolerant species;

c) Planting native or indigenous plants – These plants have lower water requirements and have evolved to cope best with the existing conditions, hence reducing maintenance, fertilising and watering requirements;

d) Using irrigation systems that utilise drip irrigation systems;

e) Using recycled and biodegradable products in the landscape design - Such elements could include recycled soils and other hard paving features;

f) Allowing for composting, mulching and worm farms on site;

g) Using quality, long lasting materials; and

h) Using soils and mulches manufactured with recycled waste.

2) Soil Landscapes

Any Landscape Plan or assessment should include a study of the soil profile on the particular site and select plant species accordingly. In this regard, soil landscape maps and accompanying interpretive reports for Western Sydney have been produced (by the former Department of Natural Resources) and may be of assistance.

3) Minimising Soil Erosion

a) Landscaping works must comply with the ‘Erosion and Sedimentation’ in the ‘Land Management’ section of this DCP, including the submission of an Erosion and Sediment Control Plan where required under that section.

b) Care should be taken when undertaking landscaping works to ensure that soil from the site and any that may be brought to the site is not lost into the drainage system or surrounding environs as this may impact on indigenous flora and fauna and local waterways.

c) Sediment control measures are to be installed prior to any excavation on site. These measures are to be maintained throughout construction of the landscaping works and until the landscaping is established.

4) Avoidance of Excavation and Filling

a) Landscape works must comply with the 'Site Stability and Earthworks' controls in the 'Land Management' section of this DCP.

b) Landscaping works should minimise any earthworks by accommodating the natural landform and utilising designs that require minimal cut and fill, particularly around existing trees to be retained.

5) Conserving Site Soil

a) Where it is necessary to remove areas of topsoil as a result of cut and fill requirements, this should not be removed from the site but stockpiled in another part of the site for re-use in the landscaping process. This is both beneficial for the environment and saves money.

b) The following controls apply to topsoil stockpiled on-site:

   i) Do not store topsoil in any of the tree protection areas (see item 8 below);

   ii) Ensure that the stockpile is stabilised during the construction period by covering it with hessian, mulch or a cover crop;

   iii) Ensure that the stockpile will not blow away on windy days by either providing adequate covering or ensuring that it is kept well watered; and

   iv) Use appropriate sediment and erosion control techniques to ensure that the stockpile is retained and does not leave the site.

c) The proposed location and management of stockpiles of topsoil should be detailed in the landscape information that accompanies the development application.

6) Species Selection

a) Plant selection for all landscaping works must consider and will be assessed for its suitability to existing site conditions such as soils, aspect, drainage and micro-climate.

b) Native species is encouraged for any landscape design.

c) The use of exotic or introduced species may be considered if they are part of a site's and locality's existing landscape character and there is a low chance of spreading into native bushland.

d) If a site has remnant native bushland or is located adjacent to native bushland, the plant species that should be used in the landscape design should be those that occur in the bushland, preferably provenance stock.

e) Species selected should not include those listed in the *Noxious Weeds Act 1993* or on the list of environmental weeds (see Appendix F5 Technical Information to this DCP).

f) Planting should consist of a variety of trees, shrubs and ground covers to contribute to biodiversity.

7) Bushfire Resistant Species

To determine whether a particular site is 'bushfire prone land', advice should be sought from Council's Development Services Department. In these areas, appropriate landscape design and plant species selection will help reduce the risk of bushfires. While no plant is fire proof or completely fire resistant, some plants are less flammable than others.

Landscape design and plant selection should consider bushfire risk. The recommended list of indigenous species in Appendix F5 has a reference to some plants, which are appropriate to these areas due to their low level of flammability and ability to regenerate after a fire.

8) Protection of Trees and Vegetation on Construction Sites and Adjoining Public and Privately Owned Land

a) If a Tree Management Plan is required, it must identify the vegetation that is to be retained with the development and how it will be protected during and after construction. Tree protection measures must be in accordance with Australian Standard AS4970-2009 Protection of trees on development sites.

b) Where existing vegetation is to be retained, that vegetation must be protected from soil compaction, root, trunk and limb damage, soil contamination and changes in surface levels that affect the health of the vegetation.

c) The Tree Management Plan is to be in place prior to commencement of any site works. "Site works" includes the demolition of existing structures or the entrance onto the site of any machinery for excavation, demolition or large scale rubbish removal. Protection measures are to be installed prior to the commencement of any site work in accordance with Australian Standard AS4970-2009 Protection of trees on development sites.

d) Trees, vegetation and their root zones on public property and private land adjacent to the development site may also need to be protected during the construction process. A common example of this is the protection of street trees located in the public footpath. These trees and vegetation will also need to be included in the Tree Management Plan and protected in accordance with its recommendations.

9) Vegetation Communities

a) In some cases, there may be sites that contain remnant native vegetation. Where remnant native vegetation exists on a site, a flora and fauna assessment report will be required. (See the 'Vegetation Management' section of this Plan for further details). The purpose of the flora and fauna assessment report is to determine whether the proposed development, including landscaping works, are likely to significantly affect any threatened species, populations or ecological communities or their habitats listed under the *Threatened Species Conservation Act 1995*.

10) Irrigation/Water Consumption

a) Landscape design should minimise water consumption through selection of indigenous and drought-tolerant species and use of water retaining mulches and soil treatments. It should also include species that can act to establish a micro-climate quickly to assist slower growing species and reduce water consumption.

b) If additional watering is required, preference is for low water usage irrigation devices, such as drip irrigation systems, during the plant establishment period.

c) The proposed irrigation system should be detailed in the landscape information submitted as part of the development application.

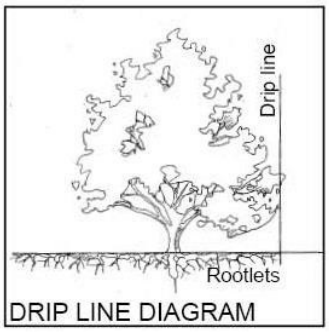
11) Minimisation of Impervious Surfaces

a) Where possible, all landscape designs should include permeable paving options. Permeable paving includes the use of permeable/porous paving units, ornamental gravel and paving on a compacted sand bed. The benefits of using permeable paving include:

   i) Ensuring that air and water are available to roots to ensure healthy, secure growth;

   ii) Providing a safe and stable pedestrian/vehicular surface treatment; and

   iii) Assisting in the protection and conservation of large, established trees where the root system extends beyond the drip line.



DRIP LINE DIAGRAM

b) The following minimum areas of permeable surfaces are required to facilitate on-site stormwater infiltration for each land use:

   i) Residential – please refer to controls included in the Residential Development section of this Plan.

   ii) Industrial - 15% of the site area.

12) Salinity

a) Landscape designs must take into account the salinity controls in the 'Land Management' section of this Plan.

b) All landscape designs should consider soil salinity and undertake the following practices:

   i) Select salt tolerant plant species and raise garden beds, ensuring adequate drainage;

   ii) Use mulch in all garden beds;

   iii) Minimise the area of lawn as this requires large quantities of water;

   iv) Use 'water wise' garden design features (including timers, selection of plants with low water needs, grouping plants of similar water usage together, etc);

   v) Plant native trees and shrubs;

   vi) Use non-corrosive materials when constructing pipes and channels;

   vii) Assess current and proposed water storages, artificial lakes and drainage basins as they contribute to groundwater recharge, and minimise where possible;

   viii) Correct drainage to protect building footings and foundations; and

   ix) Refer to the Map of Salinity Potential in Western Sydney (DIPNR, 2002) and the accompanying Guidelines for advice on specific ways salinity may affect a particular site.

c) Soil tests and urban capability mapping are recommended to determine whether salinity is likely to be a problem. If the land is potentially affected by salinity, prevention and monitoring strategies should be employed, such as:

   i) Carrying out soil tests as advised by the Office of Environment and Heritage;

   ii) Ensuring adequate drainage is located away from buildings and associated infrastructure to avoid ponding;

   iii) Connecting roof drainage to stormwater systems, rather than sullage pits;

   iv) Monitoring changes in water table levels and groundwater quality by installing piezometer ('monitoring bore') networks;

v) Avoiding over-watering of lawns and gardens;

vi) Selecting plants with low water requirements and applying mulch; and

vii) Checking and repairing water leaks as soon as possible.

13) Materials Selection

a) Landscaping works must comply with the controls relating to the use of sustainable materials in the 'Waste Management' section of this Plan.

b) The use of recycled and biodegradable products is preferred in landscape design, such as recycled on-site soils and recycled hard landscaping materials.

6.1.3. Neighbourhood Amenity and Character

1) Landscape Character

a) Landscape design should reinforce the identified natural attributes of the site including, but not limited to, watercourses, landmark elements, landforms, views and vistas, significant trees, vegetation patterns and historic buildings.

b) Remnant native vegetation should be retained, managed and incorporated into landscape designs to conserve the natural biodiversity across the landscape.

c) Landscape design should enhance the amenity and visual quality of the site. Landscaping solutions are to be used to screen and enhance visually obtrusive land uses or building elements within their setting.

2) Integration of Design

a) All landscape and building designs should be complementary and aim to achieve similar design outcomes. The design of both buildings and landscaping should utilise the same site analysis drawings and concepts. In this way, the site will be developed with a building design and a landscape design that deliver the best possible development solution for the owners and the community.

3) Streetscape

a) All sites make a contribution to the streetscape by way of the design of any structures or vegetation. Therefore, any landscape submission must include an assessment of the streetscape.

b) Generally, Council requires that dominant positive streetscape elements are to be continued in the design of any landscaping works to ensure that the development integrates into and enhances the existing streetscape character. Features that contribute to the existing streetscape include:

i) Street trees and vegetation;

ii) Pavement materials/details;

iii) Architectural character;

iv) Setbacks of buildings and other structures;

v) Existing uses, e.g. residential/retail/industrial;

vi) Heritage items;

vii) Traffic – vehicular and pedestrian;

viii) Car parking – off street, on street, access, etc;

ix) Privacy;

x) Building heights, mass, material and colour;

xi) Links with other spaces;

xii) Street dimensions/scale – street width, verge and path treatments;

xiii) Lighting;

xiv) Maintenance issues, e.g. rubbish collection, letterboxes;

xv) Landscape style; and

xvi) Street furniture, fences, gates and signage.

c) Some elements of landscape design and streetscape that should be implemented include the following:

i) Landscape design should be used to soften the impact of buildings and as a visual element between the street and the development;

ii) Fencing that is forward of the building line should be incorporated with the landscape and consistent with that in the street or locality;

iii) Landscape design should be used to soften the impact of car parking areas; and

iv) In open car parking areas, one large shade tree for every 6 car spaces is to be provided as a minimum to improve visual amenity and reduce the heat island effect.

4) Community Safety

a) Landscape designs must comply with the safety and crime prevention controls in the 'Site Planning and Design Principles' section of this DCP.

b) All landscape designs should promote the safety of the community through the maximisation of natural surveillance and appropriate lighting. Such measures include the following:

i) Appropriate levels of lighting of public spaces such as driveways, gardens and links through the site;

ii) Appropriate lighting and visibility of the entry to dwellings;

iii) Provision of appropriate plant species that minimise opportunities for concealment of intruders and do not provide hidden recesses;

iv) Dwelling entries that are visible from the street or other public areas;

v) Fences or planting that allow glimpses or overview of the street, private courtyards and other open space areas;

vi) At driveways, street intersections and other crossing points, landscaping that does not block views between pedestrians and approaching vehicles; and

vii) Landscaping that does not prevent surveillance of car parking areas.

5) Fencing and Retaining Walls

a) Landscape designs must comply with fencing controls required by this DCP.

b) Fencing and retaining walls are an important part of any landscape design and can alter the style and character of the development and the streetscape. Considerations when designing fencing or screening include:

i) Rights of access;

ii) Community safety;

iii) Design;

iv) Aesthetics;

v) Existing vegetation;

vi) Boundaries, easements and emergency access routes - these are not to be compromised;

vii) Materials and size relative to the proportions, scale and character of the street, surrounding buildings and landscape; and

viii) Maintenance issues to avoid graffiti and vandalism, and life cycle cost (i.e. considering the cost of a product over its entire life span).

c) Retaining walls are to be kept to a minimum to reduce earthworks. See the 'Land Management' section of this DCP for requirements for excavation and filling.

d) All retaining walls are to be constructed of masonry or concrete material. Timber retaining walls are not permitted.

~~d)~~e) Development involving earthworks and retaining walls need to have regard for the amenity of any adjoining/surrounding properties and natural flow of water across the land. See Council's *Stormwater Drainage Specification for Building Developments.*

6) Planting on Structures

a) Landscape designs that propose planting on structures will require a Landscape Concept Plan which must outline how the area of planting on structures will be maintained for the life of the development.

7) Buffer zones

a) Where buffer zones are provided to help minimise land use conflicts, they must be densely planted in accordance with the requirements of this section of the DCP, using generally native or indigenous species. Council requires that these buffer areas be fully maintained continuously, with failed plants and trees to be replaced immediately with new plantings of the same species.

6.1.4. Site Amenity

1) Contextual Design

a) Landscape designs should seek to screen development, particularly from the sides and rear of an allotment.

b) Landscape design should be used to highlight architectural features, define entry points, indicate direction, and frame and filter views into the site. Landscape design should also be responsive to the bulk and scale of the development.

c) Shrubs and small trees should be used to screen service areas and block unwanted views that reduce privacy.

d) Plantings should be of advanced species except where it is demonstrated to Council's satisfaction that semi-advanced stock is more suited to soil and/or plant characteristics.

e) Landscape design should ensure that plantings when mature will not conflict with structures and services.

2) Open Space Requirements

a) The amount of open space is crucial to the landscape design. This amount will vary depending on:

   i) The use proposed on the site;

   ii) The requirements of the occupants;

   iii) Character of the neighbourhood;

   iv) Requirements in other sections of this DCP;

   v) Retention of mature/significant trees/vegetation; and

   vi) Whether the space is a private or public space.

b) Communal space/recreational facilities must be located and designed to avoid nuisance or danger to neighbours, residents and visitors. Consideration should be given to the type of activities to be undertaken, hours of use, noise generation and on-going maintenance and safety of the space/recreational facility. Consideration should also be given to:

   i) Separating conflicting activities (e.g. play spaces away from driveways); and

   ii) Including equipment such as seating, shade structures and children's play equipment.

c) Communal open space should generally have access only from within the site. Communal open space for multi dwelling housing should be accessible from all dwellings within the development. Surveillance of this space should be possible from at least 2 dwellings.

d) The design of a development should maximise solar access to all open spaces.

e) Trees should be selected and located to regulate solar access to buildings. Deciduous trees are best planted on northern and western aspects to allow solar penetration in winter and shade in summer.

3) Deep Soil Zones

a) Landscape design should maximise the area of a deep soil zone, especially around existing trees to provide sufficient soil depth for roots.

b) The following minimum areas for a deep soil zone are required for each land use:

   i) Residential - please refer to controls included in the Residential Development section of this DCP;

   ii) Industrial - 10% of the site area.

4) Equal Access

a) In accordance with the Federal *Disabilities Discrimination Act 1992* and the NSW *Anti Discrimination Act 1977,* and all relevant Australian Standards, the following design elements must be considered when designing any landscape projects to ensure equal access for people with disabilities:

   i) Pedestrian routes;

   ii) Tactile warning strips with a strong contrast to adjoining paving;

   iii) Stairways/steps;

   iv) Landings;

v) Ramps;

vi) Handrails;

vii) Seating;

viii) Lighting;

ix) Signage

x) Luminance contrast of street and park furniture.

5) Heritage

a) Landscape designs must comply with any relevant requirements of the 'Culture and Heritage' section of this DCP.

b) If a site is listed as a heritage item or is within a heritage conservation area, a heritage impact statement may be required**.** The landscape design is to retain any natural, cultural or architectural features that are essential to the conservation of the heritage significance of the place. The landscape design should respect the importance of these heritage features, be of a sympathetic style and form, and should be influenced by any relevant heritage landscape evidence.

For more information contact Council's Development Services Department.

6) Noise, Vibration and Dust Reduction

a) Where appropriate, all landscape designs are to incorporate landscape techniques to act as a barrier or buffer to reduce dust, noise and vibration levels from adjoining activities. Examples include fencing and planting adjacent to driveways and the like which can contribute to noise attenuation.

7) Location of Utility Services

The location of utility services, such as gas and electricity, can significantly impact upon existing vegetation and locations for proposed vegetation. As such, the following requirements are applicable:

a) Common trenching for compatible underground services should be maximised to reduce repeated disturbance to established plantings.

b) Overhead cabling of services should be placed in allocated easements.

c) Selected plant species should not obstruct or interfere with infrastructure facilities having regard to:

i) The mature height of trees and shrubs beneath overhead services; and

ii) The root growth of trees and shrubs and underground services.

d) Services should be located away from existing and proposed vegetation and their root zones.

8) Utility Areas

a) Waste and recyclables storage facilities should be located behind the building line and not adjacent to communal outdoor seating/recreation areas.

b) The storage area is to be suitably screened.

c) Outdoor clothes drying facilities are to be hidden from the street.

9) Landscaping and Above Ground On-Site Stormwater Detention

a) Landscape works must comply with the stormwater management and drainage requirements in the 'Water Management' section in this DCP.

b) All landscape works are to include provision for adequate drainage including collection or dispersal of stormwater runoff, prevention of ponding of water on pavements or discharge of runoff onto adjoining properties or public areas.

c) Above ground detention structures should be suitably landscaped to improve the visual amenity of the development.

d) Detention structures should be suitably integrated into the landscaping for the whole site, including common open space areas. Ideally, such structures should appear as a feature as opposed to an engineered structure or element.

e) Plant species used in these areas must be capable of withstanding periodic inundation and must not impact upon the functioning of the area as a detention structure.

f) Where above ground storage of detained water is proposed, the landscape design will be required to accommodate this through the following:

i) The maximum allowable depth of ponding in residential areas is 300mm, and in industrial/business areas is 1.2m;

ii) Subsoil drainage is to be installed around the outlet to prevent the area remaining saturated during wet weather;

iii) The maximum batter slope around a landscaped area is to be 1 in 4, with 1 in 6 being preferable;

iv) Mulching with wood or bark chip in storage areas subject to inundation in more frequent storm events (i.e. up to and including the 20% Annual Exceedance Probability (AEP) storm) is not considered desirable. Weedmat or similar should be used in these areas;

v) Those areas of the basin subject to inundation up to and including the 5% AEP storm are to be turfed. Trees may be planted in the turfed area. Shrubs and/or groundcovers may be planted above the 5% AEP water level; and

vi) Careful consideration should be given to the types of planting within the basin to ensure the area can be maintained and the storage volume is not reduced to an unacceptable level. If substantial planting is proposed within the basin, the storage volume is to be increased to accommodate this. Refer to the Landscape Technical Specifications in Appendix F5 Technical Information for a plan relating to some of the above details.

10) On-Site Effluent Disposal and Landscaping

a) As sewer is not available to some areas of Penrith, some developments may need to consider on-site effluent disposal, and in particular, land application areas for the disposal of treated effluent. If this is the case, specific vegetation will be required that can cope with this treated effluent. Appendix F5 provides a list of species which are appropriate for such land application areas. Additional requirements for on-site sewage management are included in the 'Infrastructure and Services' section of this DCP.

11) Car Wash Bays

a) Where appropriate, landscape designs should incorporate an area with a permeable surface where a car can be washed.

b) The car wash bay may be turfed or gravel and should prevent contaminants from entering the stormwater system.

6.1.5. Construction

All landscaping construction is to meet the minimum 'Landscape Technical Specifications' in Appendix F5 Technical Information to this DCP.

C. Lifting the Bar

The following represent some ways in which applicants can demonstrate additional commitment to the landscape principles expressed in this DCP. Demonstration of this commitment may lead to Council considering variation of development controls. Applications that vary the development controls listed in this section will need to demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) Landscape irrigation/watering systems should, where possible, utilise recycled grey-water/stormwater or water from on-site detention systems to avoid use of potable drinking water for this purpose; and

b) 'Greening' of all suitable roof spaces in order to reduce energy needs for cooling and create more sustainable roof designs.

D. Other Information

It is recommended that applicants seeking to address this issue also refer to other relevant information including:

- Centre for Architectural Ecology - Collaborations in Green Roofs and Living Walls: BCIT School of Construction and the Environment at http://commons.bcit.ca/greenroof/case.html
- Green Roofs Australia at http://greenroofs.wordpress.com/
- Penrith City Council's *Landscape Character Strategy* (2006)
- Penrith City Council's *Sustainability Blueprint for urban release areas* (June 2005)
- SEDA: Solar Access for Lots, Available at www.energysmart.com.au/brochures/Solar_Access_for_Lots_Guide.pdf.

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C13 Infrastructure and Services

A. Background

This Section seeks to address a number of issues relating to the provision of infrastructure and services, and the design and construction of engineering works. These issues relate to all development. However, the issues are particularly important in areas where there is limited access to infrastructure or services/utilities such as in rural areas or new release areas.

B. General Objectives

a) To ensure existing infrastructure and services, including easements, are taken into account in siting and designing any proposed development;

b) To ensure there is adequate provision of utilities and services to allotments to support any proposed development without significant additional burden on Council and utility providers;

c) To ensure on-site sewage management systems in the City's unsewered areas are sited, designed, constructed, operated and maintained to prevent risks to public health and the environment;

d) To achieve set engineering and construction standards for infrastructure, which is provided either by Council or a private developer; and

e) To ensure social facilities are provided in a manner appropriate to the proposed development.

C. Other Relevant Sections of this DCP

Penrith DCP 2014 is a multi-layered document that recognises the relationship of a number of issues to achieving sustainable outcomes. Therefore, in order to address infrastructure and services, it is important to read all relevant sections of this DCP.

13.1. Location of Easements for Infrastructure

A. Background

A number of properties within the City of Penrith are encumbered with major infrastructure that may affect the potential development opportunities for the site.

B. Objectives

The objective of this section is to ensure existing infrastructure and services, including easements, are taken into account in siting and designing any proposed development, and relevant service authorities are consulted.

C. Controls

1) Applicants should identify the type and location of infrastructure (including the easement) that is on the site and consult with the relevant service authority to determine whether the easement will be a constraint to development of the site.
2) Applicants should consider the likely impacts of locating adjacent to or on an easement and the likely land uses/activities proposed on the site. Buildings (including swimming pools) or the storage of flammable or explosive materials or flammable liquid carriers must not be located within easements.
3) Proposals that encroach into the easement will require the approval of the relevant service authority. It is recommended that applicants consult with the relevant service authority as part of the initial stages of the development concept.

13.2. Utilities and Service Provision

A. Background

An integral part of determining whether certain land uses are suitable for a site involves assessing whether the appropriate utilities and services are available on the site to service the proposed development, and whether they have sufficient capacity to meet the demand of the proposal (and any future increase in demand) in the area.

This issue is particularly relevant in rural areas and in new release areas where services may not exist. Even in urban areas, existing services may not be capable of meeting further demands placed by new development.

This section aims to ensure that development consent is only granted where a proposal can be appropriately serviced, either through the existing system having sufficient capacity or being upgraded, or an alternative system being provided. In most cases, the developer will be required to fund necessary system upgrades or alternatives.

B. Objectives

a) To ensure that development will not place unreasonable pressure on servicing authorities in terms of timing and extent of supply;
b) To ensure that development will take place only where satisfactory arrangements are made with the servicing authorities; and
c) To ensure that adequate consultation is carried out with the relevant servicing authorities during the formulation of development proposals.

C. Controls

1) General

a) Any site analysis (see the Site Planning and Design Principles Section) should address the existing and proposed provision of services/utilities to a property and whether there is satisfactory capacity to address the required demand of the proposal.

b) Satisfactory arrangements should be made with the servicing authorities for the provision of services to the property.

c) Where possible, services (including easements) should not be located in areas where vegetation will be removed or damaged.

2) Infrastructure Delivery Plan for New Release Areas

a) The preparation and submission of an *Infrastructure Delivery Plan* (IDP) is required for all new release areas. The IDP is required to identify all infrastructure, including civil works, utility services and community, social, cultural and recreational facilities, to service a new release area and establish a framework for its timely provision.

b) The IDP should include associated costing (including on-going operating and maintenance costs) and estimated delivery timeframes for all infrastructure, with a commitment to providing services up front where they are required early in the life of new estates. Where possible, the IDP should demonstrate efficient use and/or extension of existing infrastructure. The IDP should explore opportunities for the delivery of innovative and sustainable infrastructure, services, facilities and networks with adherence to the principles of social justice, equity and accessibility.

c) The IDP shall provide an accurate costing for all infrastructure to be provided and a delivery program with key pre-planning design and construction phases identified. It shall also incorporate relevant apportionment of costs where it is agreed those will be shared with other providers. The IDP will form the basis for the development of Section 94 Contributions Plans and/or Development Agreements, as well as agreements required to be entered into with the State Government and its agencies for the delivery of regional based facilities.

d) For further details on what should be addressed in the IDP, see Appendix F3 – DA Submission Requirements.

3) Water

a) Sydney Water should be contacted regarding its requirements in conjunction with discussions with Council about development, subdivision and building applications.

b) For some developments, it will be necessary to provide evidence to Council that consultation has been carried out when building and development applications are submitted. For most developments, provision of evidence that consultation with Sydney Water has been carried out will be a condition of consent. Please discuss this with Council's Development Services Department.

c) Council is unlikely to grant consent to applications for developments which place unreasonable pressure on Sydney Water's supply capacity.

d) It will generally be the applicant's responsibility to pay for or construct any increase in capacity of services.

4) Electricity

a) Applicants are required to make satisfactory arrangements with Endeavour Energy for the provision of electricity and/or lighting to the site.

5) Telecommunications

Applicants are required to make satisfactory arrangements with Telstra for the provision of telephone and data cables.

Telecommunication infrastructure in new release areas should provide the following:

a) Multiple telecommunication services including high speed internet (including broadband), voice and data systems;

b) Cabling for all telephone lines, cable TV and internet, built into all buildings from the outset;

c) Underground telecommunications infrastructure; and

d) Consideration of the provision of a centralised (C.A.T.V) system rather than individual antennae or dishes particularly for multi dwelling housing and residential flat buildings.

6) Gas

Natural gas supplies are not available to many parts of Penrith's rural areas. Applicants are advised to discuss the provision of gas supplies with AGL Energy or the local gas delivery company.

13.3. On Site Sewage Management

A. Background

On-Site Sewage Management Systems (OSSM system)

The City of Penrith consists of both sewered and unsewered areas. The main systems used in unsewered areas are aerated wastewater treatment systems (AWTS), pump-out systems and absorption trench disposal systems.

Issues with OSSM systems

The predominant soil landscape groupings in Penrith are Wianamatta group shales and clays. These soil types characteristically have poor permeability due to their clay content. In many cases, effluent from failing OSSM systems diffuses into the surrounding environment rather than being adequately treated by the system through absorption, evaporation and plant uptake. Improved regulation, operation and maintenance of OSSM systems can address these issues. This section has been developed to help applicants assess the selection, design, installation, operation and maintenance of domestic OSSM systems and draws from Council's 'On-site Sewage Management and Greywater Reuse Policy'.

This section applies to development proposals involving new domestic OSSM systems or changes to existing domestic OSSM systems on unsewered land in the City of Penrith. It includes requirements for subdivision and development proposals that intend to rely on OSSM systems.

B. Objectives

a) To guide applicants and landholders towards sustainable on-site management of sewage and waste water;

b) To protect and enhance the quality of public health and the environment within the Penrith LGA.

c) To assist Council to prioritise resources for the efficient regulation and monitoring of OSSM systems within the City.

d) To prevent risk to public health – wastewater may contain bacteria, viruses, parasites and other disease-causing organisms. OSSM systems should be selected, sited, designed,

constructed, operated and maintained so that contact with effluent is minimised or eliminated, particularly for children; residuals, such as composted material, are handled carefully; and treated sewage is not used on edible crops that are consumed raw.

e) To protect land and vegetation – OSSM systems should not cause the deterioration of land and vegetation quality through soil structure degradation, salinisation, water logging, chemical contamination or soil erosion;

f) To protect surface and ground waters – OSSM systems should not contaminate surface and ground waters as a result of flows from treatment systems and land application areas;

g) To conserve and reuse resources - the resources in domestic wastewater (including nutrients, organic matter and water) should be utilised as much as possible within the bounds posed by the other performance objectives; and

h) To protect community amenity – OSSM systems should not unreasonably interfere with the quality of life and, where possible, should add to local amenity.

These objectives reflect the objectives of Council's On-site Sewage Management and Greywater Reuse Policy.

C. Controls

1. New OSSM Systems

a) Approvals are required for the installation and operation of all new OSSM systems. Installation and operational approvals will initially be assessed together.

b) The installation and operation of OSSM systems are to be in accordance with Council's On-Site Sewage Management and Greywater Reuse Policy.

c) A Wastewater Assessment Report is required to be submitted with an application for the installation of a new domestic OSSM system when the criteria of Council's On-Site Sewage Management and Greywater Reuse Policy have been met.

d) A Wastewater Assessment Report is also required with an application for all commercial systems, in accordance with Council's On-Site Sewage Management and Greywater Reuse Policy.

D. Lifting the Bar

The following represents some ways in which applicants can demonstrate additional commitment to on-site sewage management principles expressed in this DCP. Demonstration of this commitment may lead to Council considering variation of development controls. Applications that vary the development controls listed in this section will need to demonstrate that the proposed development complies with the objectives relevant to the development controls it seeks to vary.

a) Adopting the latest techniques/technology for on-site sewage management to maximise treatment and minimise any environmental impacts from run-off and land management.

b) Design of all OSSM systems to allow for reuse of treated wastewater for non-drinking purposes, such as irrigation and toilet flushing (in accordance with NSW Health, Department of Water and Energy and NSW Office of Water requirements).

c) Treatment of on-site effluent to a secondary or tertiary level before it enters any centralised sewage management system.

E. Other Relevant Information

This DCP recommends that applicants seeking to address this issue should also refer to other relevant information including:

a) Penrith City Council's *On-site Sewage Management and Greywater Reuse Policy*, 2014

b) *Local Government (General) Regulation 2005.*

c) Standards Australia/Standards New Zealand (2000) AS/NZS 1547:2012 On-site domestic wastewater management

d) Department of Local Government, NSW Environment Protection Authority, NSW Health, Department of Land and Water Conservation and Department of Urban Affairs and Planning (1998) *Environment and Health Protection Guidelines – On-site Sewage Management for Single Households*.

e) *Sydney Regional Environmental Plan No.20 - Hawkesbury Nepean River (No.2 - 1997).*

13.4 Engineering Works and Construction Standards

A. Introduction

The purpose of this section is to ensure that engineering works, such as earthworks, roads, traffic management devices, footpaths, stormwater and drainage systems, are designed and constructed to appropriate standards, and in accordance with sound engineering practice.

B. Objectives

a) To ensure a consistent approach to the design and construction of engineering works; and

b) To set performance standards for the design and construction of engineering works.

C. Controls

All engineering works shall be undertaken in accordance with the provisions of Council's:

- Stormwater Drainage Specifications for Building Developments ~~(Working Draft);~~
- Council's Water Sensitive Urban Design (WSUD) Technical Guidelines;
- Engineering Design Specifications for Civil Works; and
- Engineering Construction Specifications for Civil Works.

Copies can be obtained from Council.

13.5 Development Adjacent to the Sydney Catchment Authority Controlled Areas – the Warragamba Pipelines

A. Objectives

a) To ensure the Warragamba Pipelines are taken into account in siting, designing and constructing in any proposed development adjoining or in the vicinity of the pipelines.

b) To ensure that development adjacent to the Warragamba Pipelines corridor does not impact on the continued operation and maintenance of the water supply infrastructure.

B. Controls

1) Where major development (including subdivision) is proposed adjacent to the Warragamba Pipelines corridor, applicants shall consult with the Sydney Catchment Authority (SCA) as part of the process of preparing the development application. Development is to be consistent with the SCA publication "*Guidelines for development adjacent to the Upper Canal and Warragamba Pipelines*". Any written requirements of the SCA shall be submitted with the DA and the DA documentation shall show how the requirements have been addressed.
2) Prior written approval shall be obtained from the SCA for any access that may be required to the Warragamba Pipelines corridor during the investigation and construction phases.
3) Access points to the Warragamba Pipelines corridor for SCA staff and contractors to carry out inspections and maintenance shall be retained or provided in accordance with SCA requirements.
4) Stormwater systems serving development adjacent to the Warragamba Pipelines shall be designed to ensure that stormwater does not enter the Warragamba Pipelines corridor.
5) Appropriate security fencing shall be provided, or existing security fencing retained along the length of development boundaries that directly adjoin the Warragamba Pipelines corridor, in accordance with SCA requirements.
6) Road crossings of the Warragamba Pipelines shall be minimised and located and designed in accordance with SCA requirements.
7) Where possible, a local road or shareway shall be provided between development and the Warragamba Pipelines corridor.
8) Earthworks (excavation or filing) and landscaping works carried out adjacent to or crossing the Warragamba Pipelines shall avoid damage to the infrastructure in accordance with SCA requirements.

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F3 DA Submission Requirements

1. Introduction

This Appendix outlines the requirements for submission of supporting information with development applications. Not all applications will require all the supporting information listed in this section. Which reports are required will depend on the land use itself, the scale of the development, its location and the individual site features.

The distinction between minor and major development is discussed in Appendix F2 'Development Process'. In some cases, the scale of development or the nature of the proposed site will mean that what would normally be classed as minor development may be major development, and vice versa. If in doubt, please contact Council.

Table F3.1 in section 2 below outlines which information is likely to be required for different land uses in different areas. Applicants will need to be aware of site features and natural hazards (e.g. flooding, bushfire, vegetation, high visibility, etc) in order to determine whether a particular report or plan will be required. If in doubt, please contact Council.

2. Submission Requirements Overview

Table F3.1 shows the submission requirements for a number of different types of applications to Council.

Table F3.1

MATRIX OF INFORMATION TO ACCOMPANY APPLICATIONS	Residential Dwellings	Alteration and additions to residential dwellings	Garage, Outbuilding, Awning, Carport, etc	Farm Shed	Swimming Pool	Dual Occupancy/ Secondary Dwelling	Multi dwelling housing and residential flat buildings	Commercial / Industrial building	Alteration and additions to Commercial / Industrial	Demolition	Subdivision of Land	Septic tank	Advertising sign	Home business	Applicant Checklist	Council Checklist
Site Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Floor Plan	✓	✓	✓	✓		✓	✓	✓	✓		✧	✓		✓		
Elevation Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	❖		
Section Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✧	❖		
Specifications	❖	❖	❖	❖	❖	❖	❖	❖	❖	✓		✓	✧	❖		
Statement of Environmental Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✧	✓		
BASIX	✓	❖			❖	✓	✓									
Building Sustainability Rating Certificate	✓	✓				✓	✓	✧	✧		✧					
Shadow Diagrams	✧	✧				✧	✧	✧	✧							
Landscaping Plan	✧	✧	✧	✓		✓	✓	✓	✧		✓	✓				
Erosion / Sediment Control	✓	✓	✧	✧	✧	✓	✓	✓	✧	✓	✧	✧	✧			
Drainage Plan (Stormwater)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✧	✧	✓				

MATRIX OF INFORMATION TO ACCOMPANY APPLICATIONS	Residential Dwellings	Alteration and additions to residential dwellings	Garage, Outbuilding, Awning, Carport, etc	Farm Shed	Swimming Pool	Dual Occupancy/ Secondary Dwelling	Multi dwelling housing and residential flat buildings	Commercial / Industrial building	Alteration and additions to Commercial / Industrial	Demolition	Subdivision of Land	Septic tank	Advertising sign	Home business	Applicant Checklist	Council Checklist
Site and Soil Assessment Report	✧	✧	✧			✧					✧	✧		✧		
Waste Management Plan	✓	✧		✧	✓	✓	✓	✓	✧	✓				✧		
External Colour Schedule	✓	✓		✓		✓	✓	✓	✓							
Survey / Contour Plans	✓			✧		✓	✓	✓			✓					

✓ Indicates this information is required

❖ Indicates this information is required if you are applying for a Construction Certificate or Complying Development Certificate

✧ Indicates this information may be required

Certain applications may require the submission of additional information that has not been listed above. Council encourages you to consult prior to lodging your application. This ensures that many issues may be resolved before an application is lodged and that each application contains all necessary information to enable prompt processing by Council.

3. Plans/Drawings

Table F3.2 lists the types of plans and drawings likely to be required for minor and major development. A minimum of 6 complete sets of all plans and documents are required for the submission of applications.

Table F3.2

Ref.	Plan	Minor	Major	Comments/Other
1	CD with all Plans in PDF format	✓	✓	
3	Survey/contour Plan	✓	✓	If relevant
4	Site Plan	✓	✓	If relevant
5	Site Analysis	✓	✓	
	Local analysis		✧	
	Regional analysis		✧	
6	Floor Plans	✓	✓	If relevant
7	Section Plans	✓	✓	If relevant
8	Elevation Plans	✓	✓	If relevant
9	Demolition Plans	✓	✓	If relevant
10	Shadow Diagrams		✓	
11	Landscape Plan	✧	✓	If relevant
12	Specifications of Advertising Signage	✓	✓	If relevant
13	Specification of External Finishes	✓	✓	If relevant
14	Sample Board		✓	If relevant
15	Photomontages		✓	If relevant
16	Subdivision Plan		✓	If relevant
17	Model		✓	If relevant
18	Plant and Plant Rooms		✓	If relevant

✓ Indicates this information is required

✧ Indicates this information may be required

4. Supporting Report Requirements

Tables F3.3 and F3.4 list the types of reports likely to be required for minor and major development.

Table F3.3

Report	Minor	Major	Notes / Comments
Site Analysis (Site Plan)	✓	✓	Level of detail will vary depending on scale and/or complexity of development or site
Statement of Environmental Effects	✓	✓	Level of detail will vary depending on scale and/or complexity of development or site
Building Sustainability Rating Certificate			
• BASIX Certificate	✓	✓	BASIX Certificate required for dwelling construction or alterations.
• Non-residential Development		✓	Required for non residential development (including mixed use) over $1 million.
Landscaping Information			
• Landscape Site Analysis Plan	✓	✓	
• Landscape Concept Plan	✧	✓	
• Landscape Detail Plan	✧	✓	
• Landscape Implementation Report		✧	
• Landscape Maintenance Report		✧	
• Landscape 3 Year Landscaping Report		✧	
Erosion and Sediment Control			
• Erosion and Sediment Control Plan	✓	✓	Level of detail will vary depending on scale and/or complexity of development or site
• Additional Erosion and Sediment Control Measures		✓	

Report	Minor	Major	Notes / Comments
Stormwater and Drainage			
• Drainage Plan (Stormwater)	✓	✓	
• Site and Soil Assessment Report	✓	✓	
• Stormwater and Drainage Report		✧	
Waste Management Plan	✓	✓	
Transport and Traffic Impact Assessments			
• Traffic Impact Statement	✧	✓	
• Traffic Report		✧	
• Transport Management and Accessibility Plan (TMAP)		✧	

✓ Indicates report is required

✧ Indicates this information may be required

Certain applications may require the submission of additional information that has not been listed above. Council encourages you to consult prior to lodging your application. This ensures that many issues may be resolved before an application is lodged and that each application contains all necessary information to enable prompt processing by Council.

Table F3.4

Report	Minor	Major	Notes / Comments
The following reports are required if the site or development characteristics fit the necessary criteria. For example, if a site is on bushfire prone land, a bushfire assessment report will be required. If the proposal includes works to trees and vegetation then the relevant applications and reports will be required.			
Works to trees and vegetation			
• Tree Survey and Assessment Report	✓		Information to be provided with applications for tree pruning / removal
• Aboricultural Survey Report	✧	*✓	Certain works to trees and vegetation
• Tree Management Plan	✧	*✓	Where trees to be retained as part of development

Report	Minor	Major	Notes / Comments
• Flora and Fauna Assessment Report	*✓	*✓	Information to be provided with development applications for works to any indigenous trees and vegetation
• Species Impact Statement	*✓	*✓	*where Council determines works to trees and vegetation likely to impact threatened species, populations, ecological communities or habitats
Bushfire Assessment Reports			
• Non-integrated development	*✓		*if site is bushfire prone land
• Integrated development		*✓	*if site is bushfire prone land
Flood Study	*✓	*✓	*if site is affected by 1 in 100 ARI flood event
Salinity Analysis	*✓	*✓	*if site identified as subject to potential risk of salinity
Visual Impact Assessment	*✓	*✓	*if site is located in areas identified on Penrith LEP 2010 Scenic and Landscape Values Map or land zoned E1 or E2 on Penrith LEP 2010 Land Zoning Map
Heritage			*any development that would: -affect a heritage item; -be carried out in a heritage conservation area; -affect a place of potential heritage significance; or -occur in the vicinity of a heritage item.
• Heritage Impact Statement	*✓	*✓	
• Heritage Conservation Management Plan	✧	✧	*where proposal could affect the significance of a heritage item, heritage conservation area or place of potential heritage significance
• Archival Record	*✓	*✓	*where proposal involves demolition or partial demolition of a heritage item, a place within a heritage conservation area or a potential place of heritage significance

Report	Minor	Major	Notes / Comments
• Archaeological Assessment Report	*✓	*✓	*where proposal involves disturbance or development of a heritage item listed as an *archaeological site* in Penrith LEP 2010
• Aboriginal Cultural Heritage Archaeological Survey Report	✧	✧	*where proposal involves disturbance to the soil or construction works and the land is potentially archaeologically sensitive or has an area of 5 hectares or more
Contamination			
• Contamination Investigation Report / Preliminary Contamination Investigation (Stage 1)	✧	*✓	*where contamination is, or may be, present
• Detailed Contamination Site Investigation (Stage 2)	✧	*✓	*when preliminary investigation indicates land is contaminated or is, or was, formally used for a potentially contaminating activity
• Site Remedial Action Plan (Stage 3)	✧	*✓	*where remedial action is required
• Validation and site monitoring reports	✧	*✓	*to confirm whether the clean-up objectives have been attained and whether further remediation or restrictions on land use are required
• Site Audit (Contamination)	✧	*✓	*where independent review is required of site investigation, remediation or validation
• Chemical Use and Storage Report	✧	✧	*if proposal involves storage of chemicals on the site
Noise Impact Statement	*✓	*✓	*where proposal may be impacted by road, rail or aircraft noise and/or where proposal is potentially noise generating
Land Stability, excavation and filling			
• Geotechnical report	*✓	*✓	*where building is proposed on land with slope gradient higher than 15%
• Landfill validation report	*✓	*✓	*where proposal involves landfill

Report	Minor	Major	Notes / Comments
Water Management Plan	✓	✓	Where application is for an industrial or rural land use that will increase the water needs of a particular area
Social Impact Assessment		✓	
Economic Impact Assessment		✓	Including child care centres over 40 places, major retail development
Environmental Impact Assessment	✧	✓	Major development (e.g. designated development) and development that may result in contamination
Urban Design Assessment		✓	
Local Analysis	✧	✓	
Regional Analysis	✧	✓	
Infrastructure Delivery Plan		✓	Required for new urban areas
3D Modelling		✧	Required for certain developments in St Marys Town Centre

✓ Indicates report is required

✧ Indicates this information may be required

Certain applications may require the submission of additional information that has not been listed above. Council encourages you to consult prior to lodging your application. This ensures that many issues may be resolved before an application is lodged and that each application contains all necessary information to enable prompt processing by Council.

4.1. Site Analysis (Site Plan)

A Site Analysis involves looking at the features of the site and the immediate surrounding area and, where possible, presenting the information in a diagram(s). This enables the opportunities and constraints to be identified and subsequent development to respond appropriately to the site characteristics. A Site Analysis should include the following minimum elements:

1) The site's dimensions and areas;

2) North point and the site's orientation (e.g. solar access);

3) Topography (with 0.5m to 1m contours);

4) Road, pedestrian and cycle access points;

5) Services and infrastructure (e.g. electricity poles, stormwater drainage lines, natural drainage, kerb crossings and easements);

6) Rights of way;

7) Views to and from the site (more detail is provided below);

8) Site overland flows and drainage patterns;

9) Geotechnical characteristics of the site and suitability for development;

10) Location of site in relation to shops, community facilities and transport;

11) Heritage items on site or on adjoining properties;

12) Form and character of adjacent and opposite buildings in the streetscape, including both sides of any street that the development fronts;

13) Location and use of any existing buildings or built features on the site;

14) Location and important characteristics of adjacent public, communal and private open spaces;

15) Location of significant vegetation on the site and on adjoining properties and all street trees;

16) Location of any significant noise sources on and in the vicinity of the site; and

17) Assessment of site contamination and/or remediation.

The Site Analysis includes the site and the immediate context - usually up to 50 or 100 metres in any direction from the site (depending on the scale of development, the proposed land uses and its impacts). The Site Analysis should include plan and section drawings of the existing features of the site at the same scale as the site and landscape plan.

Not all of the elements listed above will be relevant for every development or site. You are strongly recommended to contact Council's Development Services Unit to discuss the requirements for your proposal prior to lodging a development application.

4.2. Statement of Environmental Effects

A Statement of Environmental Effects (SEE) is a written document that supports the development application. It demonstrates that, as the applicant, you have considered what impact your development will have on the natural and built environment and how you propose to mitigate any negative effects. All developments will require a SEE, although the level of detail may vary according to the type of development. For most minor development, there is no need for the SEE to be prepared by a specialist.

A SEE should include, but is not limited to, the following:

An Assessment of Relevant Planning Controls

This section is important as it demonstrates how the proposal complies with relevant planning policies (including State Environmental Planning Policies (SEPPs), Local

Environmental Plans (LEPs), Development Control Plans (DCPs) and other relevant policies).

For each issue listed below, identify which policies apply to the site and describe how the proposal complies.

Site Suitability

i) Identify flooding, drainage, landslip, mine subsidence, soil erosion, bushfire or any other risk.

Access and Traffic

ii) Describe driveway access, manoeuvrability and pedestrian safety.

iii) Discuss the suitability of the existing road network.

iv) Describe the number of vehicle movements entering and exiting the site, including delivery trucks.

v) Describe the number and location of parking spaces.

Streetscape and Design

vi) Discuss how the design of the development has taken into consideration the existing streetscape.

vii) Provide details of the proposed external finishes, including material type and colour.

Services

viii) Discuss the availability of utility services such as power, water, sewer and telephone services.

ix) Describe the method of sewerage effluent and stormwater disposal.

Privacy, Views and Overshadowing

x) Provide shadow diagrams and explain how they satisfy Council's requirements for solar access.

xi) Discuss how the proposal affects the views both from and into the site, from neighbouring properties, roads and any more distant elevated vantage points together with any measures to reduce the impact.

Social and Economic Effects

xii) Discuss whether the development will have a positive or negative social impact on the locality. Provide proposed measures to address any negative impacts.

xiii) Discuss what economic impact the development will have on the locality.

Flora and Fauna

xiv) In relation to the Threatened Species Conservation Act, discuss the impact that the development will have any threatened or endangered species.

4.3. Building Sustainability Rating Certificate

4.3.1. Residential Development (BASIX Certificate)

A BASIX Certificate is required for all dwellings, including those dwellings in a mixed use development and serviced apartments intended or capable of being strata titled. Proposals for additions and/or alterations to an existing dwelling also need a BASIX Certificate.

The Building Sustainability Index (BASIX) is a web-based planning tool designed to assess the potential performance of residential buildings against a range of sustainability indices. Applicants can generate the BASIX Certificate only on the NSW Department of Planning BASIX website: www.basix.nsw.gov.au. For more information, phone the BASIX Help Line on 1300 650 908.

The applicant is required to submit the BASIX Certificate with the development application or Complying Development Certificate application. The BASIX Certificate and plans and/or specifications must be consistent. Plans and specifications must identify BASIX commitments fundamental to the design of the development (e.g. location and size of rainwater tanks, windows, heating and cooling systems). Inconsistencies may be resolved through amendment of plans and/or specifications or by submitting a new BASIX Certificate with commitments that match the rest of the application.

Like other development and building standards, BASIX commitments will be checked for installation and operation as part of the certification of completed building works. It should also be noted that as many BASIX commitments will involve the purchase and correct installation of building elements and materials, it is important to keep all receipts and certificates of installation for review by the certifying authority.

4.3.2. Non-residential Development

Non-residential developments including mixed use developments with a construction cost of $1 million or more are to demonstrate a commitment to achieving no less than 4 stars under Green Star or 4.5 stars under the National Australian Built Environment Rating System.

The applicant is required to submit the rating certificate with the development application or Complying Development Certificate application. The plans and specifications must also identify the Green Star or NABERS commitments which will be checked by a professional building certifier during construction. Submitted plans or specifications and the certificate must be consistent. Inconsistencies may be resolved through amendment of plans and/or specifications or by submitting a new Certificate with commitments that match the rest of the application.

National Australian Built Environment Rating System (NABERS)

NABERS is a national rating system that measures the energy efficiency, water usage, waste management and indoor environment quality of a building or tenancy and its impact on the environment. NABERS provides a star rating based on a buildings actual operational performance. The rating takes into consideration:

- The climactic conditions in which the building operates
- The hours of its use

- The level of services it provides
- The energy sources it uses
- Its size and occupancy.

For more information, visit www.nabers.gov.au

Green Star

Green Star is an environmental rating scheme that provides formal accredited evaluation of the environmental design and achievements of buildings across nine categories (management, indoor environment quality, energy, transport, water, materials, land use and ecology, emissions and innovation). Green Star provides certified ratings of 4, 5 or 6 Stars. Information about Green Star is available from www.gbca.org.au/green-star.

The Green Star certification system was developed and is administered by the Green Building Council of Australia, a not-for-profit organisation.

4.4. Landscape Plans

All design work is to be undertaken to a level consistent with industry best practice and must meet the following requirements as a minimum. The degree of detail is to be relevant and appropriate to the scale of the development. The name, qualifications and membership details of the person or company preparing the plans is to be shown on each plan.

4.4.1. Landscape Site Analysis Plan

The purpose of a Landscape Site Analysis Plan is to ensure that key site planning issues are identified and are a part of the design process. For category 2 and 3 developments (see the Landscape Design Section of this Plan), the details of the site analysis are best depicted on a separate plan. In the case of category 1 proposals, this information can form part of the Landscape Concept Plan.

It is not sufficient to prepare a Landscape Site Analysis Plan and then ignore it during the design process. The Landscape Site Analysis Plan will have identified the opportunities and constraints of a particular site and the relevant surrounding area. The purpose of the Landscape Site Analysis Plan is to inform the design process. Some of the information will also form the basis for preparing management plans for vegetation, erosion and sedimentation control, stormwater and waste.

The following indicates the sort of information to be collected and presented in the Landscape Site Analysis Plan depending upon the site and the complexity of the proposal. Figure F3.1 provides an example.

1. Site survey

a) Identifies the lot and its boundaries.

2. Plan information

a) Scale of plan at 1:100 or 1:200 (use ONLY these scales) plus bar scale.
b) North point.

c) Name and qualifications of person preparing Landscape Site Analysis Plan.

3. Existing site features

a) Location and uses of any existing buildings and structures on the site showing those to be removed and retained.

b) Location and height of walls and fences built to the boundary.

c) Heavily shaded areas from existing structures, mature trees or dominant landform, such as rock ledges.

d) Archaeological and heritage sites.

e) Any easements and rights-of-way and their restrictions.

4. Services

a) Location of existing overhead and underground utility services (electricity, gas, telephone, water, sewer and stormwater drainage lines, inlets and collection points).

5. Use of adjacent land

a) Location and uses of adjacent buildings and vegetation.

b) Ridge levels and floor levels of adjacent buildings.

c) Potential for overlooking into and from window openings in walls adjacent to the development site.

d) Potential for shading on adjacent properties.

e) Streetscape features and character (e.g. street trees, poles, kerb crossovers, bus stops) and street trees

6. Landform

a) Height contours at regular intervals (and any relevant road benchmark) and areas of steep slope (20% or more).

b) Existing natural features (e.g. cliffs, rock outcrops).

c) Orientation of site (e.g. south-facing slope).

7. Soils

a) Depth of topsoil and subsoil.

b) pH (the level of soil acidity affects its performance).

c) Condition - fertility, whether it has been compacted, cut or filled.

d) Erosion problems, contamination or salinity.

8. Plants

a) Existing established individual or stands of trees and vegetation with their height and spread, condition and common/botanical name – particularly note any trees listed as "Significant".

b) Existing ground levels around the base of trees.

c) Extent and name of any weed infestation.

d) Plants proposed to be removed.

e) Plants proposed to be protected and retained.

9. Wildlife

a) Any habitats on the site and nearby land.

b) Fauna habitat possibilities (e.g. niches in rockeries, ponds for frogs, habitat plants (nectar for small birds)).

10. Climate

a) Directions of pleasant and unpleasant summer and winter winds.

b) Windbreaks and their likely permanence.

c) Frost pockets.

d) Shady areas.

e) Direction and extremity of bushfire threat.

11. Water

a) Sources of water flowing on to the site and the general quality of that water.

b) Drainage patterns on the site, areas of concentrated runoff, ponding, possible flooding.

c) Adjoining riparian zone, if within 40 metres of a waterway.

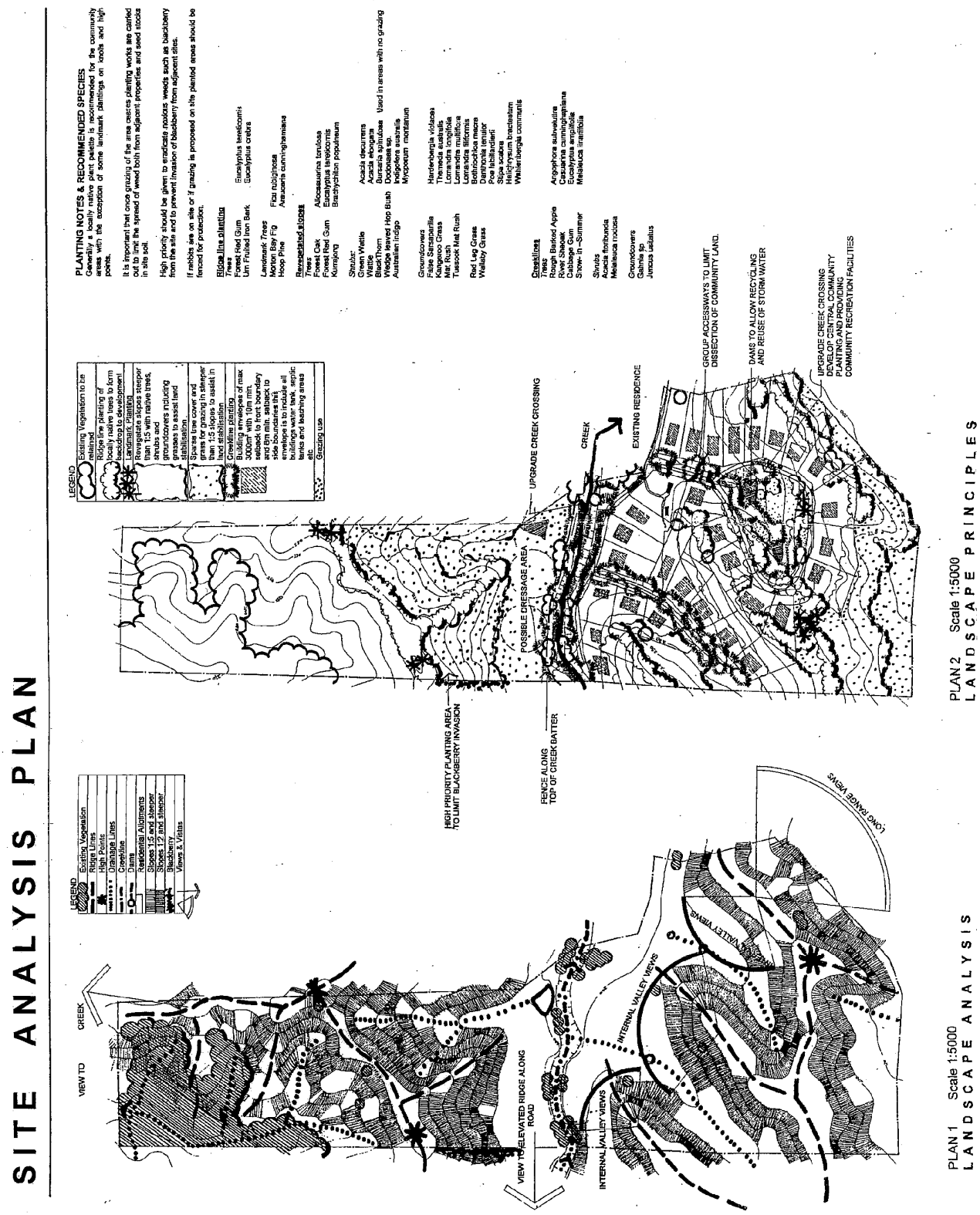
d) Characteristics of the drainage system immediately downstream of the site (e.g. bushland creek or a constructed stormwater drainage channel).

12. Views and vistas

a) Good and unsightly views into and from the site.

b) Qualities of the site that are important in the view to and from the site (e.g. major trees).

Figure F3.1


SITE ANALYSIS PLAN
LEGEND
Existing Vegetation
Ridge Lines
High Points
Drainage Lines
Creeks
Residential Allotments
Slopes 1:5 and steeper
Slopes 1:2 and steeper
Blackberry
Views & Vistas
VIEW TO CREEK
VIEW TO ELEVATED RIDGE ALONG ROAD
INTERNAL VALLEY VIEWS
INTERNAL VALLEY VIEWS
VALLEY VIEWS
LONG RANGE VIEWS
HIGH PRIORITY PLANTING AREA TO LIMIT BLACKBERRY INVASION
FENCE ALONG TOP OF CREEK BATTER
PLAN 1 Scale 1:5000
LANDSCAPE ANALYSIS
LEGEND
Existing Vegetation to be retained
Ridge line planting of locally native trees to form backdrop to development
Landmark Planting
Revegetate slopes steeper than 1:5 with native trees, shrubs and groundcovers including grasses to assist land stabilisation
Sparse tree cover and grass for grazing in steeper than 1:5 slopes to assist in land stabilisation
Creek line planting
Building envelopes of max 3000m² with 10m min. setback to front boundary and 6m min. setback to side boundaries that encompass house, all buildings water tank, septic tanks and leaching areas etc.
Grazing use
PLANTING NOTES & RECOMMENDED SPECIES
Generally a locally native plant palette is recommended for the community areas with the exception of some landmark plantings on knolls and high points.
It is important that once grazing of the area ceases planting works are carried out to limit the spread of weed both from adjacent properties and seed stocks in site soil.
High priority should be given to eradicate noxious weeds such as blackberry from the site and to prevent invasion of blackberry from adjacent sites.
If rabbits are on site or if grazing is proposed on site planted areas should be fenced for protection.
Ridge line planting
Trees
Forest Red Gum — Eucalyptus tereticornis
Um Fruited Iron Bark — Eucalyptus crebra
Landmark Trees
Moreton Bay Fig — Ficus rubiginosa
Hoop Pine — Araucaria cunninghamiana
Revegetated slopes
Trees
Forest Oak — Allocasuarina torulosa
Forest Red Gum — Eucalyptus tereticornis
Kurrajong — Brachychiton populneum
Shrubs:
Green Wattle — Acacia decurrens
Wattle — Acacia sophorae
Black Thorn — Bursaria spinulosa
Wedge leaved Hop Bush — Dodonaea sp. Used in areas with no grazing
Australian Indigo — Indigofera australis
Mycoperum montanum
Groundcovers
False Sarsaparilla — Hardenbergia violacea
Kangaroo Grass — Themeda australis
Mat Rush — Lomandra longifolia
Tussock Mat Rush — Lomandra multiflora
Lomandra filiformis
Red Leg Grass — Bothriochloa macra
Wallaby Grass — Danthonia tenuior
Poa labillardieri
Stipa pubescens
Hairy Panic — Panicum tractestum
Wahlenbergia communis
Streetlines
Trees
Rough Barked Apple — Angophora subvelutina
River Sheoak — Casuarina cunninghamiana
Cabbage Gum — Eucalyptus amplifolia
Snow-in-Summer — Melaleuca linariifolia
Shrubs
Acacia floribunda
Melaleuca nodosa
Groundcovers
Gahnia sp.
Juncus usitatus
POSSIBLE DRESSAGE AREA
UPGRADE CREEK CROSSING
CREEK
EXISTING RESIDENCE
GROUP ACCESSWAYS TO LIMIT DISSECTION OF COMMUNITY LAND.
DAMS TO ALLOW RECYCLING AND REUSE OF STORM WATER
UPGRADE CREEK CROSSING
DEVELOP CENTRAL COMMUNITY PLANTING AND PROVIDING COMMUNITY RECREATION FACILITIES
PLAN 2 Scale 1:5000
LANDSCAPE PRINCIPLES

4.4.2. Landscape Concept Plan

A Landscape Concept Plan is required for all category 2 and 3 developments and may also be required for some category 1 developments. It should express the developer's intent and ideas, and show how the proposed landscaping relates to the characteristics of the site and its setting.

The following information should be provided in the Landscape Concept Plan:

a) A statement summarising the vision or concept of the design, existing and proposed character, relevant issues identified in the site analysis and other reports, and how the design responds to those issues for example heritage and access issues.

b) All proposed areas to be landscaped including balconies, roof gardens, courtyards. Show general landscape materials, finishes and treatments (e.g. massed planting beds, specimen trees, paving, gravel, turf, water element, lighting, signage). Include notations linked to specific parts of the plan to explain purpose, function and character.

c) Hard and soft landscaped areas showing contours, spot heights and finished levels, including retaining walls and fencing heights, types and colours.

d) Existing trees to be retained including surveyed spot height at the base of the trunk, and numbered where relevant according with the arborist report. Also include the extent of tree protection zones and measures on the plan (refer to AS4970 Protection of Trees on Development Sites).

e) Broad descriptions of proposed land modelling and areas of cut and fill. The plan must demonstrate that any proposed changes of level will not have an adverse effect on the plants and natural features to be retained.

f) Description of landscape values being promoted (e.g. bushland habitat, temperature moderation, reduce runoff and increase infiltration, heritage, streetscape compatibility, etc.).

g) Indicative planting scheme that includes an indicative schedule of tree, shrub and groundcover species to be used (include botanical and common name, mature height, spread of foliage and container size). Any species nominated for street trees should be listed separately.

h) Specification notes for maintenance works (watering, weeding and fertilising of plants for successful establishment) including the proposed duration of the plant establishment period. Also proposed maintenance activities that will affect the appearance of plants such as hedging.

i) Accessibility and universal design statement for open space areas, including compliance with relevant Australian Standards, seating types (including armrests and backs), ramps, kerb ramps etc.

j) Existing trees that adjoin the site or may be affected by the development including existing trees to be removed.

k) Landscape details (including cross sections and elevations) to indicate changes in level, walls, depth of planting media, preliminary construction details or any key components.

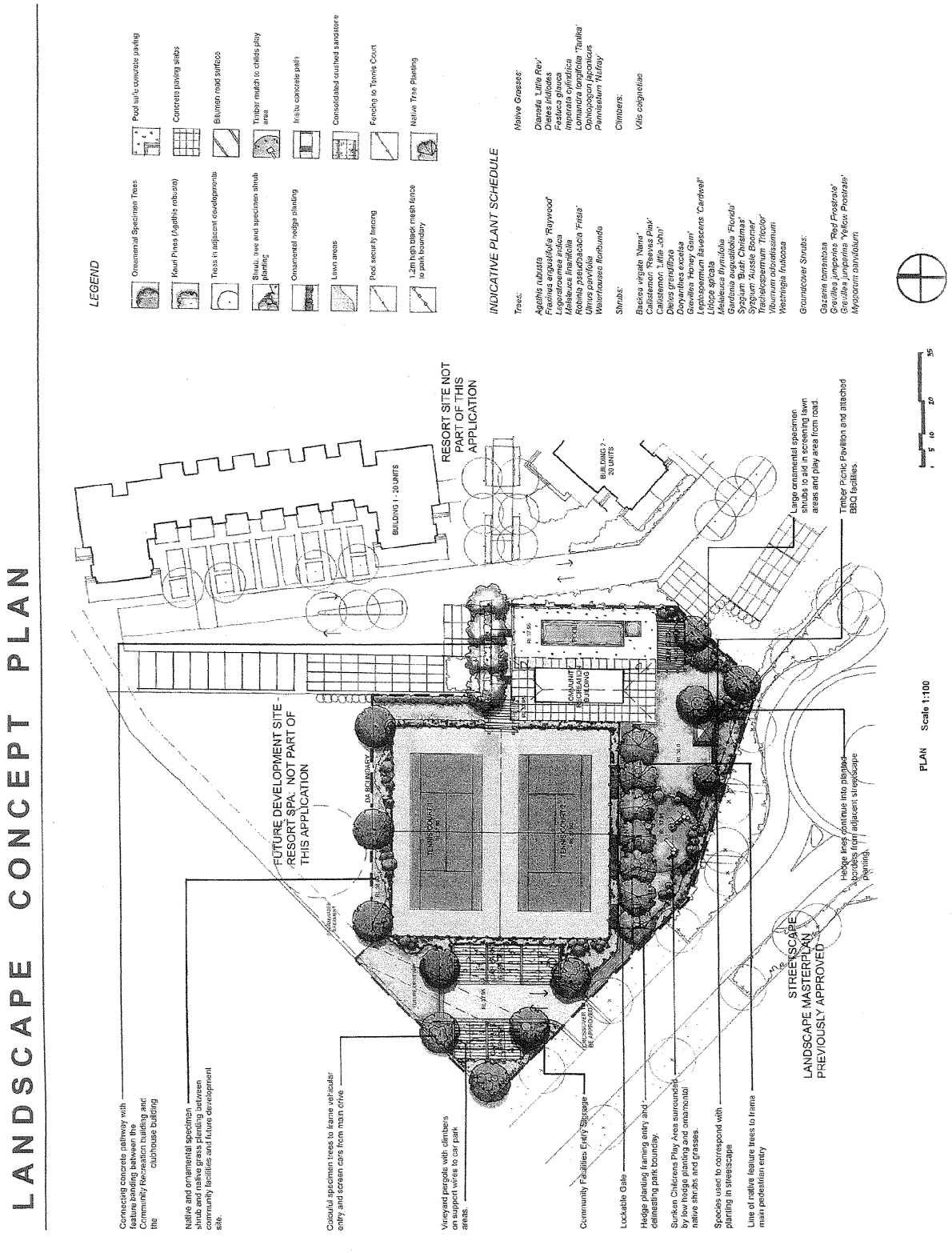
l) Replacement strategy for failures in plant materials and built works.

m) Erosion and sediment control details may need to be included depending upon the scale of the works.

n) Submit any other related plans for the context eg. masterplans, precinct plans with other stages, circulation networks.

An example of a Landscape Concept Plan is included in Figure F3.2. Elevations and sections are recommended to illustrate design intent.

Figure F3.2


LANDSCAPE CONCEPT PLAN
LEGEND
Ornamental Specimen Trees
Kauri Pines (Agathis robusta)
Trees in adjacent developments
Shrub, tree and specimen shrub planting
Ornamental hedge planting
Lawn areas
Post security fencing
1.2m high black mesh fence to park boundary
Post tail's concrete paving
Concrete paving slabs
Bitumen road surface
Timber mulch to childs play area
In-situ concrete path
Consolidated crushed sandstone
Fencing to Tennis Court
Native Tree Planting
INDICATIVE PLANT SCHEDULE
Trees:
Agathis robusta
Fraxinus angustifolia 'Raywood'
Lagerstroemea indica
Melaleuca linarifolia
Robinia pseudoacacia 'Frisia'
Ulmus parvifolia
Waterhousea floribunda
Shrubs:
Backea virgate 'Nana'
Callistemon 'Reeves Pink'
Callistemon 'Little John'
Dietes grendiflora
Doryanthes excelsa
Grevillea 'Honey Gem'
Leptospermum flavescens 'Cardwell'
Lomandra longifolia
Melaleuca thymifolia
Gardinia augustifolia 'Florida'
Syzygium 'Bush Christmas'
Syzygium 'Aussie Boomer'
Trachelospermum Tricolor
Viburnum odoratissimum
Westringia fruticosa
Groundcover Shrubs:
Gazania tomentosa
Grevillea juniperina 'Red Prostrate'
Grevillea juniperina 'Yellow Prostrate'
Myoporum parvifolium
Native Grasses:
Dianella 'Little Rev'
Dietes iridiodes
Festuca glauca
Imperata cylindrica
Lomandra longifolia 'Tanika'
Ophiopogon japonicus
Pennisetum 'Rubrum'
Climbers:
Vitis coignetiae
Connecting concrete pathway with feature banding between the Community Recreation building and the clubhouse building
Native and ornamental specimen shrub and native grass planting between community facilities and future development site.
Colourful specimen trees to frame vehicular entry and screen cars from main drive
Vineyard pergola with climbers on support wires to car park areas.
Community Facilities Entry Signage
Lockable Gate
Hedge planting framing entry and delineating park boundary.
Sunken Childrens Play Area surrounded by low hedge planting and ornamental native shrubs and grasses.
Species used to correspond with planting in streetscape
Line of native feature trees to frame main pedestrian entry
FUTURE DEVELOPMENT SITE - RESORT SPA: NOT PART OF THIS APPLICATION
RESORT SITE NOT PART OF THIS APPLICATION
BUILDING 1 - 20 UNITS
BUILDING 2 - 20 UNITS
TENNIS COURT 1
TENNIS COURT 2
COMMUNITY RECREATION BUILDING
POOL
CHILDRENS PLAY AREA
Large ornamental specimen shrubs to aid in screening lawn areas and play area from road.
Timber Picnic Pavilion and attached BBQ facilities.
Hedge lines continue into planted boarders from adjacent streetscape planting.
STREETSCAPE LANDSCAPE MASTERPLAN PREVIOUSLY APPROVED
PLAN Scale 1:100
1 5 10 20 35

4.4.3. Landscape Detail Plan

A Landscape Detail Plan is required for all Category 3 developments and may be required for some category 2 developments. When Council requires a Landscape Detail Plan the documentation is to be concise and detailed, suitable for tendering. The Landscape Detail Plan must be consistent with the Landscape Concept Plan approved as part of the development consent. For smaller developments, it may be appropriate for the Landscape Concept Plan to be combined with the Landscape Detail Plan.

All requirements listed to be shown on the Landscape Concept Plan, a Landscape Detail Plan should provide information on the following:

1. Site layout

a) Details for special treatments (e.g. weed eradication, creek banks, mounding, roof gardens, extent or edge basement). Clearly define deepsoil and podium areas.

b) Location of utility areas and screening details (e.g. garbage receptacle area, storage of recyclable waste, clothes drying area, letter boxes, play areas, common open space, staff recreation areas).

c) Location and details of lighting and other outdoor fixtures (e.g. signs, furniture including street lighting and power poles).

2. Built structures

a) Existing and proposed buildings and other structures (including finished levels and floor heights) including play equipment.

b) Roadways, driveways, car parks, podiums and footpaths (including materials and finished levels). Particular attention should be paid to any areas proposed to meet Australian Standards on Disability Access.

c) Existing and proposed walls, fences, gates and retaining walls (including materials, heights, colours and finished levels).

d) Overshadowing caused by proposed built structures on existing site features and on adjacent land.

3. Plant selection

a) Planting layout plan showing location of species and dimensions at maturity, including street trees, trees on adjacent properties, trees on site, shrubs, groundcovers, turf, etc.

b) Planting schedule with botanical and common names, whether evergreen or deciduous and local/native/exotic species, container size, quantities, dimensions at maturity, spacing and staking and tying requirements for all species nominated.

c) Schedule listing botanical and common names of trees to be removed, and trees to be retained.

4. Construction details

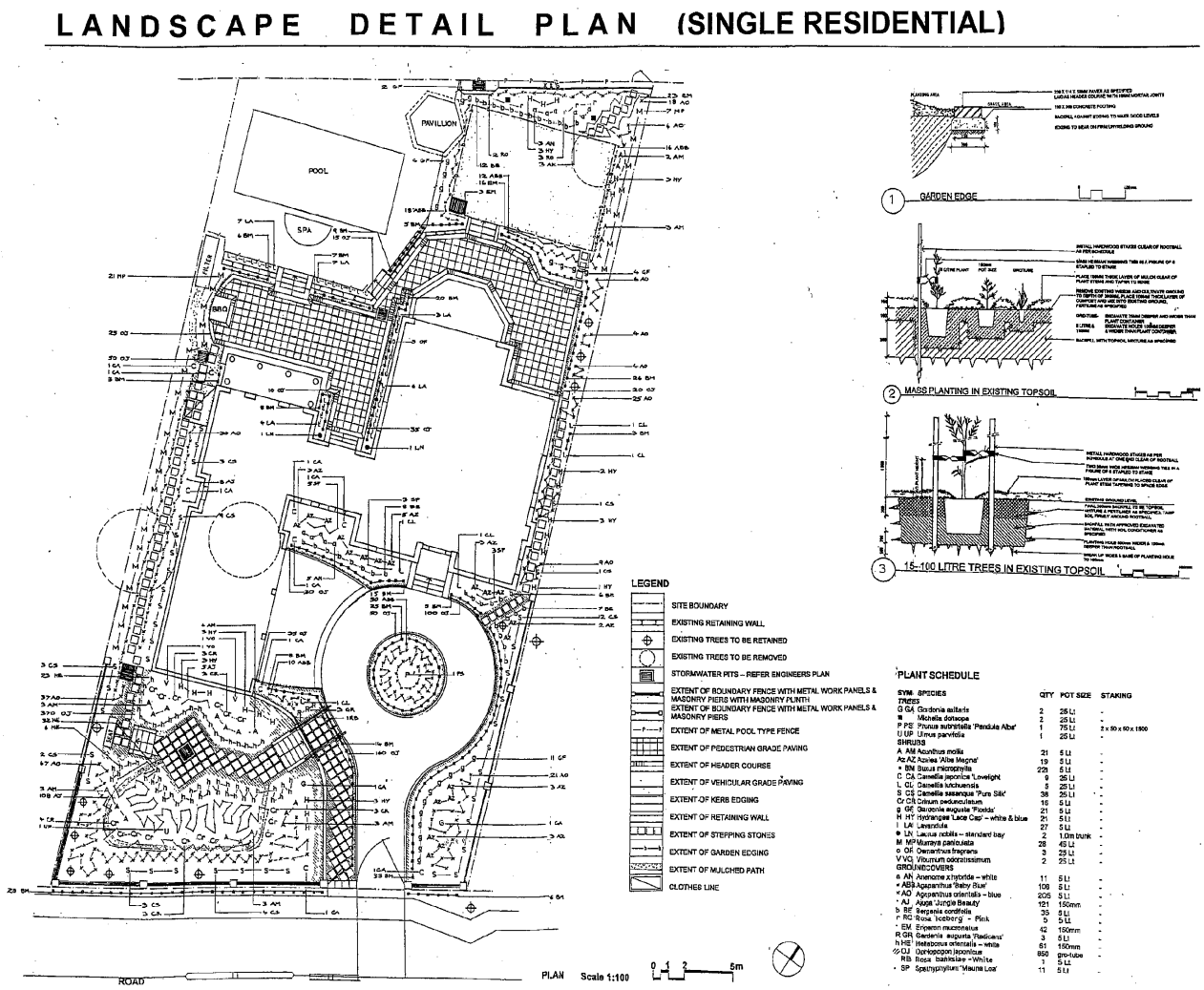
a) Standard construction and detail drawings (e.g. sections through mass planting beds, tree planting, paths, steps, retaining walls and fencing).

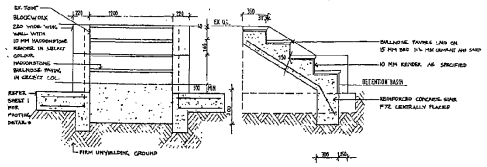
b) Detailing and location of all edge treatments (e.g. concrete, brick, timber).

c) Any non-standard construction details to demonstrate how the design would be implemented.

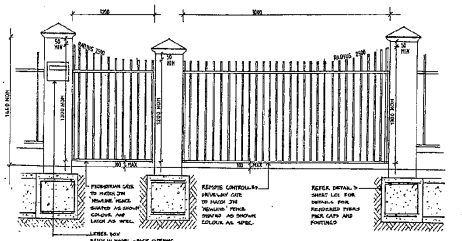
Examples of Landscape Detail Plans are included in Figures F3.3 – F3.5.

Figure F3.3: Landscape Detail Plan (Single Residential)

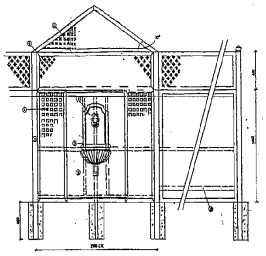




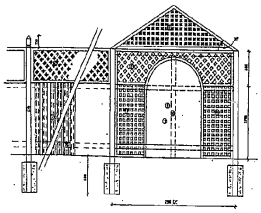
1 STAIRS FRONT GARDEN-ELEVATION & SECTION SCALE 1:20



2 ENTRY GATES-ELEVATION SCALE 1:20



3 FENCE AND DETAIL TO POOL AREA



4 TIMBER FENCE AND DETAL EASTERN BOUNDARY

NOTE – ALL FENCING TO HAVE PAINTED FINISH AS SPEC. COLOURS TO SCHEDULE BY ARCHITECT

BLOCKWORK NOTES

B1. MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH ALL RELEVANT S.A.A STANDARDS AND CODES OF PRACTICE.

B2. CONCRETE BLOCKS SHALL BE CATEGORY 'C' GRADE 12, HOLLOW 'A' BLOCKS, AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF NET AREA OF 12 MPA. REFER TABLE 3.1-AS3700. OBTAIN EVIDENCE OF COMPLIANCE.

B3. CEMENT MORTAR SHALL CONSIST OF 1 PART CEMENT: ½ PART LIME, 4 ½ PARTS SAND AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3.5 MPA AT 28 DAYS (REFER TABLE 4.1 – AS3700)

B4. CHEMICAL ADDITIVES, OR BLENDED SAND SHALL NOT BE USED IN THE MORTAR WITHOUT THE APPROVAL OF THE SUPERINTENDENT.

B5. THICKNESS OF MORTAR BEDS SHALL NOT EXCEED 12mm. ALL MORTAR BED JOINTS SHALL BE FULLY BEDDED.

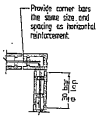
B6. PROVIDE ELEMENT BLOCKS IN THE BOTTOM COURSE CLOSE BEFORE GROUTING. REMOVE MORTAR FINS PROTRUDING INTO CORES.

B7. REINFORCEMENT SHALL BE POSITIONED ACCURATELY AND TIED SECURELY. VERTICAL BARS AND STARTER BARS ARE TO BE AS CLOSE TO BACK FACE OF WALL AS POSSIBLE, CONSISTENT WITH OTHER REQUIREMENTS.

B8. CORES IN EACH BLOCK SHALL BE FILLED WITH GROUT HAVING A MINIMUM COMPRESSIVE STRENGTH OF 15 MPA AT 28 DAYS. 75mm MAXIMUM AGGREGATE, 20 ± 2mm SLUMP.

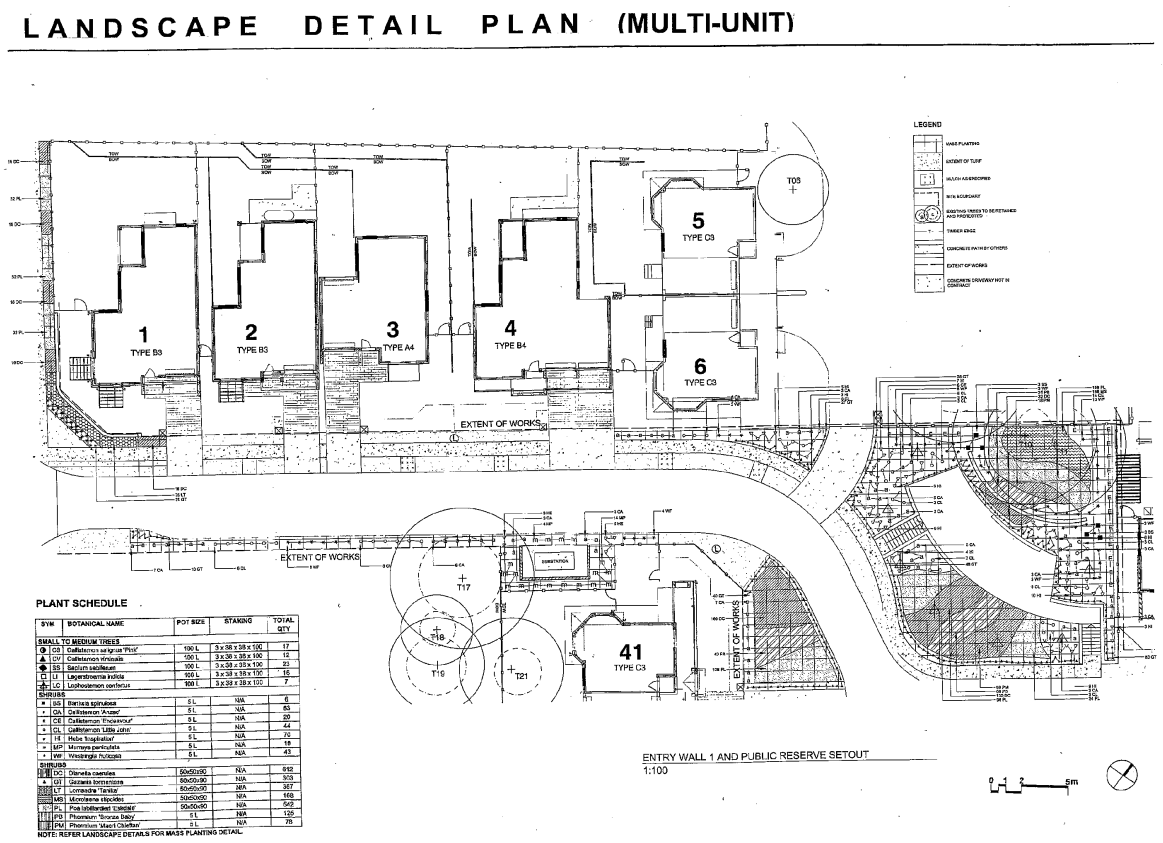
B9. GROUT IN LIFTS SHALL BE COMPACTED BY RODDING OR WITH A HIGH FREQUENCY PENCIL VIBRATOR.

B10. GROUT POUR HEIGHT NOT TO EXCEED 2 METRES.



CORNER DETAIL
N.T.S.

Figure F3.4: Landscape Detail Plan (Multi-Unit)



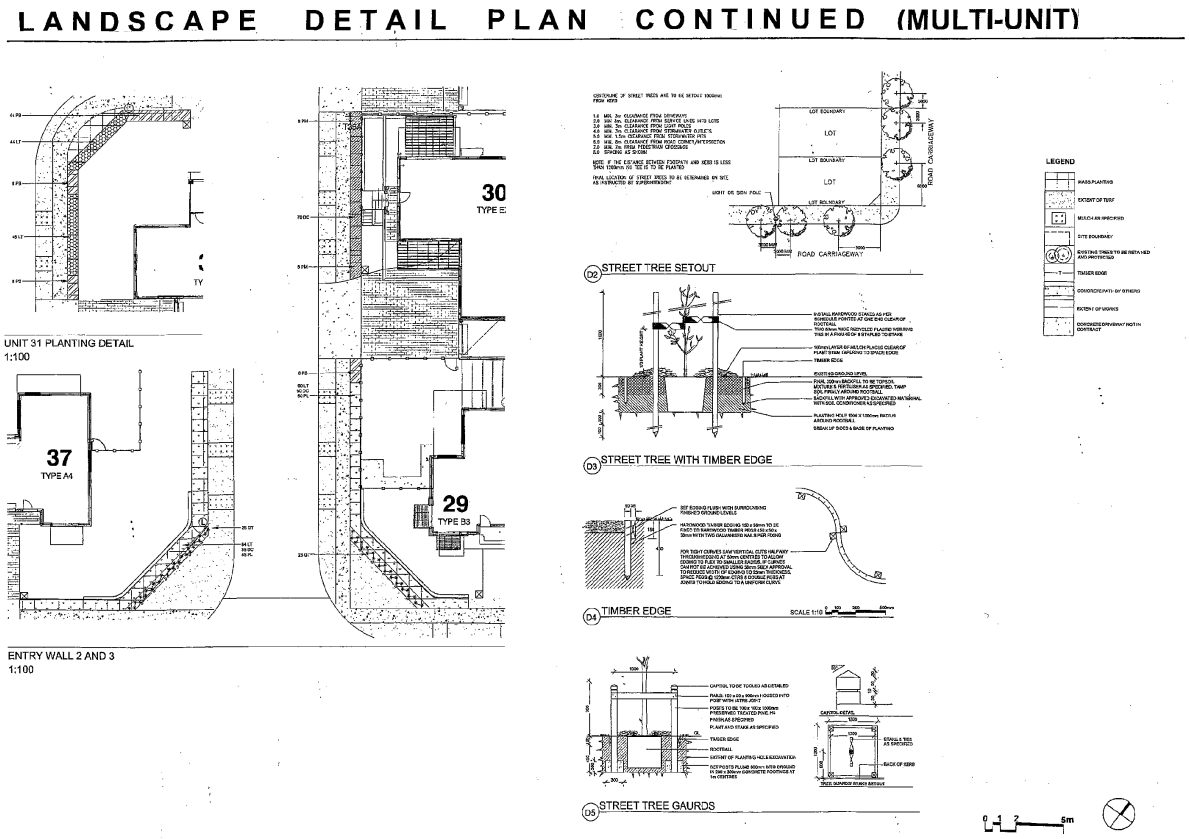
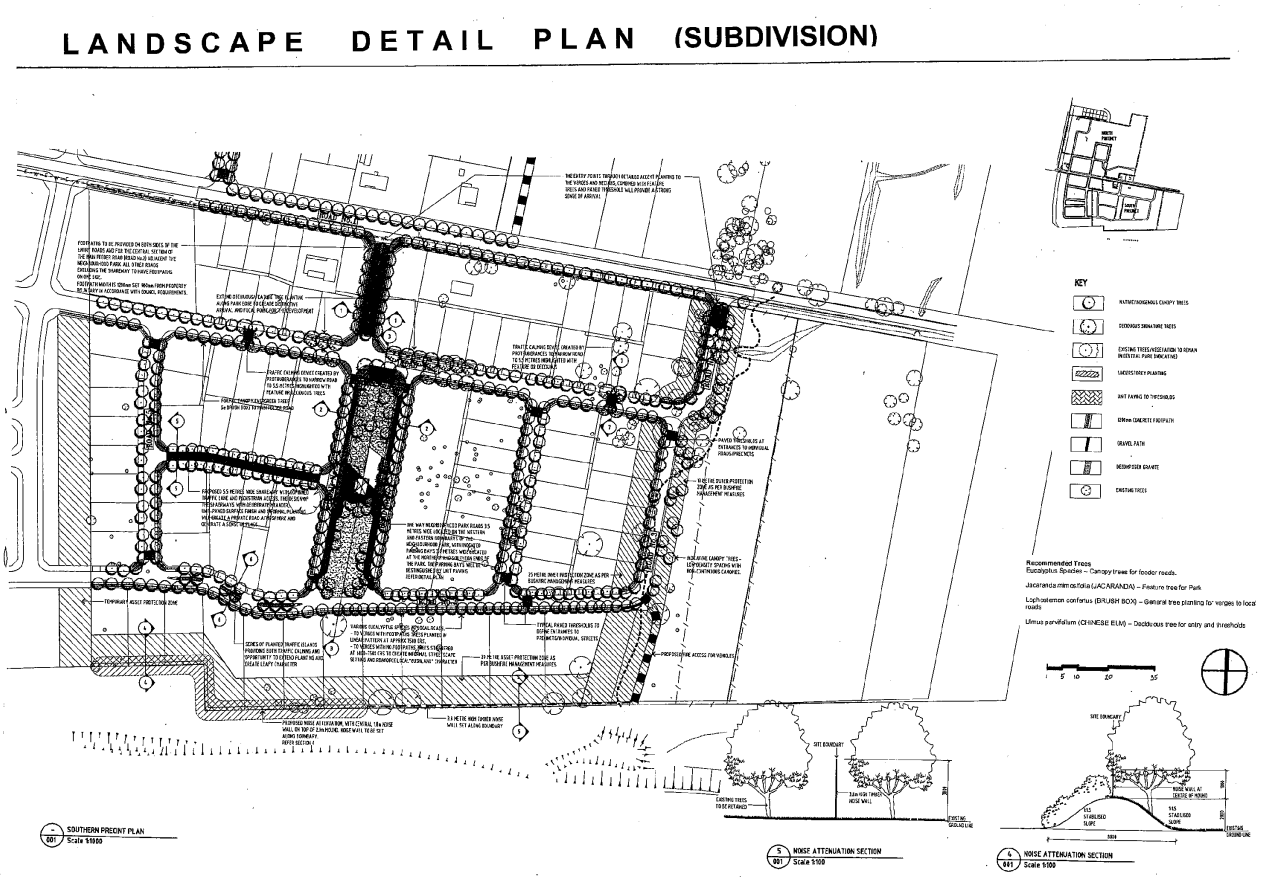


Figure F3.5: Landscape Detail Plan (Subdivision)



A maintenance manual is required to be provided (to City Parks specifications/requirements) for open space and public domain areas to be handed over to Council. This is usually provided at the construction certificate stage)

4.4.4. Landscape Implementation Report

When the landscape works associated with the consent are completed a Landscape Implementation Report is to be submitted to Council. This will provide written certification that:

a) The landscape works have been implemented substantially in accordance with the approved plans. Minor variations to the approved plans, such as small changes in plant quantities, are acceptable.

b) The landscape works have been implemented in accordance with the Landscape Design Section of this DCP.

c) The landscape works have been implemented in accordance with best practice industry standards.

d) A plant establishment period has been set, and its duration and name of contractor engaged to undertake the maintenance work.

No Occupation Certificate for the development will be issued prior to Council receiving this report. If Council is not the Principal Certifying Authority for the development, a copy of the Implementation Report is to be forwarded to Council.

4.4.5. Landscape Maintenance Report

Twelve months after the Principal Certifying Authority has issued an Occupation Certificate, a Landscape Maintenance Report is to be submitted to Council. This will provide written certification on whether the approved landscaping has been completed in accordance with the approved landscape plan and consent conditions. The Maintenance Report should also state whether the work has been completed in accordance with all relevant Australian Standards and that all plants are healthy with no evidence of die-back, stress, disease or loss.

4.4.6. Landscape 3 Year Landscaping Report

For larger and more visually significant developments, Council at its discretion may place a condition on the consent requiring that a report be provided to Council 3 years after the issuing of the Occupation Certificate. This report is to certify one of the following:

a) Landscaping has matured and is in accordance with the original landscape approval.

b) The landscaping has not matured in accordance with the original design philosophy and requires significant restoration. If this is the case, restoration plans are to be submitted to Council for approval and implemented at the expense of the property owners.

As a guide, developments that may have this condition placed upon the consent will generally be in visually significant locations or of a size that Council considers warrants ensuring that the landscaping is still thriving and in accordance with the original design philosophy.

4.5. Erosion and Sediment Control

An Erosion and Sediment Control Plan is required where any proposed land use or development activity involves:

a) The disturbance of the existing ground surface or placement of fill thereon, and/or result in a change to the shape of the land; and

b) Changes in the velocity and/or volume of water runoff entering directly or indirectly a natural waterbody, or flowing over the land.

4.5.1. Erosion and Sediment Control Plan

Erosion and Sediment Control Plans (ESCP) must include:

1) A drawing that clearly shows the site layout and, where appropriate, the approximate locations of best management practices and other matters listed in (2) and (3) below. Where these drawings are to scale, the scale should be at 1:500 or larger.

A narrative should accompany the drawing that describes how erosion control and soil and water management will be achieved on site, including ongoing maintenance of structures.

2) The following background information should be presented on the drawings(s):

   a) Location of site boundaries and adjoining roads;

   b) Approximate grades and indications of direction of fall;

   c) Approximate location of trees and other vegetation, showing items for removal or retention (consistent with any other plans attached to the application);

   d) Location of site access, proposed roads and other impervious areas (e.g. parking areas and site facilities);

   e) Existing and proposed drainage patterns with stormwater discharge points;

   f) North point and scale.

3) On the drawing or in a separate commentary, show how the various soil conservation measures will be carried out on site, including:

   a) Timing of works;

   b) Locations of areas where a protective ground cover will, as far as is practicable, be maintained;

   c) Access protection measures;

   d) Nature and extent of earthworks, including the amount of any cut and fill;

   e) Where applicable, the diversion of runoff from upslope lands around the disturbed areas;

   f) Location of all soil and other material stockpiles including topsoil storage, protection and reuse methodology;

   g) Location and type of proposed erosion and sediment control measures;

   h) Site rehabilitation proposals, including schedules;

   i) Frequency and nature of any maintenance program;

   j) Other site-specific soil or water conservation structures.

4.5.2. Additional Erosion and Sediment Control Measures for Large Sites

Where an application is for a site(s) over 2500m^2 and there will be substantial excavation, cut and/or fill, the applicant is required to include a number of additional measures in the Erosion and Sediment Control Plan:

1) Identify all areas likely to cause pollution of waterways from the transport of stormwater runoff containing sediment and silt, and implement appropriate devices to stop the risk of pollution.

2) Divert clean water around the construction site to prevent contamination.

3) Retain as much natural vegetation as possible and limit site disturbance.

4) Control stormwater that enters the construction site from upstream.

5) Divert stormwater from undisturbed upper slopes onto stable areas.

6) Retain and stockpile all excavated topsoil on site for future landscaping and to minimise risk of erosion.

7) Prevent sediment/silt from entering adjoining public or private property (especially drains) by installing sediment control devices at the low side of sites and wash down areas.

8) Provide a single, stabilised entry/exit point to the site.

9) Prevent sediment or building materials from reaching the road or Council's stormwater system. Remove sediment by sweeping, shovelling or sponging. Under no circumstances shall sediment be hosed.

10) Where a work zone permit over public property is applicable, ensure that appropriate debris control devices are implemented to prevent spillage of building materials into stormwater drains.

11) Compact all drainage lines when backfilling.

12) Connect downpipes to the stormwater system as early as possible.

13) Revegetate all disturbed areas, after on-site works are completed, in order to stabilise surface.

14) Maintain all sediment control devices during construction and earthworks to standards acceptable to Council.

4.6. Stormwater and Drainage

Relevant Stormwater Drainage Policy

Council has adopted the *Stormwater Drainage Specification for Building Developments.* This policy provides guidance to ensure ensure that stormwater drainage for building developments is designed to provide a robust, safe and low maintenance system to manage stormwater impacts on the drainage network and surrounding properties in a holistic manner that is incorporated aesthetically with the overall development.

This policy sets out the documentation that is required to be submitted to Council as part of the Development Application.

4.6.1. Drainage Plan

Where developments result in stormwater runoff, detailed stormwater management plans are required. The submission requirements are contained in Council's *Stormwater Drainage Specification for Building Developments.*

Stormwater design is an important consideration in planning a development and should be considered prior to determination of the final building layout and landscaping treatment.

A concept Stormwater Management Plan (SMP), prepared by a suitably qualified person shall be submitted with the Development Application. The SMP shall include a site drainage plan prepared in accordance with the checklist in Appendix A of Council's *Stormwater Drainage Specification for Building Developments.* The SMP shall also address Council's *Water Sensitive Urban Design Policy* and *Water Sensitive Urban Design Technical Guidelines.*

4.6.2. Stormwater and Drainage Report

A Stormwater and Drainage Report may be required for major development; or if the site is subject to flooding from adjacent or on site drainage channels; or if the site is affected by drainage constraints; or if the development proposes to divert a natural or artificial drainage line (including overland flow paths).

A Stormwater and Drainage Report must include:

1) A statement or justification as to why the proposed development is appropriate on flood prone land;

2) A survey of the site, with 1 metre contours;

3) A survey of the watercourse/drainage line (if applicable);

4) The estimated 1% Average Exceedance Probability flood level (or 1:100 ARI flood level); and

5) Demonstration that:

- The development will not increase the drainage flow to other properties;
- The quantity and velocity of runoff will not increase, post development; and
- The buildings are sited away from the impact of any drainage overflow.
- Further details are contained in Council's *Stormwater Drainage Specification for Building Developments.*

4.6.3. On Site Detention Systems

An On Site Detention Systems Report is required for developments as specified in Council's *Stormwater Drainage Specification for Building Developments*. The system must be designed by a suitably qualified civil engineer and address the requirements of the DCP and Council's *Stormwater Drainage Specification for Building Developments.*

4.6.4. Site and Soil Assessment Report

A Site and Soil Assessment Report is required to be submitted for a new domestic 'Aerated Wastewater Treatment System' (AWTS) when:

- The buffer distances as referred to in the controls in the On Site Sewage Management subsection of Infrastructure and Services section are not provided;

- A subdivision application is being considered;
- The AWTS is proposed within an identified high risk area; e.g. when site slope exceeds 20% (refer to table in the On Site Sewage Management provisions of the Infrastructure and Services Section of this Plan); or
- An on-site SMS already exists on the site and a second system is proposed.

A Site and Soil Assessment Report is required to be submitted for all other types of on-site SMS. Section 4 of the 'Environmental and Health Protection Guidelines - On Site Sewage Management for Single Households' and AS/NZS 1547:2000 should be used as a guide. A model Site and Soil Assessment Report is included in Council's On-site Sewage Management and Greywater Reuse Policy.

4.7. Waste Management

4.7.1. Waste Management Plans

Waste Management Plans are required for any application for demolition, construction or change of use of buildings for rural, residential, commercial or industrial development, or subdivision. This includes alterations or additions of over 50% of the existing buildings. Waste Management Plans are also required for applications for a Complying Development Certificate.

Waste Management Plans must provide details of:

a) The types and volumes of wastes and recyclables likely to be generated as a result of the development;

b) How waste and recyclables will be stored and treated on site;

c) How waste and recyclables are to be disposed of; and

d) How ongoing waste management will operate once the development is complete.

Table F3.5 provides an outline of the details required on these plans, which are to accompanying the development application.

Table F3.5

Proposed Development	Details Required on Plans
Demolition	Areas to be excavated On-site sorting and storage areas Access for vehicles

Proposed Development	Details Required on Plans
Construction	Areas to be excavated On-site sorting and storage areas Access for vehicles
Single Dwellings and Dual Occupancies	Location of waste storage and recycling areas
Multi-Unit Dwellings	Location and design for waste storage areas / facilities
Commercial Development	Location and design of waste storage areas / facilities Vehicular access
Industrial Development	Location and design of waste storage areas / facilities Vehicular access

4.7.2. Sample Waste Management Plans

The applicable sections of Tables F3.6 – F3.10 below must be completed and submitted with your development application for demolition, construction or use of a premise.

Table F3.6

OUTLINE OF THE PROPOSAL			
Site Address:	*162 Smith Street, Green Park*		
Name of Applicant:	*Joe Bloggs, Buildwell Construction*		
Address of Applicant:	*PO Box 101, Penrith NSW 2003*		
Phone:	*4732 1234*	Fax:	*4732 4321*
Buildings and other structures currently on the site:			
3 bedroom brick house, concrete slab and driveway, timber fencing			
Description of Proposal:			
Two storey commercial building (with offices), built with a metal frame and brick construction			
Applicant's Signature:		Date:	

Table F3.7: Demolition

Materials	**Destination**			
	Re-use and recycling		**Disposal**	
Material	Estimated Volume (m^2 or m^3)	ON SITE Specify proposed reuse or on-site recycling	OFF-SITE Specify contractor and recycling outlet	Specify Contractor and Landfill Site
Excavation Material	*200m^3*	*Re-use top soil for landscaping and behind retaining walls*		*Remainder to XY landfill by JKL waste contractors*
Green waste	*60 m^3*	*Separated – some chipped for landscaping*	*Remainder to XYZ Landscape Suppliers for re-use*	*Stumps and large trunks separated and to Deep Gully Land Fill by JKL Waste Contractor*
Bricks	*100 m^3*	*Clean and reuse lime mortar bricks for footings. Broken bricks for internal wall*	*Concrete mortar bricks to KLM Crushing and Recycling Company*	*NIL*
Concrete	*15 m^3*	*Existing driveway to remain during construction*	*KLM Crushing and Recycling Company*	*NIL*
Timber – what kind? *Hardwood*	*5 m^3*	*Re-use for formwork and studwork. Chip remainder for use in landscaping.*	*To stockpile at EFG Transfer Station, by JKL Waste Contractor*	*NIL*
Plasterboard	*3 m^3*	*Break up and use in landscaping*		*Remainder to XY landfill by JKL waste contractors*

Materials	**Destination**			
	Re-use and recycling		**Disposal**	
Material	Estimated Volume (m^2 or m^3)	ON SITE Specify proposed reuse or on-site recycling	OFF-SITE Specify contractor and recycling outlet	Specify Contractor and Landfill Site
Metals - What kind? *Aluminium*	*1 m^3*		*FGH Metal Recyclers*	*NIL*
Other *Tiles/ Doors/ Windows*	*5 m^3*	*Broken tiles used for access*	*S.T Second Hand Building Supplies*	*NIL*

Note: Details of on-site waste management should be provided on the plans accompanying your application (i.e. location of on-site storage areas / containers, vehicular access point, etc).

Table F3.8: Construction

Materials	**Destination**			
	Re-use and recycling		**Disposal**	
Material	Estimated Volume (m^2 or m^3)	ON SITE Specify proposed reuse or on-site recycling	OFF-SITE Specify contractor and recycling outlet	Specify Contractor and Landfill Site
Excavation Material		*See demolition section*		
Green waste		*See demolition section*		
Bricks	*2 m^3*		*KLM Crushing and Recycling* *Company*	*NIL*
Concrete	*5 m^3*		*KLM Crushing and Recycling* *Company*	*NIL*
Timber – what kind? *Hardwood*	*3 m^3*	*.*	*XYZ Landscape Suppliers for chipping and composting*	*NIL*
Plasterboard	*1 m^3*		*XYZ Landscape Suppliers*	*NIL*
Metals - What kind? *Aluminium*	*3 m^3*		*FGH Metal* *Recyclers*	
Other *Tiles/ Doors/* *Windows*	*1 m^3*			*Deep Gully landfill by JKL Waste Contractor*

Note: Details of on-site waste management should be provided on the plans accompanying your application (i.e. location of on-site storage areas / containers, vehicular access point, etc).

Table F3.9: Ongoing use of a premise

Type of Waste To be Generated	**Volume** (m^3 or litres per week)	**Proposed On-Site Storage and Treatment Facilities**	**Destination**
Recyclables • office paper • retail paper / cardboard • glass, aluminium, steel, and plastic containers • wooden pallets • printer cartridges • plastic crates • ferrous and non-ferrous metals • wood/timber • vehicle batteries **Liquid Waste** • cooking oils • sump oil **Organic Waste** • food organics • garden organics **Medical Waste** • syringes, sharps • bandages and any blood or body fluid contaminated products **Other Waste** • food scraps etc • non recyclable plastics (i.e. wrapping) • non-recyclable retail wastes including fabrics, ceramics and contaminated paper and cardboard	Refer to waste generation rates in Appendix F5 Technical Information	**Interim Storage** • separate storage bins for general waste and recyclables placed in strategic locations throughout the building (see location plan) • liquid wastes stored within sealed containers • all medical wastes stored in approved secured containers • garden organics removed by gardening contractor • food organics stored in water and vermin proof containers **Storage Prior to Collection** • central garbage and recycling bin storage bay/room for all users located adjacent to loading dock at rear of complex • shared garbage and recycling bin bays (residential units) provided in accordance with Councils requirements (see plans) • food and organic waste stored in refrigerated rooms if required • medical waste bins store in secure room or storage area • liquid waste and batteries stored in a suitably bunded area or location to secure accidental spillage • wooden pallets and plastic crates stored in loading dock area	**Collection and Processing** • dry recyclables collected weekly by ABC Contractors for processing at the Disy Recycling Plant Sydney • general waste collected twice weekly by Dump Contractors for delivery to the Government landfill site at Western Creek • medical waste collected weekly by Med Contractors for incineration at the local hospital • cooking oils and motor vehicle oils collected by Liquid Recyclers for reprocessing into liquid gold • food organics collected twice weekly by Food Processors for processing and recovery of energy • garden organics delivered to XYZ composting plant • wood and plastic crates collected by the distributor for reuse • scrap metals collected weekly by Ferrous Contractors for recycling at their Bathurst Plant

Type of Waste To be Generated	Volume (m^3 or litres per week)	Proposed On-Site Storage and Treatment Facilities	Destination

Note: Attach plans showing the location of waste storage and collection areas, and access routes for tenants and collection vehicles.

Table F3.10: Ongoing management of a premise

Describe how you intend to ensure the ongoing management of waste on-site
1. Interim waste storage areas and/or bins and communal waste storage areas and/or bins will be well signposted to ensure correct use.
2. Cleaning staff will be employed to transfer wastes and recyclables from the interim storage containers to the communal storage area and ensure that the storage bins and storage area is kept clean and in good order.
3. The company tenanting the premises will prepare an environmental management system addressing office and retail waste and recycling. This will include expectations and objectives for sorting and separating wastes.
4. An information kit will be provided to all tenants addressing office and retail wastes, their recycling requirements, and details of the location and operation of the waste storage area.
5. Waste audits will be conducted annually to determine waste output and to improve waste avoidance and resource recovery practices.

4.7.3. Waste Management Checklists

Checklist for Applicants

	Yes	No
Is the waste management plan completed?		
Are facilities available for the separation of wastes and recyclables?		
Has an area been allocated for the storage and collection of wastes?		
Are the waste storage and collection areas located so as to provide easy access for both occupants and collection services?		
Do your plans show details of on-site storage space for construction materials, waste materials and recyclables?		
Is the project planned to maximise the reuse of materials?		
Have arrangements been made for the ongoing management of waste?		

Checklist of Site Works

	Yes	No
Is the waste management plan acknowledged on-site?		
Are waste responsibilities clarified for all personnel and sub-contractors?		
Are works scheduled to minimise time between delivery and installation?		
Is the site planned and managed to minimise wastes?		
Have you arranged for the sale of recycled and salvaged materials?		
Are waste bins covered, sign-posted and properly used?		
Is site signage in place indicating environmental/waste commitment?		

4.8. Transport and Traffic Impact Assessments

4.8.1. Traffic Impact Statement

A Traffic Impact Statement is a simplified process of identification and assessment of relevant traffic impacts of a development. A Traffic Impact Statement may be required for any development proposal where traffic generation and impacts are minor, but have potential to adversely affect the surrounding areas. A Traffic Impact Statement may be prepared by anyone as long as it is of a suitable standard.

The information provided should reflect the size, type and location of the development as well as the relationship to surrounding developments and the adjacent transport network.

The following provides an outline of issues to be addressed in a Traffic Impact Statement:

a) Traffic generation/attraction and trip distribution of the proposed development;

b) Parking provisions appropriate to the development;

c) Impact on road safety;

d) Existing public transport services in the vicinity of the proposed development;

e) Impact of generated traffic on key adjacent intersections, streets in the neighbourhood of the development, the environment and other major traffic generating development sites in close proximity;

f) Existing parking supply and demand in the vicinity of the proposed development;

g) Safety and efficiency of access between the site and the adjacent road network;

h) Impact of traffic noise;

i) Peak period traffic volumes and congestion levels at key adjacent intersections;

j) Safety and efficiency of internal road layout, including service and parking areas;

k) Existing proposals for improvements to the adjacent road network and hierarchy;

l) AADT- annual average daily traffic. It is the estimated yearly total of traffic movements divided by 365; and

m) Volumes and historical trends on key adjacent roads.

4.8.2. Traffic Report

A Traffic Report is an intermediate level of investigation and assessment of relevant traffic impacts of a proposed development. Development proposals of a size or capacity detailed in Column 2 of Schedule 3 of *State Environmental Planning Policy (Infrastructure) 2007* must be accompanied by a Traffic Report. Council may also require a Traffic Report for other development proposals whose scale, nature or type has potential to impact on transport and traffic.

The Traffic Report must detail the assessed impact of projected pedestrian, cycle and vehicular traffic associated with the proposal and include recommendations as to the extent and nature of the traffic facilities necessary to preserve or improve the safety and efficiency of the adjacent road system, especially on major roads.

The requirements for Traffic Studies and Reports are detailed in the NSW Roads and Traffic Authority “Guide to Traffic Generating Developments.” The information provided should reflect the size, type and location of the development as well as the relationship to surrounding developments and the adjacent transport network. Reports should be prepared in accordance with the requirements of the “Guide to Traffic Generating Developments”, an outline of which is provided in Table F3.11.

Table F3.11: Key issues in preparing traffic impact studies

Procedures & Key Parameters	Source	Check✓
Brief description of the development		
Application and study process		
Introduction		
Background		
Scope of report		
The key issues and objectives of a traffic impact study		
General Data Collection / Existing Conditions		
Description of the Site and Proposed Activity		
Site location		
Current land use characteristics (zoning) of the proposed site and land use in the vicinity	Development Consent Authority	
Site access		
The Existing Traffic Conditions		
Road hierarchy; including the identification of the classified road network (major and minor roads) which may be affected by the development proposal	Council / RTA	
Inventory of road widths, road conditions, traffic management and parking control	Council / RTA and Survey	
Current and proposed roadworks, traffic management works and bikeways	Council / RTA	
Traffic Flows		

Table F3.11 cont.

Procedures & Key Parameters	Source	Check✓
Commuter parking provision	State Rail / Cityrail / Survey	
Pedestrian Network		
Identify major pedestrian routes	Survey	
Pedestrian flows and potential conflicts with vehicles, particularly where such conflicts cause capacity constraint on either vehicular or pedestrian movement	Survey	
Pedestrian infrastructure	Survey	
Proposed developments in the vicinity		
Proposed Development		
The Development		
Plan reference, if plans not contained in study report		
Nature of development		
Gross floor areas of each component of development		
Projected number of employees/users/residents		
Hours and days of operations		
Staging and timing of development		
Selection of appropriate design vehicles for determining access and circulation requirements	Section 6	
Access		
Driveway location, including review of alternative locations	Sections 5, 6	
Sight distance of driveways and comparisons with stopping and desirable minimum sight distances	Section 6	
Service vehicle access	Section 6	
Analysis of projected queuing at entrances	Section 6	
Current access to site and comparison with proposed access		
Provision for access to, and by, public transport	Section 6	

Table F3.11 cont.

Procedures & Key Parameters	Source	Check✓
Circulation		
Proposed pattern of circulation	Section 6	
Internal road widths	Section 6	
Provision for bus movements	Section 6	
Service area layout		
Parking		
Proposed supply		
Parking provision recommended by State Government policy	RTA / DUAP	
Council code and local parking policies and plans	Council	
Parking layout		
Projected peak demand, based where appropriate on similar research reports and on surveys of similar developments;	Section 5	
Parking for Service / courier vehicles and bicycles	Section 5	
Impact of Proposed Development		
Traffic generation during design periods		
Daily and seasonal factors		
Pedestrian generation and movements		
Traffic Distribution and Assignments		
Hourly distribution of trips		
Assignments of these trips to the road system based where possible on development feasibility studies or on origin/ destination surveys undertaken at similar developments in the areas		
Impact on Traffic Safety		
Assessment of Road Safety Impact		
Impact of Generated Traffic		
Daily traffic flows and composition on key streets and their expected effect on the environment particularly in residential areas		

Table F3.11 cont.

Procedures & Key Parameters	Source	Check✓
Peak period volumes at key intersections and effect of generated traffic on congestion levels	Survey	
Impact of construction traffic during construction stages		
Other proposed developments in the vicinity their timing and likely impact, if known		
Assessment of traffic noise		
Public Transport		
Options for extensions and changes to bus routes and bus stops following discussions with the STA and or private bus operators	STA / Private Operators	
Provision for pedestrian access to bus stops		
Recommended Works		
Improvements to site access and circulation		
Improvements to roads, signals, roundabouts and other traffic management measures		
Improvements to pedestrian facilities		
Effect of recommended works on the operation of adjacent developments		
Effect of recommended works on public transport services including access to bus routes and bus stops		
Provision of LATM measures		
Funding of proposed improvement projects		
Noise attenuation measures		

4.8.3. Transport Management and Accessibility Plan

A Transport Management and Accessibility Plan (TMAP) is required to be submitted for all major developments. A TMAP is a comprehensive assessment of the transport impacts of a major site development or re-development proposal. The TMAP must identify a package of appropriate transport measures (including infrastructure, services and demand management initiatives) for the proposed development, to manage the demand for travel to and from the development, and reduce the demand for travel by private car and commercial vehicles. This should include maximising opportunities for public transport, cycleways and pedestrian paths that link to existing or planned community, recreational and business services and facilities.

The TMAP must be prepared by a suitably qualified and experienced person. The NSW Department of Transport and Roads and Traffic Authority's "Draft Interim Guidelines on Transport Management and Accessibility Plans" provides information of the requirements of TMAPs. The following information is taken from this document to provide an overview of the requirements for a TMAP.

1) **Project Context**

a) Outline the strategic context; and

b) Set objectives and targets/performance criteria. Objectives and targets should include the objectives of this DCP, particularly the general objectives of C10 'Transport, Access and Parking', the specific objectives of the Transport and Land Use Section of this Plan and any other relevant section.

1) **Proposal**

a) Describe the proposed site;

b) Describe the proposed development/land use and the potential future land uses; and

c) Describe the current transport infrastructure context.

2) **Initial Transport Assessment**

a) Outline the technical assessment assumptions; and

b) Assess the existing travel patterns (including freight).

3) **Transport Assessment of Proposal**

a) Determine an initial estimate of travel demand (person trips, freight trips or both);

b) Estimate the distribution of generated trips between origins and destinations;

c) Estimate likely modal split (including freight);

d) Estimate the loads on transport infrastructure/services that serve the project study area;

e) Analyse capacity/amenity/government policy implications and determine if desired transport system performance criteria are met;

f) Identify feasible options (including transport and development design) to modify transport impacts; and

g) Test options to meet objectives and targets.

4) **TMAP and Agreement**

a) Identify appropriate measures, including infrastructure, services and policies; and

b) Check options against objectives and targets, and cost effectiveness and agree on preferred option package.

5) **Agreed Package**

a) Include consideration of funding, timing and evaluation.

6) **Review of TMAP and Agreement**

a) At the time of development application and at an appropriate interval.

4.9. Works to Trees and Vegetation

Where trees or vegetation are proposed to be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed, an assessment of the impact of that work must be carried out. This assessment will vary in scale and complexity depending on the location and extent of the works and whether the site contains any threatened species, population, ecological community or its habitat. Applicants are advised to consult with Council's

Development Services Unit or Tree Management Officer regarding the form of application (Tree Pruning/Removal Application or Development Application) and the level of information required.

4.9.1. Tree Survey and Assessment Report

A Tree Survey and Assessment Report is the minimum level of information to be provided for works to any tree or vegetation. The Tree Survey and Assessment Report is to be provided for a Tree pruning/removal application. A Tree Survey and Assessment Report must address the following matters:

1) The location and type of tree(s) or vegetation;

2) Details of the proposed works and the reasons for the works;

3) The health and condition of the tree(s) or vegetation, including its structural soundness and the condition of the root zone;

4) The aesthetic, scientific and/or historic importance of the tree(s) or vegetation;

5) The impact of the proposed work on the appearance, health or stability of the tree(s) or vegetation and the general amenity of the surrounding area, including any effect on the streetscape;

6) In the case of an application to remove a tree(s) or vegetation, whether pruning would be a more practicable and desirable alternative;

7) The risk of personal injury;

8) The risk of damage to buildings, structures or services;

9) The extent of other trees and vegetation on the property;

10) Whether the tree(s) or vegetation is habitat, a source of food or shelter, or used by fauna.

4.9.2. Arboricultural Survey Report (or Arborist Report)

All existing vegetation on the site should be noted on the landscape site analysis plan and in the landscape submission to Council. This includes all existing trees, bushland and shrubs of any prominence or value. However, in the case of large and/or significant trees or shrubs, a separate report should be prepared by a qualified consulting arborist. This report should include an Arboriculture Survey to provide detailed information on the trees present. Full detail of trees to be removed, as well as trees proposed for retention, should be given.

The report is to be prepared by an arborist. Arborists Reports on existing trees and shrubs taller than 5m are to include the following information, where appropriate:

1) Allocated survey number (to correlate with survey plan and identify location within site);

2) Species name and common name;

3) Trees/shrubs to be retained;

4) Trees/shrubs to be removed due to the proposed development;

5) Trees/shrubs to be removed due to death or disease;

6) Estimated height (to aid on-site identification and assessment of significance);

7) DBH (Diameter at Breast Height – to indicate tree maturity and allow estimation of lateral root spread);

8) Canopy spread (to allow assessment of any requirement to prune or likely impact of overshadowing);

9) Health and/or condition status;

10) Recommended TPZ (Tree Protection Zone) for trees, which are to be retained, if applicable. This is the minimum distance from the centre of any tree at which development should commence;

11) All trees on adjoining properties that are within 3m of the boundary of the proposed development; and

12) Where the proposed development will have a significant impact upon the future health and suitability for retention of other large or significant trees located on adjacent properties, but which are further away than 3m, their existence is to be noted and appropriate recommendations provided for their management.

Where the consulting arborist chooses to apply further information, such as a SULE rating, or comparative suitability scale, Council will give this due weight in an assessment of an application.

Council, in assessing development applications where tree removal is included, will consider the following:

1) The contribution that the tree makes to the visual landscape that it sits within, including streetscape and distant views;

2) If trees are proposed to be removed, whether the proposed development can be modified to retain the tree/s; and

3) Whether there are any special construction requirements near to or adjacent to any trees proposed to be retained on the development site.

If there are significant trees on the site, which are being retained, Council may require that these trees be valued by a consulting arborist using the Thyer Method of valuation. If this is the case, this information is to be submitted to Council along with a copy of the Thyer Tree Valuation Work sheet for each tree or group of trees as a part of the Arboricultural Survey Report.

It should be noted that Council generally encourages the retention of trees on development sites and encourages development proposals to be designed so as to minimise the need for tree removal, while ensuring the health of the trees which are retained. Council will consider the removal of trees on development sites in the following instances:

1) The applicant can demonstrate that it is not possible to modify the development to allow retention of the tree/s as the proposed development will become economically unviable.

2) The applicant can demonstrate that the trees are of such a size and scale that, if they were to be retained, they would not be compatible with the development.

3) The applicant can demonstrate that the health of the trees warrants their removal as they are posing a hazard or threat.

4) The applicant can demonstrate that the safe useful life expectancy of the tree is minimal.

5) The applicant can demonstrate that the tree makes minimal contribution to the streetscape.

6) The applicant can demonstrate that the tree or trees make minimal contribution to the landscape amenity of the locality or neighbouring properties.

4.9.3 Tree Management Plan

Where trees are proposed to be or are required to be retained as a part of a development, the Arboricultural Survey Report should also provide a comprehensive Tree Management Plan.

The Tree Management Plan is to be in place PRIOR to commencement of any site works. Site works includes the demolition of existing structures or the entrance onto site of any machinery for excavation, demolition or large scale rubbish removal.

4.9.4. Flora and Fauna Assessment Report including a Seven Part Test

Where vegetation works are proposed to any indigenous vegetation, a Flora and Fauna Assessment Report will, in most cases, also be required. The Flora and Fauna Assessment Report must be undertaken by a suitably qualified and experienced person; i.e. a person with tertiary qualifications in ecology, zoology or botany; with a minimum of 5 years experience in undertaking flora and fauna surveys and assessments; with a demonstrated knowledge of the flora and fauna that occurs in the Penrith local government area; and possessing appropriate licences or approvals under relevant legislation.

The assessment and report must be undertaken and prepared in accordance with the following guidelines:

- *Threatened Species Assessment Guidelines – The Assessment of Significance for TSC Act* (DECCW (OEH) 2007)
- Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft) (DEC, 2004)
- *Significant Impact Guidelines – Matters of National Environmental Significance for the EPBC Act* (Prepared by the Commonwealth Department of the Environment, Water, Heritage and the Arts, 2013).

The report must include as a minimum:

1) A written and mapped description of the plant and animal species present and their habitats;

2) A clear site plan showing, as a minimum, the proposed development and any associated APZ and Effluent Management Area, location of all vegetation and important site features, location of any vegetation to be removed.

3) A statement on whether any of the plant and animal species or their habitats are listed as threatened, endangered or vulnerable species or communities under the *Threatened Species Conservation Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*;

4) A description of the proposed vegetation works and, if the works are to be undertaken as part of a proposed development, a description of the proposed development, including measures to mitigate adverse impacts;

5) An objective assessment to determine whether the proposed works and development are likely to significantly affect any threatened species, populations or ecological communities or their habitats. This assessment is required under section 5A of the *Environmental Planning and Assessment Act 1979*. Section 5A lists the factors that must be taken into account in making such a determination; and

6) Consideration of the likely impacts the proposed works or development may have on any potential use of the vegetation as a fauna movement corridor. Where relevant, consideration of the importance of any rural dams for fauna habitats. The location of any Asset Protection Zone or Effluent Management Area should also be considered by the assessment.

4.9.5. Species Impact Statement

A Species Impact Statement must be prepared by a suitably qualified and experienced person. It is required when Council has reviewed the flora and fauna assessment report and determined that the proposed works and/or proposed development are likely to have a significant effect on a threatened species, population or ecological community or its habitat. The species impact statement must be prepared in accordance with the requirements of the *Threatened Species Conservation Act 1995.* Before preparing a species impact statement, the requirements of the Office of Environment and Heritage and Council must be sought.

4.10. Bushfire Assessment Reports

Development applications on bush fire prone land must be accompanied by a Bush Fire Assessment Report. The Bush Fire Assessment Report must include all the information required by the Rural Fire Service's 2006 publication "Planning for Bush Fire Protection" (PBP).

4.11. Flood Study

A Flood Study will be required for any development on land which has been identified as fully or partially flood affected. A flood study must include:

1) A statement or justification as to why the proposed development is appropriate on flood prone land;

2) A survey of the site, with 1m contours;

3) A survey of the main watercourse (if applicable);

4) The estimated 1% Average Recurrence Interval (ARI) flood level;

5) Location of flood free access/egress, including spot points to demonstrate that the surface of the access is driveable in flood events;

6) Demonstration that:

a) The development will not increase the flood hazard or risk to other properties;

b) The structure of the proposed buildings will be adequate to deal with flooding situations;

c) The proposed building materials are suitable;

d) The buildings are sited in the optimum position to avoid flood waters and allow safe flood access for evacuation;

e) The proposed redevelopment will not expose any resident to unacceptable levels of risk, or any property to unreasonable damage; and

f) Any existing buildings comply with the Draft Flood Proofing Code.

Additionally, where filling of flood liable land is proposed, the Flood Study will need to demonstrate that:

a) Flood levels are not increased by more than 0.1m by the proposed filling;

b) Downstream velocities are not increased by more than 10% by the proposed filling;

c) Proposed filling does not redistribute flows by more than 15%;

d) The potential for cumulative effects of possible filling proposals in that area is minimal;

e) There are alternative opportunities for flood storage;

f) The development potential of surrounding properties is not adversely affected by the filling proposal;

g) The flood liability of buildings on surrounding properties is not increased; and

h) No local drainage flow/runoff problems are created by the filling.

The above criteria can only be addressed and satisfied by the submission of a detailed Flood Study by an appropriate consulting engineer. The Flood Study would involve both hydrologic and hydraulic analysis of the watercourse and the effects of the proposed filling on flood levels, flow velocities and distribution of flows.

4.12. Salinity Analysis

A Salinity Analysis is required if the site has been identified as subject to a salinity hazard, or if a preliminary investigation has indicated that the site is, or is likely to be, affected by salinity.

A Salinity Analysis must include:

- Results of the initial evaluation;

- Description of the landscape;
- Description of the soil profile;
- Soil chemical analyses;
- Soil aggressivity and sodicity (if relevant);
- The impact of the proposed development on the saline land or potentially saline land;
- The impact of the saline land or potentially saline land on the development; and
- A Remedial Action Plan, which details;
    i) The remediation objectives;
    ii) The process and standards by which the land will be remediated; and/or
    iii) Mitigation measures required during the course of construction;
    iv) Specific measures that will be undertaken to reduce the risk of salinity damage to property and structures.

Investigations and sampling for salinity are to be conducted in accordance with the requirements of "Site Investigations for Urban Salinity" (Department of Natural Resources).

The author of the Salinity Analysis must sign off on the project on completion of works and submit this to Council prior to an Occupation Certificate being issued, if required.

4.13. Visual Impact Assessment

New proposals on land identified in the LEP on the Scenic and Landscape Values Map or on land zoned E1 National Parks and Nature Reserves or E2 Environmental Conservation are required to submit a Visual Impact Assessment (VIA) with their development application. Depending on the nature of the development, the VIA is to be prepared by either the designer of the development or a suitably experienced and qualified professional.

Visual Impact Assessment Type 1 (VIA 1)

The following information is to be submitted when undertaking a VIA for Category 1 development:

1) Describe the existing visual landscape character of the site and surroundings, taking into consideration existing features such as: the natural landscape (e.g. ridgelines, hillsides, slopes, watercourses and vegetation); the built form (e.g. buildings and structures, roads and other infrastructure); and land use patterns (e.g. in rural areas, existing agricultural patterns and scale). Refer to Penrith City Council's "Landscape Character Strategy" (2006).
2) Provide ground level photographs confirming the scenic prominence of the site and surrounding locality relative to public vantage points. Provide a map to indicate the location from where the photograph is taken and an arrow indicating the direction it was taken.

3) Identify the visual impacts and list the mitigation measures employed to reduce the visual impact of the development.
4) Superimpose a sketch of all components of the development (e.g. buildings, fences, driveways, dams and signage), as well as all mitigation measures (e.g. mature vegetation, colours and screens) onto at least three photo images taken from relevant viewpoints, to illustrate the appearance of the final development.

Visual Impact Assessment Type 2 (VIA 2)

The following information is to be submitted when undertaking a VIA for Category 2 development:

1) Baseline Study – Describe and map the existing visual landscape character and determine the objectives for managing visual landscape character. Refer to Penrith City Council's "Landscape Character Strategy" (2006). Describe and map the site and surroundings, taking into consideration existing features such as: the natural landscape (e.g. ridgelines, hillsides, slopes, watercourses and vegetation); the built form (e.g. buildings and structures, roads and other infrastructure); and land use patterns (e.g. in rural areas, existing agricultural patterns and scale).

2) Describe the proposed development:

   a) Analyse, describe and illustrate the main visual components of the proposed development, particularly elements likely to be visible;

   b) Describe what different development options (e.g. siting options, different building designs (including orientation, form, colours and materials) and landscape designs) have been considered;

   c) Provide plans showing locations and the extent of major visual features. Include elevations of buildings and other major structures, showing elements such as height, colours and proposed materials; and

   d) Where appropriate, include a projected timeline describing changes to the proposed development over a period of time.

3) Identify and evaluate the potential visual impacts:

   a) Identify the views and likely viewers affected;

   b) Identify and describe the likely changes to the visual landscape character and views; and

   c) Evaluate the impacts showing the relationship between 'sensitivity' of the affected landscape (the extent to which the landscape is able to accommodate the type and scale of development without adverse effect on character or value) and 'magnitude' of the impact (a combination of extent, scale and duration of any impact).

4) Demonstrate visual mitigation measures:

   a) Determine whether or not the proposed development meets the objectives for managing visual landscape character established in step a) above;

   b) Identify measures that reduce the negative impacts and facilitate the positive impacts (e.g. layout; choice of site level; reduced proportions; reflectivity of colour of materials;

articulation; extent of cut and fill; visual buffers; and extent of vegetation removed and retained); and

c) Demonstrate a commitment to implementation of the measures and, where relevant, submit a contingency plan should mitigation not be successful.

5) Provide a diagrammatic 'summary drawing' to show how all mitigation measures work together in response to the development.

Submission Material for VIA 1 and 2

Appropriate information should be submitted to support the visual impact assessment and may include:

a) Succinct and understandable text;

b) Illustrations that are closely linked to the text, including annotated maps, plans, overlays and photographs;

c) Aerial photographs showing the site and surroundings, predominant patterns of land use, buildings, vegetation and gardens;

d) Ground level photographs confirming the scenic prominence of the site and surrounding locality relative to public vantage points. Care should be taken in selecting viewpoints and the focal length of camera settings, so as to represent what the eye sees and not mislead interpretation. Panoramic views are best presented as a sequence of such photographs rather than a wide angle photo. A map should be provided to indicate the location from where the photograph is taken and an arrow indicating the direction it was taken;

e) Measured surveys describing topography and natural features, and locating structures and services;

f) Charts and tables to convey complex information and allow comparisons to be made (e.g. landscape data, impact magnitude and significance);

g) Visualisations such as photo montages, video representations, 3D computer-generated models, with viewpoints selected with care;

h) Specialist reports, such as an architectural concept report or a landscape concept plan.

Council may request additional specific information to assess the ability of a proposal to address the principles for protecting areas with scenic and landscape values, depending on the specific circumstances of the proposal and the site.

4.14. Heritage

4.14.1. Heritage Impact Statements

As a minimum, the following issues must be addressed in a Heritage Impact Statement:

1) **For development that would affect a heritage item:**

a) The heritage significance of the item as part of the environmental heritage of Penrith;

b) The impact that the proposed development will have on the heritage significance of the item and its setting, including any landscape or horticultural features;

c) The measures proposed to conserve the heritage significance of the item and its setting;

d) Whether any archaeological site or potential archaeological site would be adversely affected by the proposed development;

e) The extent to which the carrying out of the proposed development would affect the form of any significant subdivision pattern; and

f) The issues raised by any submission received in relation to the proposed development in response to the notification or advertising of the application.

2) **For development that would be carried out in a heritage conservation area:**

a) The heritage significance of the heritage conservation area and the contribution which any building, work, relic, tree or place affected by the proposed development makes to this heritage significance;

b) The impact that the proposed development would have on the heritage significance of the heritage conservation area;

c) The compatibility of any proposed development with nearby original buildings and the character of the heritage conservation area, taking into account the size, form, scale, orientation, setbacks, materials and detailing of the proposed development;

d) The measures proposed to conserve the significance to the heritage conservation area and its setting;

e) Whether any landscape or horticultural features would be affected by the proposed development;

f) Whether any archaeological site or potential archaeological site would be adversely affected by the proposed development;

g) The extent to which carrying out of the proposal development in accordance with the consent would affect any historic subdivision pattern; and

h) The issues raised by any submission received in relation to the proposed development in response to the notification or advertising of the application.

3) **For development that would affect a place of potential heritage significance:**

a) The heritage significance of the place as part of the environmental heritage of Penrith;

b) The impact that the proposed development will have on the heritage significance of the place and its setting, including any landscape or horticultural features;

c) The measures proposed to conserve the heritage significance of the place and its setting;

d) Whether any archaeological site or potential archaeological site would be adversely affected by the proposed development; and

e) The extent to which carrying out of the proposal development in accordance with the consent would affect any historic subdivision pattern.

4) **For development within the vicinity of a heritage item:**

a) A Heritage Impact Statement shall be lodged with a development application for buildings or works in the vicinity of a heritage item. This requirement extends to development that:

i) May have an impact on the setting of a heritage item, for example, by affecting a significant view to or from the item or by overshadowing; or

ii) May undermine or otherwise cause physical damage to a heritage item; or

iii) Will otherwise have any adverse impact on the heritage significance of a heritage item or of any heritage conservation area within which it is situated.

b) As a minimum, the following issues must be addressed in the Heritage Impact Statement:

i) The impact of the proposed development on the heritage significance, visual curtilage and setting of the heritage item;

ii) Details of the size, shape and scale of, setbacks for, and the materials to be used in, any proposed buildings or works; and

iii) Details of any modification that would reduce the impact of the proposed development on the heritage significance of the heritage item.

4.14.2. Heritage Conservation Management Plan

A Heritage Conservation Management Plan may be required where a proposal could affect the significance of a heritage item, heritage conservation area or place of potential heritage significance. A Conservation Management Plan guides the future development and management of a heritage item, place or area in a way that protects its heritage significance. It not only identifies a preferred use for the item, place or area but also how any proposed changes will be implemented so that the maximum heritage significance is retained. As such, it provides a framework for investigating, assessing and managing the heritage significance of heritage items, places or areas.

The issues to be addressed in the Conservation Management Plan will vary depending on the heritage item and the proposed development. Conservation Management Plans must be prepared by a qualified heritage consultant in accordance with the guidelines of the NSW Heritage Office. The following is provided as a guide only on the information to be included in a Conservation Management Plan:

a) An investigation of the heritage item's historical and geographical context, its history, fabric, research potential, and importance to the community;

b) A statement of significance, of the nature, extent and degree of significance of the heritage item based on the documentary and physical evidence;

c) A conservation policy, arising out of the statement of heritage significance, to guide current and future owners of the item on the development potential of the item and its ongoing maintenance. Constraints and opportunities should be identified;

d) Examination of current proposals for reuse or development, and how they can best be achieved in accordance with the conservation policy. Where proposals may have an adverse impact on the heritage significance of the item, the need for such work must be justified. Where development proposals have not been finalised, several likely options are to be discussed;

e) Recommendations for how the heritage item can best be managed bearing in mind those responsible and interested in its ongoing conservation. It is to include proposals to review the Conservation Management Plan and the item's maintenance.

4.14.3. Archival Recording Standards

Archival recording is required where demolition or partial demolition of a heritage item, a place within a heritage conservation area, or a potential place of heritage significance is proposed. The archival recording should be undertaken by a heritage consultant experienced in the preparation of an archival recording.

The following is a simple checklist of items that must be included in an archival recording. Additional information may be submitted if it adds to the understanding of the place.

1) Title page with subject, author, client, date and copyright;

2) Statement of why the record was made;

3) Outline history of the item and associated sites, structures and people;

4) Statement of heritage significance of the items using "Assessing Heritage Significance" by the NSW Heritage Office (2002);

5) Inventory of archival documents related to the item (e.g. company records, original drawings), when available;

6) Location plan showing the relationship to surrounding geographical features, structures, roads, vegetation etc. including a north point;

7) Base plans - Drafted or hand-drawn base plans shall be prepared and include:

   a) Cross-references to photographs;

   b) Names of the relevant features, structures and spaces; and

   c) A north point.

8) Black and white photographic record - One set of 35mm black and white negatives labelled and cross-referenced to base plans and accompanied by informative catalogues are required. Two copies of proof sheets and select medium format prints showing important details shall be provided. Images shall include:

   a) Views to and from the site (possibly from four compass points);

   b) Views showing relationships to other relevant structures and landscape features;

c) All external elevations;

d) Views of all external and internal spaces (e.g. courtyards, rooms, roof spaces etc.); and

e) External and internal details (e.g. joinery, construction joints, decorative features, paving types, etc.).

All photographic images shall be mounted and labelled.

9) Colour slides - Two copies mounted in archival stable slide pockets, clearly labelled and cross-referenced to base plans. Images shall include:

a) Views to and from the site and/or the heritage item; and

b) Views and details of external and internal colour schemes as appropriate.

Selected colour prints may be required. They should be mounted and labelled.

10) Measured Drawings - Appropriately scaled drawings printed on archival stable paper shall be provided. For a built item, this may include:

a) Site plan (1:500 or 1:200);

b) Floor plan/s (1:100 or 1:50);

c) Elevations and sections (1:100 or 1:50);

d) Roof plan/s (1:100 or 1:50);

e) Ceiling and joinery details (1:20 or 1:10); and

f) Machinery and services details (e.g. drainage lines).

11) Presentation - The archival recording shall be presented to Council as a single bound document preferably in A4 format. Large maps shall be folded and inserted as map pockets attached to the document. Similarly, all photographic images shall be fixed to the document and labelled. No unbound documents or loose supporting materials such as maps, plans, slides, negatives or prints are acceptable.

Two complete copies of the archival recording are required. However, one copy may not include a set of photographic negatives and colour slides. An additional copy of the whole recording must be submitted on electronic media in additional to the two required hard copies.

4.14.4. Archaeological Assessment Report

Archaeological Assessment Reports should contain sufficient data to stand alone; support documents should be unnecessary. They should demonstrate the process and results, providing information in a format that is useful as reference material. Archaeology is a specialised field and many activities, including excavation, must be undertaken or supervised by a trained archaeologist.

The content of an Archaeological Assessment Report will depend on the site and the purpose of the study. The NSW Heritage Branch of the Department of Planning is

responsible for developing best practice standards, policies and guidelines for the treatment and conservation of historical archaeological remains that are known or anticipated to exist in NSW. Advice should be sought from the Heritage Branch regarding specific requirements for archaeological assessments.

The following checklist provides a guide to likely minimum information requirements:

a) Site or study area marked on a map;

b) Relevant statutory controls/zonings;

c) Author identification;

d) Background to the assessment, including reference to previous reports;

e) Outline of methodology employed;

f) Sources consulted;

g) An historical outline/summary;

h) Analysis of physical evidence (possibly illustrated);

i) Synthesis (possibly in graphic overlay form);

j) Likelihood of archaeological remains occurring (known, potential, no archaeological features), may be presented graphically;

k) Identification of research themes and questions (and how these were derived);

l) Assessment of significance (statement of significance and/or graded zones);

m) Identification of issues;

n) Policy statement;

o) Recommendations;

p) Acknowledgments;

q) Bibliography.

4.14.5. Aboriginal Cultural Heritage Archaeological Survey Report

An Aboriginal Cultural Heritage Archaeological Survey is required for development proposals on land identified as potentially archaeologically sensitive in the Culture and Heritage Section of this DCP. The Department of Environment, Climate Change and Water (DECCW) should be contacted for advice on survey needs and requirements. The following information is taken from the NSW National Parks and Wildlife Service “Aboriginal Cultural Heritage – Standards and Guidelines Kit” to provide an indication of the archaeological survey reporting requirements.

An Archaeological Survey Report must provide a full description of the development and its potential impact on the landscape and heritage resource. This should be a summary of both the impact history of the study area (previous land uses, previous impact assessments and

their results), and the potential impact of the proposed development on cultural heritage. It should include consideration of the impact of the development both during and after construction/implementation (i.e. many sites survive the construction of a development, only to be slowly degraded and disturbed by changes in land use over the longer term). The following information is required, as appropriate, to the specific type of development:

a) The type of development proposed and how the proposed development is to be implemented;

b) Flexibility of project design, timing and staging of the proposal; and

c) Identification of direct and indirect impacts (both short and long term).

d) The following is an indication of the requirements for a report:

e) Introduction (including description of study area and proposed activity/development and a description of the impact);

f) Experience/Qualifications;

g) Aboriginal Values;

h) Community Consultation (significance);

i) Methodology (including details of field work);

j) Photographs;

k) Results (including discussion of the study area);

l) Recommendations;

m) References (other reports); and

n) Maps (including maps of study area), glossary, appendices, plates, figures, etc.

4.15. Contamination

Advice on the reporting requirements for contaminated sites should be sought from the relevant state environment agency. The following information is taken from “Guidelines for Consultants Reporting on Contaminated Sites (1997)”. Applicants should refer to this document for full information on reporting requirements.

4.15.1. Contamination Investigation Report / Preliminary Contamination Investigation (Stage 1)

The Preliminary Site Investigation Report should:

a) Identify all past and present potentially contaminating activities;

b) Identify potential contamination types;

c) Discuss the site condition;

d) Provide a preliminary assessment of site contamination; and

e) Assess the need for further investigations.

An appraisal of the site history is fundamental to the preliminary assessment and may be used to assess potential site contamination. It is important to review and assess all relevant information about the site, including information obtained during a site inspection.

Where a complete site history clearly demonstrates that site activities have been non-contaminating, there may be no need for further investigation or site sampling.

However, where contaminating activities are suspected or known to have occurred, or if the site history is incomplete, it may be necessary to undertaken a preliminary sampling and analysis program to assess the need for a detailed site investigation

4.15.2. Detailed Contamination Site Investigation (Stage 2)

The Detailed Site Investigation Report should give comprehensive information on:

a) Issues raised in the preliminary investigation;

b) The type, extent and level of contamination;

c) and assess:

d) Contaminant dispersal in air, surface water, groundwater, soil and dust;

e) The potential effects of contaminants on public health, the environment and building structures;

f) Where applicable, off-site impacts on soil, sediment and biota; and

g) The adequacy and completeness of all information available to be used in making decisions on remediation.

If the results of the detailed site investigation indicate that the site poses unacceptable risks to human health or the environment – on-site or off-site, and under either the present or the proposed land use – then a remedial action plan needs to be prepared and implemented, and development consent obtained for these works.

4.15.3. Site Remedial Action Plan (Stage 3)

The Remedial Action Plan should:

a) Set remediation goals that ensure the remediated site will be suitable for the proposed use and will pose no unacceptable risk to human health or to the environment;

b) Document in detail all procedures and plans to be implemented to reduce risks to acceptable levels for the proposed site use;

c) Establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner; and

d) Identify and include proof of the necessary approvals and licences required by regulatory authorities.

Once remedial work is complete, a report should be prepared detailing the site work conducted and regulatory decisions made.

4.15.4. Validation and Site Monitoring Reports

Reporting requirements are of two types: validation and, where appropriate, ongoing site monitoring.

Validation reporting

Where remedial action has been carried out, the site must be 'validated' to ensure that the objectives stated in the Remedial Action Plan have been achieved. A report detailing the results of the site validation is required.

The extent of validation required will depend on:

a) The degree of contamination originally present;

b) The type of remediation processes that have been carried out; and

c) The proposed land use.

Validation must confirm statistically that the remediated site complies with the clean up criteria set for the site. For guidance, see the NSW EPA's "Contaminated Sites Sampling Design Guidelines". Where applicable, the US EPA's "Methods for Evaluating the Attainment of Cleanup Standards" (1989) can also be used.

The Validation Report must assess the results of the post-remediation testing against the clean-up criteria stated in the Remedial Action Plan. Where targets have not been achieved, reasons must be stated and additional site work proposed to achieve the original Remedial Action Plan objectives.

The Validation Report should also include information confirming that all DECCW and other regulatory authorities' conditions and approvals have been met. In particular, documentary evidence is needed to confirm that any disposal of soil off-site is done in accordance with the Remedial Action Plan.

Ongoing site monitoring reporting

Where full clean-up is not feasible, or on-site containment of contamination is proposed, the need for an ongoing monitoring program should be assessed. If a monitoring program is needed, it should detail the proposed monitoring strategy, parameters to be monitored, monitoring locations, frequency of monitoring, and reporting requirements.

4.15.5. Site Audit (Contamination)

In determining applications for development, Council may require an independent review (Site Audit) of any or all stages of the site investigation, remediation or validation process, conducted in accordance with the *Contaminated Land Management Act* ('CLM Act').

A Site Audit will lead to the provision of a Site Audit Statement, stating for what use the land is suitable, including any conditions that should be adhered to for that land use (e.g. to maintain capping). Only site auditors accredited by the DECCW under the CLM Act can issue site audit statements. A Site Audit Statement must be prepared in accordance with DECCW Guidelines for the NSW Site Auditor Scheme and must be in a prescribed form.

4.15.6. Chemical Use and Storage Report

A chemical use and storage report may be required if the development involves storage of chemicals on the site.

A chemical use and storage report will not be required when:

a) The use of chemicals is for routine cleaning, and the chemicals to be used are of household or hospital grade;

b) The total quantity of chemicals to be routinely used or stored on the site does not exceed 100 litres;

c) The chemicals to be used or stored are not of sufficient acidity, alkalinity or strength to cause significant harm on skin contact, or to the environment if a spill were to occur;

d) The application outlines the methods proposed to be used to minimise the potential for spills.

A chemical use and storage report will be required where chemicals are proposed to be stored on site or habitually used as part of a development which present a significant hazard to human health or the environment, and where those chemicals are required to be stored in quantities of greater than 100 litres.

A chemical storage and use report must include:

1) Detailed description of the use and all methods/procedures associated with the use of each chemical;

2) A floor plan of the subject premises depicting the dimensions of the building and indicating the internal layout of all equipment, storage and display areas;

3) A comprehensive list of all chemicals/goods and quantities proposed to be utilised and stored;

4) A spill response/management plan;

5) A description of the method of storage of chemicals/goods on the premises and the type of containment or packaging used including bunding or secondary containment precautions;

6) A description of the method of transportation of chemicals/goods to the premises including the size and nature of vehicles, proposed routes and frequency of delivery;

7) Details of the number of vehicles likely to be involved and the location of vehicle storage/standing areas;

8) Details of on-site water quality control; and

9) Details of waste treatment and transportation.

4.16. Noise Impact Statement

Where a Noise Impact Statement, prepared by a suitably qualified acoustic consultant, is required, it should include:

1) A description of the proposed development including plans and elevations. For rural development, this includes plans and elevations of any enclosures/external structures and descriptions of building construction and means of ventilation;

2) Details of local topography, existing and proposed buildings and exposed or shielded situations which may affect the results and any allowances made in this regard;

3) Relevant legislation, standards, guidelines and policies that have been applied;

4) Background noise measurements. For rural development, this includes details of existing daytime and night-time background levels and the means by which these levels were obtained;

5) Details of instruments and methodology used for noise measurements;

6) Noises level data for all major sources, in octave band levels where appropriate;

7) A site map showing noise sources, measurements, locations and noise receivers;

8) Noise criteria applied to the proposal;

9) Noise predictions for the proposed activity;

10) Consideration of any other significant or relevant acoustic information concerning the project;

11) A comparison of noise predictions against noise criteria. Where appropriate, this should include a comparison of the predicted noise levels with the relevant design criteria at each potentially sensitive receiver location considered;

12) A description of proposed mitigation measures, the resultant noise reduction likely, and an assessment of the feasibility and reasonableness of these measures;

13) A statement of opinion confirming how compliance with acoustic criteria requirements can be practically achieved; and

14) In situations where vibration is considered to be an issue, a suitable assessment of any vibration impacts.

4.17. Requirements relating to land stability, excavation and filling

Any development application that proposes excavation and/or filling, and therefore changes to the levels of a site, is required to clearly address the following:

1) Where the excavation and/or filling will occur on the site;

2) Justification for the need to change the land levels in terms of the overall development; and

3) Any impacts from the changed land levels as a consequence of excavation and/or filling including potential impacts on groundwater levels, flow or quality.

4.17.1. Landfill Validation Report

A Landfill Validation Report is required where importation of fill is proposed. The report must be prepared by an appropriately qualified person and must include:

1) The property description of the source of the fill (hereafter called the subject property);

2) The site history of the subject property, including present and past land uses;

3) Results of any previous site investigations for contaminants on the subject property;

4) Present and past zonings of the subject property (e.g. industrial, agricultural or defence purposes);

5) Description of the present and past land uses of the land immediately adjacent to the subject property, including any information relating to potential or known contamination;

6) Proposed location and purpose for introducing fill onto a property;

7) Details of the transporters or contractors responsible for transporting the fill material from its source to its final and approved destination;

8) Level of finished fill and extent of proposed fill in relation to adjoining property;

9) Methods of controlling erosion and siltation;

10) Effect of fill on adjoining property, particularly in relation to water flow;

11) Compaction method;

12) Advice confirming that the proposed fill is suitable for the proposed use; and

13) Advice confirming that land-filling activities comply with relevant criteria and pose no unacceptable risk to human health or the environment.

Council may require a further detailed investigation to occur if contamination is, or may be, present in the fill material to prove that the fill material is suitable for the proposed use.

4.17.2. Geotechnical Report

A Geotechnical Report must be prepared by a suitably qualified consultant and is required where the existing slope on a site is greater than 15% (or the land is likely to be subject to any land stability issues); where on site effluent disposal is proposed (this may be addressed as part of the onsite effluent disposal supporting information); or where excavations are proposed that are likely to impact groundwater, including basement levels. A Geotechnical

Report may be required for other applications due to the characteristics of the particular site or the scale or nature of the development.

The requirements for Geotechnical Reports vary greatly in scope and extent depending on the scale and type of development and the specific characteristics of the site. As a guide, all geotechnical reports will include:

1) A description of the site and its existing geotechnical hazards/risks;

2) Details of the site substrata [or sub-surface conditions], relevant geological information, advice on groundwater seepage;

3) A risk assessment in accordance with the Australian Geomechanics Society [AGS] guidelines; and

4) Recommendations on the treatment of any identified hazards and design parameters and data for the construction of the development.

4.18. Water Management Plan

Any application for a new industrial or rural land use that requires the consent of Council and will increase the water needs of a particular area must submit a Water Management Plan which:

1) Estimates future water needs of the proposed development;

2) Indicates the proposed water source to meet those needs; and

3) Outlines water conservation measures to be implemented.

4.19. Dust Suppression Plan

A Dust Suppression Plan is an essential part of controlling dust problems from agriculture, construction and extraction activities. A Dust Suppression Plan should identify potential for dust generation and the control measures to be implemented to minimise dust.

Where a Dust Suppression Plan is required for a proposed development, the plan should include:

1) A site description of the existing site and the proposed development;

2) A site map showing:

   a) North point and scale;

   b) Property boundary, contours, existing landforms, prevailing wind directions and adjacent features;

   c) All areas and vegetation to be retained or left undisturbed;

   d) All areas and vegetation that will be disturbed;

   e) Location of the proposed development/activity;

f) Location of physical barriers, such as fencing and wind breaks;

g) Location of stockpiles and storage areas;

h) Traffic routes and stabilised site access/exit points; and

i) Any areas with potential for dust generation.

3) Details of the dust control measures, including:

a) Timing of works;

b) Areas to remain vegetated, or be revegetated;

c) Wind breaks;

d) Coverings for stockpiles and transportation;

e) Frequency and location of water sprays;

f) Identifying wind speed limits for operations; and

g) Any other site or operational specific control measures.

4.20. Odour Management Plan

An Odour Management Plan identifies the range of measures to be used to minimise odour impacts. The factors contributing to odour generation are complex and vary according to the land use or industry producing the odour. Reference to industry specific guidelines and best practice is required. An Odour Management Plan should identify the potential for odour generation and impacts, and management protocols to minimise these.

Where an Odour Management Plan is required, the plan should include:

1) A description of the proposed development including plans and elevations. For rural development, this includes plans and elevations of any enclosures/external structures and descriptions of building construction and means of ventilation;

2) Details of the site characteristics (including topography, prevailing winds, adjacent land uses, location and proximity of neighbours);

3) Details of the odour that will be generated by the development, including offensiveness, intensity and frequency of odour emissions;

4) A site map showing odour sources;

5) A description of proposed mitigation measures, the resultant odour reduction likely, and an assessment of the feasibility and reasonableness of these measures; and

6) Details of relevant legislation, standards, guidelines and policies that have been applied.

4.21. Social Impact Assessment

A Social Impact Assessment will be required for all major development types which are likely to have a significant social impact on the existing community. For example, large subdivisions (residential or rural residential) or large housing developments.

A Social Impact Assessment must:

1) Identify the Community - Identify the existing community and the proposed future community. This will include a demographic assessment of existing and proposed communities;

2) Identify the Needs - Identify the needs of the community based on the assumptions made as part of 1) above. This includes health, recreation, education, employment, etc.;

3) Identify the Issues - Identify the issues that will impact on those communities and needs, particularly the ability of existing facilities to meet the needs of existing and proposed communities; and

4) Develop Recommendations and Mitigating Measures - Assess how the proposal will avoid or mitigate social impacts, including reference to any additional infrastructure proposed to be provided.

4.22. Economic Impact/Needs Assessment

An Economic Impact Assessment will be required for all development which may have an economic impact on similar uses in the surrounding area, including major retail development (traditional or bulky goods) and child care centres over 40 places.

An economic impact assessment must:

1) Identify the likely spheres of impact (traditional retail, bulky goods retail, child care centres, etc.);

2) Identify the likely extent of impact, based on proximity, similarity of service, etc.; and

3) Demonstrate that there is sufficient market for the proposed use or that the proposed use meets an unmet need in the area.

4.23. Infrastructure Delivery Plan

The preparation and submission of an Infrastructure Delivery Plan (IDP) is required for all new release areas. The IDP is required to identify all infrastructure, including civil works, utility services, community, social, cultural and recreational facilities, to service a new release area and establish a framework for its timely provision.

The IDP should include associated costing (including ongoing operating and maintenance costs) and estimated delivery timeframes for all infrastructure, with a commitment to providing services up front where they are required early in the life of new estates. Where possible, the IDP should demonstrate efficient use and/or extension of existing infrastructure. The IDP should explore opportunities for the delivery of innovative and

sustainable infrastructure, services, facilities and networks with adherence to the principles of social justice, equity and accessibility.

The IDP shall provide an accurate costing for all infrastructure to be provided and a delivery program with key pre-planning design and construction phases identified. The IDP shall incorporate relevant apportionment of costs where it is agreed those will be shared with other providers. The IDP will form the basis for the development of Section 94 Contributions Plans and/or Development Agreements, as well as agreements required to be entered into with the State Government and its agencies for the delivery of regional based facilities.

Specifically, the following infrastructure and services are to be identified and provided for in all new release areas:

1) A safe, efficient, and effective road system and cycleway/pedestrian network which links with existing and new infrastructure, public transport services, shopping centres, community facilities and recreation areas;

2) Public transport networks and systems which deliver effective access to major destinations and other transport mode connections. A Transport Management and Accessibility Plan (TMAP) (see 4.8.3 in this Appendix) will be required to identify public transport systems improvements generated by new release areas;

3) Underground routing of all utility services including gas, water, sewer, electricity and telecommunications (including broad-banding capability);

4) Planned development of infrastructure that meets local energy, water and sewer authority standards;

5) Modern telecommunication infrastructure with the capacity to support multiple telecommunications services, such as high-speed internet (including broad band), voice and data systems, and community intranets. Shared service corridors should have capacity to accommodate technology advancements and any increases in demand; and

6) Community, social, cultural, educational and recreational facilities to service the new community.

Further, the IDP must address the following matters:

1) Identify the estimated costs of community, cultural and recreational facilities and services and timeframes for delivery (e.g. relationship to housing production);

2) Develop strategies for the upfront provision of a baseline level of services and facilities to service the initial population. This includes a framework for the timely provision of social infrastructure including small-scale retail/convenience store, access to transport/bus services and open space/recreation areas, facilities and meeting places to support a healthy community (e.g. playgroups, parent groups, youth activities, seniors group, children services, medical, mail box, telephone, etc) to service the initial population;

3) Provide accurate costings for all infrastructure and identify a delivery program with key pre-planning design and construction phases. It shall also incorporate relevant apportionment of costs where it is agreed those will be shared with other providers;

4) Identify and cost all necessary maintenance requirements for infrastructure assets proposed to be transferred to Council for ownership and ongoing care including future replacement costs where necessary;

5) Identify the interim management and maintenance arrangements for infrastructure assets which will be retained in the short term by the developer pending transfer to Council; and

6) Develop Plans of Management consistent with the requirements of the Local Government Act for all open space areas proposed to be transferred to Council.

4.24 3D Modelling for Development within St Marys Town Centre

Council officers may request for any development in the St Marys Town Centre with an estimated cost greater than $1 million, or development that exceeds two-storeys in height, or development that is in a prominent location, to be accompanied by a 3D file of the proposed development in the context of the St Marys Town Centre 3D Model.

The 3D Model will be used on the basis of a two-way sharing of data, with Council providing to the prospective developer, a 3D file extract of the relevant area from the Model in the early stages of design, in order to assist in design development.

Architects and developers will be informed at the initial enquiry stage of the 3D Model requirement and encouraged to contact Council's GIS Unit to arrange for the provision of an extract from the St Marys 3D Model, or to discuss technical issues.

The process will be the subject of a licence agreement between the developer and Council and will be subject to payment of the prescribed fee, both on the provision of the 3D Model extract and at the development application stage. The agreement will require that the developer import the digital 3D plans of the proposed development into the supplied model extract for submission with the development application. The computer file extract, with the proposed development included, would be imported back into the 3D Model to facilitate assessment of the proposal by Council's Development Services Unit, other Council officers, other interested persons and ultimately Council itself.

A fee for the use of this service will be negotiated.