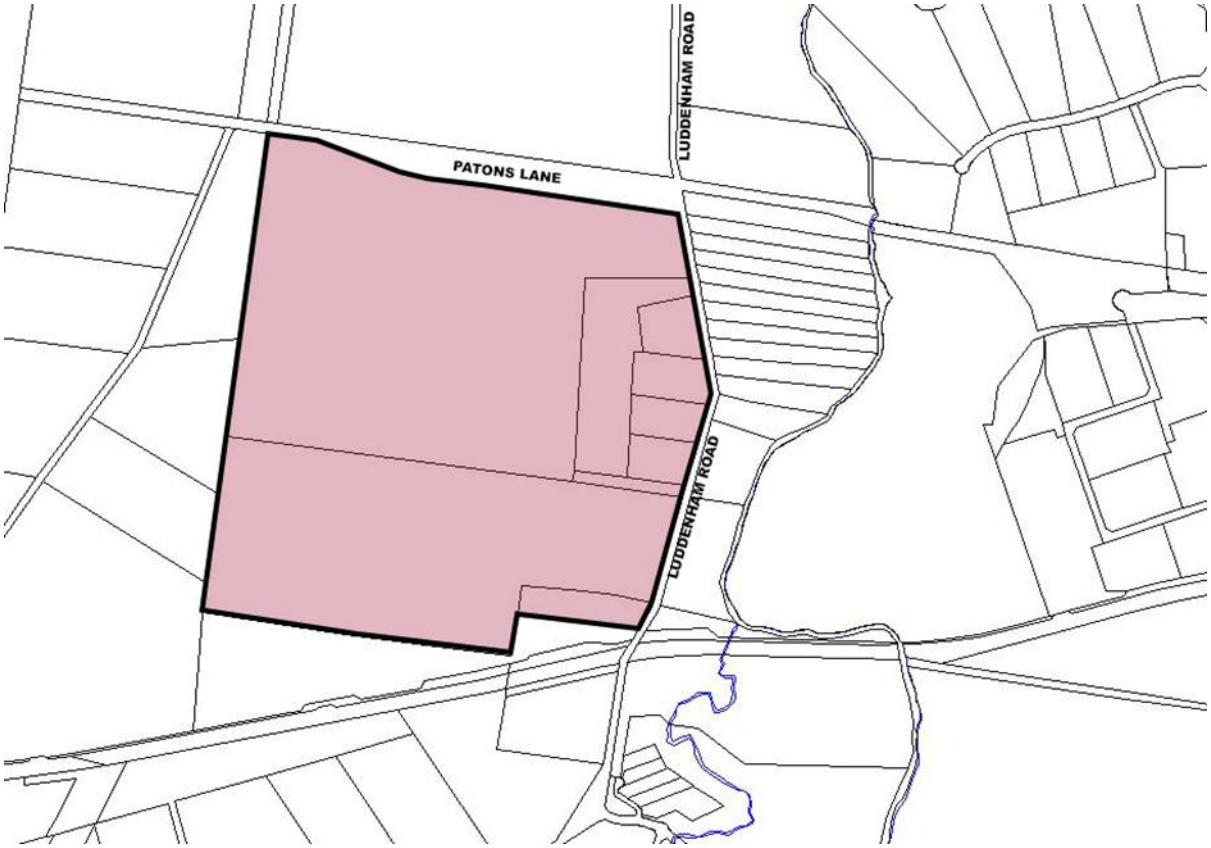
Table of Contents

17.1 Introduction

17.1.1 Area included in the Luddenham Road Industrial Business Park

This Section applies to development on land covered by the Luddenham Road Industrial Business Park Precinct as shown in Figure E17.1. This Section provides specific controls for the Luddenham Road Industrial Business Park Precinct, in addition to the general controls elsewhere in this DCP. In the event of any inconsistency between this Section and the rest of the DCP, the requirements of this Section prevail.

Figure E17. 1 Land to which this section applies



DRAFT

17.2 Site development and Urban Design

17.2.1 Building Setbacks

A. Objectives

a) To provide an open streetscape with substantial areas for landscaping;
b) To ensure a consistent and high-quality presentation to the street and enable opportunities for landscaping and tree canopy provision;
c) To enhance the visual quality of the development and the urban landscape and to minimise the visual impact of carparking and hardstand areas; and
d) To facilitate the future widening of the Luddenham Road corridor.

B. Controls

1. Setback requirements are outlined in **Table E17.1**.
2. Notwithstanding Control (1) above, no development other than the following development is permitted within the defined setback for any road, including the future widening of Luddenham Road:
    a. Landscaping in accordance with the provisions of an approved Landscape Master Plan;
    b. Accessways and driveways (not permitted in setbacks to designated roads which includes the potential widening of Luddenham Road);
    c. Utility services installation;
    d. Approved signage;
    e. Street furniture;
    f. Drainage works;
    g. Where car parking and hardstand areas are proposed within a building setback fronting a public road, these areas are to be located behind a 10m landscaped buffer for sites with frontage to an Arterial Road, and located behind a 5m landscape buffer for all other road typologies.
    h. For corner sites no car parking and hard stand areas are to be located within the secondary or side building setback, unless they are located behind the 5m landscaped setback; and
    i. On-site detention is not permitted in the building setback to the street.

Table E17.1: Minimum building setback requirements

Road Classification	Minimum Setback
Arterial Road - Luddenham Road (from the ultimate boundary of the road widening corridor)	20m
Distributor – Paton's Lane	15m
Collector Road – North South Boulevard	15m
Estate Roads	7.5m
Rear and Side Boundaries	5m
Outer Sydney Orbital Corridor	5m

17.2.2 Landscaping

A. Objectives

a) To contribute to the Greater Sydney Regional Plan – A Metropolis of Three Cities tree canopy cover target for metropolitan Sydney of 40%;
b) To contribute to the delivery of a high quality and high amenity streetscape;
c) To ensure landscaping designs deliver canopy trees for cooling and shade and enhance the visual quality of development and the urban landscape;
d) To ameliorate bulk and scale of buildings, screen undesirable views and minimise the impacts of hard surfaces;
e) To provide for a high amenity transition between the existing and ultimate interface with Luddenham Road; and
f) To ensure development is provides adequate landscape screening to rural residential uses to the east.

B. Controls

1. The landscape setback requirements for the Luddenham Road Industrial Business Park are outlined in **Table E17.2** below.
2. Setbacks shall include suitable tree planting along the northern and western elevations of buildings to provide shadow and cool the building.
3. The landscape treatment along the Luddenham Road interface is to incorporate a landscape mound treatment needed along the Luddenham Rd interface to screen buildings to the residential properties to east (refer to figure **E17.2**).
4. A Landscape Plan prepared by a suitably experienced Landscape Architect is to be submitted with all development applications. Landscape plans shall correlate with civil and services plans to ensure landscaping is achievable and sustainable to maturity.
5. Landscaped front setbacks should include canopy trees whose mature height is in scale with the proposed development.
6. Within car parking areas, tree planted landscaped blister islands are to be provided at a rate a maximum rate of 1 per 6 car spaces and be minimum width of 1.5m.

7. Street tree planting is required to be provided in accordance with Council's specifications.
8. Sufficient area/space is to be made available to allow trees to grow to maturity and not damage local infrastructure.
9. Local Indigenous groundcovers should be considered as a turf alternative in areas not specifically designed for pedestrian use.
10. Where possible existing remnant trees are to be retained and protected.

Table E17.2 Landscape setback requirements

Luddenham Road (from the boundary of the ultimate road widening corridor)	10m
Paton's Lane	6m
All other Roads	50% of building setback
Rear Boundaries	2.5m
Outer Sydney Orbital corridor	5m

Figure E17.2 Landscape Buffer

17.2.3 Building and Urban Design

A. Objectives

a) To encourage a high standard of landscape and architectural design, utilising quality materials and finishes;
b) To establish varied and articulated frontages facing or visible from public roads and places;
c) To ensure the built form along the Luddenham Road frontage contributes to the visual amenity along the streetscape;
d) To minimise perceived scale and mass and to prevent monotonous building forms resulting from limited articulation and poor design of walls or rooflines;
e) To ensure that new development contributes to the creation of a visually cohesive and high amenity urban environment;
f) To ensure buildings achieve a high level of sustainability and environmental performance; and
g) To provide high amenity places for people.

B. Controls

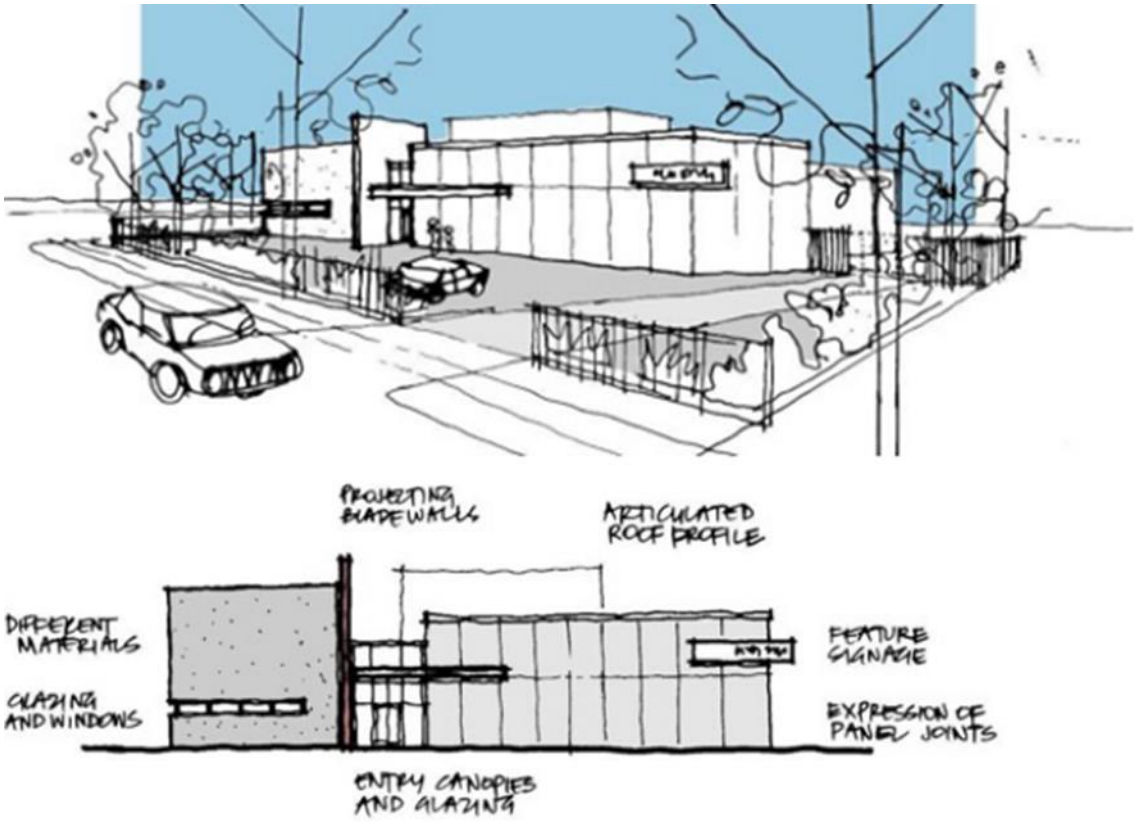
1. Prominent elevations and façades which have a frontage to the public domain, environmental zones or those that are visible from public areas, must present a building form of significant landscape, architectural and design merit.
2. The construction of large, blank wall surfaces along the prominent elevations and façades, are not permitted.
3. Large unrelieved expanses of wall or building mass will not be supported by Council, and as such should be broken up by the use of suitable building articulation, fenestration or alternative architectural enhancements and landscaping.
4. The use of large, uninterrupted areas of metal cladding or untreated concrete surfaces for wall construction is not supported. Applicants shall vary materials and/or finishes for external walls to provide attractive streetscapes and quality building designs. Council may limit the use of a single construction material to 50% of a wall surface area.
5. All loading areas should be located towards the rear of allotments, where practicable. Where loading areas are visible from the street, loading areas should be screened from the view of main road frontages through physical and/or vegetation screening.
6. Developments are to provide staff communal or break-out/lunch areas which are commensurate with the scale of the development. Such communal areas are to be high amenity and their design shall consider access to sun, shade, outlook, amenities and landscaping.
7. Details of external materials and finishes shall be submitted with the Development Application.
8. External materials should not have an index of reflectivity above 20%.
9. Energy efficient design principles should be employed in all building designs.
10. Offices are to address the streetscape and are to be located at street intersections or along frontages where possible.
11. The design of office components is to differ although complement associated warehouse activities and is to be elevated in design quality with articulating elements, glazing and cladding, and be provided with high amenity landscaping.
12. Building walls shall be articulated to provide more varied streetscapes, where visible from public roads or adjacent residential areas, particularly along the Luddenham Road frontage and for buildings visible from the rural-residential areas to the east.
13. Part of the cross-section of buildings shall be projected to reduce apparent height and scale of external walls (refer **Figure E17.3**) including:

    a. awnings and/or upper storeys that project above footpaths;
    b. roofs with eaves that project beyond external walls; and

c. colonnades.

14. Entrances to buildings and office areas must be highlighted by architectural features complementary to the overall design of the building.
15. Particular care should also be taken in:
    a. designing roof elements, which could potentially contribute to shading where possible;
    b. locating plant and mechanical equipment including exhausts, so as to reduce their visual impact; and
    c. Ensuring that external materials generate low solar absorbance, particularly on the roof to reduce urban heat island effect and reduce thermal comfort levels in the buildings.
16. Large expanses of façade which are oriented towards the rural residential areas to the east shall be minimised.
17. Hardstand areas must not be oriented towards rural residential areas to the east and are not to present to street frontages where possible.
18. The design and layout of buildings shall give consideration to local climatic conditions, including:
    a. Where possible, building should take advantage of a north or north easterly aspect;
    b. Western orientations should be avoided; and
    c. Canopy shade trees and shrubs are to be planted around buildings, car parks and hard stand areas to create shade, provide visual screening and to act as a wind break (**refer Figure E17.2**).

Figure E17.3 Acceptable Solution for articulation of large buildings



DRAFT

17.2.4 Signage and Estate Entrance Walls

A. Objectives

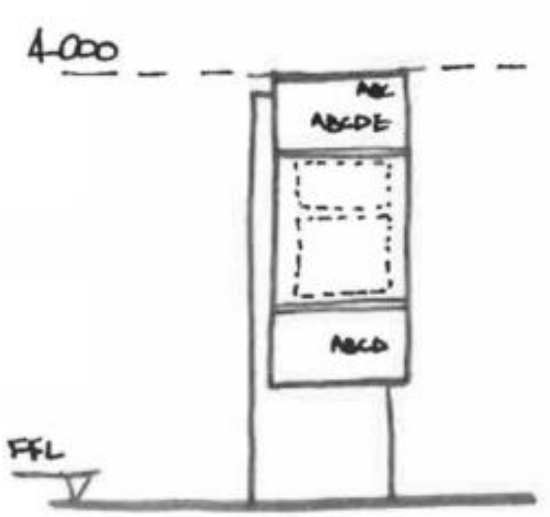
a) To promote an integrated design approach to all signage in character with the locality and its architectural and landscape features;
b) To provide a quality entrance statement and signage at each of the entrance points to the Estate;
c) To prevent the proliferation of signs;
d) To minimise the visual impact of signage;
e) To prevent distraction to motorists and minimise the potential for traffic conflicts;
f) To permit the adequate display of information concerning the identification of premises, the name of the occupier and the activity conducted on the land; and
g) To encourage a coordinated approach to advertising where multiple occupancy of sites occur.

B. Controls

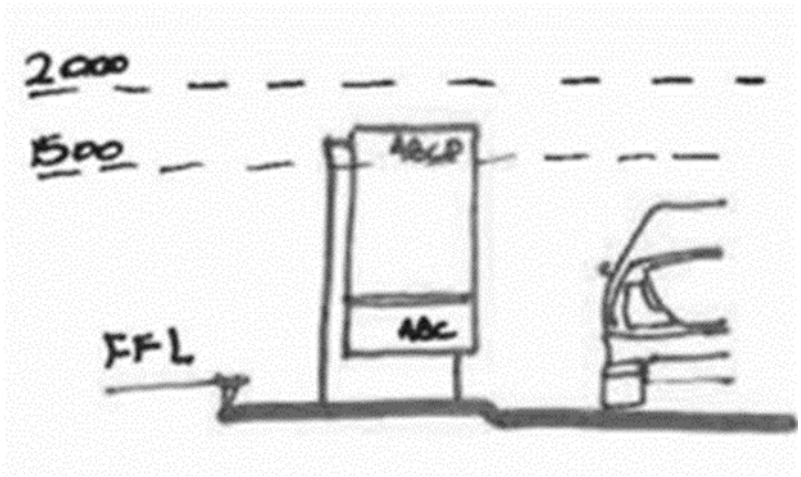
1) Estate identification pylons within the estate shall be no more than 4m in height (**refer to Figure E17.4**) and are to be located at the following entrance points to the estate:
    a. Corner of Luddenham Road and Patons Lane;
    b. Entry to the estate off the roundabout on Patons Lane; and
    c. The southern secondary entry off Luddenham Road.
2) All signage is required to be:
    a. constructed of high quality, durable materials;
    b. considered in conjunction with the design and construction of buildings;
    c. restricted generally to one sign identifying the name of the occupants and/or products manufactured or produced on the site; and
    d. contained wholly within the site.
3) Business directory signage shall be of a high quality and shall have a consistent. design throughout the Luddenham Road Industrial Business Park.
4) Illuminated signage is discouraged.
5) A detailed Wayfinding and Signage Strategy is to accompany development applications for proposals with multiple entrances, internal road networks or sites with more than 6 tenancies.
6) All signs, including pylon signs are to be no greater in height than 4m and are to be no greater in width than 2m.
7) No roof mounted signs are permitted.
8) Painted wall signs, mega-graphic signs, brand advertising, graphics or stickers greater than 2sqm are not permitted.
9) Up-lighting of signs is not permitted.

Figure E17.4 Estate Identification Signs

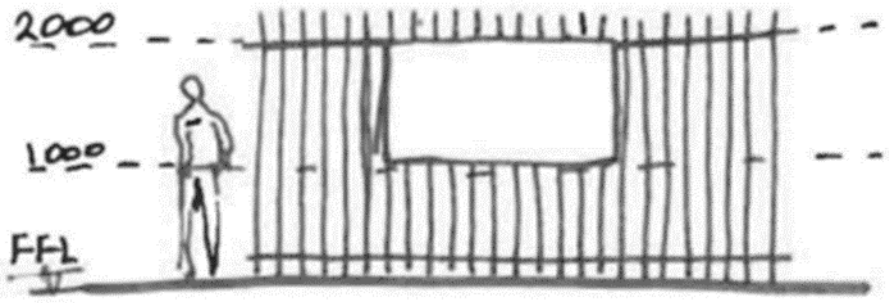
Pylon



Gate, Fence or Wall Mounted Sign



Directional Totem



17.2.5 Lighting

A. Objectives

a) To provide adequate security lighting, whilst ensuring that there are no adverse impacts on the use and enjoyment of adjoining premises and surrounding areas, particularly rural residential areas to the east of Luddenham Road;
b) To ensure building entrances, streets and public spaces are safe and adequate visibility is maintained; and
c) Encourage sustainable and efficient design of lighting which does not detract from the amenity of the precinct or nearby sensitive land uses.

B. Controls

1) A Lighting plan and details shall accompany a development application.
2) Lighting design should address the principles of CPTED where there is significant pedestrian activity, late night work-shifts or safety and security issues or considerations.
3) Adequate lighting shall be provided to meet security requirements without excessive energy consumption. Lighting powered by solar batteries or other renewable energy sources and the use of sensor lighting, both internally and externally, is encouraged.
4) Lighting is to be designed or directed so as to not cause light spill onto adjoining sites or sensitive receivers, such as rural-residential areas.

17.2.6 Services

A. Objectives

a) To ensure that adequate services are available to facilitate development;
b) To ensure that services are appropriately located and do not detract from landscaping and streetscapes; and
c) To ensure the co-location of services where possible.

B. Controls

1) All electricity and telecommunication mains be placed underground.
2) Council also requires the co-location of services where this is technically feasible.
3) All existing overhead services and wires are to be relocated underground as a result of the re-development of the precinct and as each site develops.
4) All development applications are to be accompanied by documentation confirming that essential services to meet the needs of the development can be provided to the site.

17.2.7 Interface with the Transmission Line Easement

A. Objectives

a) To create a physical buffer between the Luddenham Road Industrial Business Park and the riparian corridor within the north-western corner of the site; and
b) To provide limited opportunities for development of land affected by the transmission line easement for landscaping, water quality and on-site detention basins, flood storage basins, and/or maintenance/rehabilitation of biodiversity conservation areas.

B. Controls

1) All buildings are to be setback a minimum of 5 meters from the Transmission easement corridor.
2) Approved landscape treatment shall be carried out on land affected by the transmission line easement and must comply with TransGrid's Easement Guidelines.
3) The provision of Onsite Stormwater Detention, Water Quality and flood storage basins is permitted within the transmission line easement corridor and must comply with TransGrid's Easement Guidelines.

17.2.8 Interface with the Outer Sydney Orbital

A. Objectives

a) To ensure the proposed development does not impede on the future development of the Outer Sydney Orbital (OSO) and requirements of Transport for NSW (TfNSW);
b) To provide an appropriate interface between the proposed development and the OSO corridor;
c) To ensure the OSO is preserved and protected to allow for the corridor design to change; and
d) To ensure an appropriate and high quality interface between the development within the Business Park and the OSO corridor.

B. Controls

1) All buildings are to be setback a minimum of 5 meters from the OSO corridor.
2) Buildings are not to directly front the OSO corridor.

17.3 Environmental Quality

17.3.1 Noise Pollution

A. Objectives

a) To ensure there is minimal noise pollution and impact to the existing rural residential uses to the east of Luddenham Road.

B. Controls

1) Where it is considered likely that a development may cause an adverse impact on nearby rural or residential areas, particularly for the existing residential receivers to the east of Luddenham Road, a noise impact statement from a qualified acoustical engineer will be required to be submitted to Council for consideration with the Development Application. A noise impact statement will need to demonstrate that the proposed development will not create any adverse impact.

17.3.2 Air Pollution

A. Objectives

a) To maintain existing air quality and improve local air quality where possible; and
b) To ensure future development does not adversely affect existing air quality.

B. Controls

1) The emission of air impurities is to be controlled and limited to the standards allowed by the Protection of the Environment Operations Act 1997, to the satisfaction of Council and the Environmental Protection Authority at all times.
2) Applicants may be required to provide information detailing the potential impact of their development on air quality in the region.
3) An assessment of the merits of the proposal will be made at the Development Application stage. However, applicants should be able to demonstrate that the most efficient means of minimising emissions are being utilised.

17.3.3 Trading/Operating Hours of Premises

A. Objectives

a) To ensure the amenity of adjoining residential and rural areas is preserved.

B. Controls

1. In considering applications Council shall have regard to the likely impact of the trading hours of a particular activity on the amenity of adjoining residential and rural areas, particularly to the east of Luddenham Road.

17.3.4 Storage, transportation and/or processing of chemical substances

A. Objectives

a) To ensure that the use, storage or transportation of any chemical substance/s do not have any detrimental impact on the environmental quality of the surrounding area; and
b) To ensure any proposed development involving the storage, transportation and processing of chemical substances shall have regard to the requirements of State Environmental Planning Policy (Resilience and Hazards) 2021.

B. Controls

1. External storage of goods must be avoided wherever possible. Where the nature of the activity or the materials means that internal storage is impractical, all external storage areas must be located behind the front building setback. In addition, when assessing development applications involving external storage of goods, Council will take into consideration:
    a. The proposed height and on-site arrangement of stored goods;
    b. Visual impact of the storage area, and how this is proposed to be minimised (orientation, screening with landscaping and/or solid fencing etc.);
    c. Access arrangements; and
    d. Safety issues.

2. The following information is to be submitted with any Development Application which involves the storage, transportation and/or processing of chemical substances:
    a. Detailed description of the use and all methods/procedures associated with the use, including flow diagrams;
    b. A floor plan of the subject premises depicting the dimensions of the building and indicating the internal layout of all equipment, storage, and display areas;
    c. A comprehensive list of all chemicals/goods and quantities proposed to be utilised in the activity and stored on the subject premises;

d. A description of the method of storage of chemicals/goods on the premises, and the type of containment or packaging to be used;
e. A description of the method of transportation of chemicals/goods to/from the premises (include the size and nature of vehicles, proposed routes and frequency of delivery to and from the site);
f. Details regarding the number of vehicles likely to be involved with the use at any one time and the provision and allocation of storage/standing areas for such vehicles;
g. Details of onsite water quality control; and
h. Details of waste treatment and transportation.

17.4 Road network and Site Access

A. Objectives

a) To enhance the streetscape presentation of development to Luddenham Road;
b) To ensure development takes into consideration the future widening of Luddenham Road;
c) To enable a road network that is safe and efficient for all users and minimises through traffic on minor roads;
d) To encourage modal split and the use of public transport, bicycles and walking over private vehicles;
e) To provide safe and efficient access to Luddenham Road for all road users (light vehicles, heavy vehicles, pedestrians and cyclists), while minimising the number of road entry points;
f) To maintain and enhance the safety and efficiency of Luddenham Road;
g) To provide better connectivity between the Precinct and the Aerotropolis; and strategic pedestrian and traffic desire lines; and
h) To encourage the orderly and economic provision of road and intersection works.

B. Controls

1) A 40-metre corridor for future road widening of Luddenham Road is required as highlighted in **Figure E17.5** to provide an ultimate 60m wide road reserve.
2) The road hierarchy for the Luddenham Road Industrial Business Park is outlined in **Figure E17.6**.
3) No direct vehicular access to Luddenham Road will be permitted.
4) Development applications shall be accompanied by a Traffic and Transport Report. The Traffic and Transport Report shall include a Green Travel Plan and Travel Access Guide and assess the impact of projected pedestrian and vehicular traffic associated with the proposal and outline the extent and nature of traffic facilities necessary to preserve or improve the safety and efficiency of the road system.
5) Road design must comply with the road configurations in **Table E17.3** and corresponding road cross-sections in **Figure E17.7, Figure 17.8** and **Figure 17.9**.
6) The road network is to be designed for 30m Performance Based Standards (PBS) Level 2 Type B vehicles and tested for a 36.5m PBS Level 3 Type A vehicles.
7) All intersections within the internal road network shall incorporate traffic facilities, which promote safe and efficient pedestrian, cyclist and traffic movement.
8) Development shall, where appropriate, be designed to:
    a. Allow all vehicles to either leave or enter the site in a forward direction;
    b. Accommodate heavy vehicle parking and manoeuvring areas;
    c. Avoid conflict with staff, customer and visitor vehicular movements; and
    d. Ensure satisfactory and safe operation with the adjacent road system.
9) Development applications shall detail the volume, frequency and type of vehicle movements.

10) The design of manoeuvring areas for large vehicles shall consider the Australian Standard 2890 series and Performance Based Standards *An Introduction for Road Managers* (National Heavy Vehicle Regulator – May 2019).

Figure E17.5 Future Road widening corridor for Luddenham Road

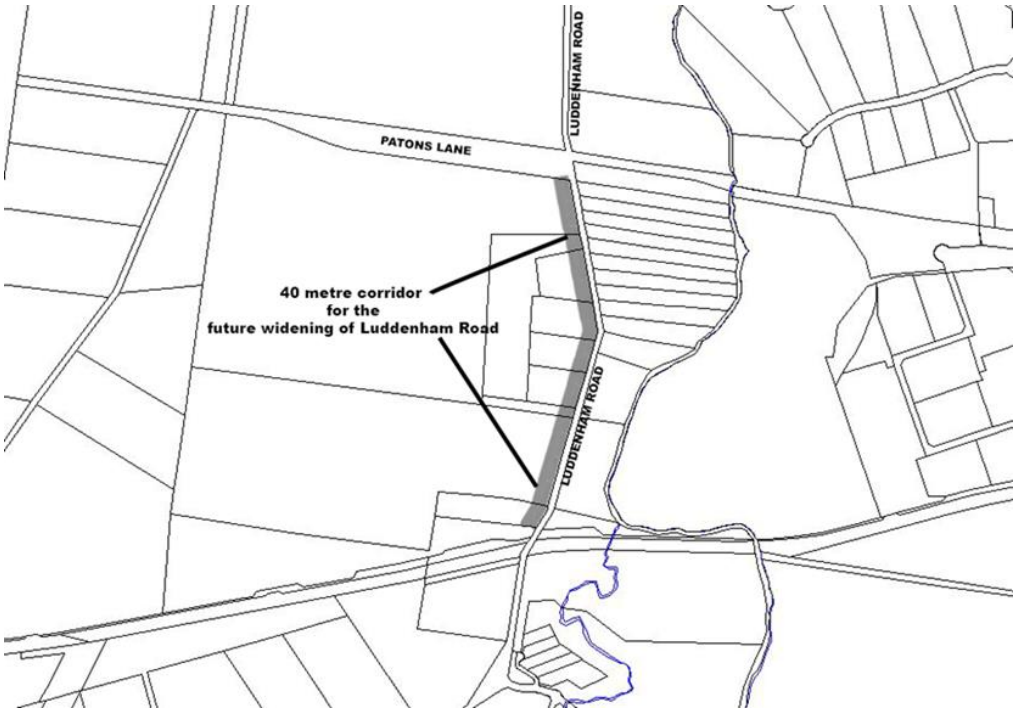


Figure E17.6 Alspec Industrial Business Park Road Hierarchy

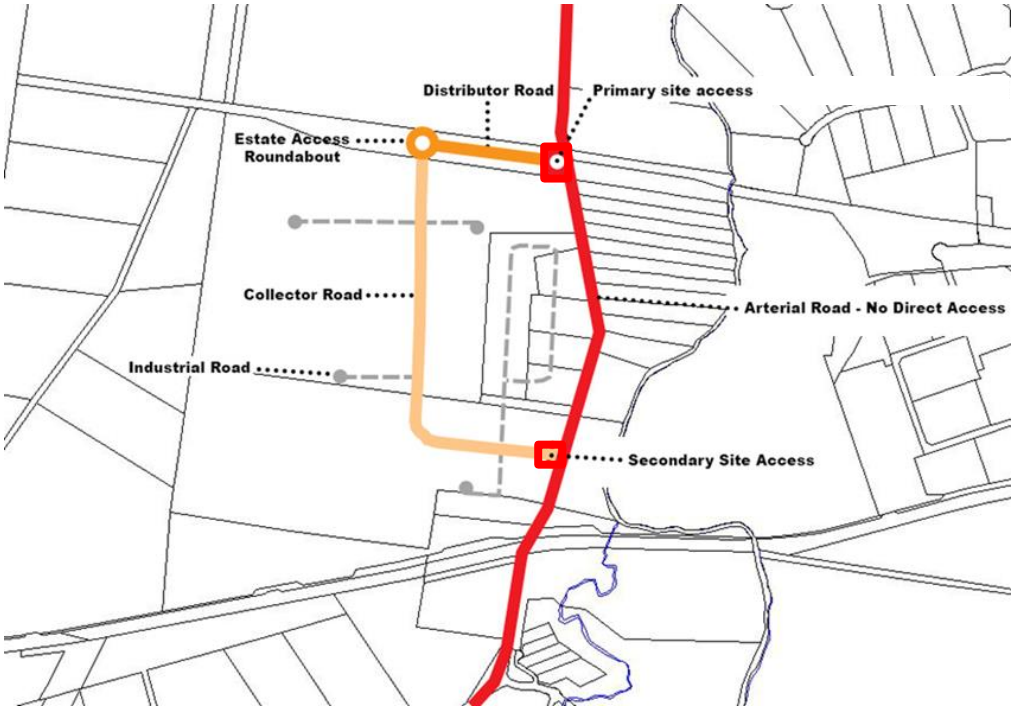


Table E17.3 Road Typologies

Component	Industrial Road	Collector Road	Distributor Road
Signposted speed	50km/hr	50km/hr	60km/hr
Pedestrian and cycle path (within verge width)	Verge 1 – 1.5m path Verge 2 – 2.5m shared path	Verge 1 – 1.5m path Verge 2 – 2.5m shared path	Verge 1 – 2.5m shared path Verge 2 – 2.5m shared path
Through traffic lane	2 x 3.5m = 7.0m	2 x 3.5m = 7.0m	2 x 3.5m = 7.0m
Kerbside / travel lane	2 x 4.0m = 8.0m (No Parking	2 x 4.2m = 8.4m (No Parking)	2 x 4.5m = 9.0m (No Parking)
Central median widths*		0.8m* (mid-block) required only at key signalised intersections and locations to separate opposing movements which may cause conflicts	1.6m (mid-block) and 5.0m required at the intersection of a collector road, distributor road, arterial road, or at any signalised intersection
Road carriageway width	15.0m (mid-block)	15.4m (mid-block no median) 16.2 (mid-block with median)	18.6m (mid-block with 1.6m median) Variable – subject to detailed intersection design and approval of road authority.
Verge width (both sides of road)	Verge 1 – 4.0m Verge 2 – 5.0m	Verge 1 – 4.6m Verge 2 – 5.6m	Verge 1 – 6.5m Verge 2 – 6.5m
Street tree planting	1.9m (both sides of road)	2.5m (both sides of road)	3.5m (inclusive of 2m clearance zone requirement on both sides of road)
Road reserve width (total)	24.0m (mid-block)	25.6m (mid-block no median) 26.4m (mid-block with 0.8m wide median)	30.6m Variable – subject to detailed intersection design and approval of road authority.

Figure E17.7 Industrial Road Cross Section

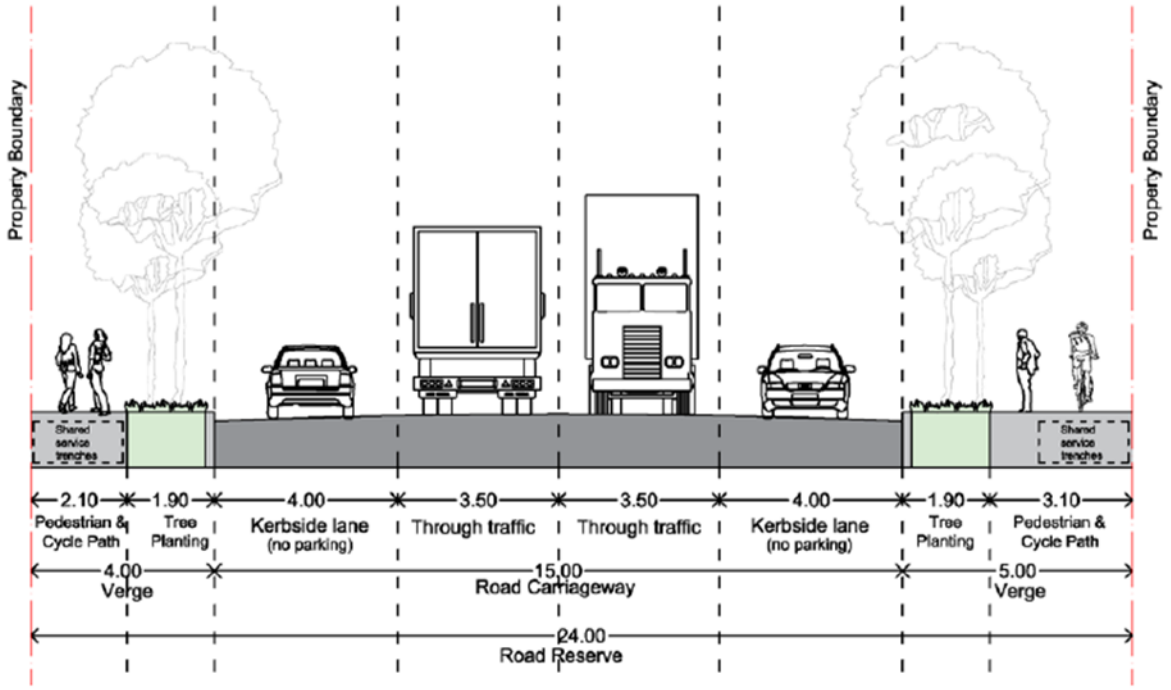


Figure E17.8 Collector Road Cross Section

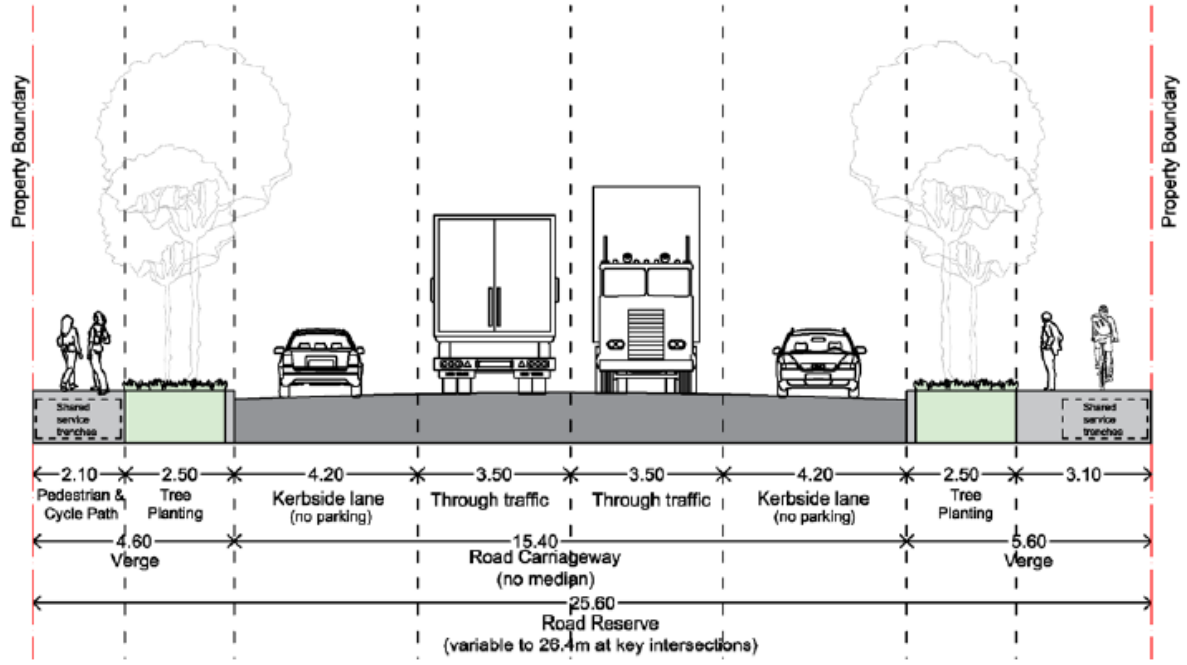
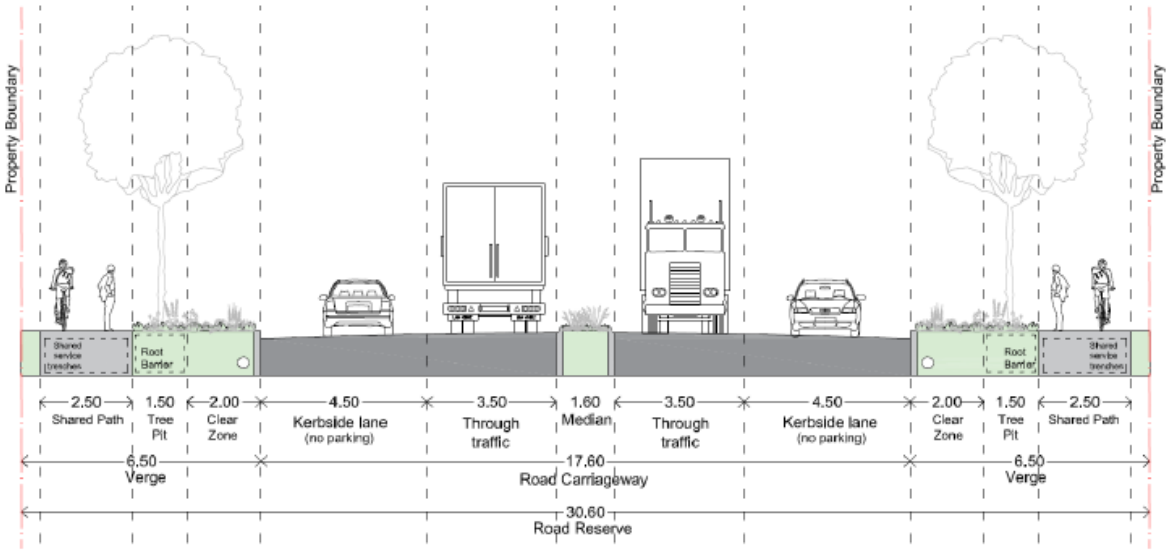


Figure E17.9 Distributor Road Cross Section



17.5 Access and Parking

A. Objectives

a) To facilitate an appropriate number of vehicular spaces having regard to the activities proposed on the land, the nature of the locality and the intensity of the use;

b) To promote efficient and safe vehicle circulation, manoeuvring and parking (including service vehicles and bicycles);

c) To reduce pedestrian and vehicle conflicts on development sites;

d) To minimise the visual impact of on-site parking; and

e) To support the complementary use and benefit of public and active transport.

B. Controls

1. Onsite car and bicycle parking is to be provided to a standard appropriate to the intensity of the proposed development as set out in **Table E17.4.**
2) The following bicycle destination facilities for staff are to be provided:
   a. For ancillary office and retail space with a gross floor area over 2500m^2, at least 1 shower cubicle with ancillary change rooms;
   b. For industrial activities with a gross floor area over 4000m^2, at least 1 shower cubicle with ancillary change rooms;
   c. Change and shower facilities are to be located close to the bicycle storage areas; and
   d. Where the building is strata-titled, the facilities are to be available to all occupants.
3) Bicycle parking, facilities and storage must be in convenient locations, visible, secure, and provide weather protection for the bicycle.
4) Electric vehicle parking and charging stations are to be integrated into car park design on the development site.
5) Charging stations are to be located within or immediately adjacent to the parking spaces.
6) On-street charging stations are to be located within the Flex Zone, a minimum of 600mm from the face of the adjacent kerb.
7) Charging stations are to be located clear of pedestrian paths of travel and do no inhibit desire lines.
8) Car parking spaces are designed to be easily converted into electric charging stations

Table E17.4. Car Parking Requirements

Activity	Parking Requirement
Freight Transport Facilities	1 per transport vehicle present at peak vehicle accumulation plus 1 per 2 employees, or to be determined by a car parking survey of a comparable facility
Industries	1 space per 200m^2 of gross floor area or 1 space per 2 employees, whichever is the greater
Vehicle Body Repair Workshops/ Vehicle Repair Stations	3 spaces per 100m^2 of gross floor area or 6 per work bay, whichever is the greater
Warehouses or distribution centres	1 space per 300m^2 of gross floor area or 1 space per 4 employees, whichever is the greater.
Ancillary office space	1 space per 40m^2 of gross floor area
Neighbourhood shops	1 space per 40m^2 of gross leasable area
Accessible Parking	Accessible car spaces should be in accordance with the Access to Premises Standards, Building Code of Australia and AS2890.
Bicycle Parking	1 space per 600m^2 of gross floor area of office and retail space (over 1200m^2 gross floor area) 1 space per 1000m^2 of gross floor area of industrial activities (over 2000m^2 gross floor area)
Electric vehicle	1 space per 40 car spaces
Car share	1 space per 40 car spaces
Electric bicycle	A charging station for electric bicycles is provided for the first 5 bicycle spaces within a development, and for every 10 bicycle spaces thereafter.
Motorcycle Parking	1 space per 10 car spaces

DRAFT

17.6 Integrated Water Cycle Management

The Luddenham Road Industrial Business Park forms part of the Wianamatta-South Creek system, an intermittent waterway that is sensitive to changes in flow and water quality. Protection and restoration of creek health, ecology and biodiversity is a key policy for future development and delivery of the Blue-Green Infrastructure Network in the catchment. By improving and maintaining waterway health we can optimise environmental outcomes and promote healthy and resilient communities.

Waterway objectives (flow and water quality) were established for the protection of waterways in the Wianamatta-South Creek catchment, in line with the Western Parkland City District Plan and NSW Government Risk-based Framework for considering Waterway Health Outcomes in Strategic Land-use Planning Decisions (2017).

In addition, the NSW Government has prepared technical notes and guidance documentation on the modelling parameters and software packages that can be used to demonstrate compliance with these objectives and the controls below (refer to the Technical guidance for achieving Wianamatta–South Creek stormwater management targets (DPE 2022).

A. Objectives

a. To protect, maintain or restore waterway health within Wianamatta-South Creek and its tributaries by managing development impacts;
b. To ensure the waterway objectives (flow and water quality) for Wianamatta-South Creek are achieved;
c. To ensure land use and development is integrated with water cycle management, including:
    a. Service planning for potable water, recycled water and wastewater;
    b. Effective management of stormwater flow and quality;
    c. Urban design and landscape integration; and
    d. Water management infrastructure solutions at a range of scales.
d. To protect, maintain and restore the ecological condition, hydrologic and hydrogeology of aquatic ecosystems (including but not limited to wetlands and riparian lands);
e. To protect groundwater quality and availability;
f. To consider whole of life costs and ease of maintenance in water planning;
g. To transition to regional water infrastructure, where feasible, to optimise the efficiency of development and deliver better outcomes for waterways, amenity and liveability;
h. To safely and effectively convey stormwater flows from the developed area to the existing waterways or stormwater treatment infrastructure; and
i. To deliver the waterway objectives (flow and water quality) held in **Appendix A.**

B. Controls

1) Development applications must demonstrate compliance with the stormwater quality targets in **Table E17.5** and the stormwater flow targets during construction and operation phases in **Table E17.6** and **Table E17.7** at the lot or estate scale to ensure the NSW Government's waterway objectives (flow and water quality) for the Wianamatta-South Creek catchment are achieved. Where the strategy for waterway management is assessed at an estate level, the approval should include for individual buildings within the estate, which may be the subject of future applications.
2) The stormwater flow targets during operation phase (**Table E17.7**) include criteria for a mean annual runoff volume (MARV) flow-related option and a flow duration-related option. Applicants must demonstrate compliance with either option.

3) Development applications must include a Water Management Strategy (WMS) detailing the proposed Water Sensitive Urban Design (WSUD) approach, how the WMS complies with stormwater targets (i.e. MUSIC modelling), and how these measures will be implemented, including ongoing management and maintenance responsibilities. Conceptual designs of the stormwater drainage and WSUD system must be provided to illustrate the functional layout and levels of the WSUD systems to ensure the operation has been considered in site levels and layout.
4) The design and mix of WSUD infrastructure shall consider ongoing operation and maintenance. Development applications must include a detailed lifecycle cost assessment (including capital, operation/maintenance, and renewal costs over 30 years) and Maintenance Plan for WSUD measures.
5) WSUD infrastructure may be adopted at a range of scales (i.e. allotment, street, estate, or sub-precinct scale) to treat stormwater, integrate with the landscape and maximise evaporative losses to reduce development flow runoff. Vegetated WSUD measures, and rainwater/stormwater reuse are preferred.
6) Development must not adversely impact soil salinity or sodic soils and shall balance the needs of groundwater dependent ecosystems.
7) Infiltration of collected stormwater is generally not supported due to anticipated soil conditions in the catchment. All WSUD systems must incorporate an impervious liner unless a detailed Salinity and Sodicity Assessment demonstrates infiltration of stormwater will not adversely impact the water table and soil salinity (or other soil conditions).
8) Where development is not serviced by a recycled water scheme, at least 80% of its non-potable demand is to be supplied through allotment rainwater tanks.

Table E17.5 - Stormwater quality targets

Gross pollutants (anthropogenic lifter>5mm and coarse sediment>1mm)	90% reduction (minimum) in mean annual load form unmitigated development.
Total suspended solids (TSS)	90% reduction in mean annual load form unmitigated development.
Total Phosphorus (TP)	80% reduction in mean annual load form unmitigated development.
Total Nitrogen (TN)	65% reduction in mean annual load form unmitigated development.

Table E17.6 - Stormwater flow targets Construction Phase

TSS and pH	All exposed areas greater than 2500 square meters mist be provided with sediment controls designed, implemented and maintained to a standard achieving at least 80% of the average annual runoff volume of the contributing catchment treated (80% hydrological effectiveness) to 50mg/l TSS or les and pH in the range 6.5-8.5.
Oil, litter and waste contaminants	No release of oil, litter or waste contaminants
Stabilisation	Prior to completion of works for development, and prior to removal of sediment controls, al site surfaces must be effectively stabilised including all drainage systems. An effective stabilised surface is defined as one that does not, or is not likely to result in visible evidence of soil loss caused by sheet, rill of gully erosion or lead to sedimentation water contamination.

Table E17.7 - Stormwater flow targets Construction Phase

Option 1: Mean Annual Runoff Volume (MARV) Approach	
MARV	≤ 2 ML/ha/year at the point of discharge to the local waterway
90%ile flow	1000 to 5000 L/ha/day at the point of discharge to the local waterway
50%ile flow	5 to 100 L/ha/day at the point of discharge to the local waterway
10%ile flow	0 L/ha/day at eh point of discharge to the local waterway
Option 2: Flow Duration Curve Approach	
95%ile flow	3000 to 15000 L/ha/day at the point of discharge to the local waterway
90%ile flow	1000 to 5000 L/ha/day at the point of discharge to the local waterway
75%ile flow	100 to 1000 L/ha/day at the point of discharge to the local waterway
50%ile flow	5 to 100 L/ha/day at the point of discharge to the local waterway
Cease to flow	Cease to flow to be between 10% and 30% of the time

17.7 Flood Prone Land

A. Objectives

Objectives

a) To ensure development in the floodplain is consistent with the *NSW Flood Prone Land Policy* and principles in the NSW Government *Floodplain Development Manual*;

b) To ensure floodplain risk management minimises the potential impact of development upon the aesthetic, recreational and ecological values of waterways;

c) To maintain the existing flood regime, velocities, flow conveyance and stream hydrology;

d) To ensure development does not alter flood behaviour resulting in adverse impacts to surrounding properties, land uses and infrastructure;

e) To enable safe occupation and evacuation of flood prone land;

f) To ensure development is compatible with flood hazard and flood behaviour; and

g) To avoid adverse or cumulative impacts on flood behaviour and environment.

B. Controls

1. A comprehensive Flood Impact Risk Assessment (FIRA) (prepared by a qualified hydrologist and hydraulic engineer) is to be submitted with development applications on land identified as fully or partially flood affected. The FIRA shall include 2-dimensional flood modelling and shall provide an understanding of existing flooding conditions and developed conditions consistent with the requirements of the *NSW Flood Prone Land Policy and Floodplain Development Manual*. The FIRA shall determine:
    a. Flood behaviour for existing and developed scenarios for the full range of flooding including the 5% Annual Exceedance Probability (AEP), 1% AEP, 0.5% AEP, 0.2% AEP and Probable Maximum Flood (PMF);
    b. Flood Function (floodways, flood fringe and flood storage areas);
    c. Flood Hazard; and
    d. Flood constraints, including evacuation constraints (if applicable).

2. The FIRA shall adequately demonstrate to the satisfaction of the consent authority that:
    a. Development will not increase flood hazard, flood levels, flood velocities or risk to other properties;
    b. Development has incorporated measures to manage risk to life from flooding;
    c. For development located within the PMF, an Emergency Response Plan is in place,
    d. Structures, building materials and stormwater controls are structurally adequate to deal with PMF flow rates and velocities (including potential flood debris);
    e. Development siting and layout maintains personal safety during the full range of floods and is compatible with the flood constraints and potential risk;
    f. The impacts of climate change on flood behaviour has been considered. Flood modelling shall assess and determine flood behaviour and characteristics under future climate change flooding conditions in accordance with Clause 5.21 Flood Planning of Penrith Local Environmental Plan 2010. The following rainfall increases shall be used as a minimum when assessing the various climate change scenarios: 4.9% (High 2030); 9.1% (Low 2090); 13.9% (Medium 2090) and 18.6% (High 2090);
    g. Development considers Construction of Buildings in Flood Hazard Areas and accompanying handbook developed by the Australian Building Codes Board (2012); and
    h. Fencing does not impede the flow of flood waters/overland flow paths.

DRAFT

Appendix A Waterway Health Objectives

The waterway health objectives are derived from the Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions. This framework provides a structured approach that decision-makers, such as councils and environmental regulators, can use to help manage the impact of land-use activities on the health of waterways in New South Wales.

The waterway health objectives consist of ambient water quality and stream flows requirements of health waterways, riparian corridors and other water – dependent ecosystems in the Wianamatta – South Creek catchment. The water quality objectives are the same as those adopted by Local Government in the catchment. The waterway objectives have been prepared by the NSW Government to ensure that urban developments are achieving the NSW Government policy on water quality and waterway health.

The NSW Government has prepared technical guidance on calibrated MUSIC modelling parameters that should be used to demonstrate compliance with the targets.

Table E17.8 Flow-related objectives for waterways and water dependent ecosystems

	1st or 2nd order streams	3rd order Streams
Daily flows (L/Ha)		
Median Daily Flow Volume (L/Ha)	71.8 ± 22.0	1095.0 ± 157.3
Mean Daily Flow Volume (L/Ha)	235.1 ± 604.6	5542 ± 320.9
High Spells (L/Ha)		
≥ 90th Percentile Daily Flow Volume	2048.4 ±739.2	10091.7 ± 769.7
Frequency (number per year)	6.9 ± 0.4	19.2 ± 1.0
Average Duration (days per year)	6.1 ± 0.4	2.2 ± 0.2
Freshwater Flows (L/Ha)		
≥ 75th and ≤90th Percentile Daily Flow Volume	327.1 to 2048.4	2642.9 to 10091.7
Frequency (number per year)	4.0 ± 0.9	24.6 ± 0.7
Average Duration (days per year)	38.2 ± 5.8	2.5 ± 0.1
Cease to Flow		
Proportion of time per year	0.34 ± 0.04	0.03 ± 0.007
Duration of days per year	36.8 ± 6	6 ± 1.1

Table E17.9 Ambient water quality objectives for waterways and waterbodies

Pollutant	Value
Total Nitrogen (TN)	1.72mg/L
Dissolved Inorganic Nitrogen (DIN)	0.74mg/L
Ammonium (NH_3-N)	0.08Mg/L
Oxidised Nitrogen (NOx)	0.66mg/L
Total Phosphorus (TP)	0.14mg/L
Dissolved Inorganic Phosphorus	0.04mg/L
Turbidity	50 NTU
Total Suspended Solids (TSS)	37mg/L
Conductivity	1,103µS/cm
pH	6.20-7.60
Dissolved Oxygen	43-75%SAT
Dissolved Oxygen	8mg/L