Table of Contents

E16 Sydney Science Park

A. Background

This Section applies to development on land known as Sydney Science Park as identified in Figure E16.1.

Sydney Science Park comprises an area of approximately 287 hectares. It is located on the western side of Luddenham Road, Luddenham, approximately 8 km south of Penrith, 21 km north-west of Liverpool and 43 km west of Sydney CBD (refer to Figure E16.1). The site is generally bound by the Warragamba Prospect Water Supply Pipeline to the north, Luddenham Road to the east and existing agricultural land to the south and west. The site is located within the Broader Western Sydney Employment Area (WSEA) in accordance with State Environmental Planning Policy (Western Sydney Employment Area) 2009.

Sydney Science Park represents a new vision for Australia to cluster leading science based businesses, tertiary institutions, research and development providers in one location to advance innovation around the important principles of food security, energy and health. Sydney Science Park will comprise research and development, employment, education, retail and residential uses.

Figure E16.1: Land to which this DCP Applies - Sydney Science Park

The aim of the controls in this section of the DCP is to provide more detailed provisions for development in Sydney Science Park that will:

a) Provide high quality employment development for workers;
b) Provide a mix of housing types for workers, students and visitors in a landscaped setting;
c) Promote quality urban design, architectural excellence and environmental sustainability in the planning and development and long term use of the science park;
d) Create high quality public domain and facilitate development that integrates with and relates to the public domain;
e) Provide for mixed use development (entertainment, retail, hotels, restaurants and cafes, cultural facilities) which provide high levels of amenity for workers, students, residents and visitors;
f) Provide high levels of accessibility throughout the science park;
g) Encourage development within Sydney Science Park that gives primacy to the public domain and creates an attractive and vibrant centre;
h) Provide clear connectivity through the site and to the surrounding neighbourhood;
i) Capitalise on view corridors with the aligned of future road network; and
j) Provide the framework to facilitate and encourage the use of public; transport, safe pedestrian and cycle movement and vehicular movement.

B. Sydney Science Park Staging Plan

The development of Sydney Science Park is to be carried out in stages. The objective of staging is to facilitate the timely and efficient release of urban land, making provision for necessary infrastructure and sequencing.

Development will commence in the south, to be known as the First Community Precinct. It is envisaged that development will then progressively proceed to the north. All infrastructure and services, including public transportation, will be provided at the relevant stages of development where and as necessary. As the site is progressively developed, more than one stage may be under construction at any particular time. Development is currently forecast to commence in late 2016 and continue over a period of about 25 years.

Individual Precinct Plans (as described in Section E16.2.1.3) are to demonstrate a staged approach to land release and infrastructure provision, generally in accordance with this section of the DCP.

E16.1 Sydney Science Park Vision

Sydney Science Park will deliver to Western Sydney an urban structure providing greater choice, better value, leading edge environmental outcomes, higher design quality, improved social interaction and superior amenity. Employment in jobs of the future, high value research, technology and education facilities will be supported by business, retail and community services and housing for a diversity of incomes and lifestyles. Entrepreneurial thinking, innovative design, sound marketing and consistent delivery will ensure Sydney

Science Park quickly provides a compelling research, educational, business and housing environment.

Sydney Science Park will have the following characteristics:

- a memorable and valued urban concept that demonstrates consistency and clarity from the Precinct Plan to the scale of streets, landscaping, open spaces and built forms;
- clearly articulated and high quality open spaces that respect the site's character and create strong links with its topography, watercourses, trees and views, promote pedestrian movement, stimulate social contact, and feel familiar to the diverse mix of people and cultures for whom they are designed;
- a variety of employment and workplace opportunities and a diversity of housing types and tenure choices will be contained in a compact urban form that integrates multiple uses, encourages the creation of a walkable, pedestrian oriented community and facilitates communication between workers, researchers, academics, students, other residents and visitors;
- sustainable street activity generated by Town Centre with a 'main street' style retail, commercial and housing mix that offers lifestyle, convenience and proximity to parks and squares rather than a traditional, fully enclosed 'shopping centre' experience remote from the outdoors;
- community facilities, education, shopping and employment opportunities will be within comfortable walking distances along a network of bicycle routes and enhanced transport services;
- a Town Centre will recall the character, dynamics and advantages of the world's most prestigious university towns, a life where town and gown are inseparable;
- a variety of policies and programs designed to effectively manage water, reduce energy consumption, improve resident and employee health, ensure physical and emotional accessibility, manage waste and materials toxicity, produce a highly valued environment; and
- a viable and soundly based planning and development process for employment land, community amenities and housing that ensures infrastructure, building.

Sydney Science Park will respect the area's landscape setting and achieve a high level of scenic quality. The public domain will make a significant contribution to defining the place and making it special. Equally importantly, the community's built character will be modern and contemporary, not superficially evocative of other eras or places.

E16.2 Urban Structure

E16.2.1 Precinct Plan

E16.2.1.1 Overview

The Precinct Plan is based around the creation of an integrated employment, educational and residential community supported by a connected open space and street network. Sydney Science Park, as illustrated in Figure E16.2, will:

- Deliver a social, economic and environmental sustainable community through integrated land use and transport planning;
- Deliver community facilities, education, shopping and employment opportunities that will be within comfortable walking distances along a network of bicycle routes and enhanced transport services;
- Provide a variety of employment and workplace opportunities and a diversity of housing types and tenure choices that will be contained in a compact urban form that integrates multiple uses, encourages the creation of a walkable, pedestrian oriented community and facilitates communication between workers, researchers, academics, students, other residents and visitors;
- Respond to the importance of the future rail line extension and proposed station;
- Provide for a higher order road hierarchy that has been developed in a manner that provides for flexibility of development of various land uses;
- Establish two east west connectors that represent key structural elements of the site;
- Provide a grid street hierarchy that promotes permeable connections and accessibility, trip containment, walking, cycling and use of public transport;
- Establish sustainable street activity though a town centre with a 'main street' style retail, commercial and housing mix that offers lifestyle, convenience and proximity to parks and squares rather than a traditional, fully enclosed 'shopping centre' experience remote from the outdoors;
- Provide a range of housing densities and dwelling types to satisfy the needs of a wide spectrum of households, at different life stages;
- Provide an extensive passive and active open space and landscape network that shapes an identity and character responsive to the topography of the site, and integrates a livable, robust network of parks, reserves, corridors and streetscapes; and
- Provide clearly articulated and high quality open spaces that respect the site's character and create strong links with its topography, watercourses, trees and views, promote pedestrian movement, stimulate social contact, and feel familiar to the future diverse mix of people and cultures.

Sydney Science Park will be supported by two main parallel east-west road connections or spines, each supporting a specific function within the science park – Commercial Road and

City Road. The wider southern spine, Commercial Road, will support larger employment generating, research and development and educational activities, while the northern spine, City Road which connects to the future railway station with accommodate an interim local village, a Town Centre and mixed uses including residential.

Pedestrian and cycle paths will be provided in appropriate locations in the open space network, as will the stormwater management facilities. The landscaped public domain will improve amenity for workers, visitors, and residents of the nearby areas in addition to providing convenient and clear internal linkages, while respecting the area's landscape setting and achieve a high level of scenic quality.

Figure E16.2: Precinct Plan

Individual Precinct Plans (as described in Section E16.2.1.3) will be prepared. While generally in accordance with the Precinct Plan, the more detailed Precinct Plans may modify the Precinct Plan and will prevail to the extent of any inconsistency.

The Sydney Science Park comprises a series of integrated uses, each with a distinctive character and role. A strong street grid network provides a flexible framework to support a variety of development options within the science park. Although uses are not necessarily limited to a particular part of the site, they must address the character of the space in which they are located.

E16.2.1.2 Character Areas

Sydney Science Park has five main themes or character areas, as illustrated in Figure E16.3 below.

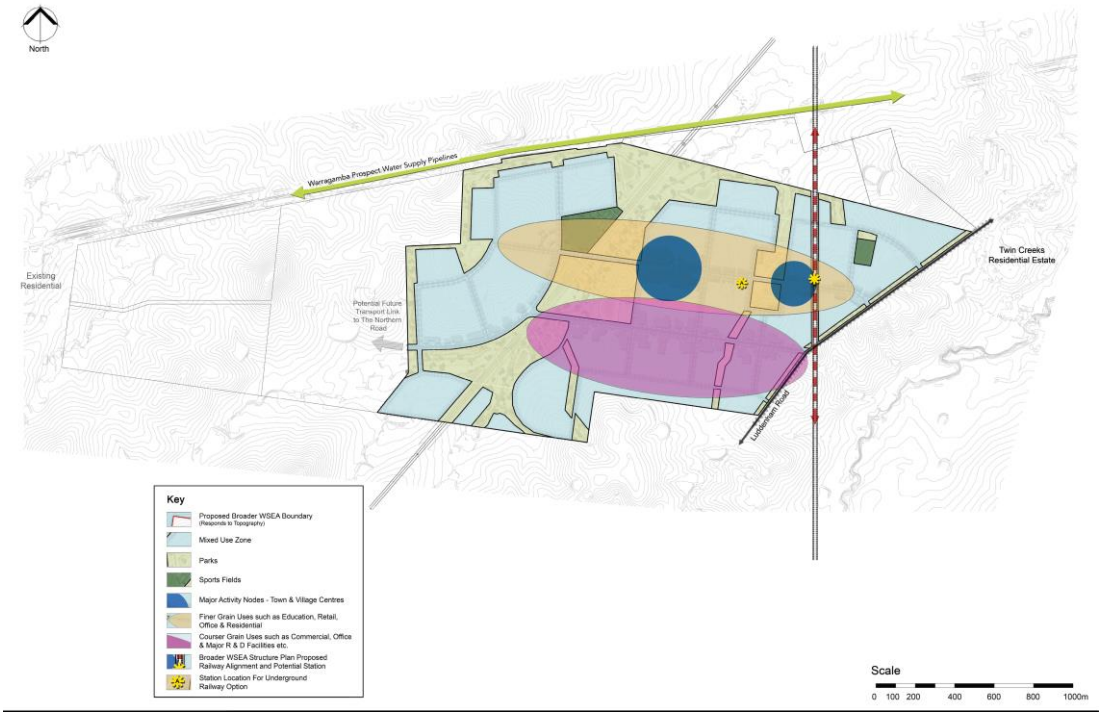


Figure E16.3: Precinct Plan Theme / Character Areas

Town Centre Character Area

The Town Centre is centrally located within the Sydney Science Park, along City Road and on the eastern side of the Central Open Space Corridor. The new Town Centre will comprise a wide range of retail, commercial, business education, entertainment, civic recreation, residential, tourist and visitor accommodation and employment land uses including approximately 30,000m² of retail floor area (supermarkets, speciality food stores, restaurants, personal and household retail); hotels/clubs, and a community facility. The higher density housing types (residential flat buildings, shop top housing and small lot multi-unit housing) will be concentrated in and around the Town Centre and in areas of high visual and landscape amenity. It is expected that the proposed student accommodation will also be located in this area.

The genuine mixture of employment, research and development, education, residential and retail uses will contribute to the social sustainability of the overall development and activate the science park in the evenings and on weekends, thereby making them safer places and helping to create a sense of vibrancy and liveliness in the area.

Interim Local Village Character Area

In addition to the Town Centre, an interim local village is proposed towards the eastern portion of the site, adjacent to the formal lake. The interim local village will be delivered as part of the initial stages of the development to assist in place creation and to provide for the local day to day convenience retail needs of future workers and residents. It is expected that

once the Town Centre is established and 'anchor' tenants secured, retailers (including those in the interim local village) will be drawn naturally to the Town Centre, the 'heart' of Sydney Science Park. Although subject to future planning applications, it is likely that buildings within the interim village will need to be flexible in terms of design, so as to maximise opportunities for their adaptive reuse as Sydney Science Park evolves.

Commercial Road Character Area

The Commercial Road area will be the focus for larger scale employment, research and development and educational activity within Sydney Science Park. Landmark buildings are to be located on corner allotments to reinforce the intersections. The provision of generous setbacks will provide a corporate character for the area.

City Road Character Area

The City Road area will be the focus for student life and be supported by retail, employment and residential activity, and will have a main street character with activated frontages and a pedestrian dominated environment. A university administration 'hub' is identified along the new City Road. Approximately 100,000m^2 of education floor space is expected to be developed by university and education institutions within Sydney Science Park. A close association between the Science Park and the university will encourage graduates from the university to employment on site and by providing a source of qualified employees. It is expected that up to 10,000 students will be on the site, and with 400 student accommodation units to be constructed, City Road will be an attractive and lively university campus.

Sydney Science Park will provide a mix of housing types ranging from residential flat buildings, through traditional single lot residential dwellings, to provide housing diversity and choice to meet the needs of future workers, students and residents. Higher density housing types will be concentrated closer to the Town Centre, adjoining open space areas and along the City Road spine.

Central Open Space Corridor Character Zone

One of the key features within the Sydney Science Park is the central open space corridor that will provide the active and passive recreational activities for the community. The landscape and open space vision for Sydney Science Park is to:

- embrace the sites undulating topography and vistas to Blue Mountains;
- create a living and working environment that promotes health, well-being, active living and sociability;
- use open space as a way to establish connections between workers, students and residents and nature; and
- celebrate food production through community supported agriculture, community gardens and a policy to cultivate roadside land for food production where appropriate.

A. Objectives

The objectives of this section are to:

a) Create an integrated employment, educational and residential community supported by a new highly connected open space and street network;
b) Create a well-defined and accessible public domain that is connected to the community and users;
c) Create a vibrant town centre with achieve active street frontages with good physical and visual connections between buildings and the street;
d) Establish the scale, dimensions, form and functional layout of the Science Park;
e) Develop a built form and density that reflects the innovation principles of the Science Park;
f) Protect and enhance the amenity of residents in the vicinity of the development;
g) Create distinctive places;
h) Create a framework that is flexible enough to accommodate a changing range of uses over time and respond to market opportunities;
i) Facilitate the orderly development of the site; and
j) Minimise potential conflicts and achieve compatibility between different uses.

B. Controls

1) Future development is to be generally in accordance with Figure E16.3.
2) Where variation from the Precinct Plan is proposed, the applicant is to demonstrate that the proposed development is consistent with the vision and development objectives for the area and the objectives and controls in section E16.3.1 of the DCP.

E16.2.1.3 Requirements for a Precinct Plan

In the context of the Sydney Science Park, a Precinct is a particular portion of the site which is subject to coordinated planning and development.

1) A Precinct Plan showing the indicative urban structure of a Precinct is to be submitted concurrently with the first subdivision DA for that Precinct. The Precinct Plan provides a greater level of details, and prevails over the DCP to the extent of inconsistency.
2) Council must not grant consent to development on land comprised within the Sydney Science Park unless:
    a) a Precinct Plan of minimum 10 hectares has been prepared substantially in accordance with the requirements of this section of the DCP, submitted to Council and adopted by Council; and
    b) the development is generally consistent with the adopted Precinct Plan.
3) Council may waive the requirement for a Precinct Plan, or agree to vary the timing of submission of a Precinct Plan, due to:
    a) the minor nature of a development;
    b) the adequacy of other planning controls, including this DCP; or
    c) Council's discretion.

A Precinct Plan may be amended through the submission and assessment of an amended Precinct Plan for adoption by Council. Should the boundaries of the amended Precinct Plan exceed 10 hectares, a new Precinct Plan must be prepared.

Preparation of a Precinct Plan

The Precinct Plan shall set out indicative information relating to a range of matters, as relevant:

1) The existing physical, built and environmental features and constraints of the Precinct;
2) The general indication of the phasing of development;
3) The proposed site layout including an indicative road layout;
4) The distribution of land uses;
5) Pedestrian, vehicular and cycle access and circulation networks, traffic management facilities and car parking;
6) An urban design strategy, including design principles, built form guidelines and setbacks, and identification of gateway sites and corridors;
7) A landscape and fencing strategy;
8) Location and function of open space;
9) An infrastructure strategy; and
10) A public art strategy for the Precinct.

E16.2.2 Connectivity

E16.2.2.1 Street Network

Sydney Science Park will have a legible street pattern that delivers a flexible grid to deliver multiple land use form in a mixed use environment. Significant roads are located to follow subtle contours and take advantage of the sites natural assets such as riparian corridors and ridge tops. The streets will create a legible network of vehicular, pedestrian and bike linkages forming a hierarchy of streets that reinforce arrival and destination points, public realm and built form while providing a walkable, urban environment, as shown in Figure E16.4.

In the Precinct Plan, the site has been divided into a grid of approximately 300m x 300m to form the primary urban grid pattern. The roads in the Precinct Plan form the major grid which is fixed in the urban plan with flexibility on how these grids are then further broken down based on the land form and uses within each macro grid. Further, precinct planning may result in the potential for a smaller grid in certain precincts (for example, the area to the south of Commercial Road has the potential for a 200m x 200m grid).

The street character is local in nature with street tree planting used to reinforce the character of the street. Generous footpaths and setbacks allow for cafes and outdoor seating opportunities. Street tree planting will create a generous landscape treatment framing the street while providing shade.

It is anticipated that the Science Park will have a variety of new streets within the street grid:

- **Commercial Road** – runs east-west and serves as the primary road in the business and educational character area and will function as the major transport road within the development.
- **City Road** – also runs east-west and serves the retail, commercial and residential centre, it will have a main street character with activated frontages and a pedestrian focus. It will be the main link to the proposed rail station.
- **Connector Roads** – runs broadly north-south and form the grid in the opposite direction. These will be designed to cater for major pedestrian networks and potential future public transport loops.
- **Park Edge Streets** – completing the grid network, these streets follow the edge of the public open space, and provide for direct street address to open space along both edges of the primary urban park.

Within this grid a series of secondary smaller streets will divide the urban centre into more pedestrian friendly urban blocks. These secondary roads will follow the primary grid pattern running parallel to either the east-west or north-south orientation of the primary grid. The street character of these streets is made up of two primary typologies:

- Access Street – while narrower than the primary grid these streets serve as the next layer of grid and will function both as address points to smaller developments and as rear access roads to larger developments. All access roads will have a character defined by a consistent planting logic and footpath treatments.

- Lane Ways – will offer the finest grain of the development and will feature more in the core urban heart and the residential parts of the development as access to the rear of houses and apartment buildings.

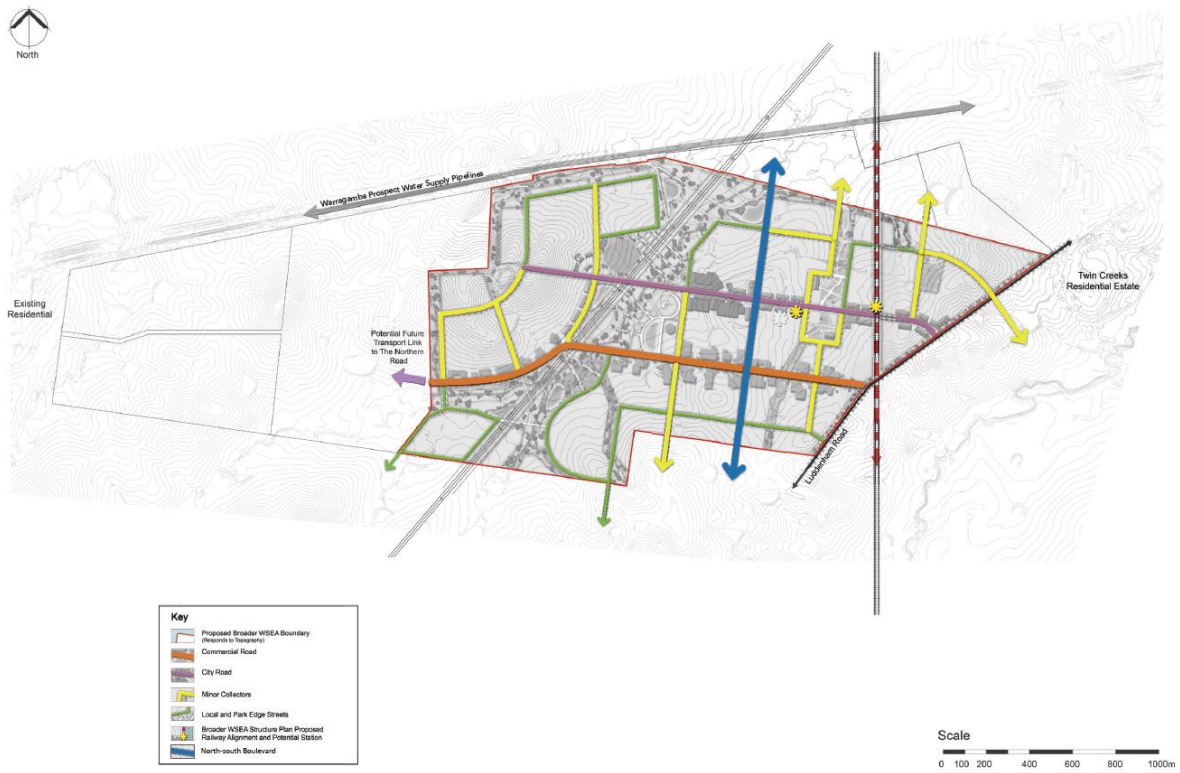


Figure E16.4: Precinct Plan Street Hierarchy

A. Objectives

The objectives of this section are to:

a) Create a quality public domain that provides legible, safe and comfortable street environments, in terms of daylight, scale, sense of enclosure and wind mitigation;
b) Provide good circulation within the site; and
c) Encourage sunlight access to new public spaces.

B. Controls

1) All streets will be constructed in accordance with the Transport, Access and Parking Section of the DCP.
2) Street network is to be provided generally in accordance with Table 1 below and Figures E16.5 – E16.10.
3) Road design of key intersections at Luddenham Road and its potential upgrade is to be carried out in consultation with RMS and Council at the detailed DA stage.
4) Notwithstanding the above, where any variation to the street network is proposed, the alternative street network is to be designed to achieve the objectives.

Table 1: Street Hierarchy

Road Type	Footpath/Verge	Parking	Road Width	Total Width
Commercial Road	6 m	3.5m both sides	22m including 8m median and parking	34m
North-South Boulevard	6 m	3.5m both sides	22m including 8m median and parking	34m
City Road	6m	3.5m both sides	19.5m including 5.5m median and parking	31.5m
Connector Road	3.9m	2.6m both sides	12.2m including parking	20m
Park Edge Street	1m park side and 5.9m building side	2.6m park side only	9.1m including parking	16m
Access Street	3.8m	2.6m one side	8.5m including parking	16.1m
Lane ways	1m both sides	Nil	6m	8m

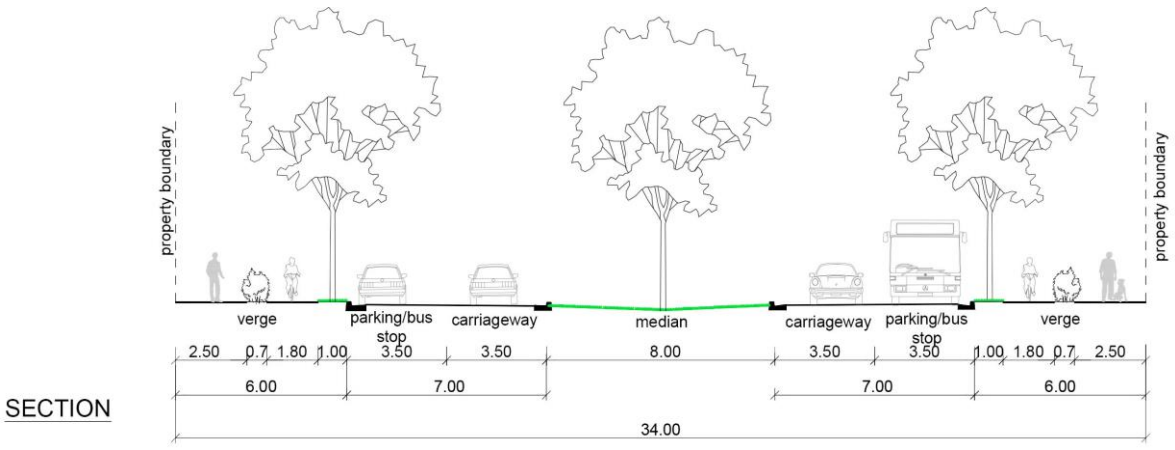


Figure E16.5: Cross Section – Commercial Road and North South Boulevard

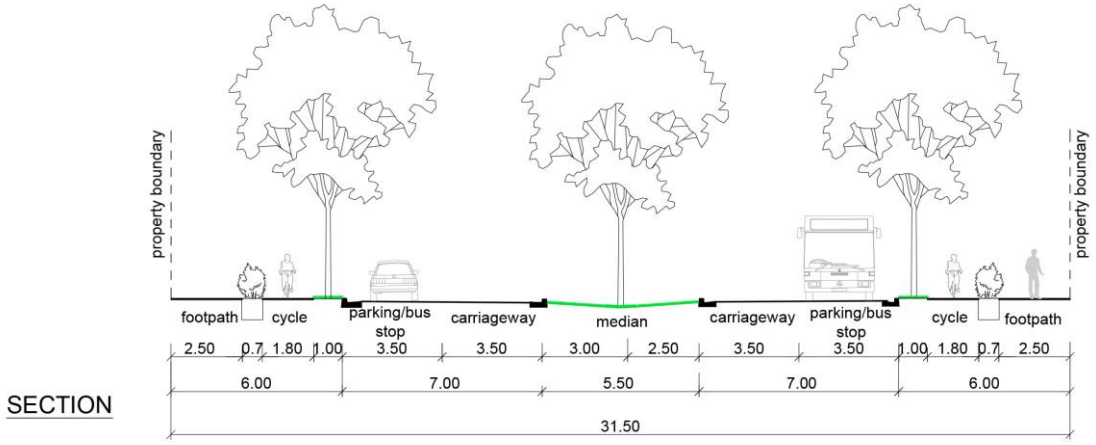


Figure E16.6: Cross Section – City Road

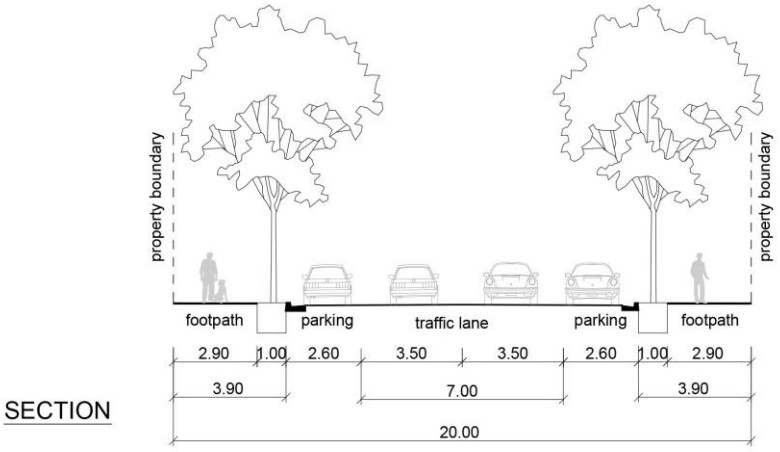


Figure E16.7: Cross Section – Connector Road

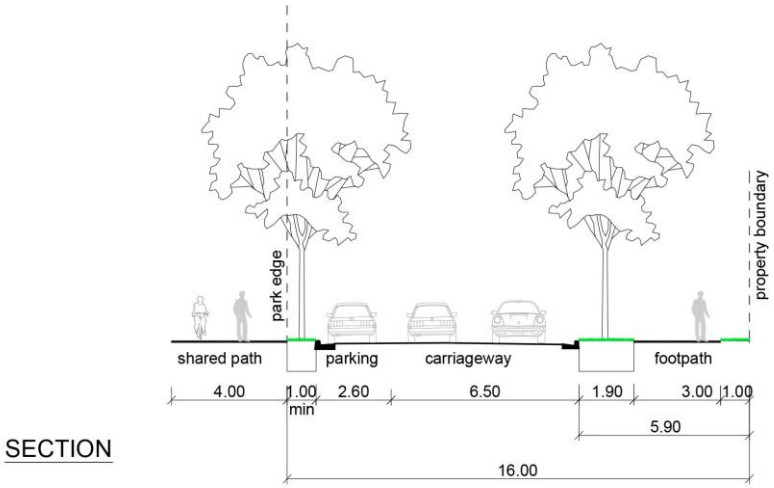


Figure E16.8: Cross Section – Park Edge Street

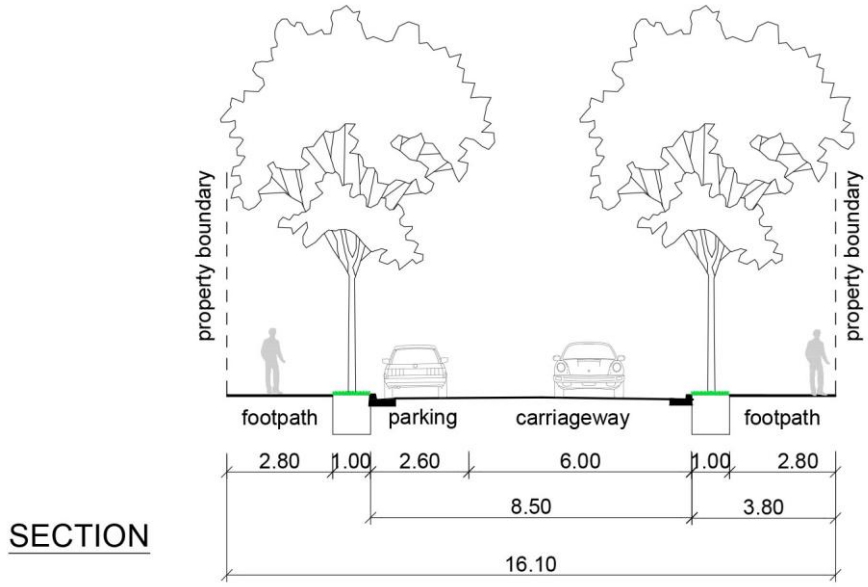


Figure E16.9: Cross Section – Access Street

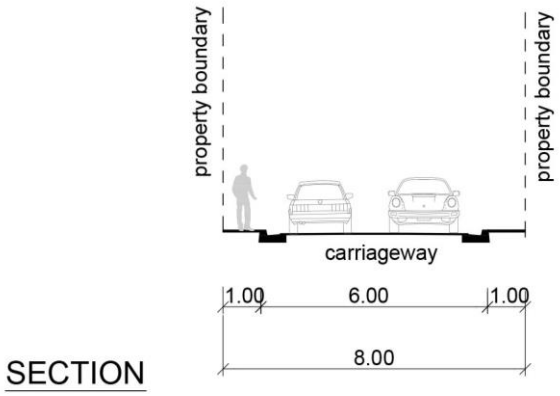
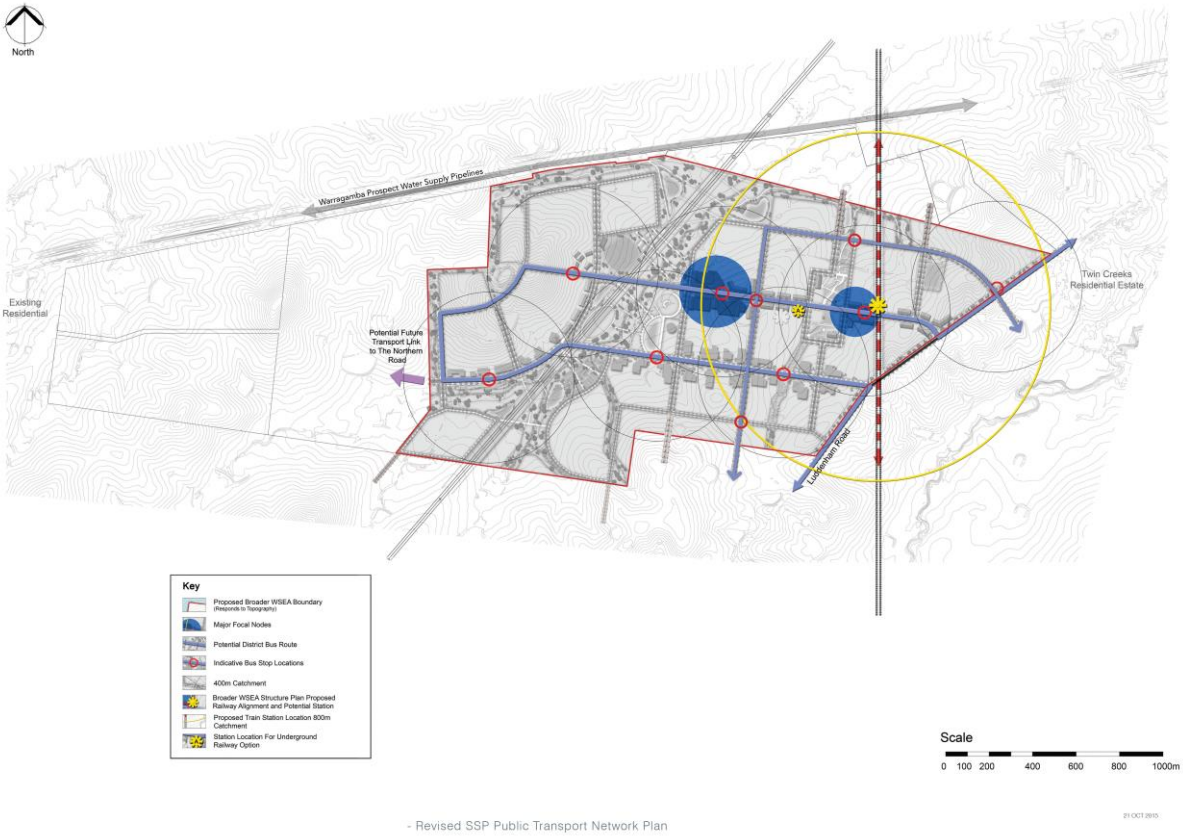


Figure E16.10: Cross Section – Lane Way

E16.2.2.2 Public Transport

The Sydney Science Park site allows for seamless integration of an expanded bus service and new services could utilise the parallel spine routes (City Road and Commercial Road) as the primary bus route as shown in Figure E16.11. The proposed bus route will link major facilities and provide access to the future rail station, with a potential future extension of the proposed bus route to link with The Northern Road. Bus stop locations will be placed to maximise a 400m walkable catchment. Bus shelters will be provided at appropriate locations.

Figure E16.11: Precinct Plan Public Transport Nodes



- Revised SSP Public Transport Network Plan

A. Objectives

The objectives of this section are to:

a) Encourage public transport use;
b) Locate higher density development near public transport opportunities;
c) To stage bus services in line with the development; and
d) Encourage an environment that promotes pedestrian amenity and safety.

B. Controls

1) Provide a street network which permits local bus routes generally in accordance with Figure E16.11 or other routes as determined by Transport for NSW and Council.
2) New development is to respond to public transport opportunities within and adjacent to the site.
3) Ensure adequate infrastructure for bus users such as seating and shelters are provided at bus stops within the site.

E16.2.2.3 Pedestrian and Cycle Network

A key feature of Sydney Science Park is its clear pedestrian and cycle network that provides links between employment areas, education facilities, open space areas and the Town Centre. As shown in Figure E16.12, these networks provide critical linkages between the different uses and will be established as a healthy option for the community. Within the town centre, generous footpaths accommodate pedestrian movement and wide lanes and in some areas dedicated cycleways facilitate bicycle movement around the site. City and Commercial Road will be the major cycle commuter routes with on street bike paths. City Road will be seen as the major pedestrian connector to the proposed rail station with wide walkways and activated frontages.

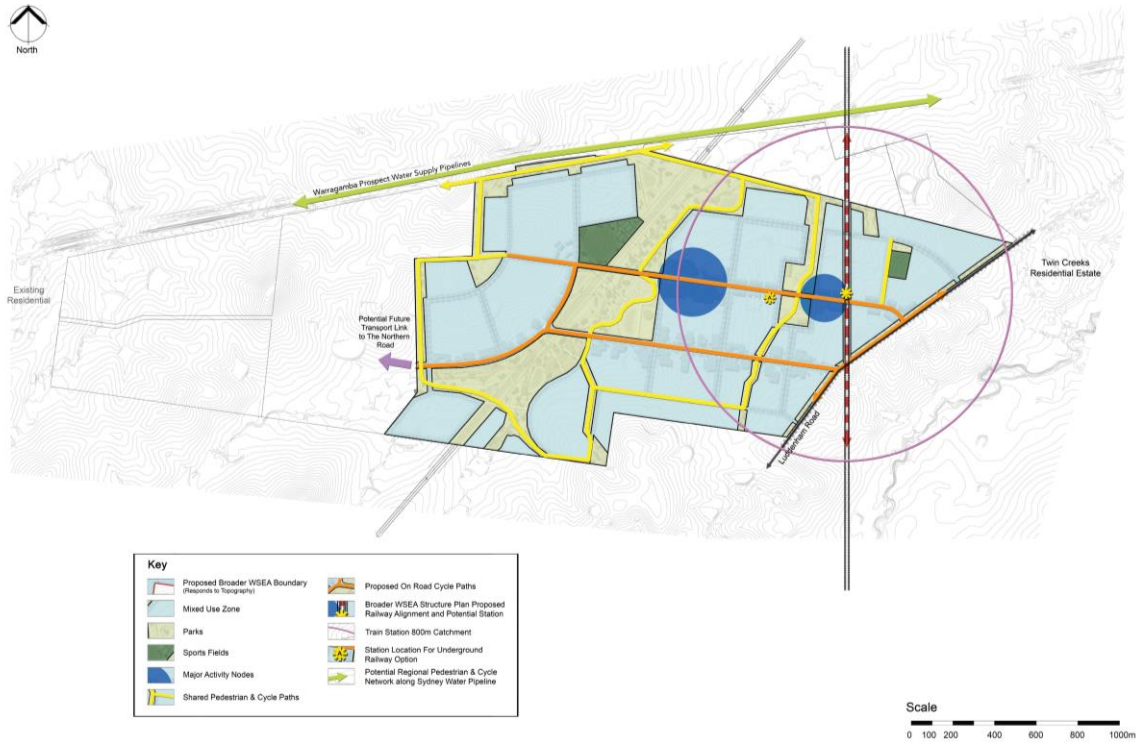


Figure E16.12: Precinct Plan Pedestrian and Cycle Network

A. Objectives

The objectives of this section are to:

a) To provide a clear pedestrian and cycle network that provides links between all key activities, community facilities, open space areas and the Town Centre.
b) To create an interconnected pedestrian and cycle network comprising streets and paths that are safe, legible, and comfortable.
c) To ensure a high level of pedestrian and cycle accessibility and priority to and within the Town Centre.

B. Controls

1) Pedestrian and cycle routes should generally be provided in accordance with Figure E16.12. Alternate configurations can be provided subject to consistency with the objectives.
2) Ensure pedestrian and cycle facilities in public spaces are safe, well lit, clearly defined, functional and accessible to all users.
3) Minimum pedestrian footpath width is to be 1.5m and a shared cycle / pedestrian path is to be 3m.
4) Pedestrian and cycle paths are to be provided as part of the open space and recreation areas.
5) Design pedestrian and cycle ways, as well as pedestrian refuge islands so that they are fully accessible by all users in terms of access points and gradients, in accordance with AS 1428 (Part 1 to 4 Design for access and mobility).

E16.2.3 Public Domain and Landscape

A high quality public domain will be delivered at Sydney Science Park. The Precinct Plan establishes a hierarchy of open space and landscape treatments to meet the needs of the future users. These include:

a) Active Open Space – providing a variety of active recreation areas such as sporting fields;
b) Cultural Community Gardens – providing a critical connection between the community and the educational functions within the Park;
c) Productive Zones – providing intensive gardens/plots for food production;
d) Regional Play Facility – providing for the specific needs of the youth;
e) Water Sensitive Urban Design – celebrating the use of water within the precinct;
f) Passive Open Space – provision of smaller urban spaces and parks to recognise important site features and important urban/civic places;
g) Pedestrian and Cycleway Networks – provide a highly connected pedestrian and cycleway network between key activity areas and to provide healthy lifestyle choices;
h) Street Tree Planting – provide themed street tree planting to improve the visual amenity, provide passive climate control and assist in way finding;
i) Signage systems – provide clear and integrated way finding systems to assist in navigation;
j) Ecological corridors – protect and enhance the existing riparian areas and remnant vegetation;
k) View Corridors - Enhance views and outlook to the open space network across the site.

The Landscape Structure response to the current landform and acknowledges the future build form of the site.

A. Objectives

The objectives of this section are to:

a) Provide landscaping that is integrated into the design of the precinct and development sites;
b) Create well designed active and passive open space and recreation areas;
c) Provide landscapes that contribute to the amenity of streets;
d) Cater to the diverse user groups within the community, including workers, residents, and visitors of different ages;
e) Recognise urban air quality and biodiversity;
f) Encourage the use of recycled water for landscaping irrigation;
g) Incorporate Water Sensitive Urban Design principles and contribute to the reduction of stormwater runoff;
h) Improve the microclimate within the development;
i) Encourage multifunctional open space networks; and
j) Retain and enhance significant riparian areas.

B. Controls

1) A landscape strategy is to be contained within each Precinct Plan. The strategy is to be consistent with the public domain and landscape objectives, and generally in accordance with the Precinct Plan for the site.
2) A detailed landscape /public domain plan is to be submitted with relevant development applications. In addition to this section of the DCP, development applications should reference the Landscape Design section of this DCP.
3) Water management principles are to be incorporated as per the Water Management Section of this DCP.
4) All public streets are to be designed as per Section E16.3.2.1. Any variation should be supported by a detailed justification to the satisfaction of Council's Engineers.
5) Verge treatments are to be designed to reflect the intended use of the street activity and function.
6) New streets in the site are to have a strong landscaped character.
7) The street detailing, furniture, lighting and finishes are to be developed to respond to the specific character of the site and its precincts.
8) Any development adjacent to the Warragamba Pipelines must incorporate security fencing, to the satisfaction of WaterNSW, to prevent public access to the pipeline corridor.

E16.2.4 Public Art Strategy

The Sydney Science Park will be a unique site based around the creation of an integrated employment, educational and residential community supported by a new highly connected open space and street network. The provision of public art within open space is an important step in contributing to this sense of place in the precinct to the creation of an enlivened public domain.

Artwork can provide interest, create engagement and should be an expression of contemporary culture as seen through the critical eyes of both local and international artists. Artworks can provide the visitors an intellectual aspect to the environment to complete the cultural enrichment that can be gained by enjoying what the open space has to offer.

An art strategy is to be developed that responds to the architectural character and environment of the science park through the staged integration of public art with public spaces.

A. Objectives

The objectives of this section are to:

a) Integrate urban art within the public domain and property development;
b) Encourage excellence in the development of urban art initiatives;
c) Create opportunities for landmark statements in the Precinct landscape;
d) Enrich the public domain through the installation of artworks throughout the Precinct; and
e) Create a rich blend of contemplative and aesthetically pleasing art appropriate to their particular location and successful works in their own right.

B. Controls

1) The Public Art Strategy is to be prepared for the site.
2) The Public Art Strategy is to be submitted with the Precinct Plan for the Town Centre, for the endorsement of Council.

Prior to lodgement of the Precinct Plan for the Town Centre, a preliminary art strategy should be documented in the first Precinct Plan for the Sydney Science Park.

E16.2.5 Stormwater Management and Water Sensitive Urban Design

A precinct Stormwater Management Strategy (SMS) will minimise the impact on water quality, identify opportunities to maximise the reuse of stormwater runoff, reduce the demand on potable water supplies, reduce pollutants and enhance the landscaping opportunities within the development.

A. Objectives

The objectives of this section are to:

a) Manage development within the Precinct with respect to its unique flooding characteristics;
b) Develop the site in accordance with sound flood management principles in accordance with the objectives of the Flood Liable lands section of the DCP;
c) Achieve high quality outcomes for water quality and quantity; and
d) Provide opportunities for WSUD initiatives.

B. Controls

1) All applications are to address the relevant sub-sections of the Water Management section of this DCP.
2) Development of the site is to provide for integrated stormwater management measures in accordance with the publication "Sydney Science Park - Water Cycle Management Strategy Report" prepared by J. Wyndham Prince, dated December 2013 (as may be updated from time to time, where endorsed by Council).

E16.2.5 Amelioration of Natural Hazards

The Precinct Plan for the Sydney Science Park has been developed having regard to natural hazards such as bush fire, flooding and site contamination.

A. Objectives

a) To require the amelioration of natural and environmental hazards including bush fire, flooding and site contamination.
b) To ensure the safe occupation of, and evacuation of, any land affected by natural hazards.

B. Controls

1) Precinct Plans are to address natural hazards, to identify particular issues relevant to each Precinct.
2) Development applications are to provide a detailed assessment where relevant, in accordance with the prevailing legislation relation to planning for bushfire protection, remediation of land, and flooding.

E16.2.6 Aboriginal Archaeological Sites

A. Objectives

a) To ensure that development is undertaken in a manner that acknowledges and protects sites of Aboriginal archaeological significance.

B. Controls

1) Any application which proposes the potential disturbance of, or development within proximity to an “Aboriginal archaeological site” identified in Figure E16.13, is to undertake an archaeological assessment in accordance with the requirements of Section 7.2 of Chapter C7 Culture and Heritage of this DCP.

2) Where the development or disturbance of an archaeological site is proposed, the applicant will be required to liaise with the Office of Environment and Heritage to ensure any related statutory requirements are complied with prior to the submission of a development application.

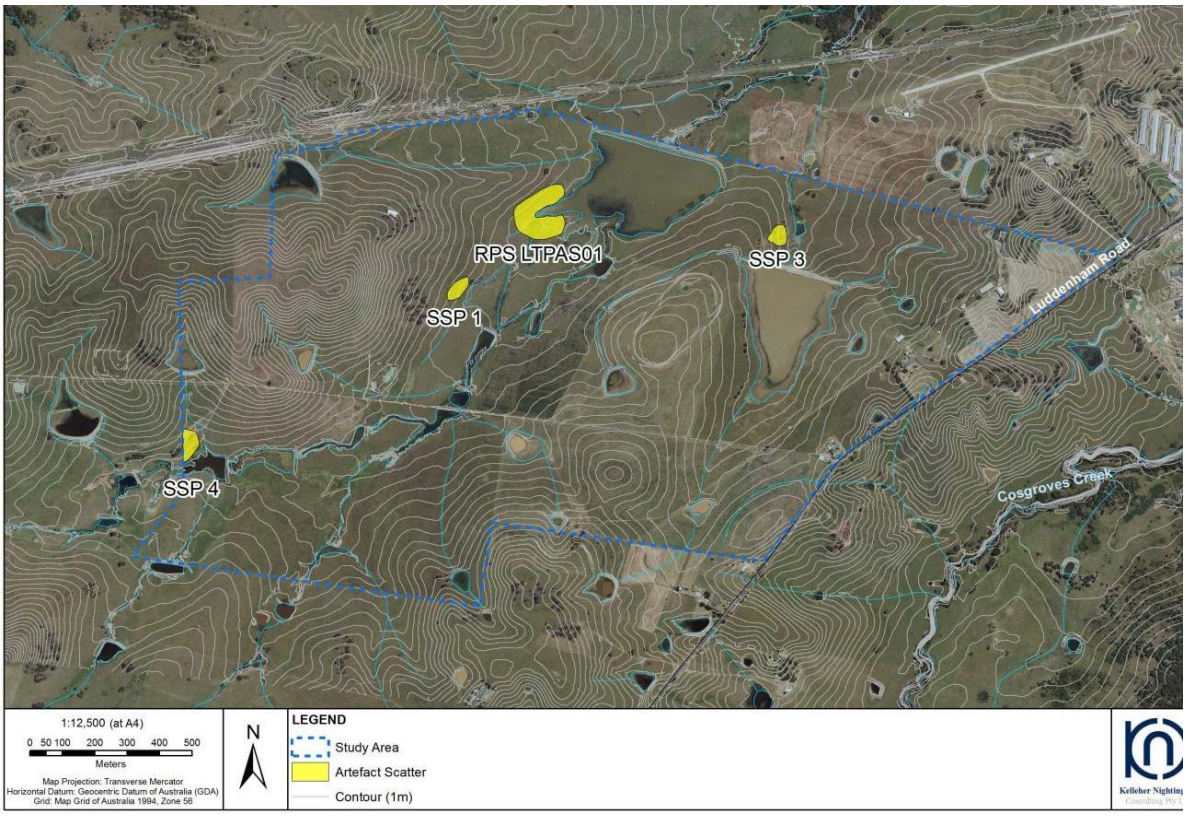


Figure E16.13: Aboriginal Archaeological Sites

E16.3 Built Form

E16.3.1 Employment Uses

E16.3.1.1 Street A, Building Height and Setbacks

The built form character of the Sydney Science Park will be defined by the building heights, setback and massing of the various streets to give a varied and flexible character to the overall plan while providing consistency and scale to streets at a local level (refer to Figure E16.15). The built form controls respond to the intended uses in each zone providing different characteristics and environments to best suit the needs of the different programmatic uses.

Variety in the built form controls for the different areas will also result in different urban environments throughout the development. Street setbacks and building alignments

establish the front building line. They help to create the proportions of the street and can contribute to the public domain by enhancing streetscape character and continuity of street facades.

Street setbacks can also be used to enhance the setting and address for the building. They provide for landscape areas and entries to ground floor apartments. Setbacks allow ventilation, daylight access and view sharing and increase privacy.

In some areas buildings should be built up to the street alignment to reinforce the urban character and improve pedestrian accessibility amenity and activity at street level. Above street frontage height, buildings may be set back to provide sunlight access to streets, pedestrian areas and lower levels of other buildings. These setbacks allow view corridors, an appropriate building scale for pedestrians, and good growing conditions for street trees.

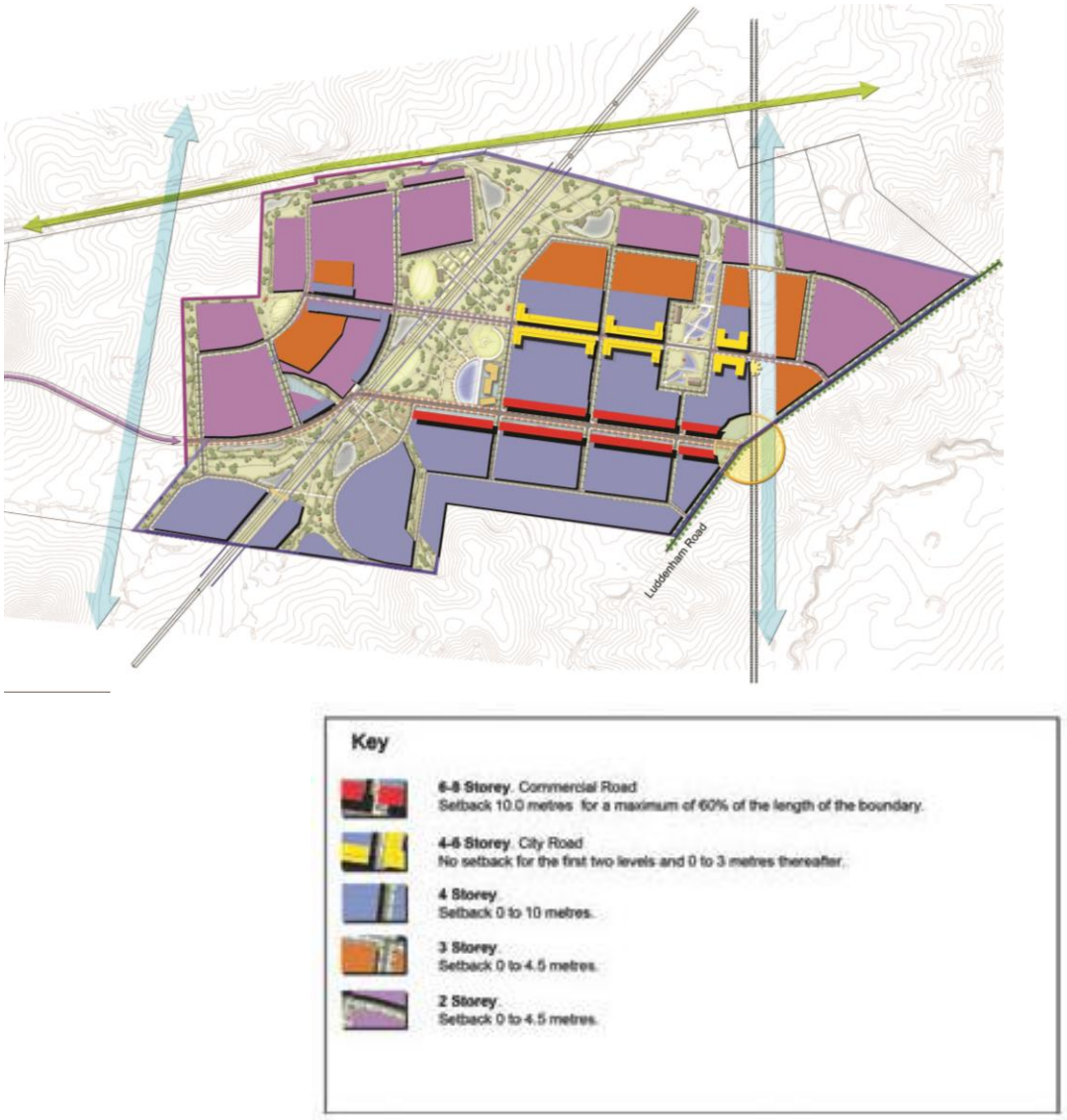


Figure E16.14: Building Height and Setbacks

A. Objectives

The objectives of this section are to:

a) Establish consistent building alignments to the street, where appropriate to building function and character;
b) Provide street setbacks appropriate to building function and character;
c) Establish the desired spatial proportions of the street and define the street edge;
d) Create a transition between public and private space;
e) Locate active uses closer to pedestrian activity areas;
f) Maximise solar access to the public domain;
g) Ensure an appropriate level of amenity for building occupants in terms of daylight access, outlook, view sharing, ventilation, wind mitigation, and privacy;
h) Achieve usable and pleasant streets and public domain areas in terms of wind mitigation and daylight access; and
i) Provide building separation for visual and acoustic privacy.

B. Controls

General

1) Where appropriate, Landmark buildings are to be located on corner allotments to reinforce the intersections.
2) Buildings are to primarily address the main access road.
3) Generous landscaping, such as a well-designed urban landscaped entry plaza, is to be provided along the Commercial Road frontage.
4) Minor projections into front building lines and setbacks for sun shading devices, entry awnings and cornices are permissible.
5) Build to lines are to be adhered to with the opportunity to build ground floor uses forward of a build to line in specific areas such as along Commercial Road if these ground floor uses promote active street frontages.

Gateway Buildings

1) Gateway sites may be nominated as part of future Precinct Plans. Special emphasis through architectural quality and detailing is required.
2) These buildings are to be iconic in form and will denote and provide emphasis to the street intersections.
3) Buildings are to address the corner condition with an emphasis on the higher order road.

E16.3.1.2 Active Street Frontages

Active street frontages promote an interesting and safe pedestrian environment. Due to the size of the area, it is recognised that not all streets will develop as active pedestrian areas. Active frontages are to be identified where active ground level uses are to be consolidated,

creating vibrant streetscapes in areas with high pedestrian traffic and possibly located close to public transport and public open space.

Active uses include:
- Shop fronts;
- Retail and service facilities with a street entrance;
- Cafe or restaurants with street entrance;
- Community and civic uses with a street entrance; and
- Recreation and leisure facilities with a street entrance.

A. Objectives

The objectives of this section are to:
a) Promote pedestrian activity and safety in the public domain;
b) Create vibrant streetscapes around areas of high pedestrian traffic;
c) Encourage activity within the Precinct outside commercial business hour;
d) Provide a mix of uses to support an increasing employment and visitor population over time; and
e) Enhance pedestrian safety, security and amenity within Precinct.

B. Controls

1) Active street fronts are to be provided within the Town Centre.
2) Entries to active frontage tenancies are to be accessible and at the same level as the adjacent footpath.
3) Vehicular access points should not, if possible, be located at primary active frontages.
4) Ground level uses at active frontage zones are to be located at or close to street level.
5) Transparency and openings to the street are to be maximised and blank walls, fire exits and building services elements are to be minimised.
6) The use of the footpath zone for outdoor seating areas is encouraged adjacent to active frontages.
7) Building entries are to address the primary road on corner sites.
8) All primary building entries should have entry canopies to emphasis the entry along the street.

E16.3.1.3 Building Depth and Bulk

A. Objectives

The objectives of this section are to:
a) Promote the design and development of sustainable buildings;
b) Achieve the development of living and working environments with good internal amenity and minimise the need for artificial heating, cooling and lighting;

c) Provide viable and useable commercial floor space;
d) Achieve usable and pleasant streets and public domain at ground level;
e) Achieve a skyline sympathetic to the topography and context;
f) Allow for view sharing and view corridors; and
g) Reduce the apparent bulk and scale of buildings by breaking up expanses of building wall with modulation of form.

B. Controls

1) All points of an office floor should be no more than 14m from a source of daylight (e.g. window, atria, or light wells).
2) Use atria, light wells and courtyards to improve internal building amenity and achieve cross ventilation and/or stack effect ventilation.

E16.3.1.4 Architectural Excellence

This Section seeks to encourage urban design and architectural excellence as well as environmental sustainability in both the public and private domain. Architectural excellence is particularly important where the building is highly visible from the public domain either outside or within the precinct.

Good building design should positively contribute to the overall architectural quality of the city and provide buildings appropriate to their context. In some circumstances, this contribution may be as an iconic or landmark building, but more typically it is as a well-mannered building that fits sensitively into the streetscape.

Architectural excellence should be achieved through careful consideration of:
- Built form – how it relates to its context;
- Quality of materials;
- Integrity of the design concept; and
- Its contribution to the public domain.

A. Objectives

The objectives of this section are to:
a) Encourage a high level of design consideration;
b) Encourage that significant buildings achieve design excellence;
c) Provide buildings that contribute positively to the precinct character; and
d) Encourage the development of sustainable design.

B. Controls
1) All applications are to include a comprehensive site analysis that informs the design of the building and its placement on the site.

2) All applications are to include a design report that explains the design concept including built form, context response and materials selection.
3) Landmark and gateway buildings are to demonstrate architectural excellence in the following areas:
   a) How the building reinforces and enhances significant vistas and view corridors
   b) How the building will enliven the public domain it adjoins.
4) Materials are to be selected for durability and quality. In general painted surfaces are not appropriate especially at street 'level'.
5) Particular attention is to be paid to detailing of materials.
6) Buildings are to be simple, elegant and well proportioned.
7) Environmental sustainable initiatives are to be incorporated into all buildings.
8) Facades are to be composed with an appropriate scale, rhythm and proportion, which respond to building use and the desired character by:
   a) Articulating building entries with awnings, porticos, recesses, blade walls and projecting bays.
   b) Incorporating architectural features which give human scale to the design of the building at street level. These can include entrance porches, awnings, pergolas and fences using recessed balconies and deep windows to create articulation and define shadows thereby adding visual depth to the façade.
9) Facade design is to reflect and respond to the orientation of the site using elements such as sun shading and environmental controls where appropriate.
10) Important corners are to be expressed by giving visual prominence to parts of the façade (e.g. a change in building articulation, material or colour, or roof expression).
11) Building services such as roof plant and parking ventilation are to be coordinated and integrated with the overall façade and building design, and screened from view. Roof forms, building services and screening elements are to occur within the overall height controls.
12) Ventilation louvres and car park entry doors are to be coordinated with the overall façade design.

E16.3.1.5 Site Coverage and Deep Soil Zones

Deep soil zones are areas of natural ground retained within a development, uninhibited by artificial structures and with relatively natural soil profiles. Deep soil zones have important environmental benefits, including:

a) Promoting healthy growth of large trees with large canopies;

b) Protecting existing mature trees; and

c) Allowing infiltration of rainwater to the water table and reduction of stormwater runoff.

A. Objectives

a) To provide developments with a high level of amenity and landscape character;

b) To retain existing mature trees and allow for future tree planting; and

c) To contribute to stormwater management and reduce runoff.

B. Controls

1) A minimum 20% of the site must be provided as deep soil area.
2) The deep soil zone is to be provided in one continuous block. If multiple deep soil zones are provided, they must have a minimum dimension (in any direction) of 6m.
3) Deep soil zones must accommodate existing mature trees as well as allowing for the planting of additional vegetation that will grow to be mature trees.
4) No structures, works or excavations that may restrict vegetation growth are permitted in deep soil zones (including, but not limited to, car parking and hard paving).

E16.3.1.6 Pedestrian Permeability

The design and function of pedestrian spaces delivers amenity to the people using these spaces. The ability for pedestrians to safely and efficiently access buildings, services and navigate through shopping areas is integral to good design. The equity and amenity of this access is also very important.

Pedestrian permeability is achieved by introducing through-site links which may be in the form of building separation, landscape dedications or setbacks.

A. Objectives

a) To ensure new development achieves appropriate pedestrian permeability;
b) To promote activation of through site links where possible;
c) To promote pedestrian circulation, amenity and safety; and
d) To promote activation of the public domain by encouraging outdoor dining in appropriate locations.

B. Controls

1) Commercial developments must provide pedestrian through-site links, the location of which will be determined on a site-by-site basis at Precinct Plan and development application stage. Based on land use and grid size, pedestrian links will not be necessary on every site.
2) Pedestrian through-site links are to be straight, with clear views from end to end.
3) Pedestrian through-site links are to be publicly accessible and universally accessible for all.
4) Where pedestrian through-site links are adjacent to a courtyard or public space, their design is to be integrated with design of the open space and access provided between the two.
5) Where pedestrian through-site links are provided between buildings, a high level of transparency is to be provided between the internal ground floor space of the building and the pedestrian link.
6) Active ground level uses are encouraged along pedestrian through-site links.
7) Public access should be provided during all business trading times.
8) Pedestrian through-site links are to be clearly signed to identify street entries and the street to which the through-site link connects.
9) Where practical, pedestrian through-site links should have access to natural light.

E16.3.1.7 Awnings

Awnings increase the useability and pedestrian amenity of public footpaths by providing shelter and enclosure at a pedestrian scale. They encourage pedestrian activity along streets and, in conjunction with active street frontages, support and enhance the vitality of the local area. Awnings provide a public presence and interface within the public domain and contribute to the identity of the development.

A. Objectives

a) To unify the streetscape;

b) To provide continuous shelter from sun, wind and rain for public streets where most pedestrian activity occurs; and

c) To reinforce a consistent pedestrian scale through all business developments.

B. Controls

1) Continuous awnings must be provided where active street frontages have been identified within the Precinct Plan.

2) Awnings should generally:

   a) Be a minimum 2.8m deep where street trees are not required, otherwise minimum 2.4m deep;

   b) Have a minimum soffit height of 3.2m and a maximum of 4m;

   c) Be stepped for design articulation or to accommodate sloping streets, integral with the building design and not exceed 700mm;

   d) Be low profile, with slim vertical fascias or eaves (generally not to exceed 300mm height);

   e) Be set back from the kerb to allow for clearance of street furniture, trees etc. (minimum 600mm).

3) Awning design must match building façades and be complementary to those of adjoining buildings.

4) Awnings are to wrap around corners for a minimum for 6m to the secondary street frontage.

5) Vertical canvas drop blinds may be used along the outer edge of awnings along north-south streets.

6) Lighting is to be recessed into the soffit of the awning or wall-mounted onto the building to facilitate night use and to improve public safety.

E16.3.1.8 Interim and Temporary Uses

During the early stages of development of each of the Sydney Science Park precincts, a range of temporary or interim facilities and uses of land (including the future rail corridor) may be considered. This aims to enliven the public domain and provide services to users and visitors to the area. Interim and temporary uses will be assessed on their merits.

E16.3.2 Residential Uses

E16.3.2.1 Housing Types

A mix of housing types that range from residential flat buildings to standard lot residential dwellings are to be provided within Sydney Science Park to facilitate housing diversity and choice. Higher residential densities (small lot, medium and high density residential flat buildings) are to be located in the vicinity of the town centre and in areas with high visual or landscape amenity and proximity to facilities (including open space, transport and service nodes). Housing typology principles are illustrated in Figures E16.15 – E16.17.

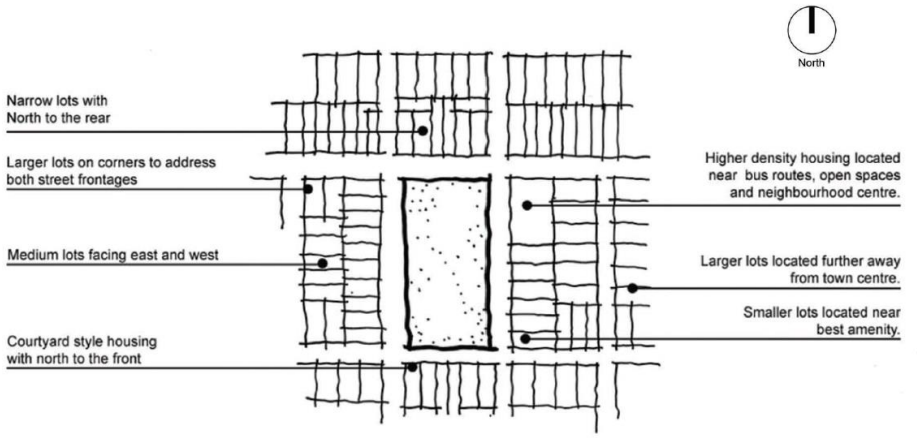


Figure E16.15: Housing Typology Principles

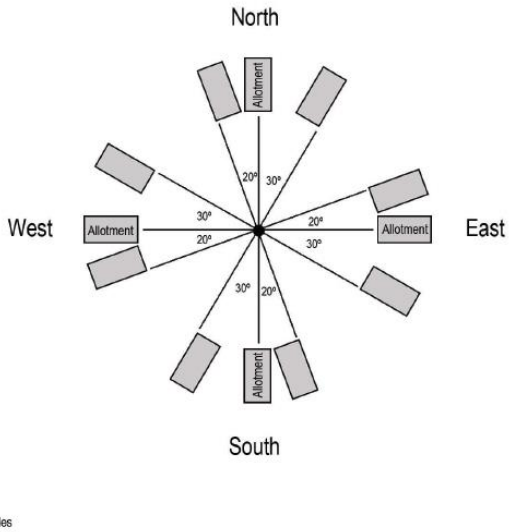


Figure E16.16: Housing Typology Principles - Allotment Orientation

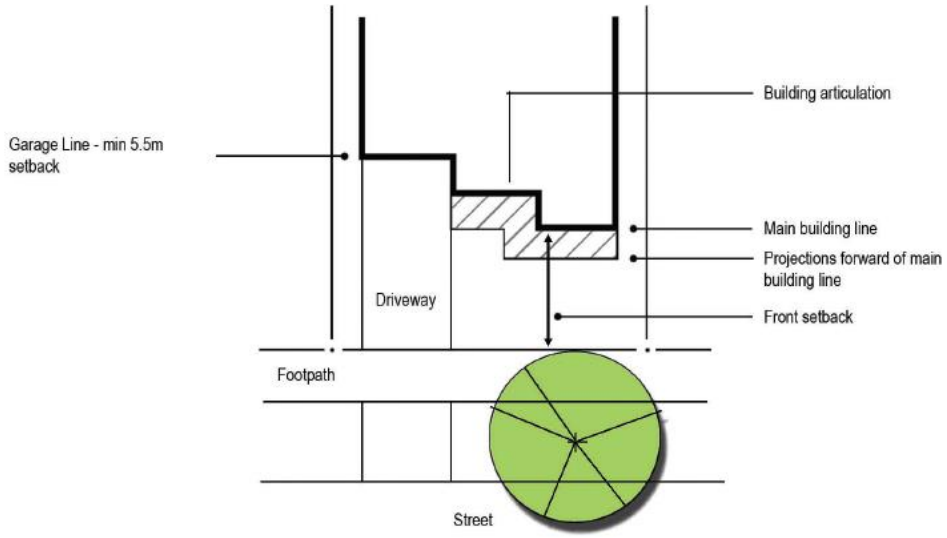


Figure E16.17: Housing Typology Principles – Street Interface Principles

A. Objectives

Small Lot

a) Encourage quality-designed dwelling houses that make a positive contribution to the streetscape and amenity of the neighbourhood;
b) Promote housing choice/variety/ affordability; and
c) Provide higher density dwellings on collector roads and bus routes, around parks and close to community facilities.

Standard Detached Dwellings

a) Encourage quality-designed dwelling houses that make a positive contribution to the streetscape and amenity of the neighbourhood; and
b) Provide definition of the public domain by ensuring development addresses the streets and open spaces.

Residential Flat Buildings

a) Encourage high quality residential apartments within areas of high amenity, in accessible locations and in close proximity to business centres;
b) Encourage the design of residential apartments to respond to the site's environmental characteristics and setting; and
c) Achieve a high level of amenity for the occupants of residential apartment buildings, adjoining developments and public places.

Note. Housing types are defined in Table 2 below.

B. Controls

Small Lot

a) Small lot housing shall comply with the requirements set out in Table 2 below.

b) Small lot housing typologies are illustrated at Figures E16.18 to E16.20.
c) Terrace housing is encouraged to have garages accessible from a car court, rear or secondary street frontage.

Table 2 – Development Controls for Small Lot Housing

Criteria	Controls
Minimum Allotment Size	125 m² (terrace) 200 m² (zero side setback lot) 200 m² (small detached)
Maximum Allotment Size	450 m²
Minimum average allotment width (measured at the primary building line)	5 m (terrace), 10 m (zero side setback lot) 12 m (small detached)
Maximum average allotment width – zero side setback lots only (measured at the primary building line)	15 m
Minimum Lot Depth	20 m
Minimum Private Open Space	16m^2(lots under 300m^2 and minimum width 3 m) 24m^2 (lots over 300m^2 and minimum width 4 m) Principal area of private open space (i.e. deck, patio, terrace or paved area) is to be directly accessible from a living area.
Maximum Building Site Coverage	70%
Setbacks	
Front	3.5 m (terrace) 4 m (zero side setback lot, small detached) Where a particular street character or urban form is to be created or reinforced (i.e. park frontage lots), a nil setback may be provided.
Rear	4 m ground level 6 m upper level
Side	1 m (except attached and zero side setback lot)
Corner Lots (secondary frontage)	2 m
Lightweight projections within front	2 m (within front setback)

Criteria	Controls
setback (i.e. balconies, verandah's perches)	

Figure E16.18: Small Lot Housing Typologies (terraces and dual occupancies)

Figure E16.19: Small Lot Housing Typologies (town homes and courtyards)

Figure E16.20: Small Lot Housing Typologies (traditional)

Standard Detached Dwellings

a) Detached dwellings shall comply with the requirements set out in Table 3.

b) Standard detached dwelling typologies are illustrated at Figure E16.21.

Table 3 – Development Controls for Standard Detached Dwellings (450-700m²)

Criteria	Controls
Minimum Allotment Size	450m²
Maximum Allotment Size	700m²
Minimum average allotment width	15 m
Minimum Lot Depth	20 m
Minimum Private Open Space	24m^2 (minimum width 4m) Principal area of private open space (i.e. deck, patio, terrace or paved area) is to be directly accessible from a living area.
Maximum Building Site Coverage	65%
Setbacks	
Front	4 m (zero side setback lot, small detached)

Criteria	Controls
Rear	4 m ground level 6 m upper level
Side	1 m (except attached and zero side setback lot)
Corner Lots (secondary frontage)	2 m
Lightweight projections within front setback (i.e. balconies, verandah's perches)	2 m (within front setback)

Figure E16.21: Standard and Large Lot Detached Dwellings

Residential Flat Buildings

a) All residential apartment buildings shall comply with the requirements set out in Table 4 below.
b) Where possible, vehicle entry points shall be located at the rear or off side streets.
c) 10% of all dwellings or a minimum one dwelling, whichever is the greater, must be designed in accordance with the Australian Adaptable Housing Standard (AS 4299-1995), to be capable of adaptation for people with a disability or elderly residents.

Table 4 – Development Controls for Residential Flat Buildings

Criteria	Controls
Minimum Frontage Width	20 m
Landscaped Area	Minimum 20% (suitable for deep soil)
Private Open Space	Minimum 8m2
Setbacks	
Front	4 m
Rear	9 m upper level
Side	5 m for buildings up to 4 storeys in height 9 m for buildings greater than 4 storeys in height
Corner Lots (secondary frontage)	4 m
Maximum Height of building	18 m

E16.3.2.2 Residential Amenity, Solar Access and Privacy

A. Objectives

The objectives of this section are to:

a) Provide a high level of residential amenity with opportunities for outdoor recreation and relaxation within the property.
b) Enhance the spatial quality, outlook, and usability of private open space, including outdoor clothes drying.
c) Facilitate solar access to the living areas and private open spaces.
d) Minimise overshadowing of neighbouring dwellings and their private open space.

e) Minimise the direct overlooking of internal and external living areas through site layout and building layout, location of windows and balconies, design of windows and use of screening devices.
f) Provide buildings that are sited and designed so as to provide for solar access and both visual and acoustic privacy.

B. Controls

Solar Access and Cooling

1) Dwelling design should:
   a) include a living room or the like with a northern aspect,
   b) ensure daylight access to habitable rooms and private open space, particularly in winter – use skylights, clerestory windows and fanlights to supplement daylight access,
   c) incorporate cross ventilation,
   d) incorporate shading and glare control, particularly in summer i.e. - using shading devices, such as eaves, awnings, colonnades, balconies, pergolas, external louvres and planting,
   e) providing external horizontal shading to north-facing windows,
   f) providing vertical shading to east or west windows.
2) Multi dwelling housing and small lot housing developments are to be designed to ensure at least 80% of dwellings have a private open space that receives direct sunlight to 50% of the private open space area for a minimum of 2 hours between 9am and 3pm in midwinter.
3) Provide an area with good solar access for outdoor clothes drying.

Privacy

1) The siting of windows of habitable rooms on the first floor shall minimise overlooking to the private open space of neighbouring properties.
2) Direct overlooking of main habitable areas and private open spaces of adjacent dwellings is to be minimised through building layout, window and balcony location and design, and the use of screening devices, including landscape treatments.
3) Habitable room windows with a direct sightline to the habitable room windows in an adjacent dwelling within 3m of the property boundary are to:
   a) be obscured by fencing, screens or appropriate landscaping,
   b) be offset from the edge of one window to the edge of the other by a distance sufficient to limit views into the adjacent window; or
   c) have fixed obscure glazing in any part of the window below 1.5m above floor level.
4) A new balcony, deck, patio, pergola, terrace or verandah and any alterations to an existing balcony, deck, patio, pergola, terrace or verandah must have a privacy screen if it:
   a) has a setback of less than 3m from a side or rear boundary,
   b) has a floor area more than 3m², and
   c) has a floor level more than 1m above ground existing ground level.

5) A detached deck, patio, pergola, terrace or additions or alterations to an existing deck, patio, pergola, or terrace must not have a floor level that is more than 600mm above existing ground level.

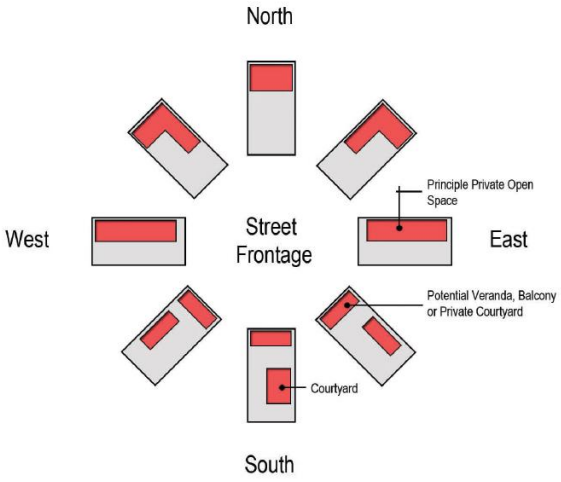


Figure E16.22: Design Principles for Open Space

E16.3.3 Water and Energy Efficient Design

A. Objectives

The objectives of this section are to:

a) To promote sustainable development which uses energy efficiently and minimises non-renewable energy usage in the construction and use of buildings.
b) To ensure that development contributes positively to an overall reduction in energy consumption and greenhouse gas emissions.

B. Controls

Residential

1) Where applicable, development is to demonstrate compliance with the design principles embodied in the Building Sustainability Index (BASIX). All commitments listed on a BASIX certificate must be marked on all relevant plans and specifications.
2) The principles and properties of thermal mass, glazing, insulation and solar energy are to be recognised and incorporated into the design of residential development not subject to BASIX.

Non-residential Development

1) Improve the control of mechanical space heating and cooling by designing heating/cooling systems to target only those spaces which require heating or cooling, not the whole building.
2) Improve the efficiency of hot water systems by:
   a) encouraging the use of solar powered hot water systems.

b) insulating hot water systems; and
c) installing water saving devices, such as flow regulators, 3 stars Water Efficiency Labelling and Standards Scheme (WELS Scheme) rated shower heads, dual flush toilets and tap aerators.

3) Reduce reliance on artificial lighting and design lighting systems to target only those spaces which require lighting at any particular 'off-peak' time, not the whole building. Incorporate a timing system to automatically control the use of lighting throughout the building.
4) All non-residential development Class 5-9 will need to comply with the Building Code of Australia energy efficiency provisions.
5) An Energy Efficiency Report from a suitably qualified consultant that demonstrates a commitment to achieve no less than 4 stars under the Australian Building Greenhouse Rating Scheme or equivalent must be provided for all commercial and industrial development with a construction cost of over $5 million.