



# ACCESS CONTROL DEVICES ON PATHS

## Design Guidance Note

WAKA KOTAHI NZ TRANSPORT AGENCY

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VERSION 1.1

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## **More information**

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# 1. PURPOSE

This document is intended for technical specialists and outlines Waka Kotahi NZ Transport Agency's expectations regarding the installation and management of access control devices on all facilities where cyclists<sup>1</sup> are permitted to be present. Access control devices in this guidance note are defined as any devices placed within 450 mm of the surface used by cyclists (measured horizontally), within the control of the approved organisation<sup>2</sup>. Such devices can include any items intended to restrict access or manage user behaviour (e.g. speed or positioning); this definition therefore includes but is not limited to:

- U-rails and banana bars
- Rigid posts (including bollards)
- Flexible posts (including 'safe hit' posts)
- Street furniture (including sign posts, street light columns, seating, sight rails, fences)
- Landscaping features such as rocks, trees and planter boxes

Features installed for the purposes of protecting on-road cycle facilities from encroachment by other motorised traffic in on-road contexts are excluded from the above definition of access control devices.

This guidance note seeks to ensure that any existing or proposed access control devices are accompanied with an appropriate level of assessment. This assessment is expected to balance the need to protect users and infrastructure while managing risks associated with access by non-authorised users and/or adverse user behaviour.

Restricting motorcycle access is not covered in this guidance note, on the basis that this will generally severely restrict cycle access and prohibit access to the facility by people in wheelchairs and mobility devices. For guidance on motorcycle barriers, refer to the [New Zealand Cycle Trail Design Guide](#) (2019).

# 2. CRASH POTENTIAL OF CYCLISTS

From time to time, cyclists make mistakes. Access control devices placed on or near facilities pose a risk to cyclist safety, capable of causing significant injury if struck. Therefore, access control devices do not comply with Safe System principles when poorly designed or applied.

The inclusion of access control devices does not comply with Safe System principles when they fail to provide a safe "road and roadside" within the limitations and characteristics of cyclists and bicycles, which include:

- Users, particularly the elderly, may have poor eyesight, delayed reactions, poor balance, brittle bones.

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<sup>1</sup> Cyclists as defined in this guidance is consistent with that in Austroads. Other facility users, such as pedestrians and wheeled recreational device users, may benefit from the implementation of this guidance.

<sup>2</sup> The access control device definition excludes cyclist hold rails provided they are installed in compliance with the intent and installation requirements as set out in [Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling](#) (2021).

- Inexperienced road users, particularly children, may exhibit poor decision making and handling skills.
- Cyclist control may be affected by the environment, for example strong wind may cause cyclists to wobble, while wet conditions can affect braking capability and traction.
- Cyclists can misjudge their speed, braking capability and positioning.
- The relaxed atmosphere on a route away from traffic danger can lead to reduced levels of concentration and increased levels of distraction.
- Bicycles offer no crash protection.
- E-bikes are allowing cyclists (including those less experienced) to travel faster.
- The law governing bicycle lighting requires a luminance value sufficient for the cyclist to be seen, but not necessarily sufficient to illuminate the way ahead. Note, other facility users such as those on wheeled recreational device users have no legal lighting requirements and may therefore be at greater risk during low light conditions.

## 3. APPLYING SAFE SYSTEM PRINCIPLES

To support safe system principles, the default position is that access control devices will typically not be present on facilities used by cyclists. Where an access control device is deemed necessary, it should comply with Section 4 of this guidance note and follow the Need Assessment Process described in Appendix A and B. Documentation pertaining to access control devices may be subject to audit.

### 3.1. Locations where access control devices should not be used

Locations where access control devices should not be used include those:

- Mid-block, or where cyclists would not reasonably be expected to slow down.
- At the end of an asset (including those vulnerable to damage through vehicular use) if that asset is already on a route protected from traffic by restrictions elsewhere, or mid-block.
- Where cyclist speeds are expected to be sufficiently high so as to result in serious injury if struck.
- Where non-authorised access is available elsewhere along the route.

### 3.2. Situations where access control devices may be used

Notwithstanding locations where access control devices should not be used (detailed in Section 3.1), access control devices may be appropriate when:

- Accidental or deliberate access to the facility by non-authorised users would pose an unacceptable risk to assets, intended users, or non-authorised users which outweigh the risk posed by the installation of an access control device. This risk must be formally quantified, assessed and recorded; and,
- Alternative methods for preventing non-authorised access are unavailable (see Section 3.3).

Any access control device situated on facilities used by cyclists (existing and new) should meet all the design requirements stipulated in Section 4. Waka Kotahi expects this to occur as soon as practicably possible<sup>3</sup>.

### **3.3. Alternative methods for preventing non-authorised access**

Where non-authorised access to a facility used by cyclists poses a safety risk, asset risk or a public nuisance, consideration shall be given to alternatives to the implementation of access control devices. Common examples could include:

- Monitoring to determine if a risk of non-authorised users exists. This would assist with justifying the need for an access control device or alternative treatment.
- Delineation (including pavement surface colour), signs and/or cyclist hold rails to deter non-authorised access. This measure will discourage but not prevent access.
- Linear barriers such as posts, sighting rails, large rocks, planting, fencing, earth bunds or high kerbs (200 mm+), positioned at least 450 mm outside the shy line of the path. This can physically restrict non-authorised access.
- Create an alignment which physically prevents non-authorised users from accessing or continuing along the facility. This could for example consist of a tight radius bend, chicane, or path division. Care is required to ensure cyclist safety.
- Upgrade/strengthen vulnerable assets (consideration should be given to maintenance vehicle access requirements).

### **3.4. Alternatives to access control devices for modifying cyclist behaviour**

Where inappropriate cyclist behaviour (for example; speed, inattention or failing to keep left) poses a potential safety risk, alternatives to the implementation of access control devices shall be provided. Common examples could include:

- Delineation (including pavement surface colour, keep left markings, slow markings, arrows, centrelines, flares, give-way triangle, etc). This measure will inform and encourage appropriate user behaviour.
- Signs (including bend warning, intersection, chevrons etc). This measure can assist in certain situations, however we note that signs may not always be correctly located within a cyclist's cone of vision.
- Increased facility width at dwell or conflict points. Increasing facility width may provide improved passing opportunities while minimising the risk of user conflict.

## **4. ACCESS CONTROL DEVICE DESIGN REQUIREMENTS**

Where access control devices are required, they should meet the following minimum design requirements.

Placement requirements:

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<sup>3</sup> This should take into account budgetary and time constraints.

- Access control devices shall provide an opening width of between 1.2 m (minimum) and 1.8 m (maximum).
- Access control device layouts, must be set out from the centre of the cycle facility (except where U-rails are used to form a chicane). At very wide access points, additional access control devices can be added, working outwards from the centre.
- Ropes/chains/cables or boom gates shall not be used.
- Where reduced path width serves as an access control device, clear and unambiguous methods to channelise path users shall be employed. Individual vertical elements and/or tapers sharper than 1:10 shall not be used.
- If a U-rail is centrally positioned, it shall have a sighting board as shown in the inset image in Appendix C.
- If the U-rails form a chicane, it should be designed such that two path users can safely pass each other within the chicane. Note, the radius of turn required to pass through the chicane should never be less than 2.5 m (and preferably not less than 4 m). The sighting boards at a chicane shall have their chevron arrows pointing in the required direction of travel.
- Accessibility for mobility device users (including hand cycles) must be considered

#### Lighting and conspicuity at the access control device

- Where an access control device is installed, its location and position shall be illuminated in low light conditions. Care should be taken to ensure vegetation growth does not impact on the ability for luminescence requirements to be met in future. Luminescence at the base of the access control device must achieve an illumination value of:
  - At least 3.5 lux where the path is already lit by its own lighting or by adjacent highway lighting; or,
  - Between 1.5 lux and 2 lux where the path is unlit.
- Isolated shading provides dark patches where access control devices may be obscured in bright conditions. Access control devices should be free from the risk of isolated shading (for example from structures or adjacent vegetation).
- All access control devices must incorporate “Diamond Grade” (or equivalent) reflective material around the entire device as in Appendix C. Designers and asset managers shall be cognisant that reflectorised elements will degrade over time and require ongoing maintenance.
- Fences positioned perpendicular to the direction of travel shall have a minimum solid area of 50%, and suitable contrast to ensure adequate conspicuity.
- Where a U-rail is mounted at right angles to a path a ‘target board’ should be fitted with red chevrons on a yellow background (as per inset image in Appendix C) which point in the direction the path user is required to take.

#### Requirements for various forms of access control device

- The height of any access control device shall not be less than 1m as stipulated in [Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling](#) (2021), Section 7.5.2.
- The colour of any bollard or U-rail shall be as in Appendix C.
- The diameter of any bollard shall be a minimum of 100mm as stipulated in [Austroads Part 6A](#) (2021), Section 7.5.2
- Removable devices must leave a flush surface and a hole no greater than 100mm in diameter following their removal. Additional consideration may be required where the facility is used by other users (e.g. covering holes if they pose a hazard for wheelchair users).

#### Pavement marking

- All access control devices should be accompanied by pavement marking. Pavement marking should provide sufficient longitudinal advance warning to facility users and encourage facility users to pass safely around the access control device (see Appendix C). Specifically, this requires:
  - pavement marking to be tapered for 20 m on either side of the access control device, or longer if this does not provide at least 2.5 seconds warning at the path design speed;
  - the taper shall be painted with a 100 mm wide permanent reflectorised road marking supplemented with 200 mm wide diagonal bars every 1.5 m. The taper shall develop evenly along its length;
  - the outside edge of the taper shall ideally be 450 mm from the access control device. In any case, this distance shall be no less than 300 mm, or greater than 600 mm<sup>4</sup>.
- Deviation from the requirement to provide a 20 m long taper is only permitted on the non-facility side of the access control device. In such instances consideration should be given to other risk mitigating measures.
- Pavement markings shall provide sufficient colour contrast to the facility surface, in order to provide sufficient conspicuity in all light conditions.

## 5. INSPECTION REQUIREMENTS

A visual inspection of facilities used by cyclists should be undertaken regularly, and at least every two years. An inspection on access control devices should:

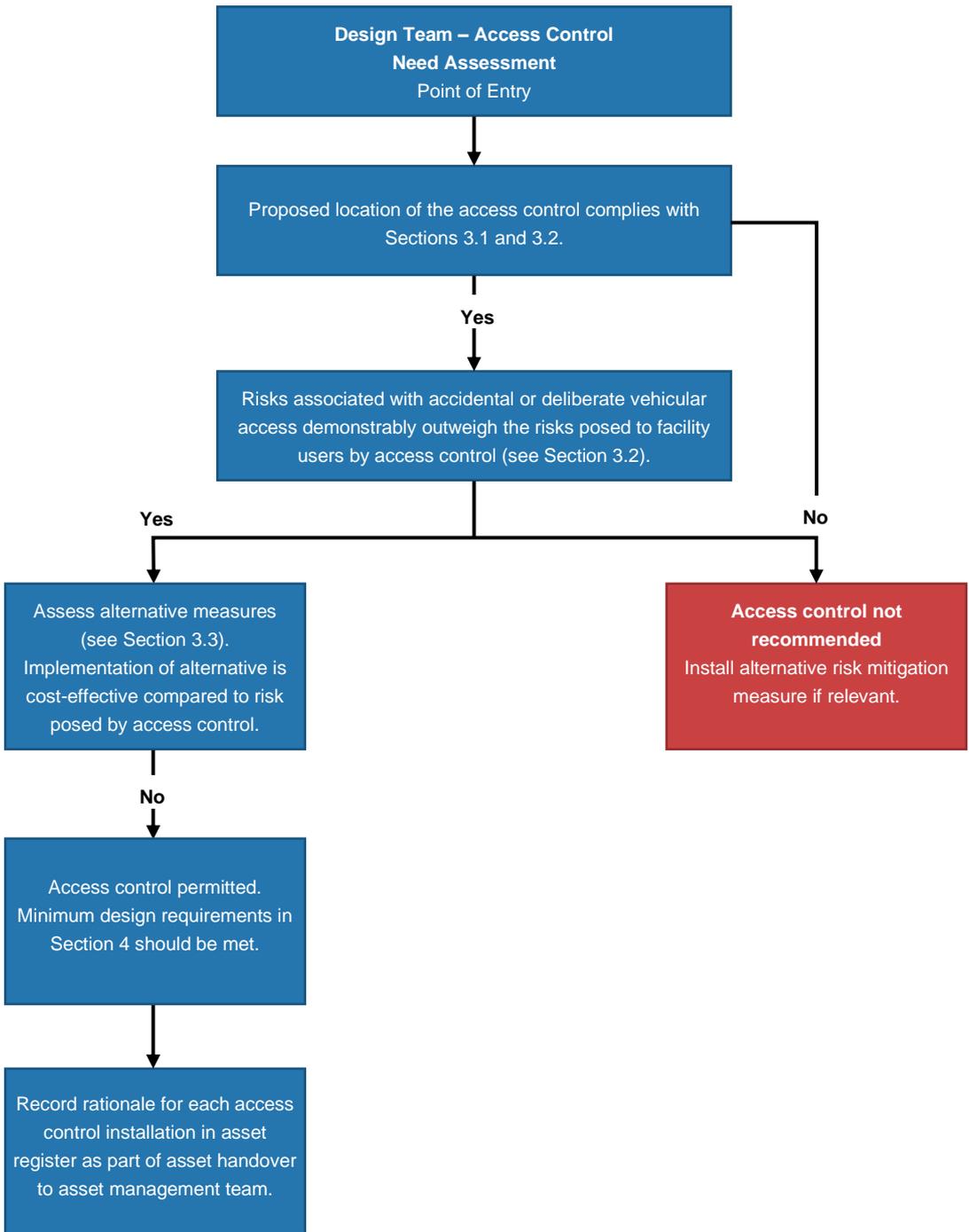
- Identify all access control devices located on or within 450 mm of the walking and cycling facility.
- Confirm that all identified access control devices are recorded in the asset register.
- Confirm that all access control devices have a completed 'Design Team – Access Control Device(s) Need Assessment' saved on the asset register.
- Confirm that the condition(s) cited in the Need Assessment are still valid for each access control device(s) installation.
- Confirm that access control device installation(s) comply with design requirements outlined in Section 4 and are in 'acceptable' condition.
- Record and report inspection findings to the asset owner for action.

Waka Kotahi has developed a simple inspection register which may assist those undertaking inspections and is available upon request. Approved organisations are free to develop their own tools and inspection processes. However, an auditable record demonstrating that inspection requirements as detailed above have been met must be available upon request.

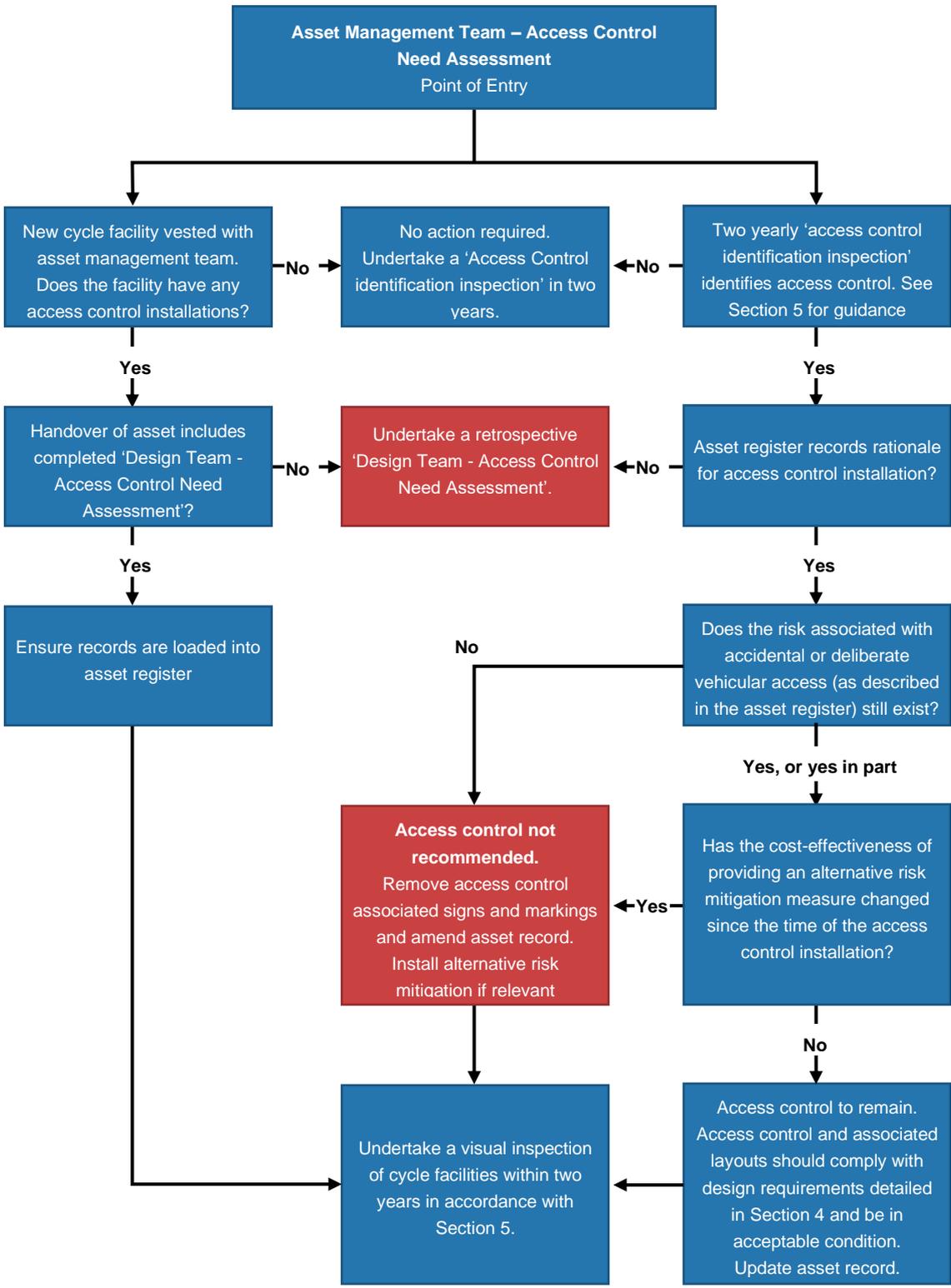
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<sup>4</sup> The marking detailed in [Austroads Part 6A](#) (2021), Figure 7.6. is not considered sufficient to provide advance warning of the access control device for the second or subsequent cyclist in a line, or to provide sufficient lateral warning, and should not be used.

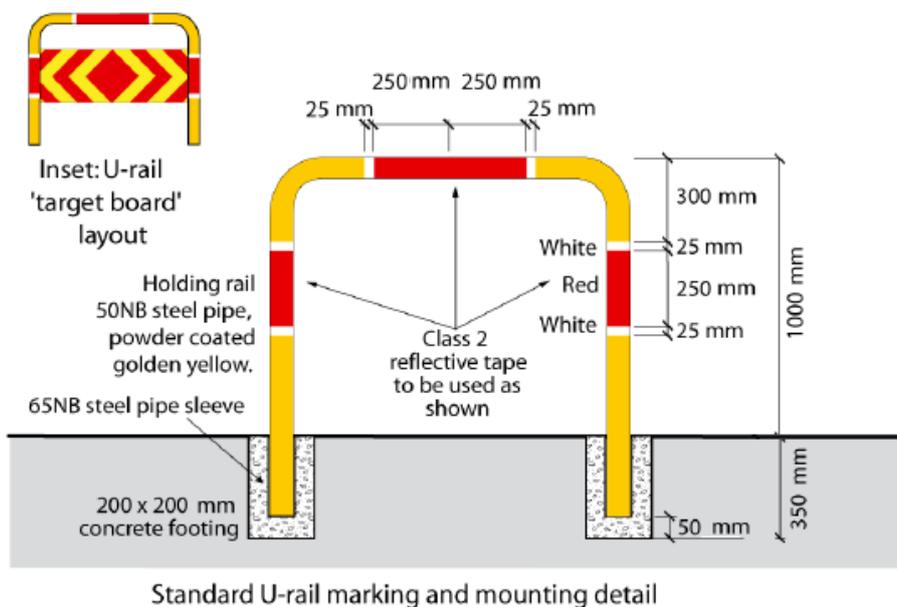
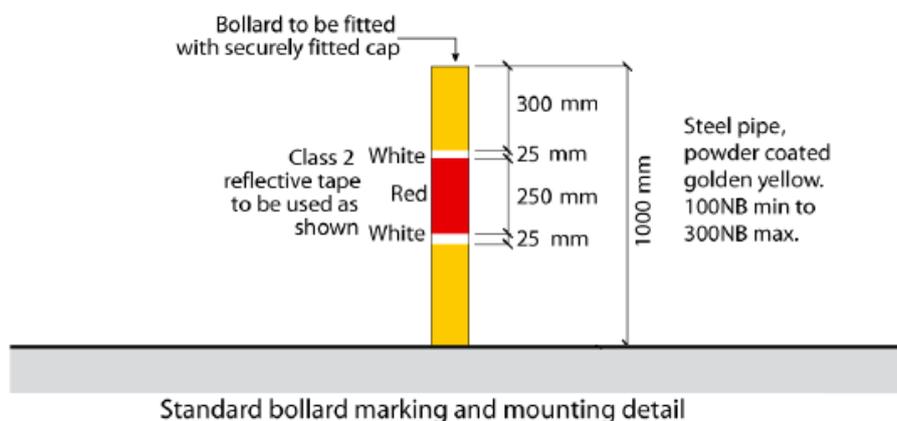
# APPENDIX A – NEW ACCESS CONTROL DEVICE(S) NEED ASSESSMENT PROCESS



# APPENDIX B – EXISTING ACCESS CONTROL DEVICES NEED ASSESSMENT PROCESS



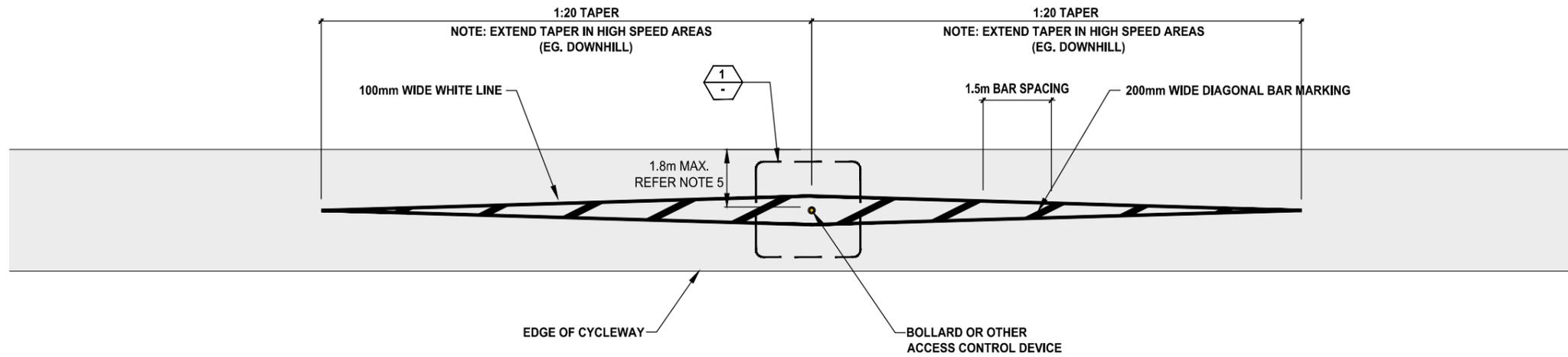
## APPENDIX C – DETAILS OF ACCESS CONTROL DEVICES AND ASSOCIATED MARKINGS



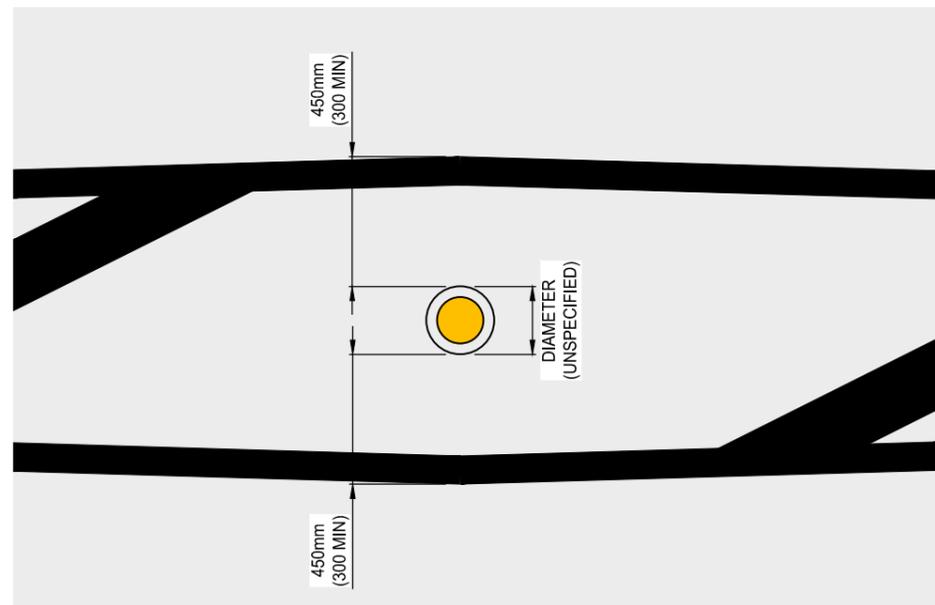
Details of a bollard and U-rail from [Austroads Part 6A](#), Figure 7.10.

Note: In situations where a person might walk into a U-rail, a horizontal element detectable by a cane should be added within 150mm of ground level.

If the risk of the bollard being hit by handlebars is a concern, consider reducing the bollard height to 850mm.



**CYCLEWAY DIVERGE  
LAYOUT 1**  
NOT TO SCALE



**UNSPECIFIED BOLLARD DIAMETER**

**1** DETAIL  
NOT TO SCALE

**LEGEND**

	WC100R	- 100mm WIDE REFLECTORISED WHITE CONTINUOUS LINE
	WC100R 1-2	- 100mm WIDE REFLECTORISED WHITE, 1m STRIPE 2m GAP
	WC200R	- 200mm WIDE REFLECTORISED WHITE LIMIT LINE
	HATCHED MARKING	- 100mm WIDE REFLECTORISED WHITE CONTINUOUS BORDER LINE
	HATCHED MARKING 200	- 200mm WIDE REFLECTORISED WHITE BAR

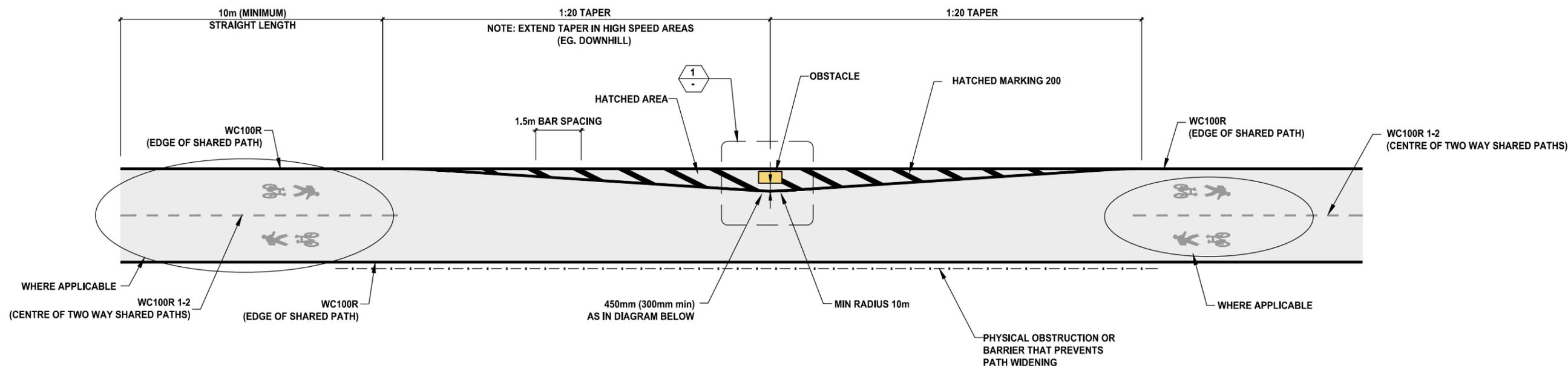
**GENERAL NOTES**

1. FOR SHARED PATH USE (SUP):  
CENTRE LINE MARKINGS (WC100R 1-2) NOT GENERALLY REQUIRED. SHOWN IN GREY DRAWINGS C002, C003 AND C004.  
- CYCLE + PEDESTRIAN SYMBOLS REQUIRED WHERE NECESSARY  
- CONSIDER DOUBLE SIZE PEDESTRIAN SYMBOL WHERE CYCLE SPEEDS MAY BE HIGH AND PEDESTRIANS MAY BE VULNERABLE.
2. FOR CYCLE ONLY PATH:  
- CENTRE LINE MARKINGS (WC100R 1-2) GENERALLY APPLIED
3. HIGH PERFORMANCE MARKINGS TO BE USED WHERE APPLICABLE
4. THE USE OF A BOLLARD OR OTHER CONTROL DEVICE FOR A MID-SECTION CONTROL DEVICE IS GENERALLY DISCOURAGED, REFER TO THE ACCOMPANYING GUIDANCE ON ACCESS CONTROL DEVICES
5. A MAXIMUM 1.8m GAP APPLIES BETWEEN ACCESS CONTROL DEVICES AND ANY OTHER PHYSICAL BARRIER



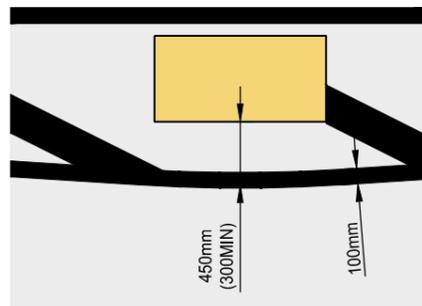
**LEGEND**

	WC100R	- 100mm WIDE REFLECTORISED WHITE CONTINUOUS LINE
	WC100R 1-2	- 100mm WIDE REFLECTORISED WHITE, 1m STRIPE 2m GAP
	WC200R	- 200mm WIDE REFLECTORISED WHITE LIMIT LINE
	FLUSH MEDIAN	- 100mm WIDE REFLECTORISED WHITE CONTINUOUS BORDER LINE
	FLUSH MEDIAN 200	- 200mm WIDE REFLECTORISED WHITE BAR



**WITH NO SPACE AVAILABLE FOR PATH WIDENING TO PASS OBSTACLE**

**LAYOUT 1**  
NOT TO SCALE



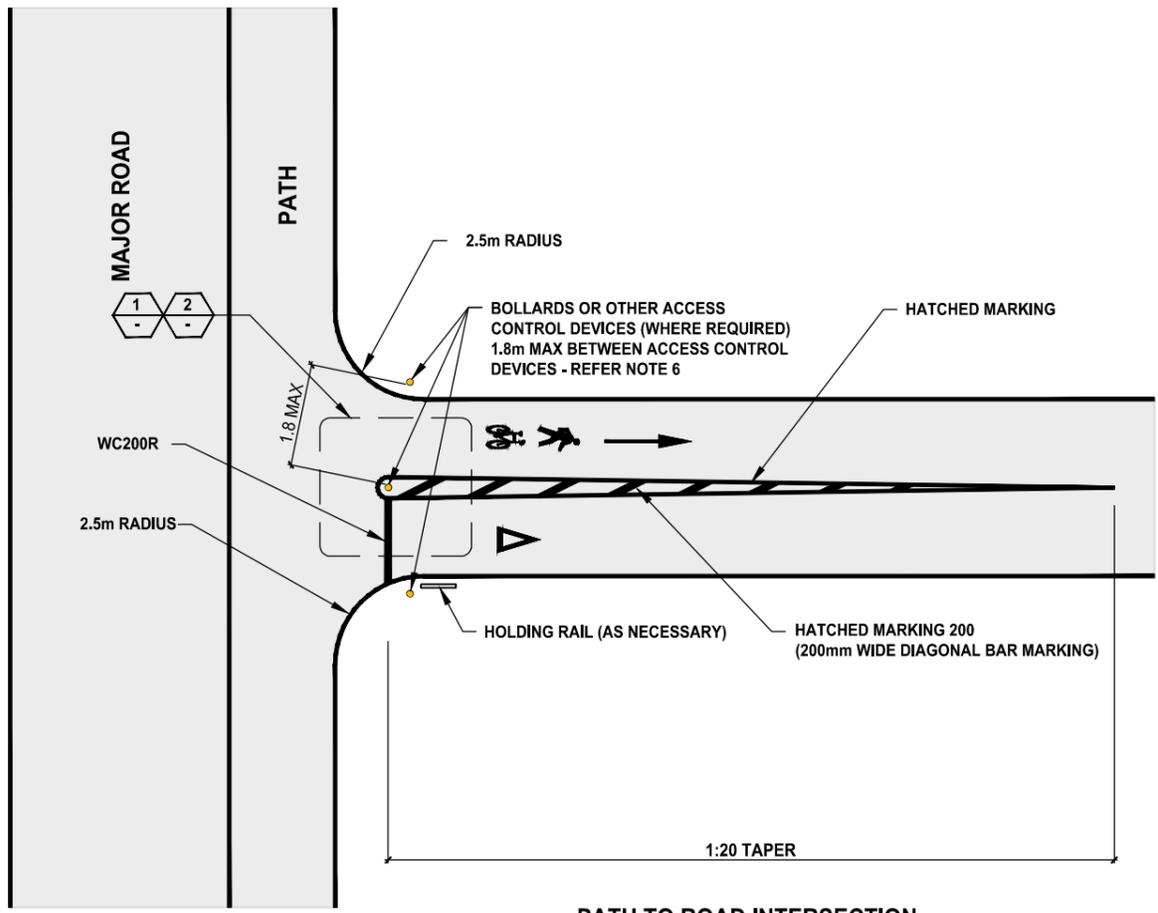
**ENLARGEMENT OF OBSTACLE**  
**(SUCH AS CABINET, GANTRY LEG, ETC)**

**1** **DETAIL**  
NOT TO SCALE

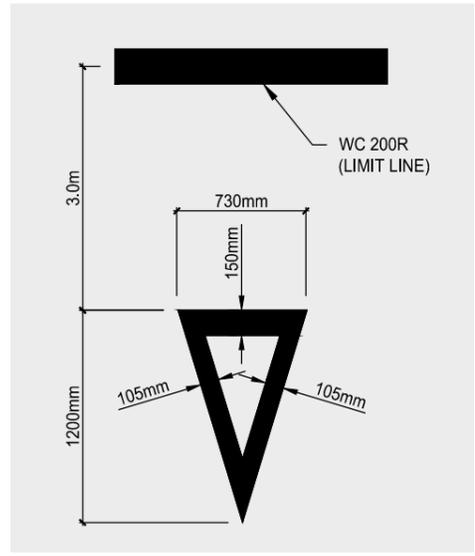
**NOTE**

1. WHERE THE APPROACH TO THE OBSTACLE IS CURVED AND THE PATH IS BEING NARROWED, CONSIDER THE INSTALLATION OF PW43.2 (ROAD NARROWS) SIGNS 20m AHEAD OF THE TAPERS



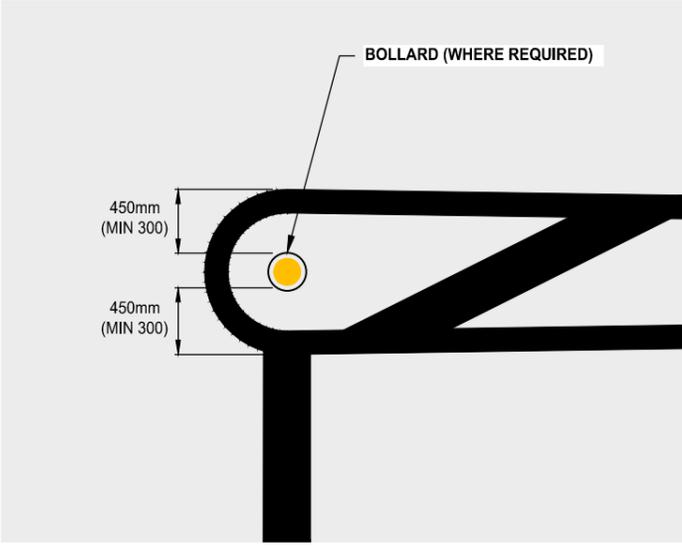


**PATH TO ROAD INTERSECTION**  
**LAYOUT 1**  
 SCALE 1:200



**GIVE WAY MARKING**

**1** DETAIL  
 NOT TO SCALE



**CYCLE PATH / SUP MEDIAN PAVEMENT MARKINGS**

**2** DETAIL  
 NOT TO SCALE

**LEGEND**

	WC100R	- 100mm WIDE REFLECTORISED WHITE CONTINUOUS LINE
	WC100R 1-2	- 100mm WIDE REFLECTORISED WHITE, 1m STRIPE 2m GAP
	WC200R	- 200mm WIDE REFLECTORISED WHITE LIMIT LINE
	HATCHED MARKING	- 100mm WIDE REFLECTORISED WHITE CONTINUOUS BORDER LINE
	HATCHED MARKING 200	- 200mm WIDE REFLECTORISED WHITE BAR

**NOTES**

1. BOLLARD DESIGN AS PER AUSTRROADS PART 6A (SECTION 7.5.3)
2. FLARE MAY BE USED TO AID CONSPICUITY WHEN NO BOLLARD IS PRESENT
3. ALL MARKINGS AND SIGNS TO BE IN ACCORDANCE WITH NZTA TRAFFIC CONTROL DEVICES MANUAL AND MOTSAM MOTSAM PART II: MARKINGS
4. HIGH PERFORMANCE MARKINGS TO BE USED WHERE APPLICABLE
5. ALL BOLLARDS SHOULD BE 450mm (300mm) CLEAR OF ANY ADJACENT PATH EDGELINE
6. A MAXIMUM 1.8m GAP APPLIES BETWEEN ACCESS CONTROL DEVICES AND ANY OTHER PHYSICAL BARRIER