

## PART 4: Subdivision design & built form controls

This Part of the Precinct Plan contains specific objectives and development controls for subdivision design, the design, layout and siting of buildings, and environmental management. These objectives and controls are designed to ensure that the development principles and key elements of the framework plan and environmental management strategies identified in the proceeding sections of the Precinct Plan are implemented.

### 11.0 Subdivision design

#### URBAN DESIGN

##### 11.1 Subdivision layout

###### Objectives

1. To provide an appropriate interface between the development parcels and the Regional Park.
2. To incorporate the principles of Water Sensitive Urban Design.
3. To utilise existing natural drainage lines, creeks and catchments wherever possible.
4. To provide legible, convenient and safe pedestrian linkages.
5. To provide deep allotments that reflect the needs of industrial development.
6. To incorporate a variety of allotment sizes, enhancing flexibility to accommodate the needs of various industries.
7. To consider the location of the local government area boundaries and ensure that it is located at the boundary between lots.
8. To ensure the efficient utilization of the development area.

9. To ensure the provision of sufficient space for parking, loading and unloading of vehicles and landscaping.
10. To maximise the natural attributes of the site.
11. To clearly define and reinforce the public domain.

###### Controls

1. Development is to be undertaken in accordance with the Framework Plan at **Figure 16**.
2. DAs for subdivision are to demonstrate how the development principles shown on the Framework Plan have been satisfied.
3. Allotments shall not straddle the local government area boundary.
4. The detailed subdivision design is to implement the Framework Plan having regard to the achievement of the other objectives and development controls set out in the following sections.

##### 11.2 Minimum lot size & dimensions

###### Objective

1. To allow for a mix of allotment sizes to encourage diversity in the nature of the industrial uses attracted to the site, and to help create an economically balanced industrial precinct that incorporates a wide range of employment generating activities.

###### Controls

1. The minimum allotment size is 1,500m<sup>2</sup>.
2. The minimum area of battleaxe allotments<sup>1</sup> excludes the area of the access handle.

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<sup>1</sup> Battle-axe allotments are not generally encouraged. However, they may provide an optimum solution to constrained or irregularly shaped land.

3. Strata subdivision of allotments is permissible.
4. The minimum width of a freehold allotment at the primary street frontage shall be 50m on the Collector Road and 35m on other roads.
4. All APZs must accommodate fire truck access. The fire truck access may be provided on either a public road, a privately owned access road located between the hazard side of the land (i.e. unmanaged vegetation) and development as shown on **Figure 26**.

### 11.3 Bushfire asset protection zones

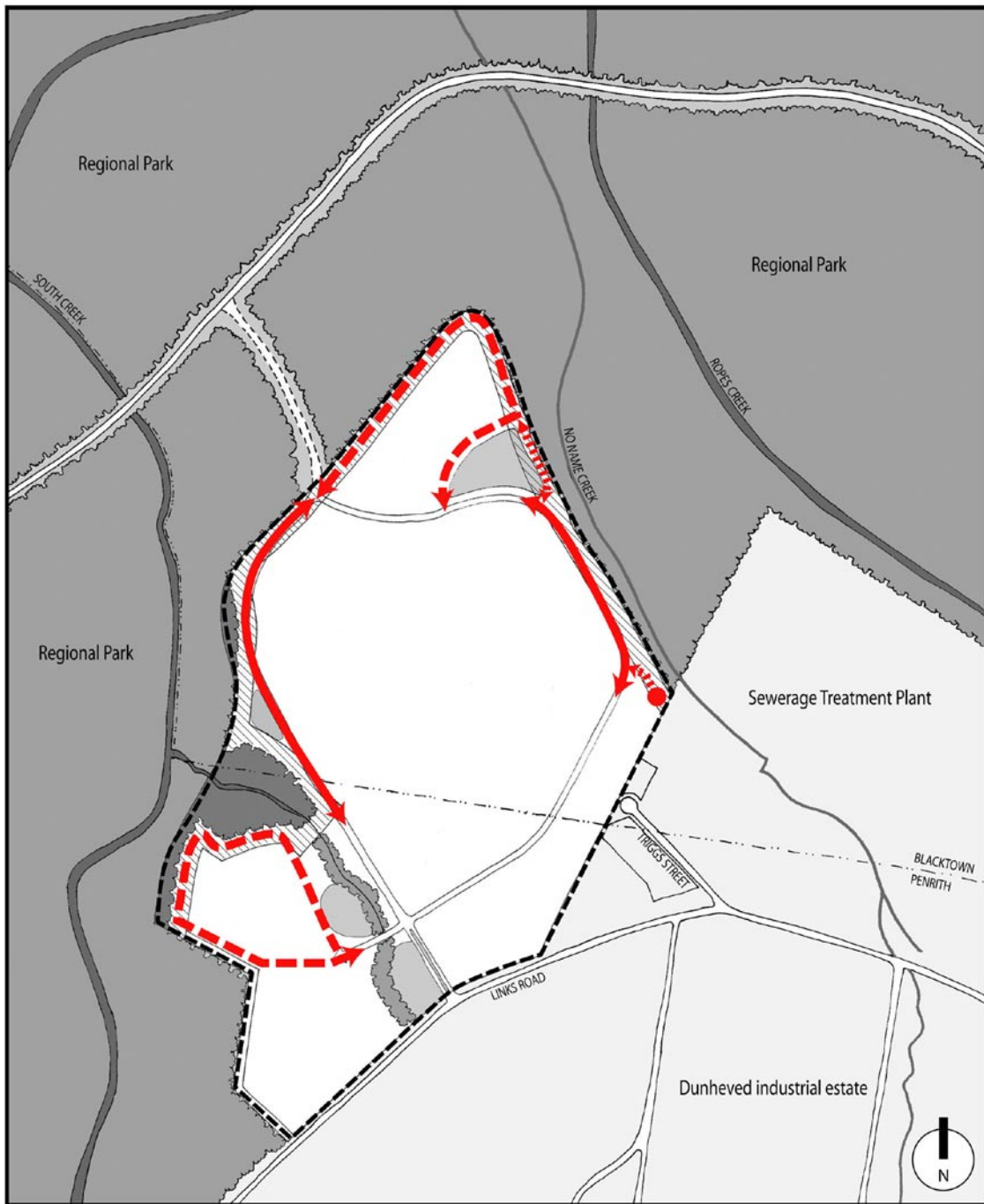
#### Objectives

1. To protect life and property from the threat of fire.
2. To manage fire risk in the North & South Dunheved Precincts so as to minimise inappropriate fire regimes that may affect the Regional Park.
3. To ensure that APZs allow for safe, accessible and efficient movement of service vehicles in the event of a fire, and that the potential for conflict between vehicles is minimised.
4. To ensure that development appropriately addresses the APZs (where relevant) to allow passive surveillance, increasing the safety and security of these areas.
5. The perimeter fire truck access must be linked to the public road system at regular intervals and must be designed and constructed in accordance with the requirements of Planning for Bushfire Protection (NSW RFS 2001).
6. Where fire truck access is to be provided within a privately owned access road, the access road is to:
  - be located within a separate community title allotment;
  - have a minimum carriageway width of 7.5m where no parallel parking is proposed, or of 10m where parallel car parking is to be provided within the carriageway;
  - incorporate a footpath on the hazard side of the road; and
  - be lit to provide safety and security for motorists and pedestrians.

#### Controls

1. Development within 100 metres of the Regional Park Boundary is required to comply with the bushfire planning provisions within Planning for Bushfire Protection (NSW RFS 2001).
2. A minimum 20m APZ is required between the external building line and the edge of the unmanaged bushland of the Regional Park in accordance with **Figure 26**.
3. No APZ is required along the boundary to the Dunheved heritage site subject to Council being satisfied that the immediately adjoining land within the Regional Park will be managed grassland. If required, any APZ shall be a minimum of 20 metres in width, located wholly within the development site.
- Sections illustrating the potential treatment of the APZs are shown at **Figure 27**. The location at which the sections are taken is shown on **Figure 20**.
8. No gates are permitted to cross any privately owned access road located within an APZ.
9. Fire hydrants are to be provided at regular intervals along all interface locations.
10. The APZs are to be maintained to a standard consistent with the performance criteria of an 'Inner Protection Area' (IPA) as described by Planning for Bushfire Protection 2001.

11. Existing larger trees may remain within the APZs provided they do not occur within 5m of a building (including crowns), have lower lateral branches pruned to the trunk to at least 2m above ground, and have a separation between the crowns of at least 2m.
12. Smaller trees and understorey are to be removed from the APZs unless the trees provide a sparse scatter of individuals used for the long-term replacement of mature trees, the trees are well spread out, do not form a contiguous pathway to the development and do not constitute more than 5 percent of the total APZ area.
13. Minimal ground fuel is to be maintained through use of paving, concrete, mown grass or less than 3 tonnes per hectare of fine fuel (i.e. material less than 6 mm in diameter).
14. Retained and new vegetation within the APZ is not to have a continuous canopy with the Regional Park or with other vegetation within the APZ.



**APZ / Fire Truck Access**  
(indicative layout)

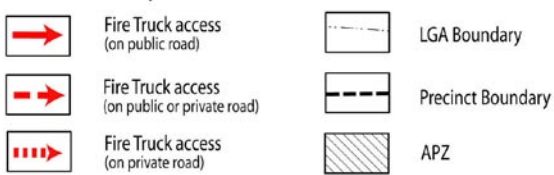


Figure 26 - Asset Protection Zones and Fire Access Trails

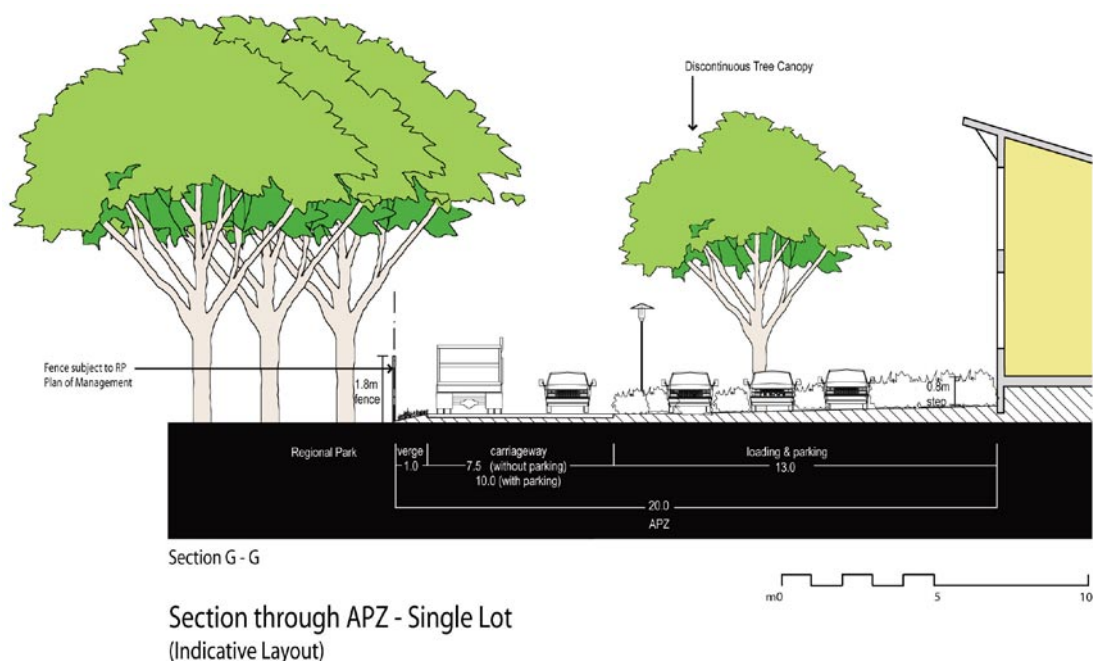


Figure 27 - Section illustrating potential treatment of APZ

## 11.4 Riparian & drainage corridors and detention basins

### Objectives

1. To protect and enhance the environmental qualities of the Regional Park.
2. To ensure that the development does not result in any net impact on the water quality and quantity of South Creek.

### Controls

1. A 40m environmental riparian corridor shall be provided along the development side of South Creek generally as shown at **Figure 23**.
2. The width of corridor shall be measured from the top of the bank.
3. The South Creek riparian corridor shall be revegetated with appropriate native tree and shrub species having regard to its drainage function and vegetation management for bushfire protection.
4. Development shall not occur within the riparian corridor except where it is necessary to allow for pedestrian/cycle access.

5. A 20m wide riparian corridor shall be provided generally as shown at **Figure 23**.
6. Development shall not occur within the riparian corridor except where it is necessary to allow for any road or pedestrian/cycle route to cross the corridor.
7. Where practical, access roads rather than development lots shall back onto the riparian corridors.
8. Detention basins shall be provided generally in locations shown on **Figures 23** and **24**.
9. The location/construction of any services/easements should not adversely impact upon the riparian corridor or its vegetation.

**Figure 28** illustrates the principles that are to be used to treat the interface between the Collector Street and the adjoining riparian corridor. The location at which the section is taken is shown on **Figure 20**.

**Figure 29** illustrates the principles that are to be used to treat the northern drainage basin. The location at which the section is taken is shown on **Figure 20**.

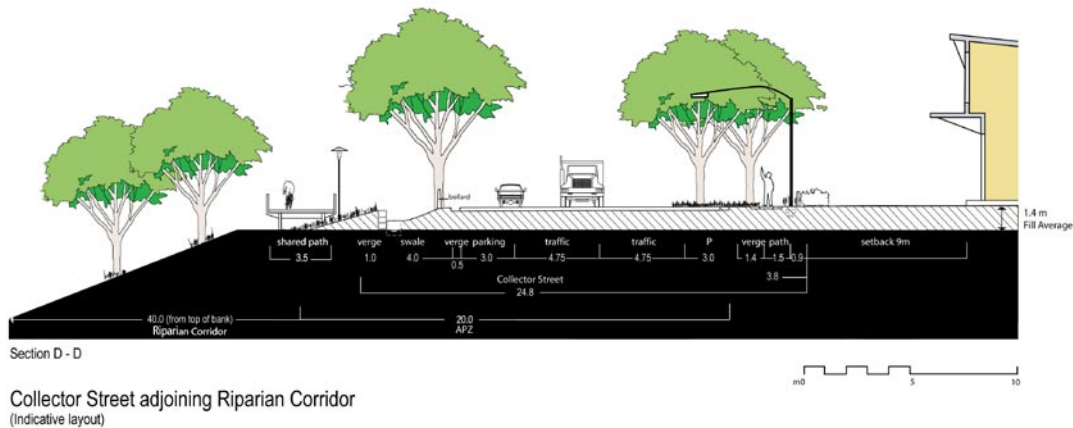


Figure 28 - Section through the Riparian Zone and adjacent Collector Road

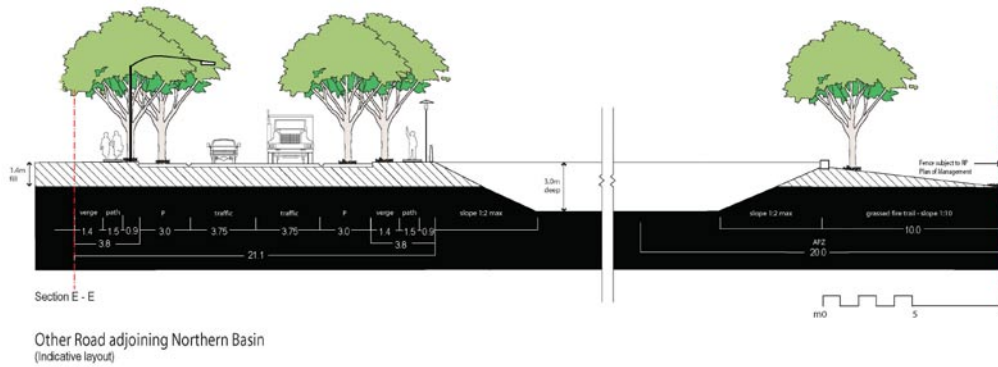


Figure 29 - Section through the northern basin

## ACCESS & MOVEMENT

### 11.5 Street network

The North & South Dunheved Precincts Framework Plan (see **Figure 16**) designates the indicative location of a collector road and an other road loop road. As detailed at Section 6.1 the provision of other local streets is subject to requirement, dependant on the subdivision configuration.

The location and intersection configuration of the collector road and other road loop road serve as a general guide to the urban structure of the site. Detailed design and placement of these roads will need to take into consideration the drainage regime of the site and the configuration and layout of lots to promote flexibility.

### Collector Road

The general design principles for the Collector Road typology are:

1. The Collector Road provides the main vehicular route for pedestrians, motorists, cyclists and public transport.
2. The Collector Road will generally run north south through the site following the edge of the Regional Park, riparian corridor and detention area, maximising legibility, assisting way finding, and ensuring lots are orientated to front the public domain.
3. Truck parking shall be restricted to off street parking to reflect the gateway frontage character of the Collector Road.

4. Drainage swales may be provided along one side of the Collector Road, subject to appropriate detailed design at the development application stage. The detailed design of any swales is to include an appropriate physical barrier along the carriageway side of the swale.
5. Any swales shall be generally located next to the riparian corridor to visually extend the green character on this side of the street.
6. Trees shall be located next to or within any swale where possible to narrow the apparent width of roads.
8. All services within street reservations shall be designed and located in an integrated manner to avoid conflict with landscape and street tree planting.
9. The development application for the Collector Road is to include details of the design/treatment of the intersection with Links Road and with the new northern entry road.
5. Drainage swales may be provided along one side of the Other Road where required and subject to appropriate detailed design at development application stage. The detailed design of any drainage swale is to include an appropriate physical barrier along the carriageway side of the swale.
6. Locate trees next to or within any swale where possible to narrow the apparent width of roads.
7. All services within street reservations are to be designed and located in an integrated manner to avoid conflict with landscape and street tree planting.
8. The design standards for the Other Road typology are illustrated on the Plan and Section at **Figure 32**.
9. All services within street reservations are to be designed and located in an integrated manner to avoid conflict with landscape and street tree planting.

The design standards for the Collector Road are illustrated on the Sections at **Figures 30** and **31**. The location at which these sections have been taken is shown on **Figure 20**.

## Other Roads

The design principles for the Other Road street typology are:

1. Locate roads where possible along a north south orientation to allow the development of east west buildings.
2. Provide an alternate route to the Collector Road.
3. Provide views from streets into the Regional Park and across detention areas.
4. Restrict wide angle views down the street by the use of street trees and appropriate front setbacks to encourage lower traffic speeds.

Table 6 - Road Widths

Road Type	Carriageway Width	Traffic Lane Width	Parking Lane Width	Verge Widths	Median Width	Footway Width
Collector Road without Median	15.5m	4.75m	3m on both sides	1m on western side of swale 0.5m adjoining western parking lane 1.4 adjoining eastern parking lane	N/A	3.8m (one side only on the side adjoining development) A 3.5m wide shared off road cycle/pedestrian route to be provided outside of the Road Reserve on the non development side of the road.
Collector Road with Median	13.5m	3.75m	3m on both sides	1m on western side of swale 0.5m adjoining western parking lane 1.4m adjoining eastern parking lane	4m	3.8m (one side only on the side adjoining development) A 3.5m wide shared off road cycle/pedestrian route to be provided outside of the Road Reserve on the non development side of the road.
Other Roads	13.5m	3.75m	3m	1.4m adjoining both parking lanes	N/A	3.8m

## 11.6 Pedestrian and cycle network

The general design principles for the pedestrian and cycle network are:

Collector Road	Other Roads
<ul style="list-style-type: none"> <li>- Provide a footpath within the road reserve on the side of the road that adjoins development.</li> <li>- Provide a shared off road cycle/pedestrian route beyond any swale on the non development side of the road where appropriate.</li> <li>- Provide an indented bus bay and bus shelter within the road reserve as shown on <b>Figure 22</b>.</li> <li>- Provide a cycle meeting bay within the road reserve where appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>- Provide footpaths on both sides of streets.</li> <li>- Reflect lower speed environment with on-road cycle routes.</li> </ul>



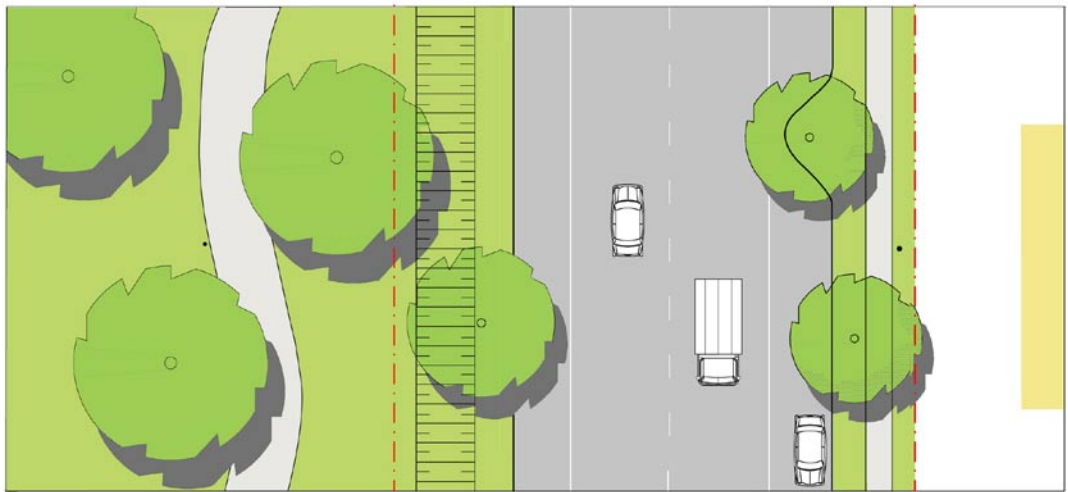
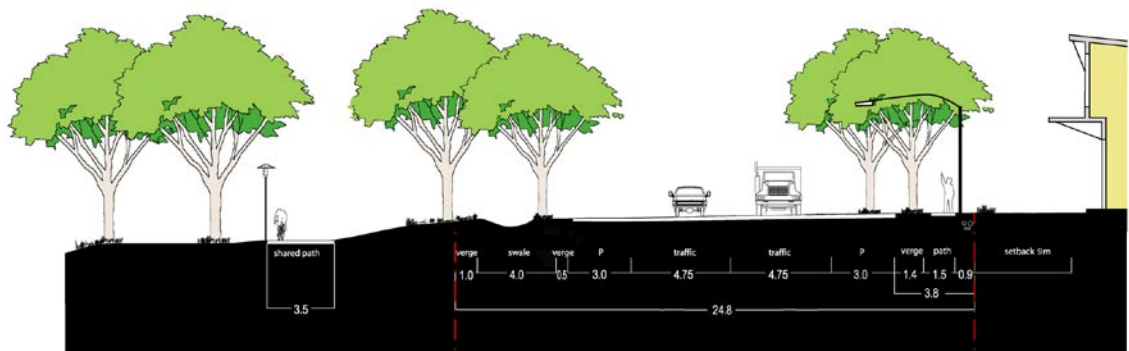
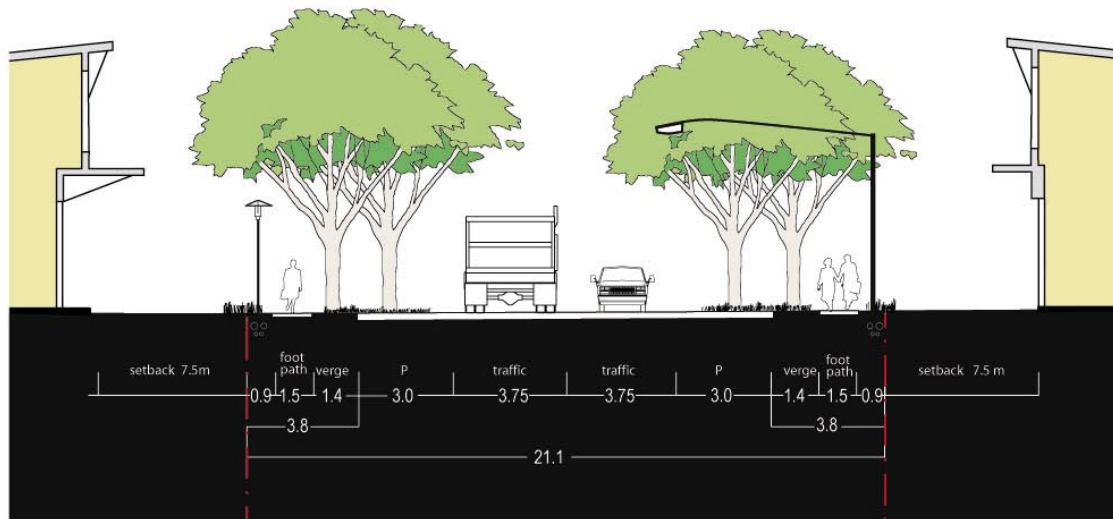


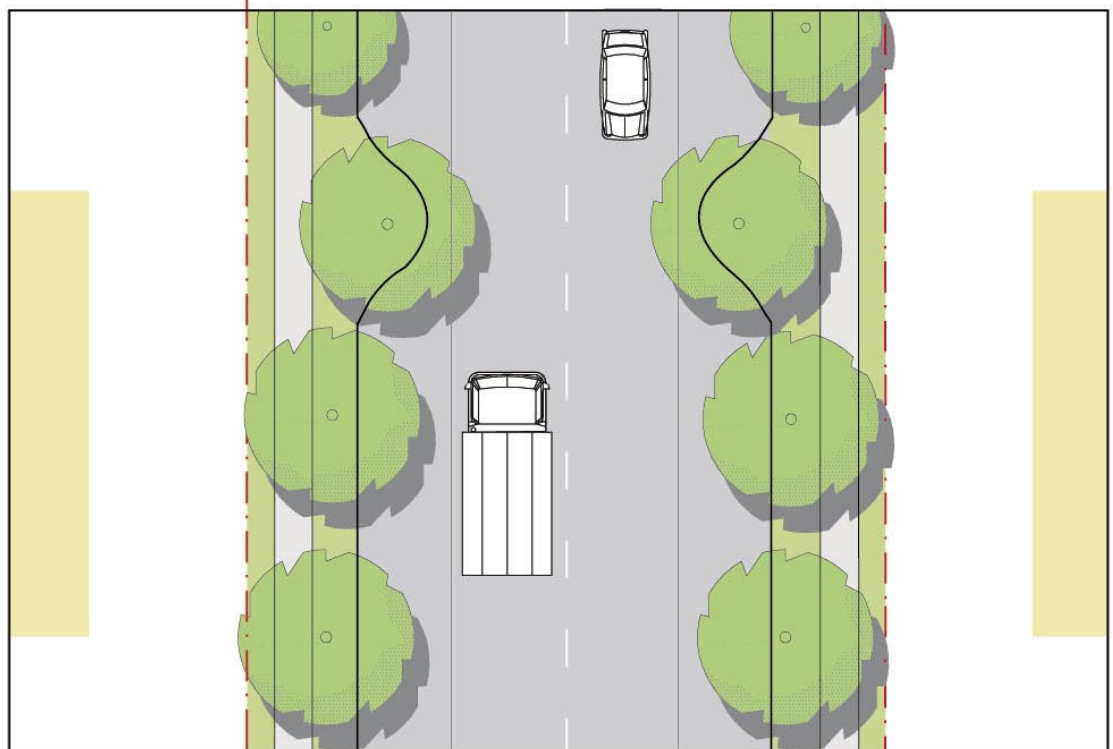
Figure 30 - Collector Road cross section and plan



Figure 31 - Collector Road at Entry (with Parking)



Section C - C



Other Road  
(Indicative Layout)

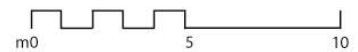


Figure 32 - Other Road plan and cross section

## 11.7 Public transport

### Objective

1. To facilitate the use of public transport through the site by the provision of bus stops.

### Controls

1. Bus stops and shelters shall be provided generally in accordance with **Figure 21**.
2. Public transport infrastructure shall be located in the general vicinity of local shops that serve the daily convenience needs of the workforce.

## OPEN SPACE & PUBLIC DOMAIN

## 11.8 Landscaping

### Objectives

1. To contribute to effective management of stormwater, biodiversity, and energy efficiency; and to improve visual amenity.
2. To encourage the use of native species of flora and low maintenance landscaping.
3. To retain and integrate existing landscape elements where possible (such as vegetation and topographic features), in the design of new development.
4. To assist in the management of salinity.
5. To assist in the delineation of character areas within the precincts.

### Controls

1. A Landscape and Urban Design Strategy shall be prepared prior to the linen release of the first subdivision.

2. The Landscape and Urban Design Strategy shall demonstrate the following:

- use of tall upright street tree species to emphasise the vertical proportions of the street;
- selection of low water demand drought resistant vegetation for use in common landscaping areas, including native salt tolerant trees;
- use of mulching cover in public landscaped areas (excluding drainage corridors);
- use of smart irrigation systems that respond to soil moisture and climate conditions; and
- landscape design.

3. Any proposal for boundary fencing to the Regional Park is to accord to the requirements of the DEC (NPWS) Regional Park Plan of Management.

## 11.9 Street tree planting

### Objectives

1. To ensure high quality street planting is provided through out the Precincts.
2. To reinforce the different character areas (refer to Section 4.1)

### Controls

1. Any development application proposing the positioning of trees within the road carriageway is to be accompanied by:
  - details relating to services provision (eg. the location and design of street lighting, the impact on the manoeuvrability of garbage trucks), drainage and location of future driveway accesses; and
  - a Road Safety Audit prepared in accordance with the RTA Guidelines.
2. Tree species should emphasise the road hierarchy and different character areas.

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| <p>3. The Landscape Strategy shall demonstrate the following:</p> <ul style="list-style-type: none"> <li>- use of appropriate durable native tree species that are endemic to the region to promote linkages to the Regional Park;</li> <li>- use of a species that minimises the risk to utilities and services;</li> <li>- the location of street trees to maintain adequate lines of sight for vehicles and pedestrians, especially around driveways and street corners;</li> <li>- selection and location of street tree species to provide appropriate shade;</li> <li>- selection and location of street trees to create an attractive and interesting landscape character, clearly defining public and private areas, without blocking the potential for street surveillance; and</li> <li>- use of turfed or paved treatments at ground level within the road reserve.</li> </ul> | <p>3. Signage, street furniture and lighting is to be:</p> <ul style="list-style-type: none"> <li>- designed to reinforce the distinct identity of the development;</li> <li>- coordinated in design and style; and</li> <li>- located so as to minimise visual clutter and obstruction of the public domain.</li> </ul> <p>4. Locating entry signage and the like within a public road reserve is subject to Council agreement.</p> <p>5. The location and design of signage and street furniture is to be indicated on a Landscape Masterplan.</p> <p>6. Vehicular Street Lighting is to be mast top lighting to meet relevant RTA and Austroads standards.</p> <p>7. Pedestrian Lighting is to be pole mounted to meet relevant Australian Standards.</p> <p>8. Major cycle routes and pedestrian access paths are to be lit for night time usage.</p> <p>9. Lighting is to be designed and managed to mitigate impacts on fauna habitat.</p> <p>10. Lighting shall be designed to incorporate a mature tree environment.</p> |
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### 11.10 Signage, street furniture and lighting

#### Objectives

1. To develop an identifiable, marketable and appropriate character for the Dunheved Precincts.
2. To ensure a high quality, functional, safe and attractive public domain.

#### Controls

1. Footpath paving must provide a hard wearing, cost effective and practically maintainable surface.
2. Street furniture shall be incorporated into the design of the streetscape and shall include a consistent approach to street lighting, street and information signs.

## SITE SERVICES

### 11.11 Water supply

#### Objective

1. To ensure that adequate provision is made for potable water supply.
2. To minimise the use of potable water.
3. To promote and encourage the re-use of stormwater and treated effluent.

#### Controls

1. Mains water supply is to be made available to every allotment.
2. Mains water supply is to be provided within the road reserve wherever possible.
3. Allotments are to be provided with a separate piped supply of treated effluent from the St Marys Treatment Plant, subject to continuing negotiations with Sydney Water, and other appropriate measures such as rainwater tanks.
4. Low water demand species are to be used for landscaping.
5. Low infiltration sewer pipelines shall be used.

### 11.12 Sewer

#### Objectives

1. To ensure that adequate provision is made for sewer facilities.
2. To minimise ground infiltration.

#### Controls

1. 'Low infiltration' or 'low pressure' systems shall be utilised to reduce ground water infiltration.
2. PVC or similar pipes shall be utilised for all sewerage construction.
3. All sewer lines shall be pressure tested prior to commissioning.

### 11.13 Electricity, telephone & gas

#### Objectives

1. To ensure that adequate provision is made for site facilities.
2. To ensure that site facilities are functional and accessible to all properties and are easy to maintain.
3. To ensure that site facilities are thoughtfully integrated into development and are unobtrusive.
4. To ensure the provision of advanced telecommunications systems that support employment activities.

#### Controls

1. Underground services are required for all utilities, including electrical services.
2. Garbage and recycling facilities shall be integrated with the overall design of buildings and/or landscaping.
3. Modern telecommunications infrastructure and services such as high speed internet services shall be provided (subject to negotiations with the relevant service providers).

### 11.14 Sydney Water Easement

The existing sewer main along the southern boundary of the Dunheved Precinct may be a potential constraint on development, depending upon:

- (a) the type & proximity of development proposed; and
- (b) any mitigation measures that might need to be implemented.

A further technical assessment of the pipe and a defined zone of influence will be undertaken by a suitably qualified expert at the time of the first relevant development application to assist the consent authority in determining the DA.

## ENVIRONMENTAL MANAGEMENT

### 11.15 Aboriginal heritage

#### Objectives

1. To further investigate the Aboriginal archaeological significance of the site.
2. To carry out further testing in the Potential Archaeological Deposit (PAD) locations as identified on **Figure 14**.

#### Controls

1. A section 90 application (NPW Act) is to be lodged with DEC NSW for consent to salvage prior to any subdivision work within the PAD locations identified at **Figure 14**.
2. Open area salvage excavation is to be undertaken where features are encountered.
3. Sub surface testing is to be conducted across the two defined PAD locations.
4. Dispersed test pits are to be excavated at intervals across a grid centred over the proposed impact area/PAD. The testing will

aim to locate high and/or moderate density pits and/or interesting assemblages.

5. A full description of any artefacts uncovered and the recording methods utilised are to be documented in an archaeological report.
6. Consultation with the Deerubbin Local Aboriginal Land Council (DLALC) and the other two Aboriginal community groups - The Darug Tribal Aboriginal Corporation and the Darug Custodian Aboriginal Corporation is to continue throughout the process.

### 11.16 European heritage

#### Objectives

1. To protect the curtilage of and vistas to the Dunheved Homestead site from visual intrusion.
2. To record any archaeological remains found within the Dunheved Precincts.

#### Controls

1. If any archaeological remains are found within the Dunheved Precincts they may only be removed or disturbed once a s. 140 approval (NSW Heritage Act) is sought from the NSW Heritage Office. This is to be applied for prior to the commencement of works in the area.
2. All works are to be monitored on an at call basis.
3. Any remains found shall be recorded in accordance with Casey & Lowe's best practice guidelines included within the Heritage Assessment Dunheved Precincts prepared by Casey and Lowe dated April 2005.
4. The results from any recording program are to be incorporated into an overall interpretation strategy that is to be developed for the St Marys Development and for the Regional Park.

5. A heritage impact statement assessing the design of subdivision of land adjacent to the curtilage of the Dunheved Homestead shall be submitted to Council with the DA.

## 11.17 Water cycle management

### Objectives

1. To accommodate peak flow rates for all storms up to the 100 year ARI event.
2. To ensure no net increase in run off for storm events between the 1 in 2 and 1 in 100 year ARI events, and a significant reduction in peak flow rates from the effects of capturing water in rainwater tanks on the allotments.
3. To maximise runoff quality controls at the source.
4. To achieve a no net increase in the annual pollutant load exported from the site.
5. To ensure that any gross pollutants such as litter, coarse sediments and floating hydrocarbons can be controlled at the allotment level.
6. To ensure appropriate management of subsoil through flows and avoid any increase in groundwater levels.
7. To avoid adverse impacts due to soil salinity.
8. To reduce water discharged to the sewer and to Ropes Creek.

### Land filling controls

1. Where required crushed sandstone tunnel spoil or equivalent shall be utilised as fill.
2. Fines-deficient rockfill such as ripped sandstone or equivalent shall be placed in the bottom 0.5m of the embankment over low-lying portions of the natural surface to facilitate drainage and provide a capillary break against rising groundwater.

3. The bulk of fill shall be placed in layers 200-300mm thick and compacted systematically to at least 95% standard density ratio.
4. The top 0.5m of fill shall be compacted to 98% of standard and its upper surface shall be cambered to shed runoff and minimise infiltration.
5. Only certified fill material validated at the source shall be used.

### Source controls

1. Spill containment devices (oil and water separators) shall be installed on the furthest downstream pit on each allotment.
2. Bioretention swales (or alternative engineering solutions) and stormwater treatment devices shall be provided along roadways as appropriate and subject to detailed design resolution to remove fine and coarse sediment, heavy metals, nutrients.
3. An underground drainage pipe system shall be located underneath the swales to collect and convey stormwater to a Gross Pollutant Trap.
4. Stormwater treatment devices shall be provided as appropriate to remove coarse sediment, litter and debris.

### Downstream controls

1. Dry infiltration basins shall be provided to supplement the treatment of stormwater provided by the source and conveyance controls generally as shown on **Figure 24**.
2. Impermeable liners shall be used for the drainage features such as bioretention swales/basins.



## Trunk drainage controls

The trunk drainage system shall consist of the following components:-

1. Pipe and street system able to convey runoff safely through the development up to the 20 year ARI storm.
2. Bioretention swales (or alternative engineering solutions) with capacity to convey the 100 year ARI flows where appropriate and subject to detailed design resolution at development application stage.
3. Combined detention/infiltration basins able to provide necessary quantity/quality controls while being able to cope with 100 year ARI flows.

## 11.18 Flood management

### Objectives

1. To minimise the potential impact of flooding on development.
2. To provide suitable evacuation routes.

### Controls

1. Roads (public or private), off street shared pathways, open space and car parking areas may extend within the 1 in 100 year ARI flood level.
2. Where a public road is located within the 1 in 100 year ARI flood level, the level of the invert of the gutter is to be at or above the 1 in 100 year flood level.
3. Where a (public or private) road provides the sole means of access to an allotment it is to be located above the 1 in 100 year flood level.

## 11.19 Soils management

### Objectives

1. To control sediment and erosion during construction.

### Controls

1. Each contractor shall prepare an erosion and sediment control plan for each lot.
2. The erosion and sediment control plan shall:
  - Detail the logistics of excavating, handling, stockpiling and reuse of the soils.
  - Describe the requirements for erosion and sediment controls including sediment fences, diversion drains, barrier fences, energy dissipaters, check dams, temporary culvert crossings and sedimentation basins.

During construction the main principles of erosion and sediment control shall include:

1. Stockpile and reuse all topsoil.
2. Divert clean runoff water from upstream drainage around the disturbed open trench area.
3. Restrict vehicular access to stabilised entry and exit points with controls to reduce soil export attached to excavators and truck tyres.
4. Minimise soil disturbance in area at any one time.
5. Restrict access to areas that do not require land disturbance.
6. Provide adequately designed sediment fences, barrier fences, catch drains, check dams and other required structures.
7. Implement all measures to maximise sediment trapping and minimise sediment export from the site.

8. Ensure that temporary top soil stockpiles are protected from erosion when works are unlikely to continue for long periods.
9. Temporary stockpiles are to be protected from erosion if not used within 2 days.
10. Ensure that stockpiles are not placed in the flow path of upslope runoff.
11. Make provisions for emergency quick cleanup and removal of any accidental spills of soil onto public property and provide tanker with pump to cope with accidental runoff.
12. Provide wire mesh and gravel inlet filters at stormwater kerbs (if any) located downstream of the entrance to the site to trap any accidental spill of soil material.
13. Monitor and maintain all sediment and erosion control measures.
14. Minimise additional soil disturbance activities during wet weather.
15. Undertake water quality monitoring at the outlet of the sediment basins to ensure compliance with DEC guidelines.
16. Stabilise rehabilitated surfaces as soon as possible. Vegetative stabilisation of disturbed surfaces shall be undertaken within 7 days after completion of construction works.
17. Procedures shall be incorporated for adequate regulation and maintenance of controls.

These activities are to be detailed and sequenced by each contractor prior to commencement of subdivision works on the site.

All works are to conform with the relevant Council requirements, Penrith City Council's Erosion and Sediment Control Development Control Plan and Code of Practice 1996 or Blacktown City Council's Soil Erosion and Sediment Policy 1998. In addition all development is to comply with Landcom's Soil and Construction Manual 2004 (the "Blue Book").

## 11.20 Salinity

### Objectives

1. To manage and mitigate the impacts of, and on, salinity.

### Controls

1. Salinity shall be considered during earthworks, rehabilitation works and during the siting, design and construction of infrastructure.
2. Each subdivision application shall be accompanied by a salinity report prepared by a suitably qualified consultant, reporting on the conditions of the site, the impact of the proposed subdivision on saline land, the mitigation measures that will be required during the course of construction and a requirement that the consultant signs off the project on completion.
3. Development is to conform to the Western Sydney Regional Organisation of Councils, Western Sydney Salinity Code of Practice (March 2003).

## 11.21 Energy efficiency

### Objectives

1. To implement the Dunheved Precincts efficient resource use strategy.

### Controls

1. The size and orientation of lots is to have regard to slope and other factors in order to maximize opportunities for solar access.

## 11.22 Tree retention

### Objectives

1. To ensure the protection and enhancement of existing significant trees where practical outside the necessary fill areas.

### Controls

1. A Tree Survey Plan shall be submitted with each subdivision DA.
2. The Tree Survey Plan shall identify the location, type and condition of all existing trees, and is to indicate those trees proposed to be removed and those to be retained.
3. Existing significant trees shall be retained wherever possible within the riparian corridor.

## 11.23 Domestic and feral animal management

### Objectives

1. To minimise the potential for domestic animals within the North & South Dunheved Precincts to impact on native flora and fauna values.
2. To ensure that development of the North & South Dunheved Precincts does not increase populations of, or improve habitats for, feral animals.
3. To encourage plantings of native vegetation, fostering shelter for native woodland birds.
4. To ensure that development of the North & South Dunheved Precincts does not proceed in such a way as to be recognised as a "Key Threatening Process" under the Threatened Species Conservation Act 1995 or the Environmental Biodiversity & Conservation Act 1999.

### Controls

1. Development in the Dunheved Precincts is to implement the relevant measures specified in Cumberland Ecology's Domestic and Feral Animal Management Plan.
2. Covered bulk rubbish bins shall be used during construction to ensure that there are no uncovered stock or rubbish piles.
3. Development must incorporate refuse storage areas designed to prevent feral animals entering. All rubbish is to be contained within closed bins.
4. Landscaping of all properties, particularly those located adjacent to the Regional Park, shall use native shrubs/trees endemic to the region.
5. Numbers of rabbits and rodents shall be monitored and controlled.
6. Access points and tracks from the proposed development area to the Regional Park shall be minimised.
7. A management plan for cats, rabbits, dogs, hares and foxes shall be undertaken in consultation with NSW NPWS prior to construction.
8. If rabbit warrens are observed within the development area, they shall be destroyed.
9. Rabbit species shall be targeted if it appears that numbers in the area have increased.

### Community education

A key component to minimising the potential impacts of feral and domestic animals on native species will be community education.

Information packs will be provided to all new residents of surrounding residential precincts and an ongoing campaign of community education will be actively promoted. The community education will also be extended to inform residents in existing adjoining neighbourhoods. This may take the form of seminars, information displays, hand out literature and website information. Education and awareness programs of feral and domestic animal management should

be implemented within the Dunheved Precincts in conjunction with other programs concerning flora and fauna, weeds and the Regional Park.

## 11.24 Weed management

### Objectives

1. To prevent the spread of weeds from the Dunheved Precinct to the adjacent Regional Park.
2. To control the spread and intensification of existing weed species within the North & South Dunheved Precincts.
3. To prevent the introduction of new weed species to the North & South Dunheved Precincts.
4. To reduce the existing weed populations within the North & South Dunheved Precincts.

### Controls

1. Development in the Dunheved Precincts shall implement the relevant measures specified in Cumberland Ecology's Weed Management Plan.
2. Landscaping in accordance with an approved landscape plan must be established as soon as practicable following completion of construction to prevent weeds from infesting disturbed ground.
3. All mulch and topsoil utilised in landscaping must be certified weed free by the material supplier or landscaper.
4. Any plant species identified as a noxious weed within the Noxious Weeds Act 1993 shall not be used in any landscaping scheme.
5. Personnel and contractors on the North South Dunheved Precincts should:
  - Avoid working in or travelling through African Love Grass infestations when they are in flower or seeding where possible.
  - Where appropriate, establish a fixed clean down site and clean down all vehicles that come in contact with weeds, and all vehicles that arrive from known weed infested areas, with high pressure hoses or compressed air at regular intervals after.
  - Contain the water and materials from the clean down site and regularly inspect for weeds species.
  - Work from the weed free to weed infested areas when spraying or slashing and start weed control from the outer edges of infestations working inwards.
  - Avoid working in or travelling through Tiger Pear except for the purpose of removal of the plant.
6. To prevent weeds from infesting disturbed ground during and after development the following measures should be implemented:
  - Re-establish vegetation as soon as possible after construction earthworks in accordance with the water, soils and infrastructure plan for Dunheved Precinct (SKM 2004);
  - Monitor disturbed areas and all sediment and erosion control structures to ensure that they are functioning correctly and prescribe follow-up weed spraying to ensure that any germinating weed does not set seed; and
  - Any topsoil brought onto the site including composted mulch used for revegetation or landscaping works is to be certified as being weed free to prevent competition from weeds species and reduce weed invasion of restoration areas. All topsoil to be brought onsite is to be certified weed free.
  - Undertake feral animal control; and
  - Ensure that follow up control measures are implemented following disturbances such as fire or floods because these can trigger major weed germination events.

### Community education

A key component to the suppression of weeds will be community education. It is essential to educate future users of the North and South Dunheved Precincts of the potential impacts of weeds and of their responsibilities to minimise these impacts. Educational leaflets will be provided to all users which will briefly describe the environmental values of the adjoining Regional Park, outline the threats to these values from weeds, recommend guidelines for landscaping and explain how to obtain details for local native nurseries and landscaping services.

### Monitoring and review

A vital component of the weed control strategy for the North and South Dunheved Precincts is follow-up work and monitoring.

Monitoring will help to identify and address nonconformance and allow the implementation of corrective actions within an appropriate time frame. It will also assist in determining cost effectiveness of weed control measures and allow for the refinement of weed control budgets.

The recommended short term monitoring program includes:

1. Short term monitoring as a "follow-up" after weed control operations to ensure that weeds present in targeted areas have actually been sprayed or removed, and to re-spray if necessary;
2. Once weeds have been initially reduced in densities due to control activities they need to be regularly monitored, so that any outbreak or spread of weeds can be quickly suppressed; and
3. This type of monitoring is essential for grassy weeds, which could remain hidden amongst the non-target vegetation during the initial control activities.

The recommended long term monitoring program includes:

1. To provide sufficient feedback on the overall success of the weed control strategies including suppression and prevention of weed spread and establishment;
2. To provide some information about the successful regeneration of native vegetation communities that contained weed species;
3. Conducting qualitative weed surveys and mapping every year in the appropriate season for five years to coincide with the implementation schedule.

Comparison of annual maps to indicate whether the distribution and abundance of weeds has increased or decreased over the year, and allow future weed control measures to be tailored to specific objectives.

An annual review of the Weed Management Plan will be undertaken to assess the effectiveness of this plan, during the first three years from the commencement of the development. The reviews will be conducted in conjunction with Blacktown City Council and Penrith City Council prior to handover of public space to local authorities at the time of public handover. A report detailing the results of annual mapping and comparisons of counts will be prepared which could also detail any necessary changes to weed control measures in order to maintain control of weeds in the Dunheved Precinct development area.

## 12.0 Built Form Controls

### 12.1 General design principles

#### Objectives

1. To ensure a safe environment by promoting crime prevention through good urban design.
  2. To ensure that built form establishes a strong relationship to the open space and Regional Park areas.
  3. To ensure development contributes to cohesive streetscapes and desirable pedestrian environments.
  4. To encourage pedestrian use of streets to enhance pedestrian safety and security.
  5. To promote energy efficient building orientation and envelopes.
  6. To avoid street views of long building elevations not screened by landscaping or that display monotonous building forms and design.
  7. To encourage the provision of a range of distinctive building forms that promote the identity of each tenancy.
  8. To encourage a high quality built form by encouraging activity on elevations fronting streets, ensuring buildings address streets and emphasising vertical forms with landscape, buildings and street lighting.
2. Buildings shall address the primary street frontage of an allotment with a clear and well lit pedestrian entry.
  3. Parking areas and service loading areas shall be integrated into site layout and building design, and not dominate the primary streetscape of an allotment. Where located at the side or rear of an allotment with more than one street frontage, these areas shall be appropriately screened from the secondary street frontage(s).
  4. Street tree planting, including endemic species, shall be provided to enhance the appearance of the street and pedestrian environment, including providing protection from the sun.
  5. Buildings shall provide variety to facades by the use of projecting upper storeys over building entries, upper storey display windows, emphasising street corners and varying roof forms.
  6. Buildings shall provide effective sunshading for windows, wall surfaces and building entries (other than loading docks) by the use of design elements such as overhanging eaves and awnings, undercrofts, colonnades and external sunshading devices including screens.
  7. Building form shall be articulated using roofs with eaves that project beyond external walls, dividing long walls into a series of forms, and emphasising customer entries and service access doors.
  8. The existing sewer main along the southern boundary of the Dunheved Precinct may be a potential constraint on development, depending upon:
    - (a) the type & proximity of development proposed; and
    - (b) any mitigation measures that might need to be implemented.

#### Controls

1. Development Applications shall be accompanied by a site analysis plan demonstrating site characteristics (site boundaries, north point, contours, location of services and nature of surrounding development etc) and site opportunities and constraints.

A further technical assessment of the pipe and a defined zone of influence will be undertaken by a suitably qualified expert at the time of the first relevant development application to assist the consent authority in determining the DA.

## 12.2 Frontage development

### Objectives

To provide for the following different types of frontage development:

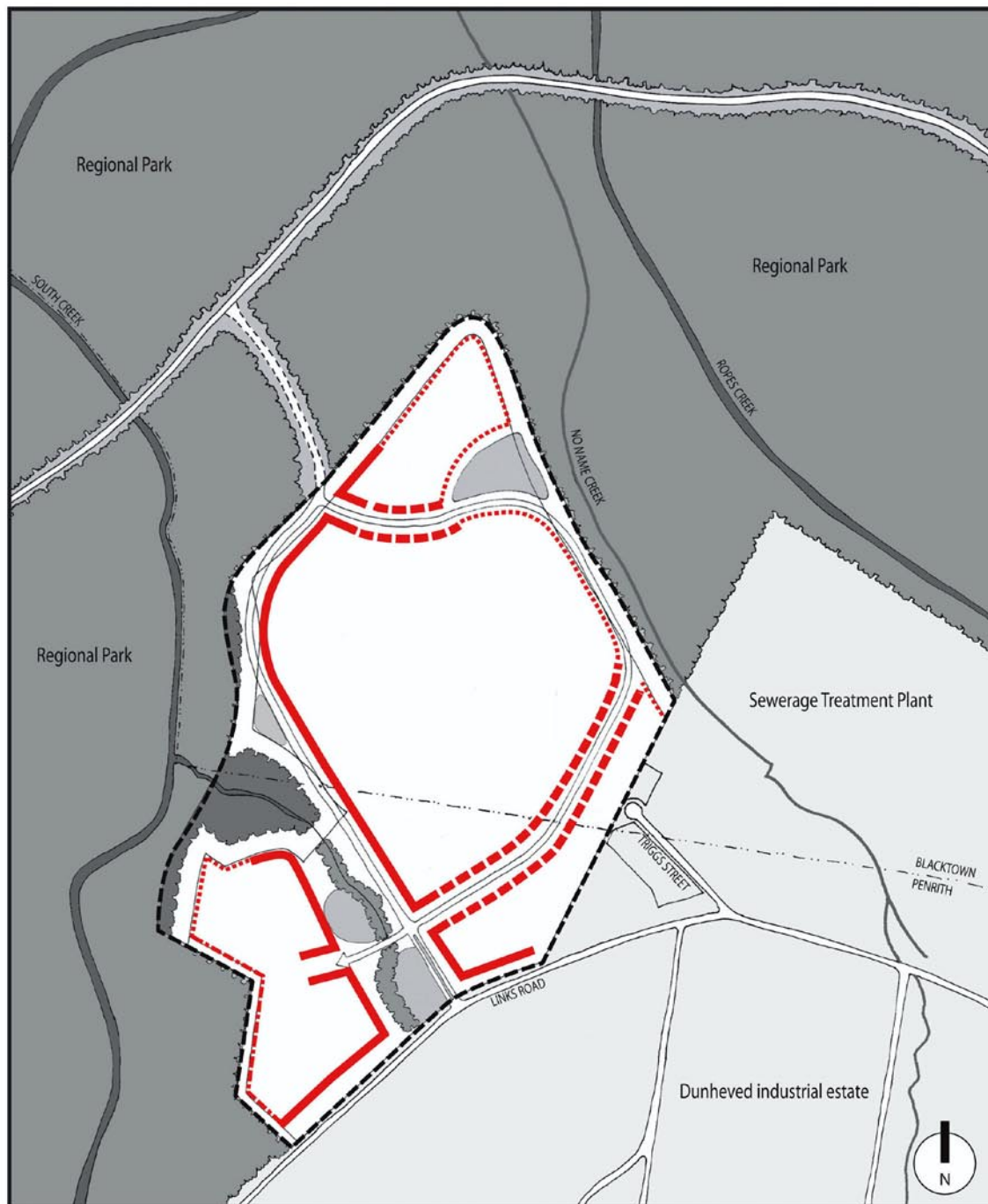
1. Development fronting the Collector Street that addresses the street utilising entrances that are clearly visible and easily accessible.
2. Local Street frontage development that maximises activity and encourages pedestrian activity along the street edge.
3. Development fronting the Regional Park that addresses the APZs and is designed to consider outlook from the park.

storage areas shall be appropriately located and/or screened so as to not be visible from the Regional Park. Loading access from the Regional Park frontage is permitted.

7. Development fronting the Regional Park boundary to the Dunheved Homestead heritage site must be setback a minimum of 10 metres from the boundary in accordance with Section 12.3.

### Controls

1. Frontage development shall be established generally in accordance with **Figure 34**.
2. Larger scale tenancies shall be provided on lots with frontage to the collector street.
3. A wide range of tenancy sizes may be accommodated on lots with primary street frontage to a local street.
4. Where an allotment has its primary street frontage to a Collector Street a minimum of 60% of the primary building facade at ground level is to be activated by the inclusion of offices, showrooms, building entry ways and the like, located to face the street.
5. Where an allotment has its primary street frontage to a local street or has a private road frontage to the Regional Park, a minimum of 40% of the primary building facade at ground level is to be activated by the inclusion of offices, showrooms, building entryways and the like, located to face the street
6. The provision of loading docks, loading areas and external storage areas along the Regional Park frontages shall be minimised. Loading docks, loading areas and external



### Frontage Development (indicative layout)

- |                                                                                     |                                     |                                                                                     |                                                                                        |
|-------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
|  | Frontage to Collector Road          |  | LGA boundary                                                                           |
|  | Frontage to Other Road              |  | Precinct Boundary                                                                      |
|  | Frontage to Regional Park           |  | Indicative Road Design<br><small>(subject to separate future approval process)</small> |
|  | Frontage to Dunheved Homestead Site |                                                                                     |                                                                                        |

Figure 33 - Development is to be generally orientated in accordance to achieve frontage as outlined above



## 12.3 Building envelope and design

### Objectives

1. To ensure the creation of a distinctive streetscape character and hierarchy of streets.
2. To ensure that building forms are consistent with the desired urban character and are of an appropriate scale for an industrial area.
3. To mitigate the visual impact of relatively large scale industrial development on the street.
4. To provide adequate distance between buildings and street alignments for landscaping and vehicle manoeuvring.
5. To provide adequate sight distance for safe traffic movement.
6. To create a strong street presence, encouraging pedestrian activity and slower traffic speeds.
7. To create a strong landscape setting to the street frontage.
8. To encourage passive surveillance of the street.
9. To encourage a high standard of architectural design for industrial buildings.
10. To allow for the efficient use of land.
11. To provide an area for tall trees to shade roofs and parking areas and to allow cross ventilation between buildings.
12. To provide view sharing across blocks.
13. To ensure activities and building forms adjacent to the boundary to the Dunheved homestead site are compatible with the protection of the Dunheved homestead heritage curtilage.
14. To encourage attractive and visually coherent streetscapes.
15. To encourage the use of building materials which are durable and which maintain a high standard of appearance over time.
16. To ensure the economic and energy efficient use of materials in the construction of industrial buildings.

### Building height controls

1. Except as provided for below, the maximum building envelope is to be in accordance with **Figure 34**, ie generally a maximum:
  - External wall height of 8.5m; and
  - Building height of 12m.

As shown as **Figure 34** the external wall height is to be measured above finished ground level<sup>2</sup>.

As shown at **Figure 34** the maximum building height is to be located within a building plane commencing 8.5m above finished ground level and projected at an angle of 30 degrees from the top of the external wall of the building.

2. Minor encroachments including projecting eaves and flagpoles may penetrate the maximum envelopes.
3. Buildings within 20 metres of the boundary to the Dunheved Homestead site are to have a maximum wall height of 7 m and a maximum height of 9 metres above finished ground level.
4. On landmark locations and at street corners the building envelope controls may be exceeded by taller structures up to an additional 3.5 metres in height that assist in the legibility of the development:
  - For 10 metres along street frontages or for up to 25% of the building length (whichever is the greater) fronting the primary street;

<sup>2</sup> Finished ground level means the ground level after filling has occurred.

- For up to 30% of the total building footprint of the level directly below.

The additional height areas may include floor space or signature roof top elements that screen mechanical plant.

### Site coverage control

1. A maximum site coverage<sup>3</sup> of 60% applies unless it can be demonstrated to the satisfaction of Council that greater site coverage will not adversely impact upon the amenity of the streetscape or adjoining allotments.

### Setback controls

1. Buildings are to be setback by:
  - 9m from the Links Road street alignment;
  - 9m from the Collector Road alignment; and
  - 7.5m from the street alignment of other Roads.
2. Where an allotment has frontage to more than one street, the building setback to the secondary street frontage(s) is to ensure that the building presents a satisfactory relationship to the street with good design and landscaping elements.
3. Where parking and/or loading/servicing areas are located at the side or rear of dual frontage lots, these are to be appropriately screened with landscaping to reduce visual impact when viewed from the street.
4. Front setbacks are to be landscaped generally with ground cover plantings to ensure the views between development and the street are not obscured. Minimum landscaping requirements are:

- one tree per 25m<sup>2</sup>; and
- a 4m wide planting zone along the total frontage of lots (except where driveways or paths exist), with the balance being either turf, paving or planting.

5. Nil side setbacks are permitted.
6. A minimum rear setback to the building alignment of 5 metres is required to provide for landscaped areas at the rear of development and to promote the circulation of breezes between building.
7. A minimum setback of 5m is required from the building alignment to any boundary that is adjacent to a drainage area or drainage corridor.
8. A minimum rear setback of 20m to the building alignment is required if there is an APZ located within the allotment.
9. Subject to meeting any requirements of Planning for Bushfire Protection 2001:
  - A minimum 10 metre setback shall be established adjacent to the boundary of the Dunheved Homestead site. No building structures (other than fencing) are to be erected within the 10 metre setback; and
  - Screening planting shall be established within the minimum 10 metre setback to provide for an appropriate interface between future development and the Dunheved Homestead site.
10. All setbacks to car parking areas are to be landscaped.
11. Water tanks shall not be located within the front setback and shall be appropriately located or screened so as to not be visible from outside of the site.

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**3** Site cover means the proportion of an allotment covered by buildings including canopy and outdoor storage areas and excluding loading, hard stand and car parking areas.

## Other design controls

1. The office component of any development is to be incorporated into the overall design of the building, and located generally along the primary street frontage.
2. Blank building facades facing the primary street frontage are not permitted.
3. Facades shall be articulated using architectural elements such as external structures, finishes, protrusions and penetrations, decorative features, textures and colours.
4. Elevations should use a variety of materials and finishes including brick, glass, steel, concrete, textured block work and pre-cast exposed aggregate panels.
5. The use of metal cladding is discouraged on front elevations, unless it can be satisfactorily demonstrated that it forms part of an architectural design solution in association with masonry, glass and other high quality materials. Where a side or rear facade is visible from the public domain the use of metal cladding must only comprise 50% of that wall's building material.
6. Any parking or detention areas along the south east boundary of the site must not alter the existing drainage of this area to the extent that it would affect the health of the trees within the Dunheved homestead site that define the curtilage of the former homestead.
7. Glazing shall not exceed 20% reflectivity.
8. Sunshading devices, such as awnings, shall be provided over all openings (other than loading docks).
9. Rooftop structures (including plant rooms, air conditioning and ventilation systems) shall be incorporated into the design of the building to create an integrated appearance.

## 12.4 Daily convenience shops

### Objectives

1. To provide for retail shops which serve the daily convenience needs of the workforce employed within the zone.
2. To co-locate daily convenience shops with public transport facilities.
3. To ensure the commercial viability of daily convenience shops.

### Controls

1. Individual small retail shops which serve the daily convenience needs of the workforce are permissible with Council consent.
2. The combined gross floor area of all individual small shops within the Dunheved Precincts shall not exceed 200m<sup>2</sup>.
3. Such shops are to be generally clustered to create a node to enhance the viability of these shops through the development of symbiotic relationships.

## 12.5 Parking

### Objectives

1. To ensure that adequate provision is made on each development site for parking.
2. To improve the visual appearance of car parking areas.
3. To minimise the visual impact of car parking areas on the streetscape.
4. To separate truck and small vehicle traffic create safe paths of travel for all vehicles.
5. To allow for shared car parking arrangements between neighbouring allotments.
6. To provide shade for car parking areas.
7. To provide for bicycle parking areas.

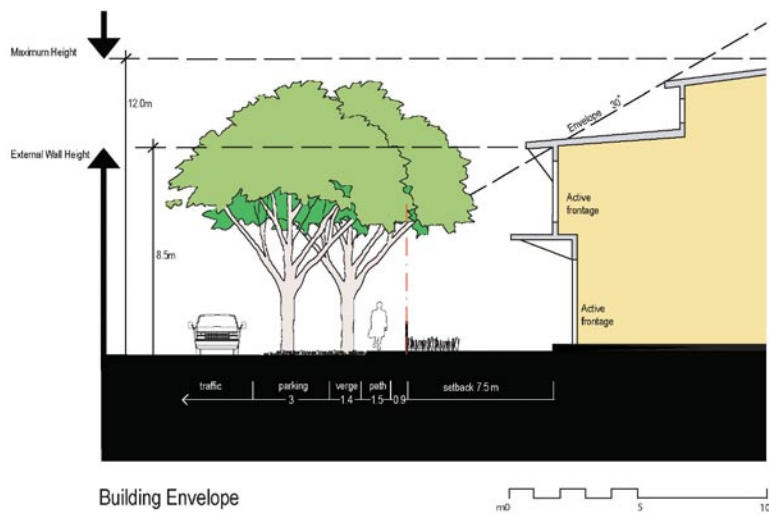


Figure 34 - Building envelope controls

### Controls

1. Access routes to carparking areas are to be clearly identified.
2. Car parking shall be located behind the required minimum front setback area (see Section 12.3).
3. Vehicular access, manoeuvring and loading areas are to be separated from car parking areas on Torrens Title allotments.
4. Visitor parking is to be clearly marked and easily identifiable and be located to be closest to the building’s main entry.
5. On-grade parking shall be within a landscaped setting.
6. A minimum 1500mm wide landscape bay shall be provided generally between every 6-8 car parking spaces.
7. Where car parking is provided immediately adjacent to a blank building facade, a minimum 1 metre wide landscaped strip is to be provided between the building and the parking.
8. The minimum distance between driveways that cross over swales shall be 25m.
9. All car-parking spaces shall be adequately drained, marked and designated upon the site.

10. Car parking shall be provided in accordance with the rates outlined in **Table 6** below.
11. Sufficient spaces shall be provided for disabled car parking. All developments providing 50 parking spaces or more must provide at least 20% or part thereof of those spaces for disabled drivers clearly marked and signposted for this purpose and located as close as possible to the building entrance.
12. A dedicated area for bicycle parking shall be provided within the car park and shall include bicycle racks or similar.

Table 7 - Car parking

Use	Rate
Factory	1 space/75m <sup>2</sup> GFA
Warehouse/Bulk storage	1 space/100m <sup>2</sup> GFA
Office component	1 space/40m <sup>2</sup> GFA
Ancillary showroom	1 space/45m <sup>2</sup> GFA
Daily convenience shop	1 space/30m <sup>2</sup> GFA

The parking rates for any use not specified in **Table 7** are to be determined on merit at the discretion of Council.

## 12.6 Loading & servicing

### Objectives

1. To encourage the optimum efficiency of land use through the provision of shared parking, turning and access routes between neighbouring sites.
2. To maximise the area available for landscaping.
3. To ensure that adequate provision is made on each development site for access by cars and trucks and for the loading and unloading of materials and goods.
4. To ensure that site facilities are functional and accessible and are easy to maintain.
5. To ensure that site facilities are thoughtfully integrated into development and are unobtrusive.
6. To ensure trucks and cars are separated to maximise on site safety.

### Controls

1. Vehicular access, manoeuvring and loading areas are to be separated from car parking areas on Torrens Title allotments.
2. All loading and unloading is to take place within the curtilage of a site.
3. Vehicles shall enter and leave the site in a forwards direction.
4. A minimum on-site driveway width of 8 metres is required for loading and servicing access. Cross-over widths shall comply with the relevant Australian Standard.
5. Where 2 battle axe handles adjoin a shared driveway may be provided with reciprocal rights of access. The minimum width of the driveway shall be 10m.

6. Loading access is permitted from the frontage of an allotment facing the Regional Park. Loading docks, loading areas and external storage areas shall be appropriately located and/or screened so as to not be visible from the Regional Park.

## 12.7 Recycling & waste management

### Objectives

1. To reduce the amount of waste going to landfill.
2. To encourage the recycling of industrial waste.

### Controls

1. Waste separation, recycling and reuse facilities shall be provided on site.
2. Waste facilities shall be fully integrated with the design of the building and/or landscaping.

## 12.8 Landscaping

### Objectives

1. To contribute to effective management of stormwater, biodiversity, and energy efficiency; and to improve visual amenity.
2. To encourage the use of native flora and low maintenance landscaping.
3. To assist in the management of salinity.
4. To establish landscaped boundaries to industrial sites.
5. To mitigate the visual impact of industrial buildings and hard stand areas through the use of landscaping.

6. To enhance visual integration of urban development with the Regional Park bushland context.
7. To provide for the passive recreational requirements of employees.

- The position of each shrub and tree species proposed to be planted. Each plant is to be identified by a code referring to a plant schedule on the plan.
- The location of any subsoil drains.

## Controls

1. Landscaping on individual allotments is required within the front building line setback.
2. Landscaping is required in the side and rear setbacks if visible from a public place. In addition, the perimeter of open storage areas is to be landscaped as necessary to provide appropriate screening from public view.
3. Car parking areas shall be landscaped to provide shade and to soften the visual impact of parking facilities.
4. 30m<sup>2</sup>, or 5% of the office GFA, whichever is the greater, shall be provided as passive recreation on each allotment for use by employees. Such areas shall be suitably landscaped.
5. Low water demand drought resistant vegetation shall be used in landscaping areas, including native salt tolerant trees.
6. Mulching cover shall be incorporated in landscaped areas (excluding drainage corridors).
7. Planting of vegetation must consider the need for passive surveillance. Excessively dense vegetation that creates a visual barrier must be avoided.
8. A Landscape Plan must be lodged with all DAs, and is to provide the following details:
  - The location of any existing trees on the property, specifying those to be retained and those to be removed.
  - The location of any trees on adjoining properties that are likely to be damaged as a result of excavations or other site works.

## 12.9 Signage

### Objectives

1. To accommodate the need to identify and promote industrial development whilst preventing the unnecessary proliferation of advertising signs or structures.
2. To encourage signage that is commensurate with the quality of development within the Dunheved Precincts.
3. To ensure signage does not detract from the visual appeal of the Dunheved Precincts.

### Controls

1. Advertising signage within the Dunheved Precincts should be kept to a minimum and should only relate to the use occurring on the respective property and shall identify the relevant business name.
2. Freestanding signage for buildings or sites including those with multiple occupancies shall be limited to a single structure at the entry to the site from a public road, along the road frontage.
3. Freestanding signs not exceeding 6m in height from ground level are to be located within an area of 5m by 3m on either side of the ingress.
4. For multiple occupancy buildings one business identification sign not exceeding 2m x 0.6m is permitted on each occupied unit. Such signs are to be a uniform shape, size and general presentation.
5. For single industrial developments, the total permissible signage and advertisements shall not exceed 1m<sup>2</sup> of advertising per 3 metres of street frontage or 50m<sup>2</sup>, whichever is

the lesser (on corner lots or lots with dual frontage only one lot frontage can be relied upon).

6. Directional signage for car parking areas, loading docks, delivery areas and the like should be designed in an attractive manner and should be located at a convenient point close to the main access to a development site. The colouring, type and scale of signage erected within individual properties should also be considered to ensure consistency within the development.
7. Roof signs are generally not permitted. In exceptional circumstances a roof sign may be permitted where it forms an integral part of the architecture of the building.

## 12.10 Fences and walls

### Objectives

1. To provide security for property owners. To contribute to the amenity of the Dunheved Precincts.
2. To ensure fences and walls improve amenity for employees of existing and new development and that they contribute positively to adjacent buildings.
3. To encourage pedestrian access to businesses from the street.
4. To ensure boundary fences and walls between allotments provide security.
5. To ensure materials used in fences and walls are of a high quality and in keeping with the character of the precincts.
6. To ensure fences and walls are sympathetic to the topography.

### Controls

1. No fencing is permitted between a building and the primary street frontage.
2. In general no fencing other than a low feature wall may be erected on any site at the entry driveway. Low feature walls

should be utilised for retaining walls, garden beds and the like.

3. No pre-finished and pre-coloured corrugated metal (eg. Colourbond) or lapped and capped fencing is permitted to any public area.
4. The use, design and materials of fences and walls are to be compatible with attractive fences and walls in the streetscape.
5. Side and rear fences and walls can be built to a maximum height of 1.8m to screen the rear of the allotment from adjacent sites.
6. Side fencing is not to be located forward of the building line.
7. Side and rear fencing it to allow cross ventilation though by the use of open chain wire or picket type pool fencing.
8. Fencing is to utilise dark colours to reduce visibility.

## 12.11 External industrial activities

### Objectives

1. To mitigate the environmental and visual impact of external processing and storage of materials.

### Controls

1. External industrial processes and/or the storage of materials will not be permitted along a road frontage and must be separated or visually screened from the Regional Park
2. Development applications proposing external industrial processes and/or outdoor or open storage areas must provide details of the parts of the site to be so used, the specific materials to be stored, and proposed screening. Outdoor storage areas shall not interfere with access, manoeuvring and parking arrangements.

## 12.12 Safety

### Objectives

1. To ensure that the siting and design of buildings and spaces contributes to the actual and perceived personal and property safety of residents, workers and visitors and decreases the opportunities for committing crime in an area.
2. To ensure development encourages people to use and interact in streets, parks and other public places without fear or personal risk.
3. To increase the perception of safety in public and semi public space including streets, car parks and parks.
4. To maximise actual and perceived safety.
5. To encourage the incorporation of principles of crime prevention through urban design and landscaping into all developments.

### Controls

1. Use of roller shutters is not permitted on windows facing the street. Security railings must be designed to complement the architecture of the building.
2. Pedestrian and communal areas are to have sufficient lighting to ensure a high level of safety. These areas must be designed to minimise opportunities for concealment.
3. All developments are to incorporate the principles of Crime Prevention Through Environmental Design.
4. The creation of areas for concealment and blank walls facing the street is to be avoided.

## 12.13 Fire construction standards

### Objective

1. To ensure the protection of life and property from the threat of fire.

### Controls

1. Where part or all of the APZ is to be located within an allotment future development must address the following:
  - visual impact;
  - measures to prevent crime and enhance passive surveillance and safety;
  - fencing (if required) between development and the access road; and
  - the use of appropriate landscaping.
2. Development within 100 m of land identified as Bush Fire Prone (for the purpose of planning will be taken as within 100m of bushland either existing or proposed) shall be constructed in accordance with the minimum requirements of Australian Standard 3595-1999.
3. All development within the Precinct is to be constructed, at a minimum in accordance with the Level 1 construction standards contained within Planning for Bushfire Protection. Other buildings closer to the western boundary of the Precinct may require a Level 2 or 3 construction standard dependent on their proximity to bushland.
4. The Fire Management Plan prepared by BES (April 2005) details these distances and construction standards.
5. Any structures (eg fences, pergolas etc) located within the APZs shall be non-combustible (ie non-combustible under Australian Standard 1530.1 and not deemed combustible pursuant to Cl.12 of Volume 1 of the Building Code of Australia).



## 12.14 Energy efficiency

### Objectives

1. To incorporate best practice energy management.
2. To promote energy efficient building envelopes.
3. To achieve high levels of indoor thermal comfort.
4. To minimise the energy required for heating cooling and lighting.

### Controls

#### Lighting

1. Natural lighting (e.g. translucent roof panels) is to be provided wherever possible.
2. Light fixtures are to be energy efficient.
3. Automatic controls are to be utilized which will turn the lights off when there is sufficient natural light.

#### Heating

1. All heating systems are to be controlled by thermostats and time controls.
2. Closing pedestrian and vehicular doors are required (consideration to be given to the use of automatically closing doors).
3. Covers are to be incorporated over evaporative coolers in winter, to reduce heat losses and protect the coolers.
4. Incorporate of appropriate building insulation to minimise heat loss (preferably 100 mm blanket plus foil in the roof, and 50 mm blanket plus foil in the walls).
5. Utilise electric resistance heaters with heat pumps where feasible (e.g. in offices and tea rooms).

6. Utilise localised heating (e.g. gas radiant panel heating in workshops, rather than warm air heaters).
7. Steel framing should be insulated, so that heat from the roofing cannot bypass the insulation and enter (or, in winter, leave) the building via the metal framing.
8. Rooms within the buildings (e.g. offices) that are heated or cooled to higher comfort levels than the overall building shall be insulated from the rest of the building.
9. White or light beige roof colours are to be used.
10. Walls exposed to afternoon sun should either be shaded, or should be the lightest acceptable colour.
11. East and west facing windows are to be minimised due to the hot, low summer sun and should be fitted with shading devices, including blade walls, and thick vegetation.
12. Consideration is to be given to the use of clear polycarbonate panels in selected northfacing walls to increase passive heat gains.
13. Consideration should be given to installation of solar water heating systems wherever possible.
14. Hot water tanks and hot water pipes shall be insulated.

#### Staff amenity areas

1. Lights are to be controlled with occupancy sensors.
2. Comfort heating and cooling is to be controlled with time-switches, timer delays or occupancy sensors.
5. Equipment left on for long periods (such as drink vending machines, boiling water units, etc.) are to be as energy efficient as possible.
6. The use of electrical appliances such as dishwashers, refrigerators, freezers, and washing machines with a minimum Energy Star Rating of 3.5 Stars is encouraged.

## 12.15 Water use

### Objective

1. To minimise the use of potable water.

### Controls

1. Where feasible, development should utilise treated effluent from the St Marys Treatment Plant for toilet flushing, irrigation of public and private spaces, and industrial use, subject to continuing negotiations with Sydney Water.
2. Where proposed, rainwater tanks should be sized as follows:
  - 20kL tanks for lots less than 3000m<sup>2</sup>;
  - 60kL tanks for lots less than 5000m<sup>2</sup>; and
  - 100kL tanks for lots greater than 5000m<sup>2</sup>.
3. Developments that consume high volumes of water in their operation shall incorporate recycling initiatives in the plant's operation to reduce the demand on water.
4. Water saving devices shall be used where possible including:
  - Use of 6 litre/3 litre dual flush toilets.
  - All staff amenity appliances to have water efficiency ratings of at least AA according to the rating issued by Water Services Association Australia.
  - Separate hot and cold water taps over basins and sinks in staff amenity areas.
  - Aerators are fitted to hot and cold water taps over basins and sinks in staff amenity areas.

## 12.16 Air Quality

### Objectives

1. To minimise adverse impacts on air quality through the implementation of appropriate measures.

### Controls

1. An air quality impact assessment report shall be prepared and submitted with any development application that may have the potential for significant adverse impact on air quality, including odour.
2. Applicants must demonstrate that the most efficient means of minimising emissions are being used.
3. All potentially airborne materials such as sand, soil, cement or the like shall be stored, screened and contained to minimize any potential effects of airborne pollution.