



AUS-SPEC

Infrastructure Specifications

0044 Pathways and Cycleways (Design)



0044 PATHWAYS AND CYCLEWAYS (DESIGN)

- **IMPORTANT:** This document has been adapted from the NATSPEC suite of specification templates for use in the MidCoast Council area by both Council and industry. NATSPEC regularly updates the base templates (currently in April and October each year), and Council may incorporate changes into its version of AUS-SPEC from time to time. To assist in highlighting any changes made by Council to the NATSPEC templates, the following conventions are used. ANNEXURE M – MIDCOAST COUNCIL SPECIFIC CLAUSES See ANNEXURE M at the end of this document which contains (where practical) MidCoast Council customisations (also known as 'office master' text). References to the Annexure are to also be inserted at relevant clauses in the main body of the document.
- Where content is added to the main body of the document, it is to be shown **in brown text like this**.
- Where content is deleted or excluded from the main body of the document, it is to be shown ~~struck through like this~~. Such clauses are to have no effect.

Where there is a conflict between main body text and MidCoast Council specific clauses, Council's specific clauses shall prevail.

1 GENERAL

1.1 INTRODUCTION

Worksection application

Description: This worksection is applicable to the design and documentation requirements for various types of cycleways and pathways. It is not applicable to paths and cycleways in complex intersections, roundabouts or railway crossings.

1.2 RESPONSIBILITIES

General

Objectives: Provide design and documentation for cycleways and pathways that:

- *Are connected, accessible and easy to maintain.*
- *Encourage walking and cycling for transportation, healthy lifestyle and recreational purposes.*
- *Provide safe walking and cycling, including for users with disabilities and limited mobility.*
- *Ensure satisfactory level of service for all pathway users.*

1.3 CROSS REFERENCES

General

Requirement: This is not a self-contained design document, conform to the following worksection(s):

- *0010 Quality requirements for design.*
- *0041 Geometric sealed road design.*

1.4 STANDARDS

Design

General: To Austroads AGRD06A and AS 3727.1.

Cycleways: To Austroads AP-G88.

Walking tracks: To AS 2156.1 and AS 2156.2.

Reference: **IPWEAQ - Complete Streets: Guidelines for Urban Street Design.**

1.5 INTERPRETATION

Abbreviations

General: For the purposes of this worksection the following abbreviations apply:

- ARRB: Australian Road Research Board.
- CBR: California bearing ratio.

Definitions

General: For the purposes of this worksection the following definitions apply:

- Bicycle path (cycleway): A path or path section intended for the exclusive use of cyclists, generally referred to as an exclusive bicycle path.
- Footpath (pathway): A public way reserved for the movement of pedestrians, motorised wheelchairs and personal mobility devices.
- Gradient: The longitudinal slope of a road or path, usually represented as a ratio of one metre rise to the horizontal distance (e.g. 1:50) or expressed as a percentage (e.g. 2%).
- Ramp: An inclined access way that has a constant gradient anywhere between 1:14 and 1:20.
- Separated path: A path divided into separated sections one of which is designated for the exclusive use of cyclists and an alternate section for other path users.
- Shared path: A paved area particularly designed (with appropriate dimensions, alignment and signing) for the movement of cyclists and pedestrians.

2 PRE-DESIGN PLANNING

2.1 PLANNING

Scheme and planning development

Initial appraisal: Determine the scheme requirements in compliance with the **DA consent conditions**, Council's objectives, strategy/policy and planning documents. Factors to consider in the appraisal include the following:

- The urban structure of the development.
- Population density.
- Terrain.
- Provision hierarchy of roads, paths, cycleways (shared or segregated) and links.
- Existing transport/infrastructure routes/network and location of centres.
- Existing levels of use, public demand and user profile.
- Community priorities.

Site assessment: Examine the physical conditions along potential routes and their surrounds to test, inform and prioritise options under consideration. Record the assessment information for the following:

- Record of baseline information.
- Identifying potential problems, especially those that may affect the scheme viability.
- Identifying key design issues for pedestrians and cyclists.
- For future auditing and justification of the scheme.

Existing physical conditions: Physical conditions to consider in the site assessment include:

- Gradient.
- User flows and frontage activity (development activity adjacent to the path, e.g. commercial buildings).
- Route continuity which may affect length of route corridor and path/road transitioning requirements.
- Surface type and condition, level of lighting, vegetation **and stormwater drainage**.
- **Identify possible conflicts with services such as sewer, water and optical fibre. Consider impacts during construction such as vibratory compaction.**
- Width **and clearances** of routes.

2.2 ENVIRONMENTAL INVESTIGATION AND PLANNING

Existing building structures

Records: Obtain drawings of existing structures along and adjacent to the planned routes in the development area/precinct.

Dilapidation reports: Inspect existing structures along and adjacent to the planned routes in the development area/precinct. Prepare a report on the condition of the structures affected by the development, including photographic records of any defects.

Existing vegetation

Requirement: Assess existing vegetation, to establish the following:

- Vegetation for retention.
- Vegetation for relocation.
- Vegetation for removal.

Development precinct investigation

Requirement: Prepare a survey and geotechnical report to establish locations of site features, levels and grade, and soil conditions.

Potential environmental impacts

Requirement: Check the development area/precinct for potential environmental impacts such as the following:

- Heritage items.
- Preservation of visual values.
- Endangered species requiring protection.
- Wildlife habitat.

Details of potential impacts: If there are potential impacts, provide details of the issues and proposed control measures for minimising the impact and protecting the surrounding environment before starting design. This may be in the form of an environmental impact statement (EIS), to be included in the Design report.

Heritage items

Heritage considerations: Review the DA consent conditions, State Heritage Register, Aboriginal Heritage Information Management System (AHIMS), and Council's Local Environmental Plan for potential impacts on heritage items.

2.3 CONSULTATION

Council and other authorities

Council consultation: Liaise with the Council's officer(s) for the following:

- Adopted pedestrian and cyclist route and strategic plans.
- Roads and traffic management.
- Landscaping and streetscape.
- Stormwater drainage.
- Structures.
- Environmental management.
- Geotechnical conditions.
- Subdivision and planning.

Other authorities: Consult with and seek approval for the scheme development from the following state government authorities:

Transport for NSW (formerly Roads and Maritime) in relation to potential interfaces with railways, classified roads, traffic signals or other public transport modes.

Other stakeholders

Stakeholder involvement: Engage with interested parties such as local community groups early in the design. As appropriate for the scheme, consult the following parties:

- The police, through Council's Local Traffic Committee.
- Statutory undertakers.
- Local residents and businesses.
- Developers of proposed new developments/schemes.
- Current users of the land.
- Groups representing disabled people (including disabled cyclists).
- Rehabilitation/mobility officers for blind and partially sighted people.
- Disability/access officers within the local authority.
- Education authorities.
- Cycle and pedestrian user groups.

- Residents' associations.
- Local environmental and amenity groups.
- Public transport operators.
- Chambers of commerce.

Public consultation

Public engagement: Once a basic scheme has been developed, undertake public consultation to the Council's requirements.

Utilities services plans

Existing services in the development area/precinct: Liaise with the utility authorities affected by the proposed development and if required, obtain service plans from the authorities of the proposed development area for above ground and below ground services.

Utility services location: To AS 5488.1 and AS 5488.2. Contact DIAL BEFORE YOU DIG to identify the locations of underground utility services pipes and cables.

3 DESIGN CRITERIA

3.1 GENERAL

Statutory requirements

Not used.

3.2 LOCATION OF PATHS

Required path properties

Requirement: Locate the pathways and cycleways to meet the following criteria for the development:

- Connectivity: Including measures such as accessibility (for people with disabilities to programs, services and activities), distance and directness, reliability, and connection to infrastructure and key destinations.
- Comfort and perception of safety: Compliance with regulations and codes, and minimisation/elimination of potential threats.
- Convenience: Easy and safe access without delay and barriers.
- Demand and level of service: Travel patterns, current and potential future walking and bicycling activity. *Worn tracks may indicate existing desire lines for pedestrian and cyclist traffic.*
- Environmental impact minimisation: Including impact on air quality, water, wetlands, noise and wildlife habitat.
- Equity: Accessibility without discrimination.
- Safety: To minimise potential accidents and maximise security.
- Visibility: If paths can be easily identified or located.

Possible path locations

Requirement: Consider the following locations in the development:

- Along river frontages.
- Within foreshore areas.
- Through parklands.
- Along railway reservations.
- Connections to public transport.
- Abutting bridges.
- Within the reservations of streets which have direct access to property.

Design considerations

Factors for determining path locations: Consider the following when locating pathways and cycleways:

- Horizontal alignment and sight lines: Locate paths to provide good sight lines along the whole length of the path for safe travel, including adequate sight distance across the inside of curves and under overhead obstructions.
- Vertical alignment: The gradient along paths (especially for cyclists) should be as flat as possible, as steep downgrades are potential hazards for cyclists travelling at high speeds.

- Align paths to allow cyclists to travel safely at their chosen speed.
- Horizontal curvature: Avoid sharp horizontal curves at the bottom of steep downgrades.
- Crossfalls and drainage: To minimise ponding.
- Adequate clearances: For example, between opposing traffic, between the cyclist operating spaces and potential hazards such as pedestrian conflicts.
- Access for emergency service and maintenance vehicles at path entrances.
- Landscaping and planting.
- Expansion and contraction (saw cut) joints, dowelling: refer to Council's standard drawings.

Location of pathways and cycleways in road reserves: As required by the DA consent conditions.

Reference: Austroads AGRD06A Table 5.1 provides further guidance on the choice of path alignment in road reserves.

3.3 PATHWAY AND CYCLEWAY FEATURES

General

Standard drawings: detail footpaths, cycleways and kerb ramps to Council's standard drawings.

Path design life or technical service life: Where a non-standard design or material is proposed, the design life is to be generally 20 years, or as required by the DA consent conditions.

Cycleway and pathway types

Cycleway type: Both on-road and off-road cycleways may be considered for new developments and retrofitting within existing roadways or public open space.

- On-road cycleways: Includes wide kerbside lanes, shared traffic lanes, exclusive bicycle lane or sealed shoulder.
- Off-road cycleways: Includes shared use bicycle/pedestrian pathway, separated pathway or exclusive cycleway.

Reference: Austroads AP-G88 provides detailed descriptions and requirements such as warrants, widths and pavement marking for the majority of cycleways.

Complementary land uses: Pathways may diverge from the road alignment either within the road reserve or across land reserves, and may be provided in conjunction with overland floodways or retention basins.

Reference: Refer to Austroads AP-R410 for more information about cycleways on sealed roads with speed limits of 70km/h or more.

Footpath requirement: Provide footpaths for new developments in accordance with DA consent conditions, or if none are specified, Council's Development Engineering Handbook.

Pathway/cycleway features table

Feature	Shared path	Separated paths			
		One-way		Two-way	
		Pathway	Cycleway	Pathway	Cycleway
Minimum path width	2.5 m (local) 3.0 m (major)	1.2 m	2.0 m	1.5 m (local) 2.4 m (major) 5.0 m (footway dining)	2.5 m (local) 3.0 m (major)
Minimum vertical clearance*	2.5 m	2.0 m (absolute) 2.4 m (desirable)	2.5 m	2.0 m (absolute) 2.4m (desirable)	2.5 m
Crossfall	≤ 2.5%**	≤ 2.5%**	Sealed surfaces: 2 to 4%***	≤ 2.5%**	Sealed surfaces: 2 to 4%***
			Unsealed surfaces: 5 %		
Gradient	1:14 – 1:20 to AS 1428.1	1:14 – 1:20	≤ 5%	1:14 – 1:20	≤ 5%

* Including tree branches, underpasses, doorways, signs and other overhead structures

Feature	Shared path	Separated paths
** It is assumed that the surfaces for these paths will be sealed to accommodate wheelchair access.		
*** Maximum crossfall for asphalt and bitumen surfaces: 3% (1:33).		

Reference: Austroads AGRD06A clause 5.1 provides more information on width of paths and also provides Tables and Figures showing requirements for roadside alignment, safety bollards heights, holding rail heights, gradients for wheeling ramps, bicycle operating speeds, lighting, special requirements for bicycle paths and pedestrian paths at intersections with main roads and/or bridges.

Other pathway/cycleway features

Minimum radius for horizontal curves for cycleways and shared pathways: Allow for the following:

- Without superelevation: To Austroads AGRD06A Tables 5.6.
- With superelevation: To Austroads AGRD06A Table 5.7.

Stopping sight distance for cycleways and shared pathways: To Austroads AGRD06A clause 5.7.

Provision at road crossings: Design and construct road crossings with appropriate grades, width adjustment for waiting areas and kerb ramps at road crossings including Tactile Ground Surface Indicator (TGSi) placement as per AS/NZS 1428.4.1. Provide crossing devices, markings and treatments in line with AGRD06A clause 7.

Provision of pram/kerb ramps: To AS/NZS 1428.4.1. Install TGSIs 300 mm from the hazard which is the road.

Minimum lateral clearances for cycleways: Allow for the following clearances between opposing bicycle operating spaces and cyclist operating spaces and potential hazards:

- Relatively flat paths: 0.5 m between the edge of cycle path and obstacle.
- Recreation paths with speed \leq 20 km/hr: 0.4 m between opposing bicycle operating spaces.
- Paths for commuting and major recreational activity: 1.0 m between opposing bicycle operating spaces.

Landscaping and stormwater drainage

Requirement: Locate, design and construct path and associated stormwater drainage measures to minimise future maintenance. Design considerations include the following:

- Measures to minimise debris washing onto paths.
- Locating paths adjacent to watercourses to prevent inundation, to minimise slippery surfaces.

Water sensitive urban design (WSUD): Comply with any DA consent conditions and Council's WSUD policies for the management of stormwater runoff from the pedestrian/cyclist facility, and/or co-location of WSUD facilities for adjoining subdivision developments within the public shared access corridor.

Landscaping: Provide landscaping as required by the DA consent conditions and approved landscape principles plans. Consider the role of landscaping associated with paths in the development, e.g. windbreaks, aesthetics (to soften the environment), providing visual cues or shorelines adjacent to paths to guide the visually impaired, water sensitive urban design, to control line of sight, providing shade or refuge and traffic management.

Safety

References: Refer to Austroads AP-R287 for more information on safety issues, and Austroads AGRD06A clause 7.5.2 for information on terminal design.

Bicycle operating speed: Ensure that where bicycle speeds diverge from pedestrian speeds, conflicts are managed, preferably by separating travel paths and providing ample sight distances. Average bicycle speeds on shared paths along flat gradients may exceed 35 km/h (10 m/s) and on moderate downslopes 50 km/h (14 m/s) or greater. Consider speed restrictions as an option of last resort if conflicts cannot be designed out.

Reference: Refer to Austroads AGRD06A clause 5.2 for maximum operating speed recommendations for bicycles.

Pedestrian walking speed: Allow for walking speed of 1.0 to 1.2 m/s.

Ramp and footpath landings table

Type of path	Longitudinal gradient	Landing requirement
Ramp and footpaths with gradients > 1:20	1:14	Every 9 m
	1:20	Every 15 m

Type of path	Longitudinal gradient	Landing requirement
Footpath ¹	1:20	Every 15 m
	1:33	Every 25 m
	Flatter than 1:33	No landing required
¹ Ground level adjacent to footpaths: ≤ 25 mm of the footpath level.		

Disabled access

Compliance: To AS 1428.1, Council's policy on access and mobility and the *Disability Discrimination Act 1992*.

Warning tactile ground surface indicators (TGSIs): Provide at the top and bottom of ramps and stairs and at kerb ramps at road crossings to AS/NZS 1428.4.1.

Way finding signs: To AS 1428.4.2.

Provision at structures

Uninterrupted movement: Facilitate continuous cyclist and pedestrian movement at proposed and existing structures, including at bridges and underpasses, roads or railways.

Signage and pavement marking

Signposting: Provide signposting to indicate destinations and potential hazards.

Reference: For more information on signposts and path markings, see Austroads AGTM10.

Signs and pavement marking: To AS 1742.9 and AS 1742.10.

Pavement design

Structural design: To Austroads AGPT02, Section 12.

Control of cracks: To CIA Z15.

Grates and covers: Flush with the adjacent path.

3.4 PATH FACILITIES

Facilities

Requirement: Include in the development scheme, design proposals for the following facilities, including at common cyclist and pedestrian destinations:

- Street furniture including seats, bins, drinking fountains and telephones.
- Waiting areas.
- Secure bicycle parking facilities and devices to Austroads AP-G88, Austroads AP-R527 and AS 2890.3.
- Picnic facilities and viewing platform facilities.
- Information stands/direction signs.
- Bicycle wheeling ramps.
- Bus stop shelters.

Lighting and lighting support structures

Generally: To AS/NZS 1158.3.1 and AS 1798.

Underpasses: To AS/NZS 1158.5.

3.5 MATERIALS

Environmental considerations

Trees policy: When designing and selecting the path and surrounding materials, consider the Council's existing or planned tree planting requirements to minimise future maintenance and environmental impact. Factors to consider include the following:

- Location of vegetation, distance from the path.
- Type of vegetation and their root system requirements to minimise branch trimming and pavement deformation and cracking, e.g. loose materials may be used to allow root system expansion.
- Path surface slip resistance.
- **If excavations for the new pavements are likely to occur near existing trees, implement a tree root protection system during the construction process.**

- Where a change in moisture infiltration to existing tree roots will result from proposed hard surfaces, specify permeable pavements instead.

Recycled construction materials: Council may consider use of local waste materials or recycled construction materials, such as recycled concrete and crushed glass for pavement subbase application or recycled plastic reinforcement for in situ concrete pavement. Refer to Austroads AGPT04E for more information.

Subgrade

CBR value for the subgrade: To the geotechnical investigation report.

Reference: Austroads AGPT02 Section 5 for more information on subgrade evaluation methods.

Typical presumptive subgrade design CBR values for different soil classification can be obtained from Austroads AGPT02 Table 5.4. Refer to AS 1726 for soil classification.

Pavement

Type: Subject to DA consent.

Materials: Subject to DA consent.

Maintenance considerations

Requirement: Nominate low maintenance materials for path surface, pavements and street furniture to suit the exposure conditions and durability requirements of the development.

Protection of materials: Allow for material protection methods to suit the durability requirements.

Other criteria

Not used.

Reference: If specifying plantation timber or certified hardwood, see www.forestrystandard.org.au for information on AFS certification to AS 4708.

4 DOCUMENTATION

4.1 STATUTORY DOCUMENTATION REQUIREMENTS

Approvals

Requirement: Document any prerequisite for approval of the development advised by the authorities at clause 2.3 Consultation, including:

- Transport for NSW for classified roads, or Crown Lands for crown roads not under Council's jurisdiction affected by the development.
- Transport for NSW or the relevant rail authority where pathway/cycleway connects and/or intersects with a public transport facility.
- ~~— Planning department for general land use and layout proposals.~~
- Utilities authority for any public or private utility affected by the development.
- ~~— Private precinct authority for pathways/cycleways which transverse the precinct.~~

4.2 DRAWINGS

Drawing content

Requirement: Provide the following drawings to describe the development (scales given are at A1):

- Locality plan.
- Site plans showing cycleways and pathways at 1:500 scale.
- Part plans at 1:200 scale, showing merging details of new cycleways and pathways with existing roads.
- Longitudinal sections at the following scales:
 - . Horizontal section: 1:500.
 - . Vertical section: 1:50.
- Cross sections at 1:100 scale. Provide transition tables if crossfalls vary.
- Design traffic loading and design CBR value for the natural subgrade material.
- Details of typical cross sections including pavement materials, pavement layer depths, edge details and details of any retaining walls, batters, fences and drainage works at 1:20 scale.
- Typical details of expansion joints, contraction joints and joints to existing pavements. Show details of additional joints at drainage pits, light poles and bollards.

- Details of handrails, bollards, street furniture, light poles and traffic signalling posts at 1:10 scale.
- Traffic management plan. **A Traffic management plan is required if the existing vehicle or pedestrian traffic is likely to be disturbed during the construction of the new pathway or cycleway.**

Design drawing format

Format required: **PDF at A1 (preferred) or A3 (for minor works). Hardcopies if requested by Council.**

4.3 SUPPORTING DESIGN DOCUMENTS

Design reports

Requirement: Provide a design report covering the following:

- Design criteria adopted for the development design.
- Site investigation reports supporting the design.
- Any additional requirements including, Traffic management plan, not covered by drawings.

Specifications

Construction documentation: Prepare technical specifications using the AUS-SPEC Construction worksection templates from the National Classification System workgroups 02, 03, 11 and 13.

Design certification

Certificate: Provide a signed and dated design certificate as evidence that a suitably qualified professional has reviewed all the design documents, including program and plans for the development, and can verify that the designed cycleways and pathways for the development site meet the Council and statutory requirements. **Use the template provided in the 0010 Quality requirements for design worksection.**

4.4 WORK-AS-EXECUTED

Work-as-executed documents

Work-as-executed drawings: Provide an additional set of final construction drawings for the purpose of recording the work completed by the Contractor.

Work-as-executed drawing format: **in open digital (not requiring specific software) CAD format (DXF), as well as DWG and PDF copies.**

Data format: To Austroads AP-R597.

Final certification of completed works

Requirement: **See Clause M3M3 in regard to the completion and handover process.**

5 ANNEXURE

5.1 ANNEXURES - REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

AS/NZS 1158		Lighting for roads and public spaces
AS/NZS 1158.3.1	2020	Pedestrian area (Category P) lighting - Performance and design requirements
AS/NZS 1158.5	2014	Tunnels and underpasses
AS 1428		Design for access and mobility
AS 1428.1	2009	General requirements for access - New building work
AS/NZS 1428.4.1	2009	Means to assist the orientation of people with vision impairment - Tactile ground surface indicators
AS 1428.4.2	2018	Means to assist the orientation of people with vision impairment - Wayfinding signs
AS 1726	2017	Geotechnical site investigations
AS 1742		Manual of uniform traffic control devices
AS 1742.9	2018	Bicycle facilities
AS 1742.10	2009	Pedestrian control and protection
AS 1798	2014	Lighting poles and bracket arms - Recommended dimensions
AS 2156		Walking tracks
AS 2156.1	2001	Classification and signage
AS 2156.2	2001	Infrastructure design
AS 2890		Parking facilities
AS 2890.3	2015	Bicycle parking facilities

AS 3727		Pavements
AS 3727.1	2016	Residential
AS 5488		Classification of Subsurface Utility Information (SUI)
AS 5488.1	2019	Subsurface utility information
AS 5488.2	2019	Subsurface utility engineering
AUS Gov Act No. 135	1992	Disability Discrimination Act 1992
Austrroads AGPT		Guide to pavement technology
Austrroads AGPT02	2017	Pavement structural design
Austrroads AGRD		Guide to road design
Austrroads AGRD03	2016	Geometric design
Austrroads AGPT04E	2009	Recycled materials
Austrroads AGRD06A	2017	Paths for walking and cycling
Austrroads AP-G88	2017	Cycling aspects of Austrroads Guides
Austrroads AP-R287	2006	Pedestrian-Cyclist conflict minimisation on shared paths and footpaths
Austrroads AP-R410	2012	Cycling on higher speed roads
Austrroads AP-R527	2016	Bicycle parking facilities: Guidelines for design and installation
Austrroads AP-R597	2019	Data Standard for Road Management and Investment in Australia and New Zealand Version 3.0
CIA Z15	2011	Cracking in concrete slabs on ground and pavements
IPWEAQ	2010	Complete Streets: Guidelines for Urban Street Design

6 ANNEXURE M – MIDCOAST COUNCIL SPECIFIC CLAUSES

M1.	Variations to or non-conformances with Council's AUS-SPEC are to be evaluated with reference to the procedure in Council's <i>Development Engineering Handbook</i> . Acceptance is to be obtained in writing from: <ul style="list-style-type: none"> a) an authorised representative of Council's Director of Infrastructure and Engineering Services, or b) an accredited certifier where they are the Principal Certifier and hold the relevant accreditation category for the type of work. 	Variation procedure
M2.	This specification applies in addition to any development consent (DA) conditions. If there is any inconsistency, the conditions of consent shall prevail.	DA conditions
M3.	Refer to the MidCoast Council <i>Development Engineering Handbook</i> for final inspection, works-as-executed and handover requirements.	Completion

7 AMENDMENT HISTORY

0	30/11/2020	First Published
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