

**Manual of Uniform Traffic Control Devices**

# **Part 13 Local Area Traffic Management**

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**2003 Edition**



**Queensland Government**

Department of **Main Roads**

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## PREFACE

Part 13 of the Manual sets out the traffic control devices to be used in conjunction with Local Area Traffic Management (LATM) treatments. LATM treatments include perimeter treatments and internal treatments such as road humps, driveway links and slow points. The LATM treatments are usually employed as part of an area-wide scheme. Traffic control devices used in conjunction with specific treatments need to comply with the conditions prescribed in this Part of the Manual.

Effective LATM schemes depend to a large extent upon local community acceptance of measures proposed for traffic control and improvement of amenity in the area (refer to Austroads – Guide to Traffic Engineering Practice, Part 10 – Local Area Traffic Management).

The Law of Negligence is the law which attaches liability for a failure to take reasonable care in circumstances where the law has imposed a duty of care. In general terms, the law requires that persons exercise reasonable care in their dealings with each other. An Authority which installs LATM treatments has a duty of care towards road users. If liability for negligence is to attach it must be demonstrated by the litigant that there had been a failure to exercise reasonable care. The test of what care is reasonable in any given case is a question of fact and degree, requiring consideration of all the relevant circumstances.

Owing to the potential for liability, it is important that LATM treatments are planned, designed and installed by suitably qualified and competent personnel, in accordance with guidelines which are accepted as good engineering practice. Further, there should be a high degree of professional consensus that LATM's would achieve the purpose for which they are intended at the particular location selected. It must be recognised that each case would be judged on its merits. In all cases therefore, it is essential that careful consideration should be given and proper engineering judgement used in assessing the need for traffic control measures of this nature at any location.

LATM treatments and associated traffic control devices which have been planned, designed and installed in accordance with the above criteria will generally be regarded as having been installed with the requisite degree of care to avoid liability in the event of an accident at such a facility.

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## FOREWORD

The main objectives of Local Area Traffic Management (LATM) schemes are to lower vehicle speeds, reduce the volume of through traffic, reduce the number and severity of accidents and improve the general amenity of residential areas. These objectives may be achieved by modifying the street environment through the provision of various LATM treatments in an area-wide scheme. In new subdivisions, the need for LATM measures is avoided to a large extent by use of appropriate design standards based on modern planning principles.

Local area traffic management is still evolving and it is likely that additional treatments will be included in future editions of this Manual.

When an LATM scheme is proposed a thorough study (including public participation) of the road network and the traffic characteristics within and adjacent to the area concerned, is required to clearly identify needs and to ensure that the traffic volumes are not merely transferred from one residential street or area to another, or to an already saturated arterial road. An adequate and appropriate network of arterial roads is a prerequisite for effective local area traffic management. Upgrading of arterial roads can encourage use by motorists and may reduce, or even completely eliminate, the need for LATM treatments on the adjacent local streets. The needs of emergency vehicles also require consideration at the planning stage as do those of buses where a bus route is to run through the LATM area.

In area-wide LATM schemes, two types of treatment are used – perimeter and internal. The intention of perimeter treatments is to indicate to road users that they are entering a different traffic environment and to induce a reduction in vehicle speed. Internal treatments are then intended to maintain reduced vehicle speeds. Traffic control devices used in conjunction with perimeter and internal treatments are specified in Section 3.

The signing and marking arrangements illustrated in Section 3 for various LATM treatments are generally appropriate where they are installed in isolation or during implementation of an area-wide LATM scheme. As indicated in Section 3, both in the text and on the drawings, certain signs and markings may be omitted when the treatment is part of a fully implemented area-wide scheme or a clearly defined segment of a staged-construction scheme, thus conserving the visual amenity of the area.

Design principles and details of some treatments which have been tested are given in Appendices to this Part of the Manual to provide some guidance in relation to current design practice. The design of a particular treatment however should be in accordance with accepted engineering principles and will always involve proper engineering judgement.

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**DEPARTMENT OF MAIN ROADS  
Queensland**

**Manual of Uniform Traffic Control Devices**

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**PART 13 – LOCAL AREA TRAFFIC MANAGEMENT**

**SECTION 1. SCOPE AND INTRODUCTION**

## **1 SCOPE**

This Part of the Manual describes the following commonly used types of Local Area Traffic Management (LATM) treatments and prescribes the traffic control devices used in conjunction with such treatments:

- (a) Perimeter treatments.
- (b) Road humps.
- (c) Roundabouts.
- (d) Driveway links.
- (e) Slow points.
- (f) Modified T-intersections.
- (g) Road closures.
- (h) Shared zones.

It also specifies appropriate signs, delineation and pavement marking to be used in association with each treatment to achieve uniformity of practice in LATM schemes. Guidance in the planning and development of LATM schemes, and details of road hump profiles and placement are given in appendices.

This Part of the Manual is applicable to roads other than arterial roads in urban areas, that is, it is applicable to collector roads or local roads.

NOTE: Detailed specifications for the design and manufacture of the signs are given in AS 1743.

## **2 REFERENCED DOCUMENTS**

The following documents are referred to in this Part of the Manual:

### **AS**

- 1158 SAA Public Lighting Code
- 1428.1 General requirements for access – Buildings
- 1743 Road signs
- 1906 Retroreflective materials and devices for road traffic control purposes
- 1906.1 Part 1: Retroreflective materials

### **AUSTROADS**

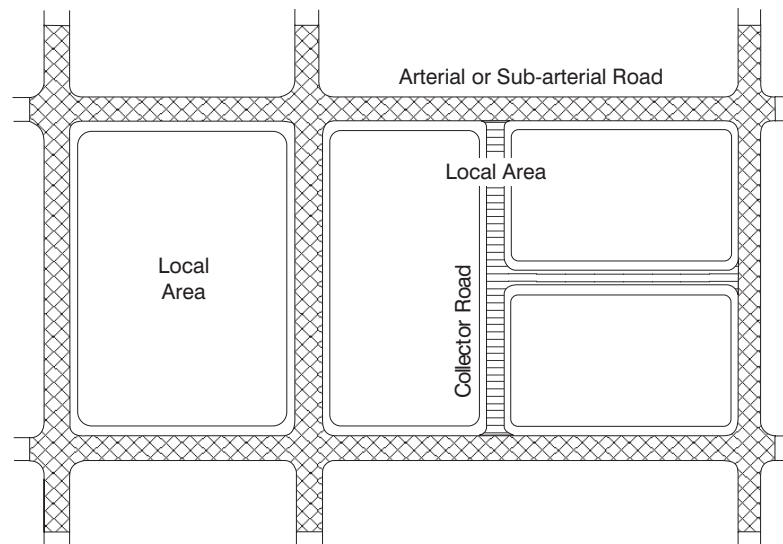
- Guide to Traffic Engineering Practice, Part 10: Guide to Local Area Traffic Management
- Guide to Traffic Engineering Practice, Roundabouts

## **3 DEFINITIONS**

For the purpose of this Part of the Manual the following definitions apply:

### **3.1 Local area**

An urban area containing only local and collector roads which is bounded by arterial and sub-arterial roads or features such as rivers, railway lines, or the limit of urban development.



NOTE: Local roads are not shown.

**Figure 1 A TYPICAL LOCAL AREA**

## **3.2 Local area traffic management (LATM)**

The analysis of traffic characteristics and the implementation of vehicle control measures within local areas.

### **3.3 Road classification**

#### **3.3.1 Arterial road**

A road that predominantly carries through traffic from one region to another.

#### **3.3.2 Sub-arterial road**

A road connecting arterial roads to areas of development, and carrying traffic directly from one part of a region to another.

#### **3.3.3 Collector road**

A non-arterial road which collects and distributes traffic in an area, as well as serving abutting property.

#### **3.3.4 Local road (street)**

A road or street used primarily for access to abutting properties.

### **3.4 Road hump**

A raised transverse section of road which causes vertical displacement of vehicles in order to control speeds.

### **3.5 Roundabout**

An intersection laid out for the movement of traffic in one direction around a central island.

### **3.6 Shared zone**

A length of roadway or roadways defined at its beginning by a Shared Zone sign and at its end by an End Shared Zone sign, or a dead end.

### **3.7 Slow point**

A section of roadway which is designed to reduce traffic speeds by horizontal displacement of vehicles.

## **3.8 Traffic management classifications**

### **3.8.1 Area wide**

The concept of traffic management over an area, rather than along an individual street or road.

### 3.8.2 Isolated

A term used to describe a treatment such as a hump or slow point which is installed in isolation rather than as part of an area-wide traffic management scheme. A treatment may also be isolated if it is built as the first part of a staged traffic management scheme.

### 3.8.3 Local area speed limit

A speed limit which applies to all of the streets within a local area.

### 3.8.4 Perimeter

The outer extremity of a local area, across which vehicles travel to enter or leave the local area.

## SECTION 2. LOCAL AREA TRAFFIC MANAGEMENT (LATM) TREATMENTS

### 4 GENERAL

This section describes the treatments commonly used in LATM schemes. A number of treatments described herein are also used on roads where LATM may not be applied viz. roundabouts, stop and give way controls at intersections and T-junctions, road closures and shared zones.

In certain instances other treatments viz. road humps or slow points, may be used in isolation. This situation would be the exception rather than the rule and careful consideration would need to be given to the provision of such an installation. Notwithstanding that advance warning of these isolated treatments may be provided, it is essential that installations of this nature can be readily seen and the potential hazard ahead appreciated by drivers.

Design principles for the use of LATM treatments are given in Appendix A. Guidelines for the location and siting of road humps are given in Appendix B.

The roads on which LATM schemes are to be implemented shall be lit to the requirements of AS 1158. In locations where such normal streetlighting may provide inadequate illumination, the need to provide additional lighting at LATM treatments should be considered.

### 5 GIVE WAY SIGNS AND STOP SIGNS

#### 5.1 Purpose

GIVE WAY signs and STOP signs are used to control traffic at intersections in a local area where it is necessary to assign, modify, or reinforce vehicle priorities.

Whilst these signs are not needed at roundabouts (the Roundabout sign R1-3 is used) or where the T-junction rule operates, they are used as follows:

- (a) GIVE WAY or STOP signs should be provided at all unsignalised intersections with four or more legs to assign vehicle priorities.
- (b) GIVE WAY or STOP signs should be provided at 3-way intersections where the layout is such that it is not clear how or whether the T-junction rule would operate, for example, at a Y-junction.
- (c) GIVE WAY or STOP signs are provided at unsignalised exits from local areas to arterial roads.
- (d) The STOP sign replaces the GIVE WAY sign on any controlled approach where sight distance is inadequate as determined in accordance with Part 2 of this Manual.

#### 5.2 Application

GIVE WAY and STOP sign control at an intersection needs to be applied in the following manner:

- (a) Every controlled intersection should have two uncontrolled legs which together form the major road through the intersection.
- (b) The major road through the intersection either –
  - (i) should be on a straight or substantially straight alignment; or
  - (ii) if on curved alignment, should have pavement markings, kerbs or other indications aligned in such a way that its path is clearly defined.

Where this is impracticable, consideration should be given to modifying the intersection as set out in Clause 9.

If such modification is not practicable recourse may be had to one or other of the special control treatments described in Appendix C. Such special control treatments shall be limited to the functional arrangements set out in the Appendix.

## **6 PERIMETER (THRESHOLD) TREATMENTS**

Perimeter (threshold) treatments are placed at the perimeter of a local area to inform road users that they are entering a lower speed environment (LATM scheme); that they can expect to encounter other similar measures in the area, and that they should reduce their speed and modify their driving behaviour to suit the local nature of the streets. The signs Speed Limit AREA (R4-10), and END Speed Limit AREA (R4-11) are used at the entry to and exit from the area to impose a local area speed limit (see Clause 17 and Figure 3). Perimeter treatments may also be used where new subdivisions designed in accordance with modern planning principles ensure that speeds in residential streets are consistent with those in LATM schemes i.e. max. 40 km/h.

## **7 VERTICAL DISPLACEMENT TREATMENTS**

### **7.1 Road hump**

#### **7.1.1 General**

The function of a road hump is to reduce vehicle speeds by causing occupant discomfort when displacing a vehicle vertically over a short distance. For most vehicles this results in increasing discomfort as the vehicle speed rises above the design speed of the hump. When correctly designed and placed humps are effective in reducing vehicular speeds.

#### **7.1.2 Hump profiles**

Two profiles which have successfully been evaluated are the 'Watts' (TRRL) design and the 'flat top' design (see Appendix B). Typical hump applications are illustrated in Figures 4 and 5.

Humps installed with the Watts profile create a marked increase in passenger discomfort if vehicles cross them above the design speed, but they do not cause a major deflection of the vehicle trajectory.

Flat top humps also create a marked increase in passenger discomfort if vehicles cross them above the design speed. However, provided the gradient of the entry and departure ramps is within guidelines (normally 1:12 or 1:15) the flat top humps have an effect similar to the Watts profile. Steeper ramps are generally used for the entry to a shared zone (see Clause 10).

One major advantage of the flat top hump is the ability to vary the length of the hump and the gradient of each ramp to more comfortably cater for vehicles of different lengths. For instance, flat top humps may be preferred on routes used by buses. Careful consideration of hump placement and hump design on bus routes is essential. It may be possible to place the humps at bus stops, thereby minimising the effect on buses. Proposed installations should always be discussed with the bus service management and emergency service organisations.

Flat top humps may also be combined with pedestrian facilities e.g. zebra crossing or refuge island. Pedestrian facilities e.g. zebra crossings, are not provided on Watts profile road humps.

#### **7.1.3 Installation**

Road humps should be constructed substantially at right angles to the travelled path and should extend as closely to the kerb as possible but leaving sufficient opening for drainage. The presence of a road hump may be highlighted by extending the kerbs on either side of the hump. Road humps should be clearly visible to approaching motorists and, where practicable, illuminated by street lighting (see Appendix B). The visibility of road humps may be enhanced by the use of pavement marking on the hump surface as described in Clause 21.6.

#### **7.1.4 Spacing**

It is most important that the first road hump crossed by drivers should be placed so that it can be clearly seen and where the approach speed of vehicles is naturally low.

An individual road hump affects speeds in its immediate vicinity. If low speeds are required over an appreciable length of road, more than one road hump may be required. The spacing between successive humps should be as uniform as possible, with due allowance for side roads, private driveways and other turning traffic. Spacing should usually be not less than 80 m, while spacing greater than 120 m may allow speeds between the humps to increase substantially.

Guidelines for the location and siting of humps are given in Appendix B.

## **8 HORIZONTAL DISPLACEMENT TREATMENTS**

### **8.1 Roundabouts**

A roundabout visually defines an intersection. It reduces speeds and simplifies the allocation of priorities. Typical roundabouts are illustrated in Figures 6 and 7.

A roundabout should operate according to driver expectancy. Any facility which looks like a roundabout should operate like one. Conversely, if a facility is intended to operate as a roundabout it should quite clearly appear to have the expected shape of a roundabout.

### **8.2 Slow points**

Slow points are usually formed by mid-block kerb extensions. They are designed to provide a visual and physical break-up of the continuity of the street and to reduce vehicle speeds. They are normally designed to create a roadway constriction equivalent to two vehicles parked on opposite sides of the street. Additional design features which may be included are –

- (a) an angled passageway between kerb extensions;
- (b) a road hump in combination; or
- (c) a median island where two-way traffic is to be catered for.

Typical slow points are illustrated in Figures 8, 10 and 11.

### **8.3 Driveway links**

A driveway link is an extended form of slow point, often extending for at least one and sometimes two or three residential frontages. It provides greater visual and physical break-up of the continuity of the street than a slow point, and greater scope for landscaping. Passing points may be required along the link if it is either of excessive length, or if it is curved such that approaching drivers are unable to see to the far end.

A typical driveway link is illustrated in Figure 9.

## **9 MODIFIED INTERSECTIONS**

As indicated in Clause 5.2, GIVE WAY or STOP sign control at an intersection needs to be applied such that drivers on all approaches can clearly appreciate which is the major road through the intersection, and it is clear to drivers on controlled approaches, the stream to which they are required to give way. If other than simple controls are unavoidable, and alternative treatments (e.g. a roundabout) are not appropriate, consideration should be given in the first instance to modifying the intersection by the construction or relocation of kerbs, median or channelising islands, widened pavement, or a combination of these, so that the path of the major road through the intersection is clearly defined. A typical modified intersection treatment is illustrated in Figure 12.

When such modification is not practicable, special control treatments may be required. Such special treatments shall be limited to those set out in Appendix C.

## **10 SHARED ZONES**

### **10.1 General**

Shared zones are generally constructed in areas where the competing demands of pedestrians, moving vehicles and parking require a form of control which allows complete pedestrian mobility whilst at the same time enhancing pedestrian safety. A speed limit of 10 km/h is usually considered appropriate. A typical shared zone is illustrated in Figure 13.

Shared zones are normally restricted to areas of high commercial activity, medium to high density residential areas or recreational areas.

### **10.2 Installation**

In the design of a shared zone the most important single element is to alter the environment to make it obviously different from other streets. This can be achieved by the use of different coloured and textured paving, by the use of full width flush paving between property lines and by judicious and aesthetic placement of planters and other landscaping. The signs SHARED ZONE (R4-4) and END SHARED ZONE (R4-5), (see Clause 20.1.9) are required to establish a shared zone. The entry point to a shared zone may incorporate a ramp of the type used to form a flat-top hump, except that it is desirably much steeper in this application (gradient may be as steep as 1:2).



Figure 2 SHARED ZONE

## 11 ROAD CLOSURES

Road closures are usually used to inhibit or prevent the use of some streets in a local area by through traffic. They can also be used to eliminate or modify intersections which have an accident history and where other remedial treatments are not practicable or appropriate. Types of closure include:

- (a) *Partial closure*, whereby access across the closure is restricted both by kerb rearrangement and regulatory control, to one direction only.
- (b) *Diagonal closure*, whereby a diagonal barrier is placed across a cross-intersection, converting it into two separate curved streets with intersection conflicts eliminated at that point.
- (c) *Full closure*, whereby a street with access at both ends is converted into a cul-de-sac.

Typical road closures are illustrated in Figure 14.

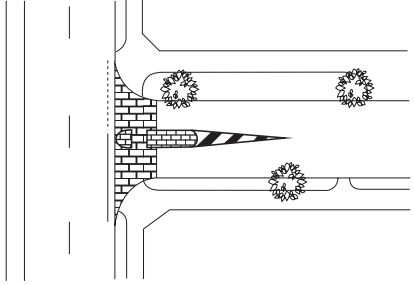
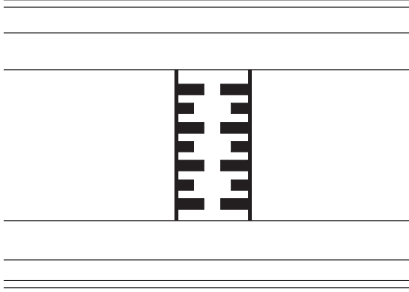
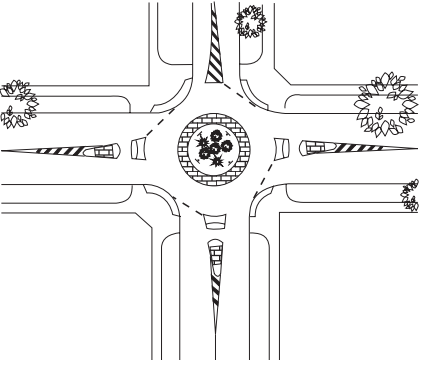
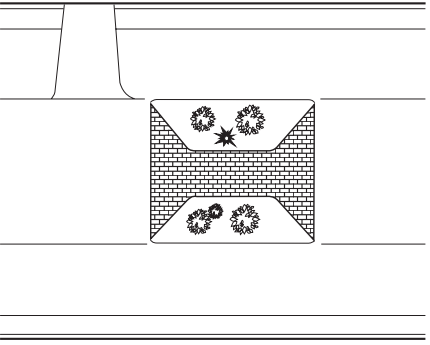
## 12 MID-BLOCK ISLANDS

Mid-block islands are usually used within a local area as an additional type of horizontal displacement treatment or slow point. They can also be useful as a refuge for pedestrians and cyclists on busier streets. When used for the latter purpose they should be completely free of landscaping or other sight obstructions.

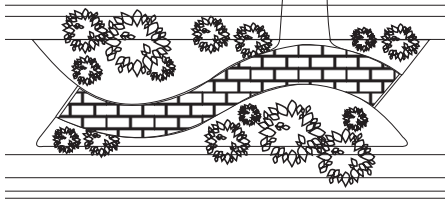
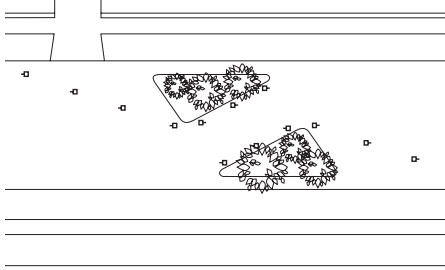
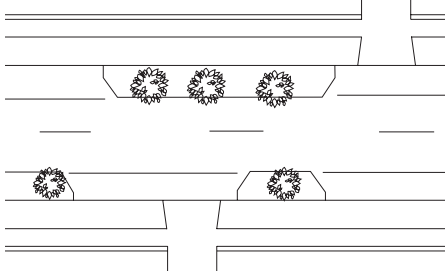
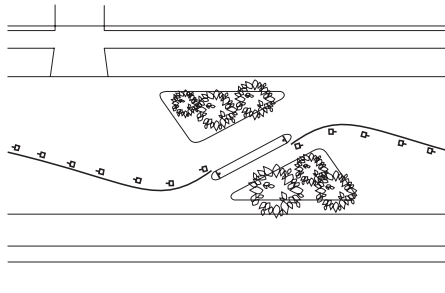
## 13 EXAMPLES AND USES OF LATM TREATMENTS

Table 1 shows typical layouts for a variety of LATM treatments. It lists uses and other considerations which need to be taken into account when determining an appropriate LATM treatment. Variations to, and combinations of, these typical figures may be needed at some locations to obtain a suitable treatment.

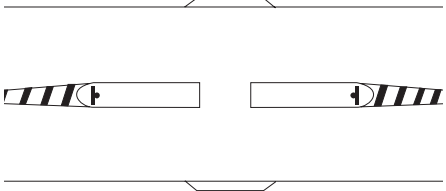
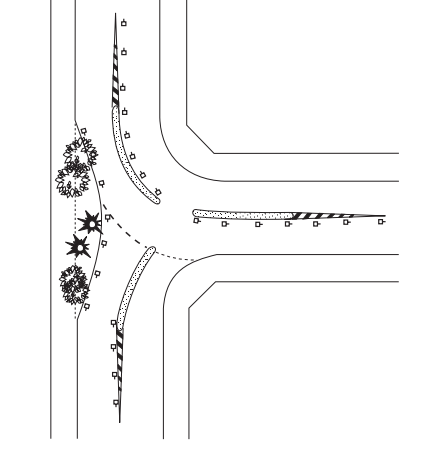
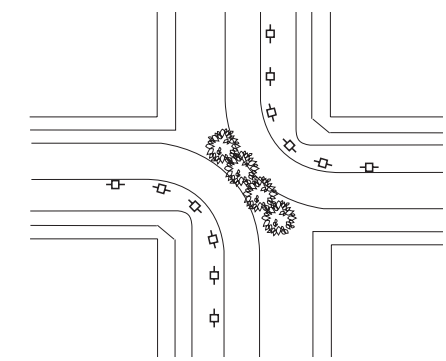
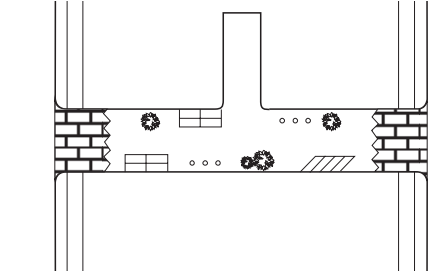
**Table 1 USE OF LATM TREATMENTS**

LATM Treatment	Uses and Advantages	Other considerations
 <p>1. Perimeter (Threshold) treatment</p>	<p>Primary use is to provide a positive indication and reminder that a driver is leaving the arterial road system and entering a local area.</p> <p>Reduces entry speeds.</p> <p>Can provide a useful staging for pedestrians.</p> <p>Provides a landscaping opportunity.</p>	<p>Low speed turns from arterial road may affect traffic flow on the arterial road.</p>
 <p>2. Road hump</p>	<p>When correctly positioned, it reduces vehicle speeds in the vicinity of the hump. When used in series, it reduces speeds over the entire length of the street.</p> <p>Through traffic is often discouraged from using the street.</p> <p>It is a relatively low cost treatment to install and maintain.</p>	<p>May increase noise due to braking, acceleration and vertical displacement of vehicles.</p> <p>Reduces the 85th percentile speeds but may leave unaffected the small percentage of high speed vehicles.</p>
 <p>3. Roundabout</p>	<p>Reduces the number of conflict points in an intersection.</p> <p>Reduces vehicle speeds through the intersection.</p> <p>Provides orderly and continuous flow of traffic.</p> <p>Clarifies priority and simplifies decision making.</p> <p>Increases conspicuity of the intersection.</p>	<p>May be restrictive for some larger service and emergency vehicles unless the roundabout is mountable.</p> <p>May involve considerable construction costs, especially if land acquisition is required.</p> <p>May increase noise because of extra gear changing.</p> <p>May require special lighting at an added cost.</p>
 <p>4. Single-Lane Slow Point</p>	<p>Reduces speed near treatment. When used in series it reduces overall speed.</p> <p>Discourages through traffic.</p> <p>Imposes minimal inconvenience to local residents.</p> <p>Increases pedestrian safety.</p> <p>Provides a landscaping opportunity.</p>	<p>Landscaping needs to be maintained to ensure adequate visibility.</p> <p>It is contrary to driver expectations if used in isolation.</p> <p>There is possibility of increased noise.</p> <p>Confrontations between opposing drivers arriving simultaneously could create problems.</p>

**Table 1 (continued)**

LATM Treatment	Uses and Advantages	Other considerations
 <p>5. Driveway link</p>	<p>As for (4)                      Provides greater break-up of the continuity of the street.                      Can provide opportunity for substantial landscaping.</p>	<p>May restrict emergency vehicles.                      May increase area to be maintained.                      Cost can be considerable because of its length. (Generally installed when street is due for reconstruction.)</p>
 <p>6. Single-lane angled slow point</p>	<p>As for (4).</p>	<p>As for (4). May restrict emergency vehicles.</p>
 <p>7. Two-lane slow point</p>	<p>Causes only minor inconvenience to local users.                      Regulates parking and serves to protect parked vehicles.                      Can be used at intervals to produce landscaping scheme.</p>	<p>Alone, not as effective for reducing speeds as other types of slow point.                      Provides less visual break-up of the continuity of the street than other types of slow point.</p>
 <p>8. Two-lane angled slow point</p>	<p>As for (4).</p>	<p>As for (4).                      It is generally less effective in controlling speeds than other treatments.                      May restrict emergency vehicles.</p>

**Table 1 (continued)**

LATM Treatment	Uses and Advantages	Other considerations
 <p>9. Mid block island</p>	<p>Provides a refuge for pedestrians and cyclists crossing the street.</p> <p>Visually enhances the residential streetscape when landscaped.</p>	<p>Does not reduce speeds as much as other vertical or horizontal displacement treatments.</p>
 <p>10. Modified Intersection</p>	<p>Reduces vehicle speeds in the vicinity of the treatment. Can lower vehicle speeds along the length of the street when placed in series.</p> <p>May discourage through traffic along the top of the 'T'.</p> <p>May be used to reinforce changes in priority resulting from alterations to conventional regulatory signing. (Stop signs and Give Way signs.)</p>	<p>May cause confusion regarding intersection priority if not correctly designed.</p>
 <p>11. Road Closures</p>	<p>Eliminates through traffic.</p> <p>Provides landscaping opportunities.</p> <p>Increases pedestrian safety.</p>	<p>May inconvenience residents in gaining access to their properties.</p> <p>Can shift traffic volumes to adjacent streets.</p> <p>May inhibit access by emergency vehicles.</p>
 <p>12. Shared Zone</p>	<p>Provides a low speed environment which is safer for pedestrians and cyclists.</p> <p>Can improve amenity without affecting access.</p> <p>Provides for flexibility of parking layouts.</p>	<p>High cost.</p>

## 14 APPLICATION OF LATM TREATMENTS

LATM treatments should not generally be used as isolated treatments, but rather should be installed as a consistent area-wide traffic management scheme in a local area. Implementation of such schemes may need to be staged over a period, and care in locating individual treatments in each stage is necessary.

A typical scheme comprises the following elements:

- (a) Perimeter (threshold) treatments at each point of access from the surrounding arterial or sub-arterial streets,
- (b) A local area residential speed limit, and
- (c) Internal LATM treatments selected as appropriate from those described in this Section, and placed at regular and frequent intervals, generally 80 to 120 m apart, on a street.

## SECTION 3. APPLICATION OF SIGNS AND MARKINGS TO TREATMENTS

### 15 GENERAL

This Section illustrates the general application of signs and pavement markings at or near typical LATM treatments. It also sets out criteria by which some signs and markings may be omitted when a fully developed area-wide scheme is in place.

The treatments illustrated are those for which evaluations have been undertaken, and those that have been widely used in recent years.

### 16 APPLICATION PRINCIPLES

As the primary aim of any LATM scheme is to improve the safety and amenity of the area, the treatments used should be designed and constructed so that both their presence and the appropriate way to negotiate them, are clearly evident to approaching road users.

Where an LATM treatment is part of a fully developed area-wide LATM scheme, certain signs and markings may be omitted. These are indicated in the descriptions of the devices or the arrangement diagrams for each treatment. Signs and markings shall not be omitted unless the development includes perimeter (threshold) treatments (see Clause 6) at all entrances to the area, together with internal treatments provided at not more than the recommended maximum spacings, and an area-wide speed limit. An exception may be made if a small proportion of these spacings is excessive, provided that the treatment at each end of such spaces are fully signed and marked in accordance with this Part of the Manual. Despite the foregoing, full signing and marking shall be provided for any treatment which may not be visible to approaching drivers at prevailing traffic speeds and under all reasonably expected weather conditions.

During staged construction of a scheme, all signs and markings shall be provided for LATM treatments until the scheme is fully developed, unless the scheme is installed in clearly defined individual segments. The entrances to such segments are to be specified using local traffic area signs – Speed Limit AREA (R4-10) sign; END Speed Limit AREA (R4-11) sign – at the segment boundaries. The locations of the segment boundaries need to be given careful consideration in relation to the position of LATM treatments, to ensure that a lower speed environment consistent with LATM principles exists within the segment at all times. In such circumstances, the signs and markings are the same as those provided for a fully developed area-wide scheme.

Full signs and markings shall be provided at an isolated treatment, notwithstanding that the treatment may be readily seen by drivers at prevailing traffic speeds.

If an LATM treatment is found to require substantial signing in order to guide motorists through it, consideration should be given to simplifying the treatment.

Signs which are intended to convey messages during the hours of darkness shall be illuminated or reflectorised (see Part 1 of this Manual). Part 1 of this Manual contains guidance on the installation and location of signs.

## 17 SPEED LIMITS

If an LATM scheme has been implemented within a local area and this area has clearly defined boundaries, a local area speed limit may be imposed. This speed limit is established by use of signs Speed Limit AREA (R4-10), and END Speed Limit AREA (R4-11) at each entry/exit point on the boundary of the area, e.g. as illustrated in Figure 3.

The speed limit used is 40 km/h, unless special circumstances dictate that it should be otherwise.

The imposition of a 40 km/h speed limit in a local area will not solve all perceived safety problems on the streets in that area nor will it necessarily alter travel speeds.

Arbitrarily imposed speed limits which are too low are not respected and actual speeds remain at the same level as before unless massive and continued enforcement is undertaken.

A 40 km/h local area speed limit should only be imposed where the geometry of the roads in the area and the LATM measures result in a general perception by drivers that this speed limit is the appropriate travel speed throughout the area.

The addition of perimeter (threshold) treatments, see Figure 3, at each entry to the local area will greatly assist in achieving the desired driver reaction.

Arterial and sub-arterial routes are not included in 40 km/h local area speed limits.

## 18 TYPICAL ARRANGEMENT DIAGRAMS FOR LOCAL AREA TRAFFIC MANAGEMENT TREATMENTS

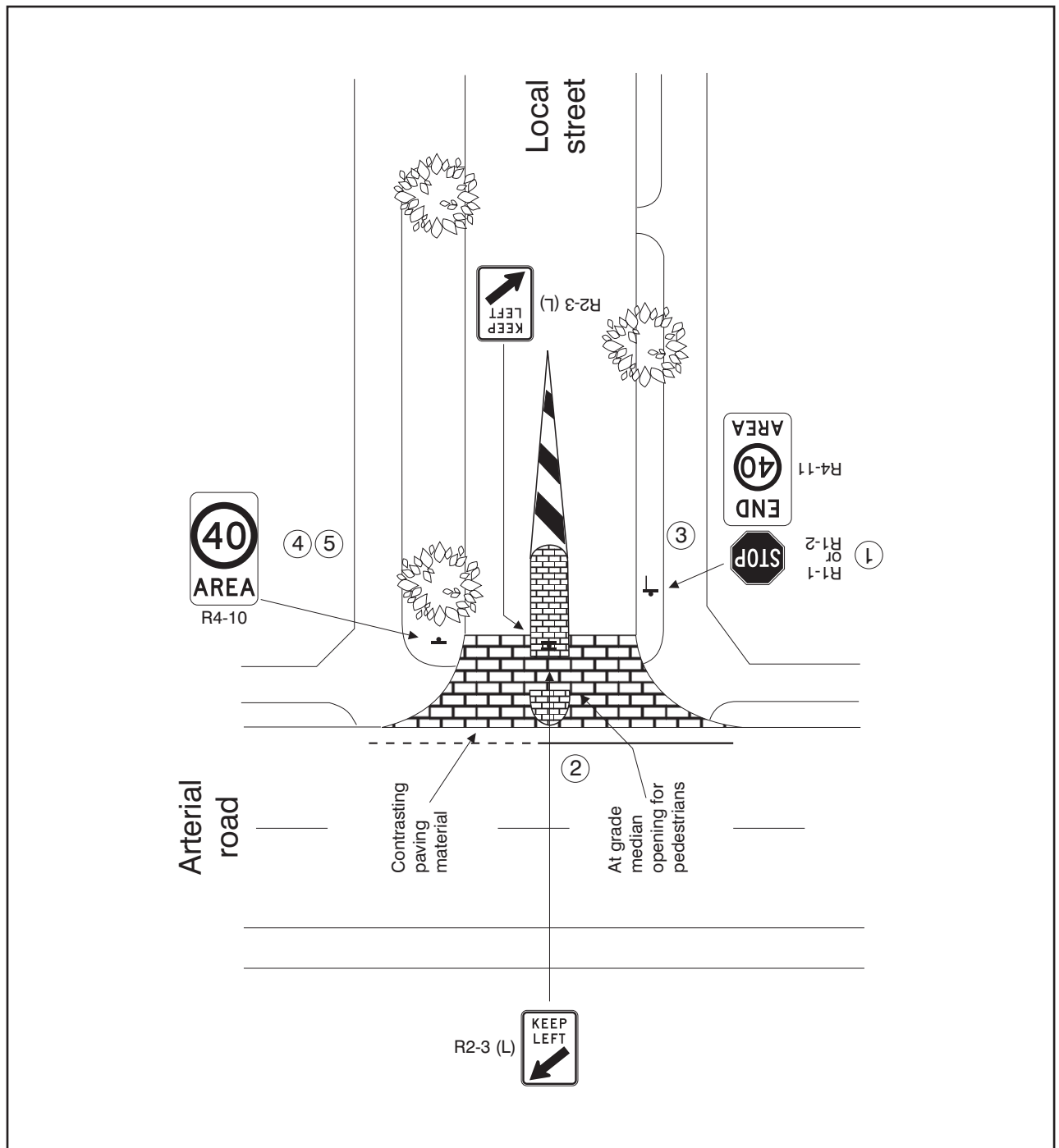
Signing and marking for the various types of LATM treatments are illustrated in Figures 3 to 14. The arrangements shown are typical for isolated treatments. The Notes to the Figures indicate signs etc, that may be omitted when the treatment is part of a fully implemented area-wide scheme or a clearly defined segment of a staged-construction scheme.

Signs at, or in the vicinity of, LATM treatments should be located, as for other street furniture, to ensure that –

- (a) sight distance is not affected at critical locations;
- (b) the signs are not obscured by other street furniture;
- (c) where appropriate, use is made of multiple use supports to reduce the number of sign installations to a minimum consistent with adequate safety.

This is particularly important where signs may need to be carefully placed with respect to traffic signals (on the perimeter of the local area), lighting columns, electrical distribution poles, or trees.

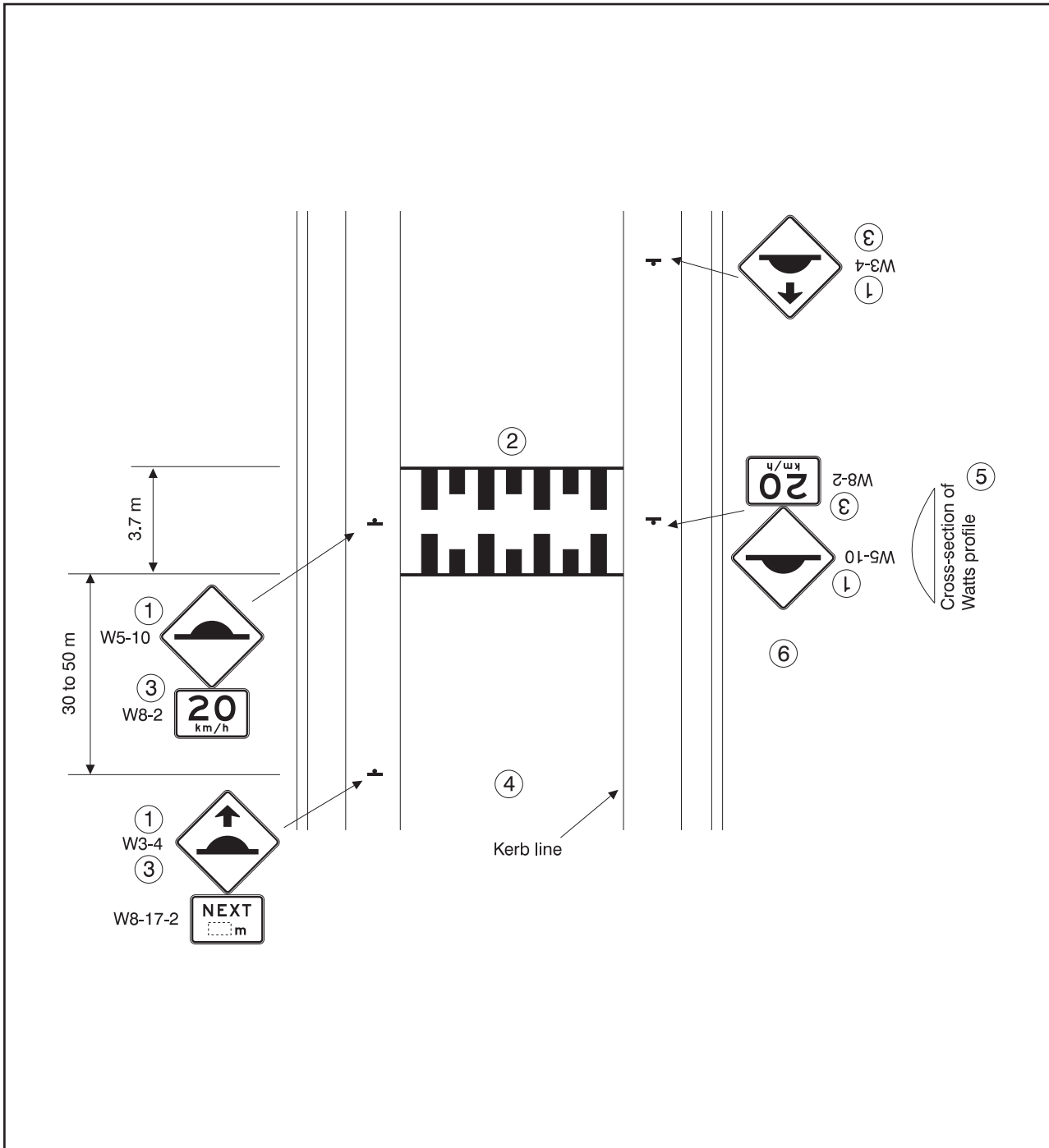
Raised reflectorised pavement markers (RRPMs) are shown on approach to certain treatments. The use of markers is optional and would depend upon the circumstances existing at each location. In some situations (e.g. at slow points) RRPMs may be replaced with reflectorised bollards (i.e. post-mounted delineators). Bollards may be circular or rectangular to suit the street environment.



## NOTES:

1. Refer to Clause 5 regarding the use of STOP signs and GIVE WAY signs.
2. The design of these treatments should allow for safe turns from the arterial road. This may require locating the splitter island further away from the intersection, or relocation of sign R2-3, or both.
3. For details of the design and use of street name signs, refer to Part 5 of this Manual.
4. Refer to Clause 17 regarding the use of local area speed limits.
5. Sign G9-41 may be mounted in conjunction with sign R4-10 where local streets may be difficult for large vehicles to negotiate (see Clause 20.3.4).

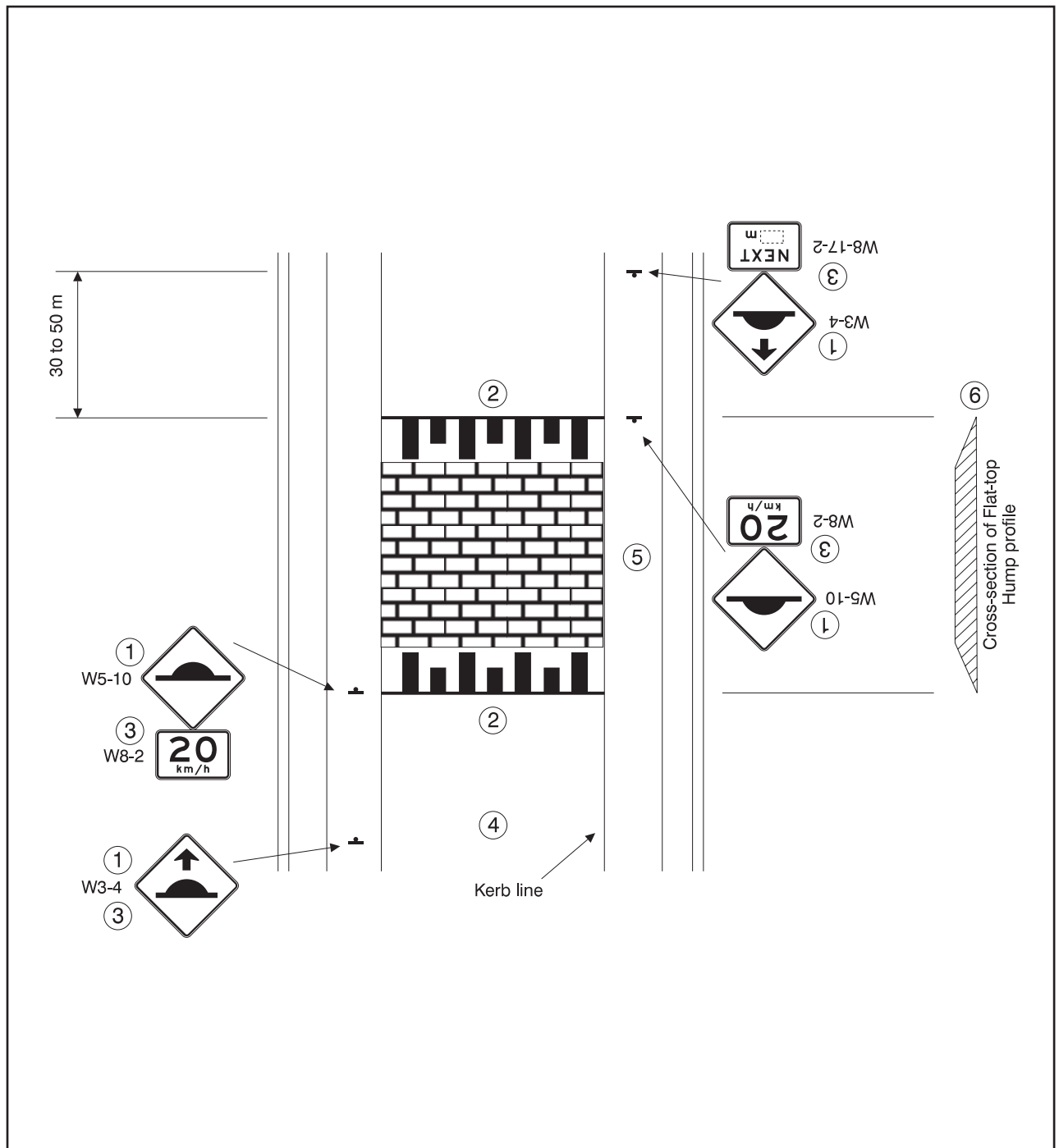
**Figure 3 PERIMETER (THRESHOLD) TREATMENT**



NOTES:

1. Sign W3-4, and sign assemblies W5-10/W8-2 and W3-4/W8-17-2 are not generally required when the treatment is part of an area-wide scheme, or a clearly defined segment of a staged-construction scheme (see Clause 16).
2. For details of hump line marking refer to Clause 21.6. This may be omitted on humps of a contrasting colour in an area-wide scheme or equivalent (see Clause 16) where the hump is clearly visible under all conditions.
3. Sign W3-4 is used in advance of isolated hump installations. Sign W8-17-2 is added if it is the first hump in a series. Sign W5-10 is used at an isolated hump; sign W8-2 is added to indicate the speed at which the hump should be crossed.
4. The hump may be supplemented with kerb extensions, see Figure 8.
5. For design details of Watts Profile road hump, see Appendix B.
6. Pedestrian facilities e.g. zebra crossing, are not combined with a Watts profile road hump.

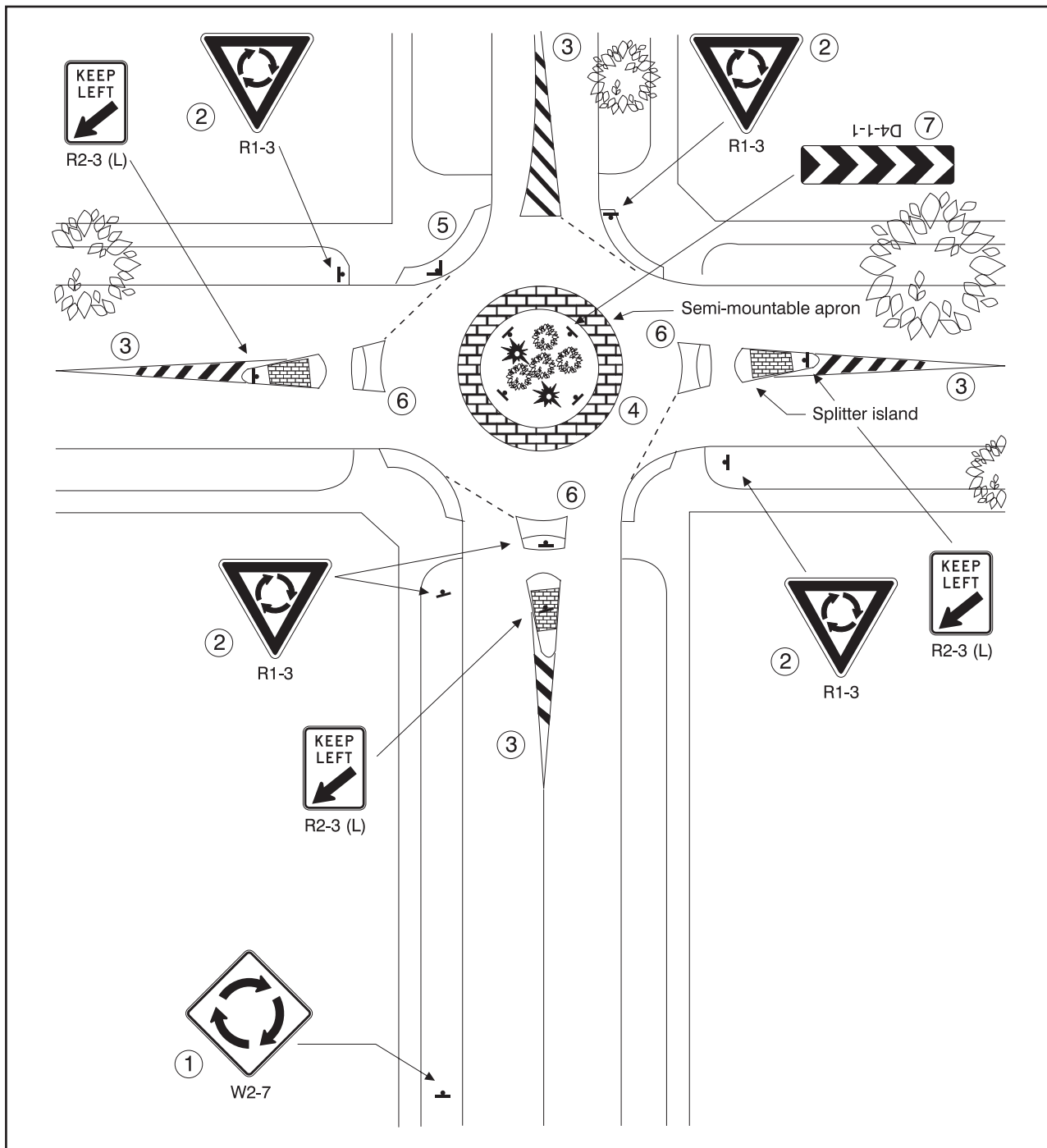
**Figure 4 WATTS PROFILE ROAD HUMPS**



## NOTES:

1. Sign W3-4, and sign assemblies W5-10/W8-2 and W3-4/W8-17-2 are not generally required when the treatment is part of an area-wide scheme, or a clearly defined segment of a staged-construction scheme (see Clause 16).
2. For details of hump line marking refer to Clause 21.6. This may be omitted on humps in an area-wide scheme or equivalent (see Clause 16) but only where the hump is of contrasting colour such that it is clearly visible under all conditions.
3. Sign W3-4 is used in advance of isolated hump installations. Sign W8-17-2 is added if it is the first hump in a series. Sign W5-10 is used at an isolated hump; sign W8-2 is added to indicate the speed at which the hump should be crossed.
4. The hump may be supplemented with kerb extensions, see Figure 8.
5. Flat top humps may be combined with a pedestrian facility or a bus stop.
6. For design details of flat-top road hump, see Appendix B.

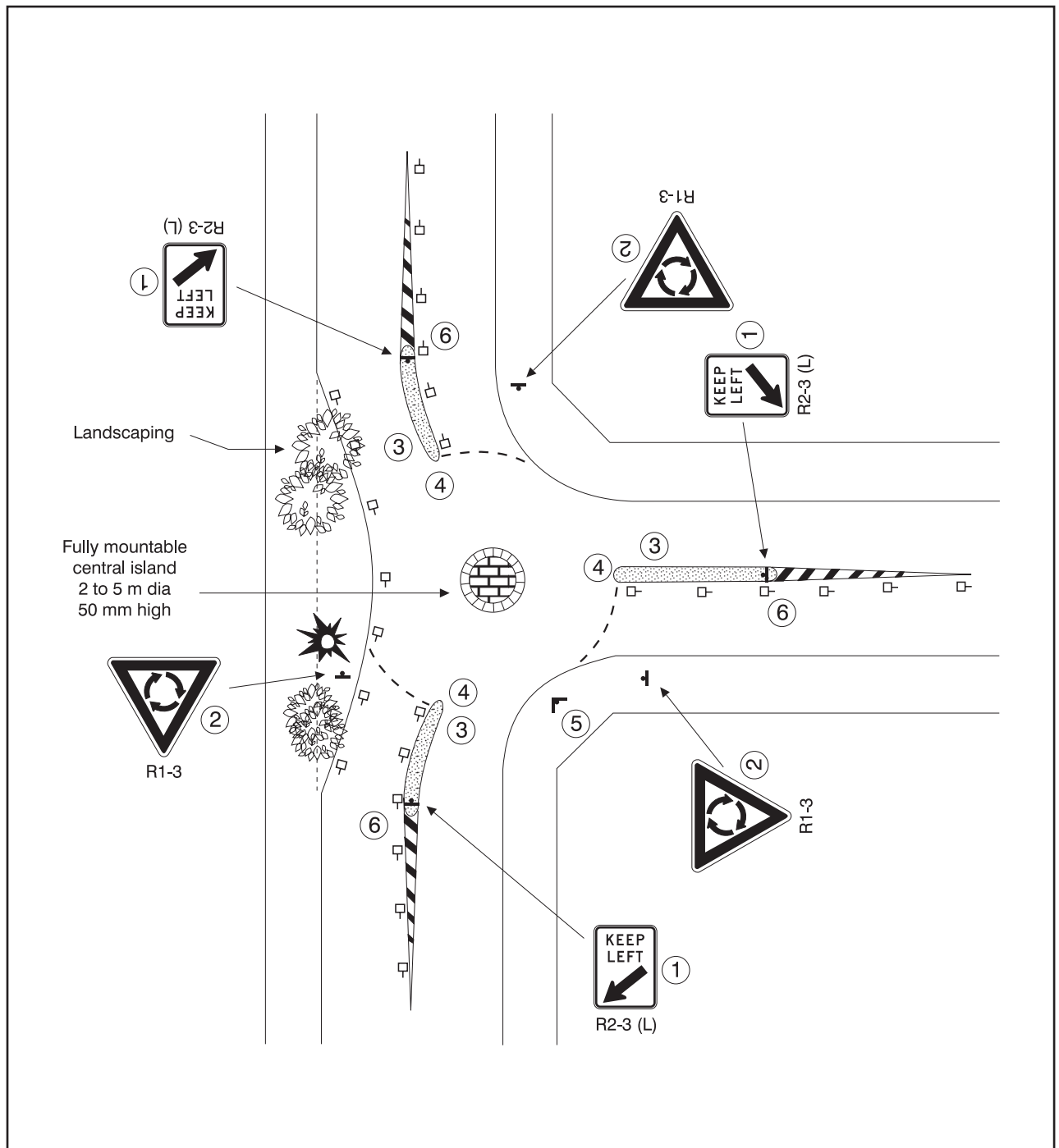
**Figure 5 FLAT-TOP ROAD HUMPH**



NOTES:

1. Sign W2-7 is not generally required in local streets, and should only be used where there is insufficient sight distance to the roundabout from one or more approaches (see Part 2 of this Manual).
2. Sign R1-3 is normally placed on the left side of the approach, but may be placed or duplicated in traffic islands as needed to provide maximum conspicuity for approaching drivers.
3. Island outline markings may be augmented with RRPMs.
4. Height of landscaping in the central island should be such as to allow adequate visibility across the island.
5. For details of the design and use of street name signs, refer to Part 5 of this Manual.
6. Kerb markings should be provided on traffic islands at the exit from the roundabout for added visibility. Where sufficient width is available sign D4-2-1 may be used together with, or in lieu of, kerb markings to delineate the nose of the island.
7. Sign D4-1 may be omitted at roundabout at minor local roads where adequate streetlighting is provided.

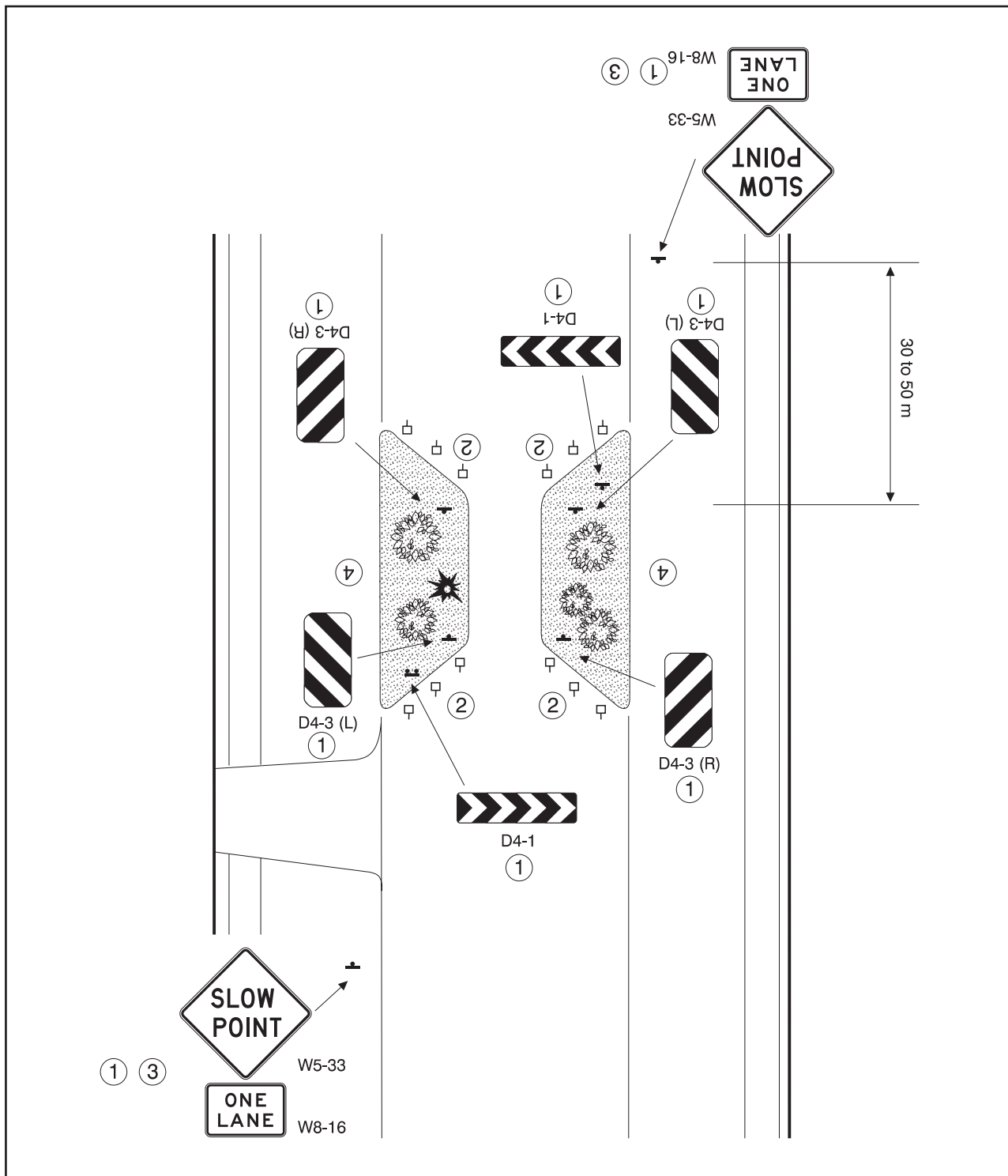
**Figure 6 LOCAL STREET ROUNDABOUT**



## NOTES:

1. Signs R2-3 may be omitted where the roundabout is an internal treatment in an area-wide scheme, or equivalent (see Clause 16), where traffic is clearly required to pass to the left of the island and adequate visibility exists to nose of island. Kerb markings are used to delineate the nose of the island in these circumstances.
2. Sign R1-3 is placed on left side of approach.
3. Walk-through gaps at pavement level may be provided in median islands.
4. Kerb markings should be provided on traffic islands at the exit from the roundabout and on the kerb extension for added visibility.
5. For details of the design and use of street name signs, refer to Part 5 of this Manual.
6. Island outline markings and kerb markings may be augmented with RRPMS (see Clause 21.7).

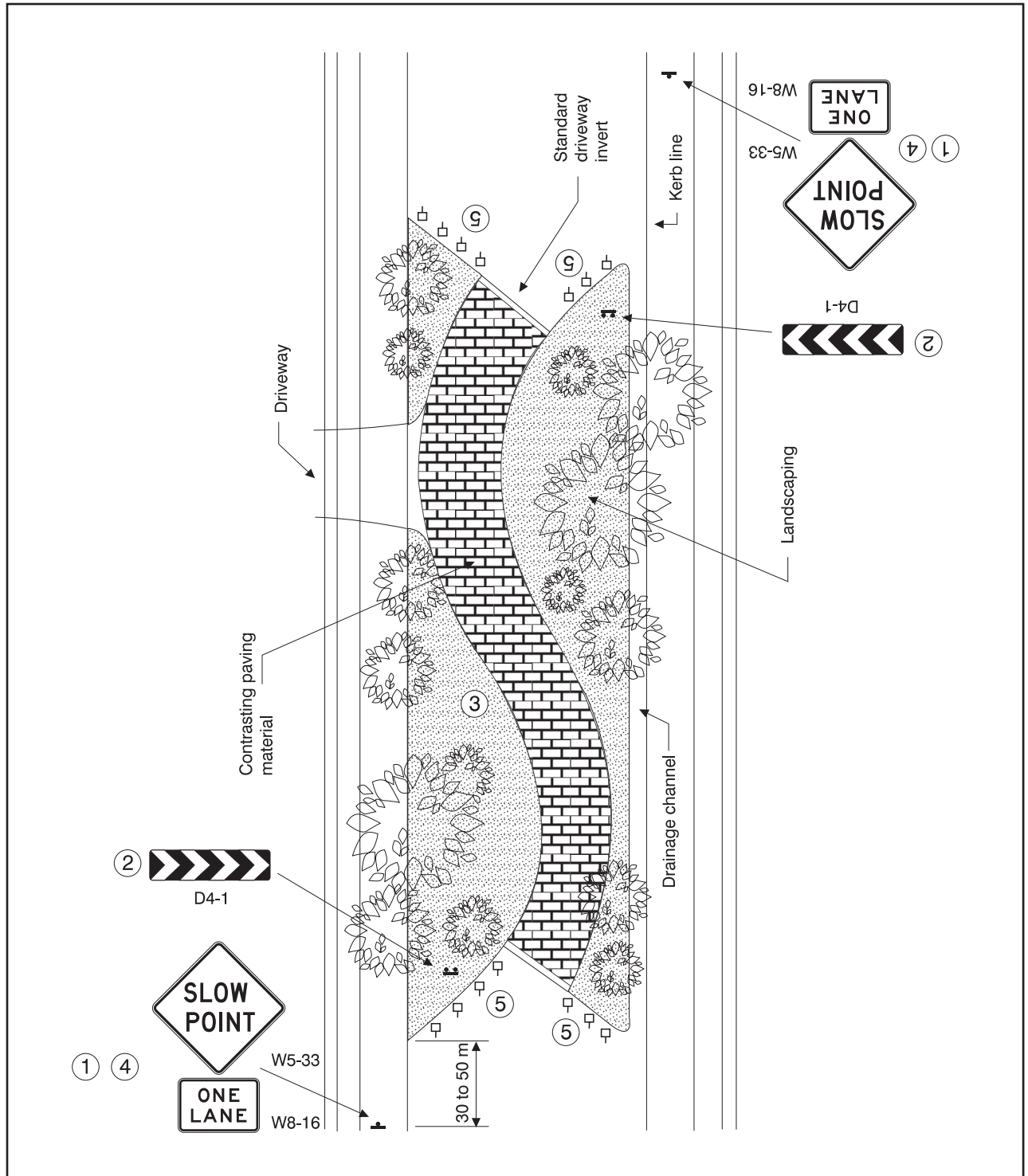
**Figure 7 SMALL DIAMETER ROUNDABOUT**



NOTES:

1. Sign assembly W5-33/W8-16 and signs D4-1 or D4-3 are not generally required when the treatment is part of an area-wide scheme or a clearly defined segment of a staged-construction scheme.
2. Kerb markings should be used, and may be augmented with RRPMS or bollards (see Clause 21.7).
3. For a slow point with road hump, sign assembly W5-10/W8-2 is erected at the road hump. Sign assembly W3-4/W8-16 is used in advance of the hump, in lieu of assembly W5-33/W8-16 (see Figure 4).
4. Special consideration may need to be given to the provision of safe passage for bicyclists. If provided behind the slow point it should be able to be kept free from rubbish.

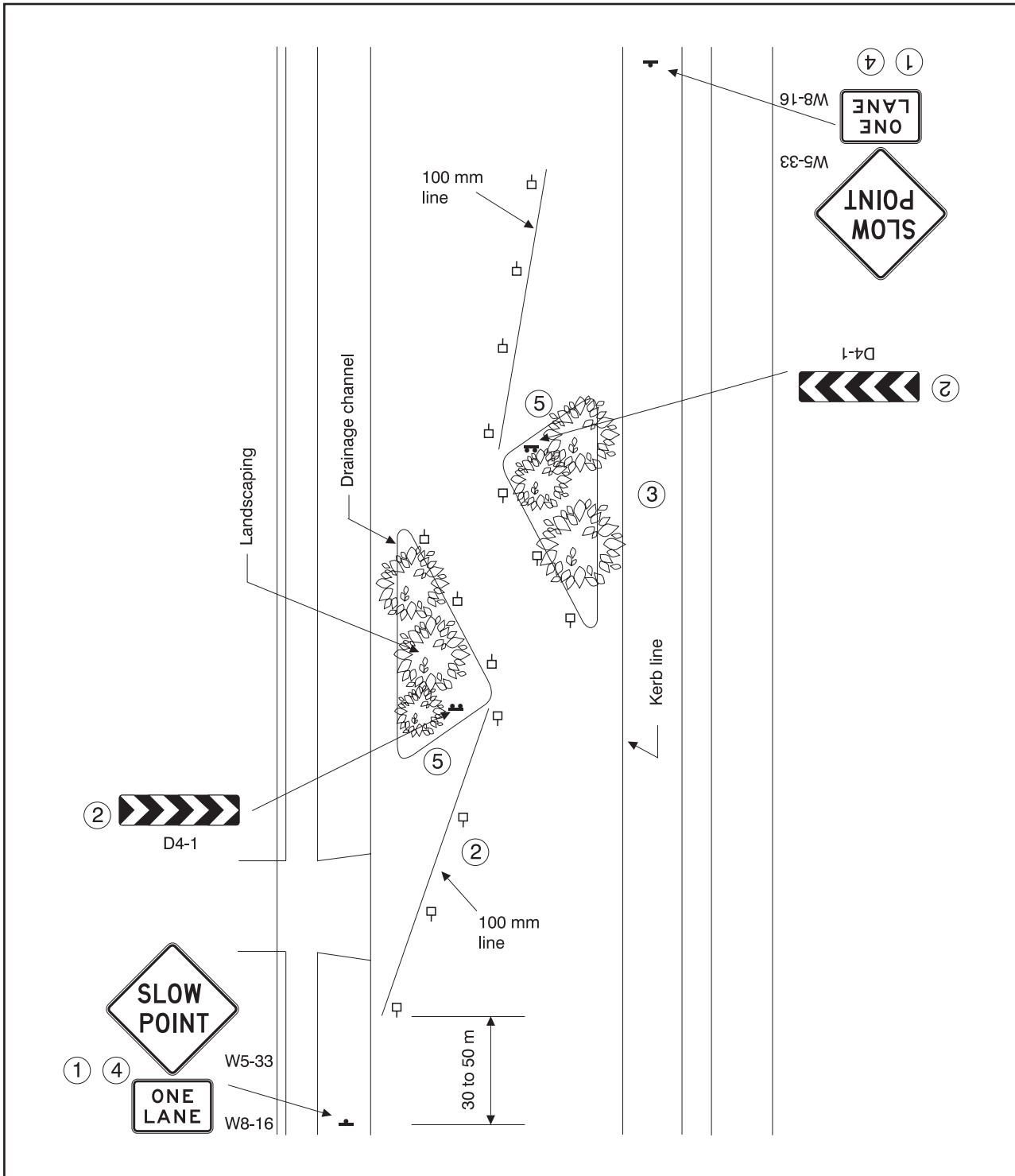
Figure 8 SINGLE LANE SLOW POINT



NOTES:

1. Sign assembly W5-33/W8-16 is not generally required in an area-wide scheme or equivalent (see Clause 16) if there is adequate visibility to the treatment having regard to likely approach speeds.
2. Hazard markers D4-1 may be omitted if the treatment is part of an area-wide scheme or a clearly defined segment of a staged-construction scheme.
3. If passing points are not constructed or passing is not practicable on long driveway links, drivers should be able to see from one end to the other.
4. An advisory speed sign (W8-2) may be needed in lieu of, or as well as, sign W8-16. It is used with sign W5-33.
5. Kerb markings should be used, and may be supplemented with RRPMs or bollards (see Clause 21.7).

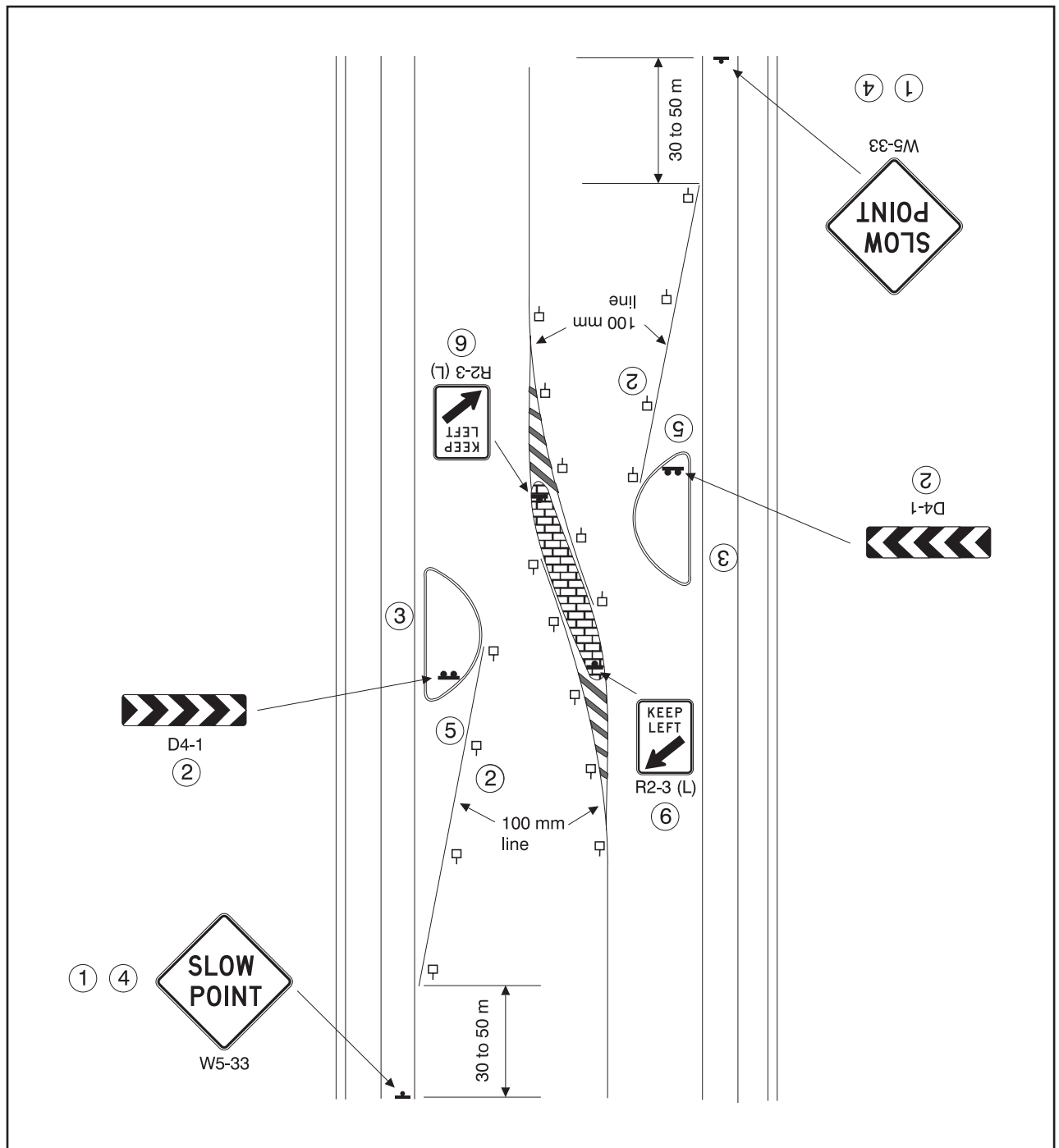
**Figure 9 DRIVEWAY LINK**



NOTES:

1. Sign assembly W5-33/W8-16 should only be used at an isolated treatment or if the treatment is the first in a series (see Clause 16).
2. Signs D4-1 and painted edge lines may be omitted if the treatment is part of an area-wide scheme or a clearly defined segment of a staged-construction scheme. In these circumstances RRPMS would also be relocated adjacent to the kerb extension.
3. Special consideration may need to be given to the provision of safe passage for bicyclists. If provided behind the slow point, it should be able to be kept free from rubbish.
4. An advisory speed sign (W8-2) may be added in lieu of, or as well as, sign W8-16 if approach speeds are high. It is used with sign W5-33.
5. Kerb markings should be used, and may be supplemented with RRPMS or bollards (see Clause 21.7).

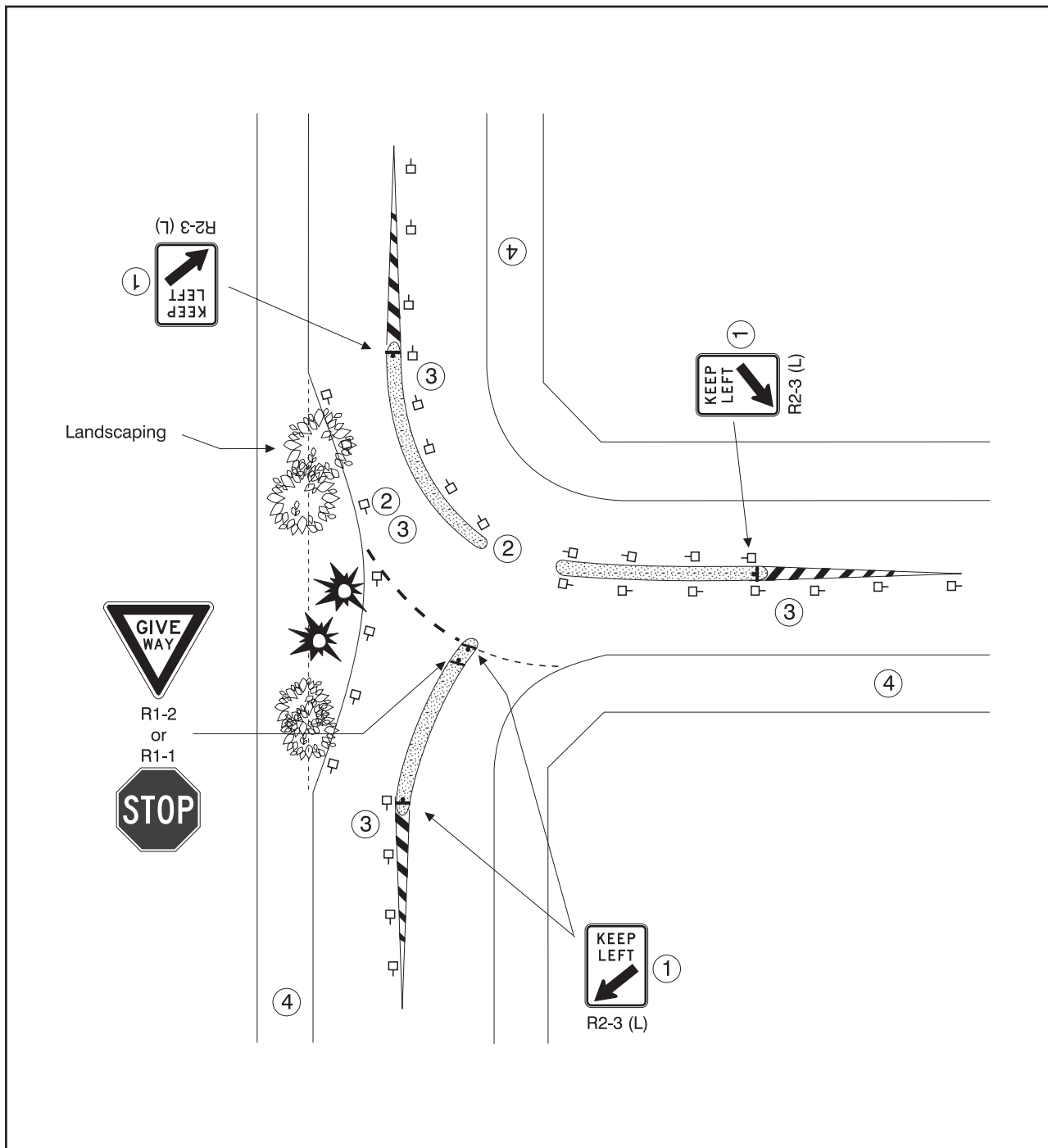
**Figure 10 SINGLE LANE ANGLED SLOW POINT**



## NOTES:

1. Sign W5-33 should only be used at an isolated treatment or if the treatment is the first in a series (see Clause 16).
2. Signs D4-1 and painted edge lines may be omitted if the treatment is part of an area-wide scheme or a clearly defined segment of a staged-construction scheme. In these circumstances RRPMS would also be relocated adjacent to the kerb extension.
3. Special consideration may need to be given to the provision of safe passage for bicyclists. If provided behind the slow point, it should be able to be kept free from rubbish.
4. An advisory speed sign (W8-2) may be mounted below sign W5-33 if approach speeds are high.
5. Kerb markings should be used, and may be supplemented with RRPMS or bollards (see Clause 21.7).
6. Signs R2-3(L) may be omitted where the treatment is an internal treatment in an area-wide scheme or equivalent (see Clause 16), where traffic is clearly required to pass to the left of the island and adequate visibility exists to the nose of the island. Kerb markings are used to delineate the nose of the island in these circumstances.

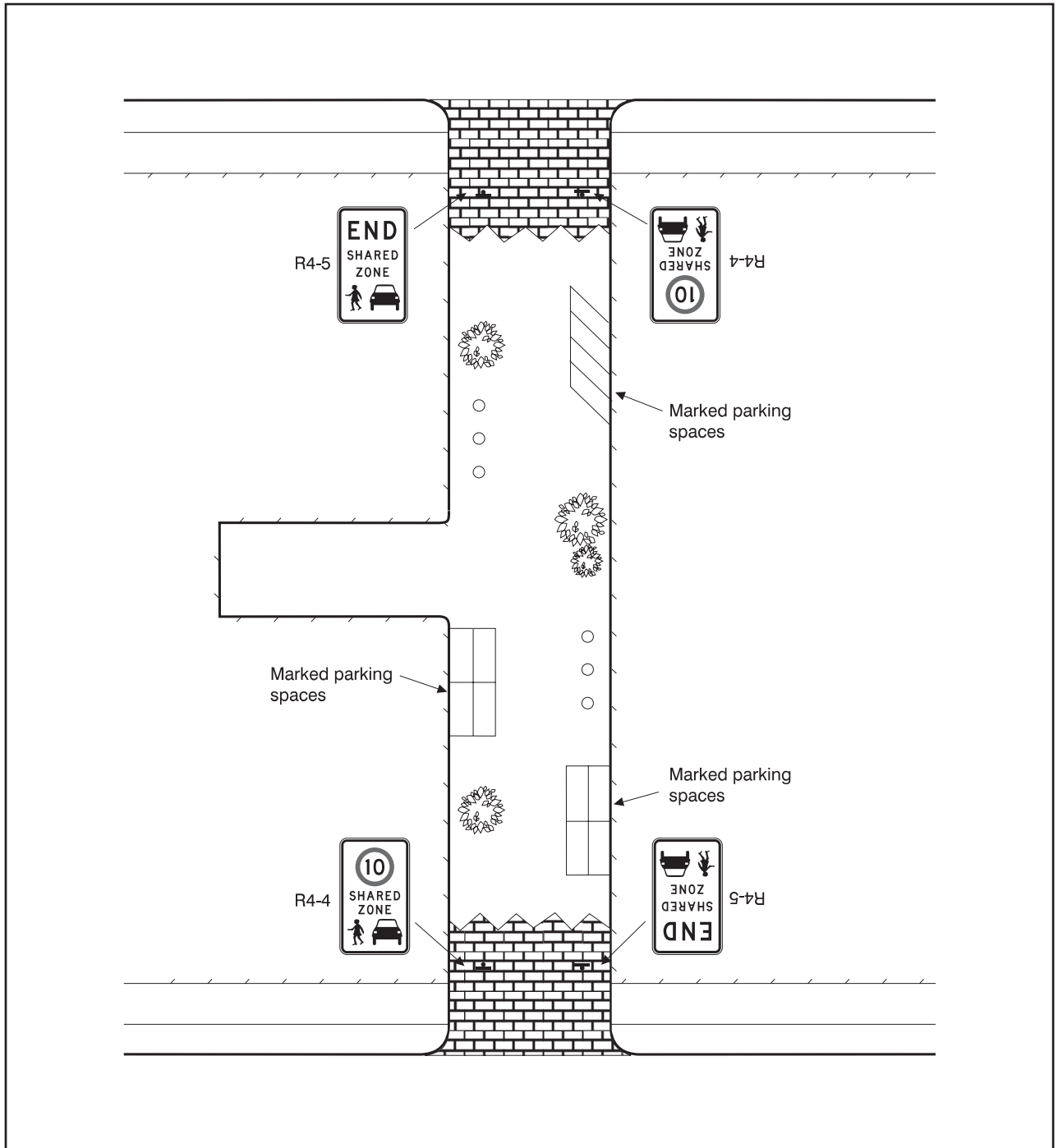
**Figure 11 TWO LANE ANGLED SLOW POINT**



NOTES:

1. Signs R2-3(L) may be omitted where the treatment is an internal treatment in an area-wide scheme or equivalent (see Clause 16), where traffic is clearly required to pass to the left of the island and adequate visibility exists to nose of island. Kerb markings are used to delineate the nose of the island in these circumstances.
2. Kerb markings should be provided on the landscaped kerb extension for added visibility (see Clause 21.8).
3. Island outline markings and kerb markings may be augmented with RRPMS (see Clause 21.7).
4. Curve or intersection warning signs are not generally needed to indicate the curve or layout at a modified T-intersection where the treatment is part of an area-wide scheme or a clearly defined segment of a staged-construction scheme.

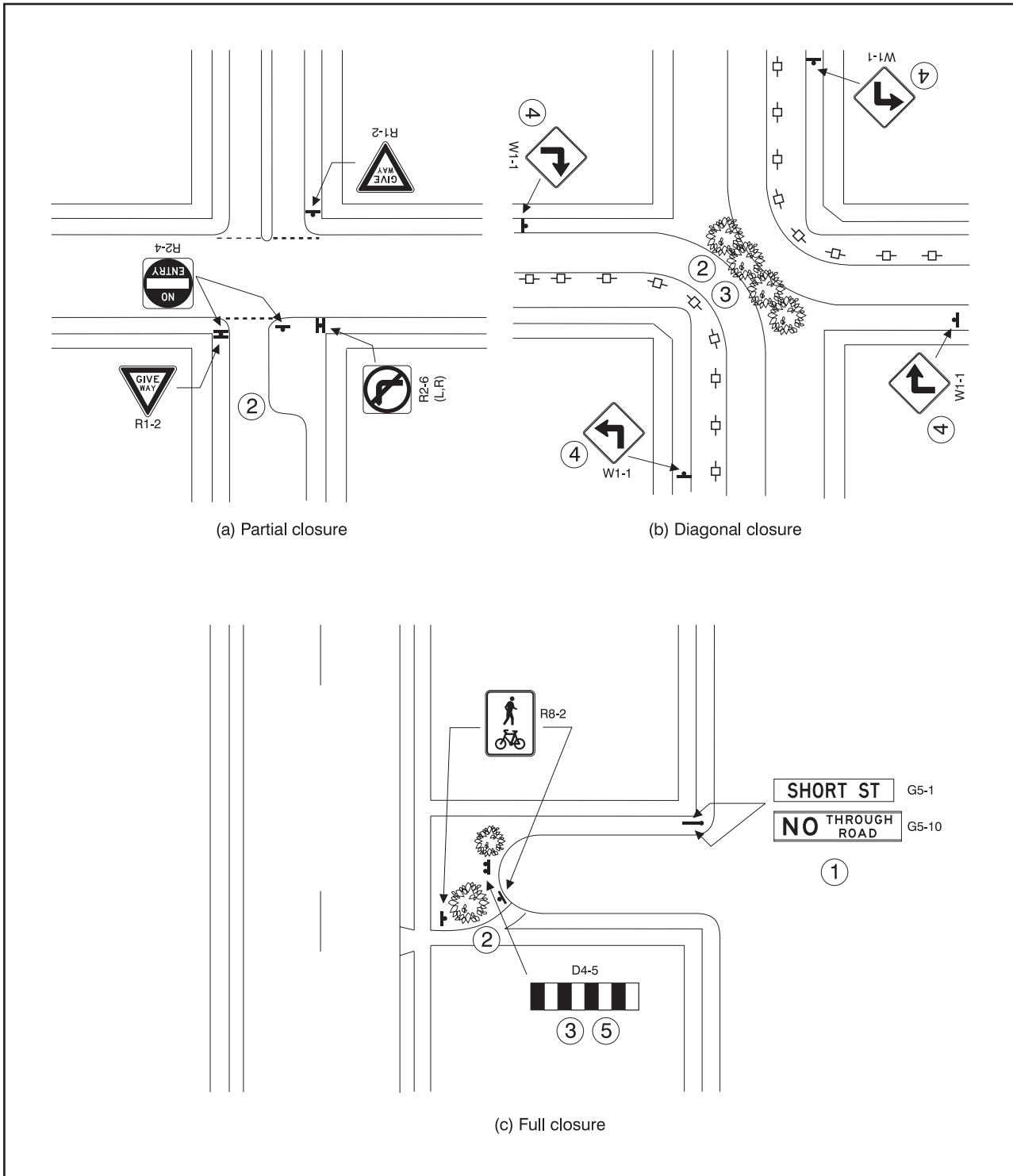
**Figure 12 MODIFIED T-INTERSECTION**



NOTES:

1. Sign G9-41 may be mounted in conjunction with sign R4-4 where it may be difficult for large vehicles to negotiate the shared zone (see Clause 20.3.4).

**Figure 13 SHARED ZONE**



NOTES:

1. Refer to Part 5 of this Manual for details of street name signing.
2. Provision for pedestrians, cyclists and emergency vehicles needs to be considered at all road closures. Provision for pedestrians and cyclists by means of a shared path (using sign R8-2) or a separated path (using sign R8-3) may be needed. END signs may be needed at long paths.
3. Hazard markers (e.g. D4-1, D4-5) may be required within the landscaped area until landscaping is fully established.
4. Curve warning signs (W1 Series) are not generally required where the treatment is part of an area-wide scheme or a clearly defined segment of a staged-construction scheme.
5. Sign D4-5 may be omitted in an area-wide scheme or where the length of the street is less than 100-150m. Sign D4-5 may be supplemented with sign G9-20 at an isolated treatment (see Clause 20.3.2).

Figure 14 ROAD CLOSURES

## SECTION 4. SIGNS AND PAVEMENT MARKINGS

### 19 GENERAL

This Section specifies the signs and pavement markings used in conjunction with LATM treatments and for directing and controlling traffic in LATM schemes.

Application of signs and markings to treatments are illustrated in Section 3.

### 20 SIGNS

Signs used to control vehicles in LATM schemes are listed in Table 2.

**Table 2 SIGNS USED IN LOCAL AREA TRAFFIC MANAGEMENT SCHEMES – SIZE TABLE**

Sign	Sign number	Size (mm)
STOP	R1-1A	600 x 600
	R1-1B	750 x 750
GIVE WAY	R1-2A	750 height
	R1-2B	900 height
	R1-2C	1200 height
Roundabout	R1-3A	750 height
	R1-3B	900 height
	R1-3C	1200 height
ONE WAY (L or R)	R2-2A	450 x 600
	R2-2B	600 x 800
KEEP LEFT & KEEP RIGHT	R2-3A	450 x 600
	R2-3B	600 x 800
NO ENTRY	R2-4A	450 x 450
	R2-4B	600 x 600
	R2-4C	750 x 750
	R2-4D	900 x 900
No Left (Right) Turn	R2-6A	450 x 450
	R2-6B	600 x 600
	R2-6C	750 x 750
	R2-6D	900 x 900
SHARED ZONE	R4-4	450 x 750
END SHARED ZONE	R4-5	450 x 750
Speed Limit AREA	R4-10A	450 x 750
	R4-10B	600 x 1000
END Speed Limit AREA	R4-11A	450 x 750
	R4-11B	600 x 1000
No Trucks	R6-10-2A	600 x 600
	R6-10-2B	900 x 900
END	R7-4B	450 x 150
	R7-4C	600 x 200
Shared Path	R8-2A	300 x 400
	R8-2B	450 x 600
	R8-2C	600 x 800
Separated Path	R8-3A	300 x 300
	R8-3B	450 x 450
	R8-3C	600 x 600
Times of Operation Supplementary Plates	R9-1-1A	450 x 300
	R9-1-1B	600 x 400
	R9-1-2A	450 x 450
	R9-1-2B	600 x 600

**Table 2 (continued)**

Sign	Sign number	Size (mm)				
BICYCLES EXCEPTED	R9-3A R9-3B	450 x 300 600 x 400				
Turn	W1-1	<table style="border: none;"> <tr> <td style="border: none;">}</td> <td style="border: none;">A</td> </tr> <tr> <td style="border: none;">}</td> <td style="border: none;">B</td> </tr> </table>	}	A	}	B
}	A					
}	B					
Roundabout Ahead	W2-7					
Road Hump Ahead	W3-4					
ISLAND	W4-5					
Road Hump	W5-10					
SLOW POINT	W5-33					
Advisory Speed	W8-2A W8-2B		600 x 400 750 x 500			
ON SIDE ROAD	W8-3A W8-3B		600 x 400 750 x 500			
ONE LANE	W8-16A W8-16B	600 x 400 750 x 500				
NEXT ...m	W8-17-2A W8-17-2B	600 x 400 750 x 500				
NO THROUGH ROAD	G5-10	850 x 200				
NO THROUGH ROAD	G9-18A G9-18B	600 x 400 900 x 600				
ROAD CLOSED	G9-20	900 x 550				
LOCAL TRAFFIC ONLY	G9-40-1A G9-40-1B	900 x 600 1200 x 800				
UNSUITABLE FOR LARGE VEHICLES	G9-41A G9-41B	450 x 300 600 x 400				
Unidirectional Hazard Markers	D4-1-1 D4-1-2A D4-1-2B	1600 x 400 450 x 450 600 x 600				
Bidirectional Hazard Markers	D4-2-1 D4-2-2 D4-Q01	1800 x 300 400 x 1000 450 x 600				
Width Markers	D4-3 A (L, R)	225 x 450				
Obstruction Marker	D4-5	1800 x 450				

**20.1 Regulatory signs**

**20.1.1 Stop (R1-1)**



R1-1

The STOP sign is used for the same purpose as the GIVE WAY sign (R1-2) (see Clause 20.1.2) but with the additional requirement that a complete stop is necessary for safety before entering the intersection (see Clause 5).

It shall be positioned in accordance with the requirements for GIVE WAY signs (see Clause 20.1.2) and be supplemented with the pavement markings shown in Clause 21.4.

### 20.1.2 Give way (R1-2)



R1-2

The GIVE WAY sign is used at locations where safe and efficient operation requires that traffic entering an intersection give way to other traffic entering that intersection or where there is a need to clarify which traffic is required to give way to other traffic. It is provided as set out in Clause 5.

Signs shall be erected as close as practicable to the edge of the intersecting roadway. Where a sign-controlled road intersects at an acute angle, the sign should be placed so that its face is not prominently in the view of road users on the through roadway.

GIVE WAY signs are supplemented with the pavement markings shown in Clause 21.4.

Guidelines for the installation of STOP signs (R1-1) and GIVE WAY signs (R1-2) are given in Part 2 of this Manual.

### 20.1.3 Roundabout (R1-3)



R1-3

The Roundabout sign shall be used on the immediate approach to roundabouts to indicate that traffic entering the roundabout must give way to traffic already within the roundabout. It is erected on all approaches, and should be located as near as practicable to the associated holding line (see Clause 21.3) at the entry point to the roundabout.

### 20.1.4 One way (R2-2)



R2-2 (L)

The ONE WAY sign shall be used to indicate a roadway upon which vehicular traffic is allowed to travel in one direction only.

A ONE WAY sign (R2-2) shall be located at the beginning of a one-way roadway or street and shall be repeated at intermediate intersections and junctions with that street. In some circumstances signs may be warranted on both sides of the roadway. Particular care should be taken to ensure that at least one sign is clearly visible on any approach to the street.

Where a one-way roadway terminates at an intersection, NO ENTRY signs (R2-4) shall be used to prohibit access from the wrong direction, see Clause 20.1.6.

### 20.1.5 Keep left or keep right (R2-3)



R2-3 (L)

The KEEP LEFT and KEEP RIGHT signs shall be used where a physical obstruction exists, e.g. traffic island or median, and it is necessary for all vehicles approaching such an obstruction to pass it on one side only.

The signs should be located at least 600 mm beyond the approach end of the obstruction. In certain circumstances it may be necessary to place them at greater distance, especially where the approach end tapers to a narrow point, or the sign is vulnerable to turning traffic.

**20.1.6 No entry (R2-4)**



R2-4

The NO ENTRY sign shall be used at the termination of a one-way roadway to prohibit access from the wrong direction. At one-way street exits, at least one NO ENTRY sign shall be erected at the intersection facing in the opposite direction to the one-way flow. The signs may need to be located a short distance into the one-way street if there is a possibility of drivers becoming confused as to which street is closed to entry. Sufficient signs shall be erected to ensure that at least one is clearly visible to drivers approaching from any direction, and some signs may have to be set at an angle to achieve this purpose.

At channelised intersections, signs such as the KEEP LEFT sign R2-3(L) which give positive instructions are preferable to NO ENTRY signs.

**20.1.7 No right turn, no left turn (R2-6)**



R2-6 (L)



R2-6 (R)

The No Right Turn or No Left Turn sign shall be used at intersections where vehicles are forbidden to make a turn to the right or left, respectively.

Times of operation supplementary plates (R9-1) Clause 20.1.14, are used in conjunction with these signs when the prohibition applies at certain times only.

**20.1.8 Speed restriction**

Local area speed limits are imposed by use of Speed Limit AREA signs (R4-10), Clause 20.1.10, at the area boundary. Where repeater signs are required within the area speed zone, these shall be Speed Limit AREA signs; and the smallest size (R4-10A) is reserved for this purpose.

**20.1.9 Shared zone signs (R4-4 and R4-5)**



R4-4



R4-5

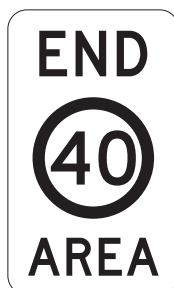
The SHARED ZONE sign (R4-4) shall be used at all entry points to a shared zone in which the street environment has been adapted for low vehicle speeds. A speed limit of 10 km/h is usually considered appropriate, see Clause 10.

The END SHARED ZONE sign (R4-5) is used to indicate the legal ending of the shared zone, where needed.

**20.1.10 Speed limit area signs (R4-10 and R4-11)**



R4-10



R4-11

The Speed Limit AREA sign (R4-10) shall be used at all the entry points to a local area in which the street environment has been adapted, or designed, for low vehicle speeds, and in which normally a 40 km/h local area speed limit has been imposed.

An END Speed Limit AREA sign (R4-11) is used at all exit points from a local area to indicate its legal ending and the ending of the 40 km/h local area speed limit.

The application of speed limits to local areas is set out in Clause 17.

**20.1.11 No trucks (R6-10-2)**



R6-10-2

A No Trucks sign is used to indicate that trucks are prohibited from entering a street. The special supplementary plate ... t GVM AND OVER (R7-Q03) may be mounted below this sign (see Part 12 of this Manual).

**20.1.12 Shared path (R8-2)**



R8-2

The Shared Path sign shall be used to designate a length of path that is for the joint use of pedestrians and bicycles.

Where a sign is needed to indicate the end of a shared path, the supplementary plate END (R7-4) is mounted below this sign. (See Clause 20.1.14).

**20.1.13 Separated path (R8-3)**



R8-3(R)

The Separated Path sign shall be used to indicate a length of path upon which bicycles travel on one side and pedestrians upon the other.

To indicate the end of a separated path, the supplementary plate END (R7-4) is mounted below this sign, where appropriate (see Clause 20.1.14).

**20.1.14 Supplementary plates (R7-4, R9-1 and R9-3)**



R7-4

Supplementary plate END (R7-4) is used appropriately with signs R8-2 and R8-3 to mark the end of the relevant facility.



R9-1-1

Times of operation supplementary plates (R9-1-1 and R9-1-2) are used as required below another regulatory sign, for example, the No Right Turn or No Left Turn sign (R2-6) when the prohibition applies at certain times only.



R9-1-2

Supplementary plate BICYCLES EXCEPTED (R9-3) may be used with another regulatory sign where bicycles are exempted from the control.



R9-3

The width of these plates should match the size of the sign with which they are used and be mounted below the sign.

## 20.2 Warning signs

Warning signs in this section may be provided in advance of a facility where there is insufficient sight distance along the road to the facility. Where the sight distance is less than the stopping distance given in Part 2 of this Manual (corresponding to the 85th percentile speed) a warning sign may be required, see Clause 16.

### 20.2.1 Turn (W1-1)



W1-1 (L)

The Turn sign should be used in advance of a sub-standard curve, see Figure 14(b).

The Advisory Speed sign (W8-2) should be mounted below this sign, see Part 2 of this Manual.

The Turn sign is not normally required where the treatment to which it applies is part of an area-wide scheme or a clearly defined segment of a staged-construction scheme, see Clause 16.

### 20.2.2 Roundabout ahead (W2-7)



W2-7

The Roundabout Ahead sign is used on the approach to a roundabout where there is insufficient sight distance to the roundabout from that approach.

### 20.2.3 Road humps ahead (W3-4)



W3-4

The Road Humps Ahead sign is used in advance of an isolated hump or at the start of a section of road in which a series of road humps has been installed. The sign is not normally required where the road humps form part of an area-wide LATM scheme or a clearly defined segment of a staged-construction scheme, see Clause 16.

The NEXT (Distance)...m sign (W8-17-2), Clause 20.2.10, is used to indicate the length of road over which a series of road humps has been installed.

The Road Hump sign (W5-10), with the ON SIDE ROAD supplementary plate (W8-3) mounted below it, may be used to warn road users approaching an intersection where road humps have been installed along the intersecting street. This assembly is only used where there is insufficient distance in the intersecting street to erect a Road Humps Ahead sign (W3-4) in the intersecting street.

### 20.2.4 Island (W4-5)



W4-5

The ISLAND sign is used where it is necessary to warn of a traffic island, or the first of a series of traffic islands, extending over a distance of less than 300 m.

### 20.2.5 Road hump (W5-10)



W5-10

The Road Hump sign (W5-10) is used to warn of any sharp rise in the road profile that is sufficiently abrupt to either create a hazardous condition, cause considerable discomfort to passengers, cause shifting of the cargo, or deflect a vehicle from its course when crossed at or above the 85th percentile speed for that section of road. It is used at all types of hump regardless of length or cross-sectional shape. The Advisory Speed supplementary plate (W8-2) is used with this sign as described in Clause 20.2.7.

It is generally used only at isolated road humps, or at the leading hump in a series of humps in a linear scheme. It is not normally required where road humps form part of an area-wide LATM scheme or a clearly defined segment of a staged-construction scheme, see Clause 16.

### 20.2.6 Slow point (W5-33)



W5-33

The SLOW POINT sign is used to indicate a slow point such as a kerb extension or angled slow point, or a driveway link.

It is generally used only at isolated slow points or driveway links, or at the first such treatment in a series in a linear scheme. It is not normally required where the treatment forms part of an area-wide scheme or a clearly defined segment of a staged-construction scheme, see Clause 16.

The Advisory Speed supplementary plate (W8-2) may be mounted below this sign to indicate the comfortable speed of negotiation of the slow point or driveway link.

### 20.2.7 Advisory speed (W8-2)



W8-2

The Advisory Speed supplementary plate supplements sign W5-10, where used, at each road hump indicating the speed of 20 km/h which is the appropriate crossing speed for the hump profiles shown in Appendix B, Figure B1.

It may also be used to supplement a Curve or Turn warning sign (W1 series), or with the SLOW POINT sign (W5-33).

### 20.2.8 On side road (W8-3)



W8-3 (L)

The ON SIDE ROAD supplementary plate is used to supplement the Road Hump sign (W5-10) to warn road users approaching an intersection where road humps have been installed along the intersecting street.

### 20.2.9 One lane (W8-16)



W8-16

The ONE LANE supplementary plate is used to supplement the Road Hump Ahead sign (W3-4) or SLOW POINT sign (W5-33) to indicate a single lane treatment where the reduction to one lane is not readily apparent.

### 20.2.10 Next (Distance) ... m (W8-17-2)



W8-17-2

The NEXT (Distance) ...m supplementary plate is mounted below the Road Humps Ahead sign (W3-4) to indicate the length of road over which a series of road humps has been installed.

## 20.3 Guide signs

### 20.3.1 No through road (G9-18 and G5-10)



G9-18

A NO THROUGH ROAD sign should be used where there is a possibility that through traffic may enter a dead-end street in error.

Sign G5-10 is designed to be mounted underneath the street name sign in the side road.



G5-10

### 20.3.2 Road closed (G9-20)



G9-20

The ROAD CLOSED sign should be erected in the centre of a road which is closed to vehicular traffic. It should be erected in conjunction with a permanent barrier across the roadway.

### 20.3.3 Local traffic only (G9-40-1)



G9-40-1

The LOCAL TRAFFIC ONLY sign may be used at the entrance to a local area to advise road users that the street is not intended for through traffic.

### 20.3.4 Unsuitable for large vehicles (G9-41)



G9-41

The UNSUITABLE FOR LARGE VEHICLES sign may be mounted in conjunction with the Speed Limit AREA sign (R4-10), or the SHARED ZONE sign (R4-4), to warn of the existence of treatments or constrictions which may be difficult for large vehicles to negotiate. This sign is usually used only in circumstances where large vehicles may inadvertently enter the local traffic area e.g. where commercial development is adjacent to the local traffic area.

## 20.4 Hazard markers

### 20.4.1 Unidirectional hazard marker (D4-1-1, D4-1-2)



D4-1-1



D4-1-2

Unidirectional hazard markers (D4-1-1, D4-1-2) are used –

- (a) to indicate an abrupt narrowing of the pavement, e.g. at a slow point;
- (b) to delineate an exposed median end or other roadway obstruction where all traffic must pass to one side; and
- (c) to delineate vehicle paths at intersections.

Chevrons may point to the right or the left to indicate the direction vehicles must take at or past the sign.

Hazard markers may not be required if the treatment and the intended traffic path are clearly visible to approaching drivers at all times, or if the treatment is part of an area-wide scheme.

### 20.4.2 Bidirectional hazard markers (D4-2-1, D4-2-2 and D4-Q01)



D4-2-1

Bidirectional Hazard Markers are used to delineate the nose of an island or other obstruction where traffic may travel to either side.

Typical sizes for the hazard markers are 1800 mm x 300 mm for D4-2-1, 400 mm x 1000 mm for D4-2-2 and 450 mm x 600 mm for D4-Q01, but these may be varied to suit a particular condition.



D4-2-2



D4-Q01

### 20.4.3 Width marker (D4-3)



D4-3 (L)



D4-3 (R)

Width markers are normally erected in pairs, one either side of the roadway at points where the roadway narrows e.g. at single lane slow points. Width marker D4-3(R) may also be erected singly below the Keep Left sign (R2-3(L)) on the first of a series of traffic islands, to delineate the nose of the island.

### 20.4.4 Obstruction marker (D4-5)



D4-5

Obstruction markers may be used to delineate obstructions within or above the road. Typical uses of these markers are:

- (i) to highlight road closures, either midblock or at the end of a cul-de-sac;
- (ii) to delineate vertical clearance above the road where height restrictions exist (see Part 2 of this Manual).

## 21 PAVEMENT MARKINGS AND DELINEATION

### 21.1 General

The pavement marking and delineation more commonly used in LATM schemes are described in Clauses 21.2 to 21.9 inclusive. All pavement markings are white and shall be reflectorised. Full details of pavement markings are provided in Part 2 of this Manual.

### 21.2 Stop lines

A stop line is an unbroken line 300 mm wide marked across the traffic lanes approaching a traffic control device at which traffic legally is required to stop. It indicates the point behind which vehicles are to stop when required.

At STOP signs where visibility is often restricted, positioning of the stop line should take into account the driver's line of sight both to left and right, the needs of pedestrians, and the clearance from traffic in the intersecting road.

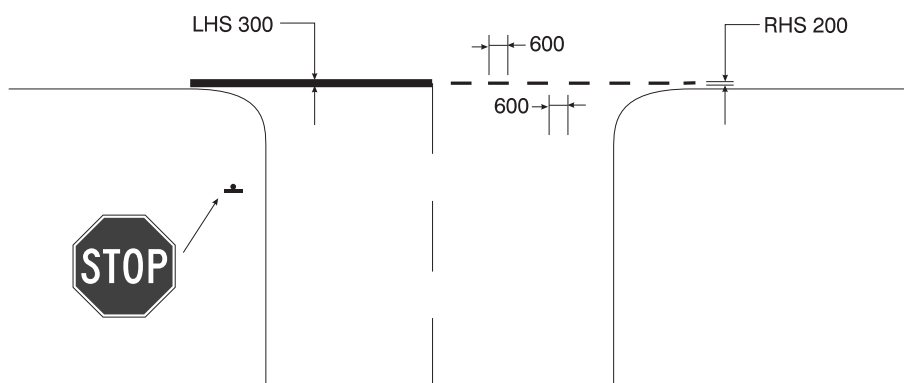
Stop lines shall generally be either parallel to the line of the intersecting road, or at right angles to vehicles approaching the line.

### 21.3 Holding lines

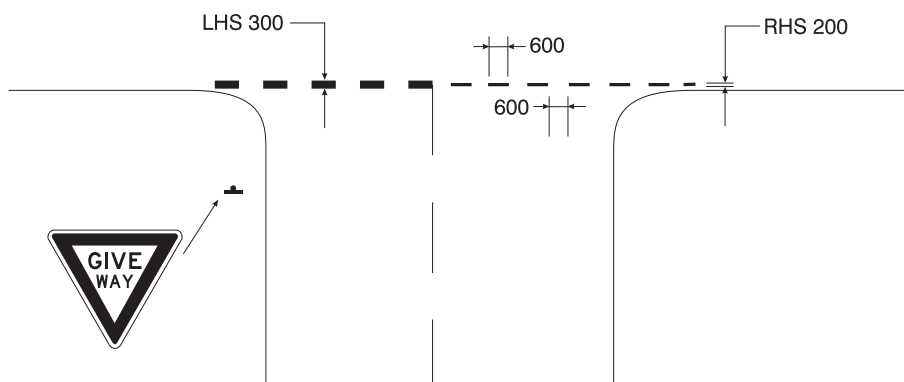
A holding line is a broken line 300 mm wide and shall consist of line segments 600 mm long separated by 600 mm gaps. Holding lines shall be used to indicate the safe position for a vehicle to be held at a GIVE WAY sign or a Roundabout sign.

### 21.4 Pavement markings at STOP signs and GIVE WAY signs

The stop and holding line markings to be used with STOP signs and GIVE WAY signs are illustrated in Figure 15.



(a) Pavement markings at STOP signs



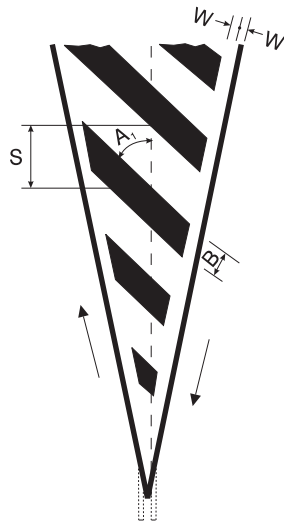
(b) Pavement markings at GIVE WAY signs

Figure 15 PAVEMENT MARKINGS AT STOP SIGNS AND GIVE WAY SIGNS

### 21.5 Markings on splayed approaches

The markings of splayed approaches to islands or obstructions shall be parallel bars as shown in Figure 16.

In local areas the minimum width measured normal to the marking shall be 1 m and the gap separating the parallel bars may vary from a minimum of 1 m to a maximum of 5 m.



$A_1 = 45^\circ$

$B = 1.0 \text{ m}$

$S = 1 \text{ m to } 5 \text{ m}$

$W = \text{equal dimensions: } 100 \text{ mm or } 150 \text{ mm}$

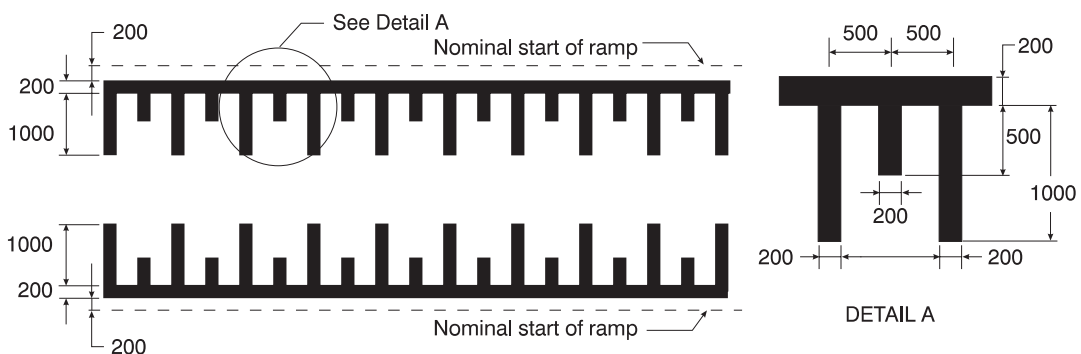
Traffic to left side only

Figure 16 SPLAYED APPROACH

### 21.6 Road hump markings

The pavement markings used at road humps (Watts profile and Flat-top) consist of a marking on each face of the hump in the form of a transverse line with a series of alternate long and short lines at approximately half metre spacing running up the face of the hump. This marking is shown in Figure 17. These markings are commonly referred to as “inverted piano-key” markings.

The marking may be omitted on humps in an area-wide scheme, or a clearly defined segment of a staged-construction scheme, if a contrasting colour pavement material is used such that the hump is clearly visible under all conditions.



NOTE:

- 1 The length of this part of the marking may be varied on the Flat-top hump to suit the length of the taper (generally between 1000 mm-1500 mm).

DIMENSIONS IN MILLIMETRES

Figure 17 PAVEMENT MARKING FOR ROAD HUMPS

## **21.7 Raised pavement markers**

Raised pavement markers are used to augment painted lines on the road surface. Markers used with the LATM treatments described in this Part of the Manual shall be retroreflective raised pavement markers (RRPM).

Typical uses of RRPM's at LATM treatments are to –

- (a) supplement the splayed approach marking (see Clause 21.5) as shown in Figures 6, 7, 11 and 12;
- (b) provide delineation at sharp curves as shown in Figure 14 (b); or
- (c) supplement edge lines on the lead-in to kerb extensions, driveway links and slow points, as shown in Figures 8, 9, 10 and 11.

The colour of RRPMs used in conjunction with LATM treatments is white.

## **21.8 Kerb markings**

Kerbs of realigned footpaths, medians and traffic islands may be marked white and reflectorised if added visibility is required.

## **21.9 Bollards**

Bollards are post-mounted delineators. Bollards may be circular or rectangular in shape to suit the street environment.

## APPENDIX A

### DESIGN PRINCIPLES FOR USE OF LATM TREATMENTS

#### A1 GENERAL

This appendix is provided to assemble some generally accepted design principles for use in LATM schemes. The information presented in this appendix is not exhaustive and users of the Manual are strongly advised to seek detailed design guidelines from authoritative sources when preparing any LATM scheme. Such design information would need to be in accordance with guidelines which are accepted as good engineering practice.

LATM seeks to create by streetscaping, an environment conducive to both traffic safety and residential amenity. Such an environment will encourage motorists to reduce their speed and maintain this lower speed in the local area. It will also generally lower traffic volumes by making the local area less attractive to through traffic.

#### A2 DESIGN PRINCIPLES

To meet the above objectives, the principles set out below should be considered in designing an LATM scheme.

##### A2.1 Streetscape

The linearity of a street should be reduced by breaking it up or segmenting it into short lengths by means of LATM treatments. This is particularly important where there would otherwise be long straight unbroken lines. Each treatment should be landscaped to create a visually pleasing environment.

##### A2.2 Location and spacing of treatments

Existing street lighting, drainage pits, driveways and services may dictate the exact location of treatments. Within these controls spacing of treatments of the order of 80 m to 120 m apart will usually be satisfactory.

##### A2.3 Design vehicles

The following points should be considered when selecting the design vehicles used in the planning of an LATM scheme:

- (a) Emergency vehicles must be able to reach all residences and properties.
- (b) Streets with a 'feeder' function between arterial roads and other local streets may need to be designed for an Austroads Design Single Unit Truck/Bus.
- (c) Streets with a lesser traffic function may be designed for smaller vehicles, with mountable kerbs or paved areas being available to the large vehicles for at least some turning manoeuvres. Treatments should be designed and constructed so as not to trap the occasional larger design vehicle. The design should take account of the likelihood of this vehicle entering the area and where practical provide for escape paths, e.g. alternative routes, adequate traversible width to be available without hitting physical obstructions, utilisation of roundabouts.
- (d) On bus routes, buses should be able to pass without mounting kerbs and with minimal discomfort to occupants. Rerouting of buses should be considered where necessary.
- (e) Provision should be made for non-motorised vehicles i.e. bicycles, prams, wheelchairs.

##### A2.4 Control of vehicle speeds

Streetscaping using treatments which shift vehicle paths laterally (e.g. slow points, roundabouts, sharp curves) or vertically (e.g. humps) should achieve the required control of vehicle speeds. Speed control treatments should be located to allow all necessary vehicle braking to take place before the treatment is reached.

##### A2.5 Visibility factors

The following visibility factors should be considered:

- (a) Provision of adequate sight distance at potential conflict points such as single lane treatments, driveway entries, and pedestrian or cyclist crossing points.

- (b) Night time delineation of street features and LATM treatments. LATM measures, especially speed control treatments, should either be located near existing street lights, or have additional streetlighting installed. Treatments or features exposed to traffic may need to be delineated using bollards (i.e. post-mounted delineators), raised reflective pavement markers and, if necessary, hazard markers.

## A2.6 Parking provisions

The presence of parked cars adjacent to a moving traffic stream is a significant cause of accidents between vehicles and pedestrians, especially child pedestrians. This situation can be improved by measures such as relocating the parking area so that there is more space between parked vehicles and moving traffic, special measures to slow traffic near concentrations of parked vehicles, or the discouragement of on-street parking altogether. Shared zones may be used to implement measures of this nature.

## A3 DESIGN DETAILS

Design details are available for humps (see Appendix B) and roundabouts (see Austroads: Roundabouts).

Some general dimensions considered appropriate at other treatments are as follows:

- (a) Pavement narrowings at slow points, partial street closures, etc.–
- (i) single lane – 2.5 m between kerbs;  
– 2.75 m between vertical obstructions higher than 200 mm above pavement level; and
  - (ii) two lane – 5.0 m minimum between kerbs.
- (b) Bicycle lanes (including where adjacent to pavement narrowings) – 1.35 m minimum (1.5 m desirable).
- (c) Width of clear sight path through a slow point or driveway link – 1.0 m maximum.

Dimensions of traversible area required for the occasional manoeuvring of large vehicles should be determined by use of relevant turning templates.

## A4 MATERIALS

Materials used in LATM scheme construction should not be inconsistent with the environment that is being created.

Smooth (non-skid) surfaces such as asphalt, rather than highly textured surfaces such as coarse exposed aggregate, are preferred for bicycle lanes and paths.

In local street situations where existing kerbing is to be replaced or new works constructed, kerbing should be trafficable (i.e. mountable or semi-mountable). The surface profile of kerbs should not contain sharp kinks or bull-noses (such as commonly occur at kerb cut-aways at pedestrian facilities and driveway entrances) as they may create difficulties for pedestrians (particularly elderly), cyclists and disabled people. Reference should be made to AS 1428.1 for kerb profiles for access for the disabled.

Materials and devices in higher speed environments (greater than 40 km/h) e.g. at isolated treatments, which are placed close to vehicle paths may need to be of frangible or break-away type of construction. Where non-frangible materials/objects are necessary for either functional or streetscape purposes, and it is determined that some means of safety protection for road users is appropriate, they may be protected using frangible materials such as dense shrubs.

## APPENDIX B

### GUIDELINES FOR DESIGN, LOCATION AND SITING OF ROAD HUMPS

#### B1 SCOPE

This Appendix gives guidance on the design, location and siting of road humps to assist in achieving the objectives of local area traffic management.

#### B2 USE

##### B2.1 Location

Road humps are generally used in streets where all of the following conditions apply:

- (a) In residential streets with a local or limited collector function.
- (b) Where a speed limit of 60 km/h or less applies.
- (c) Where the traffic volumes are less than 4000 vpd, 7.00 am–7.00 pm.
- (d) Where truck (4.5 tonne GVM or greater) volumes are less than 50 vpd.
- (e) Where the longitudinal gradient of the road is less than 10 percent.
- (f) Where the road does not form part of an important access to commercial development.
- (g) Where that part of the road is not used extensively for access to emergency service institutions, high density residential developments or public meeting places.
- (h) Where the road does not form part of a bus route. However, the existence of a bus route may not necessarily preclude the use of humps, (see Clause 7.1.2).

##### B2.2 Siting

The arrangement of road humps along a street is a major factor in determining whether the humps will effectively reduce speed and be accepted by residents. Experience has indicated that humps should be sited with the following guidelines in mind:

- (a) The first hump should be within 50 m of the start of the street but should be clear of arterial road intersections so that it does not interfere with turning movements from the arterial.
- (b) Humps are to be clear of driveway entrances.
- (c) Sight distance at least adequate for the regulatory speed limit, is to be available to traffic.
- (d) Humps should be installed at right angles to the direction of travel.
- (e) Hump spacing should be between 80 m and 120 m.
- (f) Humps should extend laterally across the full width of road pavement available to traffic (except for an allowance for drainage).

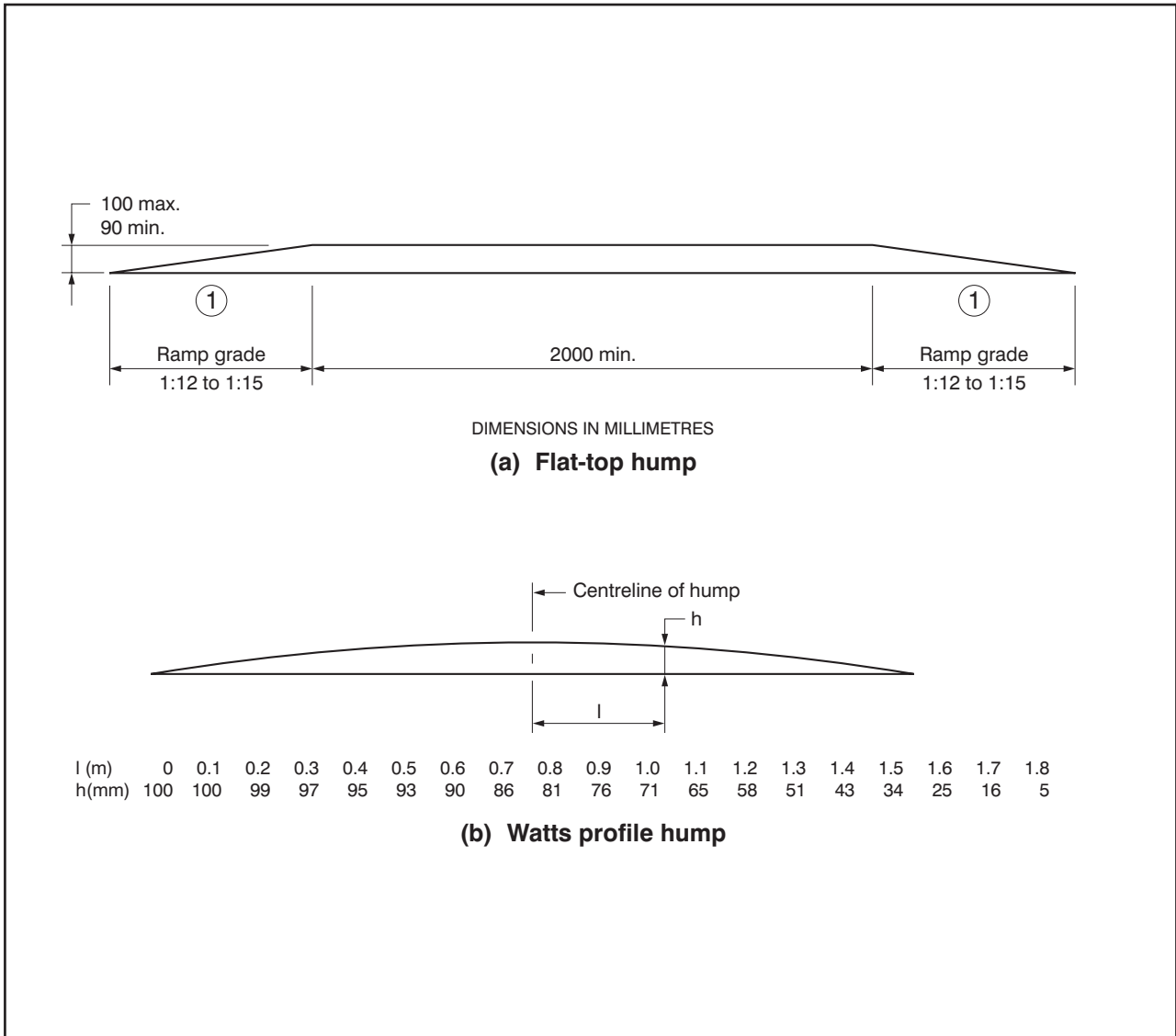
NOTE: In cases where the hump does not extend fully to the kerbside, experience has shown that many drivers choose to drive with the two left wheels off the hump.

- (g) The roads on which road humps are to be installed shall be lit to the requirements of AS 1158.

#### B3 HUMP PROFILES

The diagrams below show two hump profiles which are widely used and accepted in Australia.

NOTE: While other profiles may be effective at reducing speeds, it is especially noted that only these two profiles are considered to have been sufficiently well tested to warrant inclusion in this Part of the Manual.



**Figure B1 HUMP PROFILES**

## APPENDIX C

### SPECIAL GIVE WAY AND STOP SIGN CONTROL TREATMENTS

#### C1 GENERAL

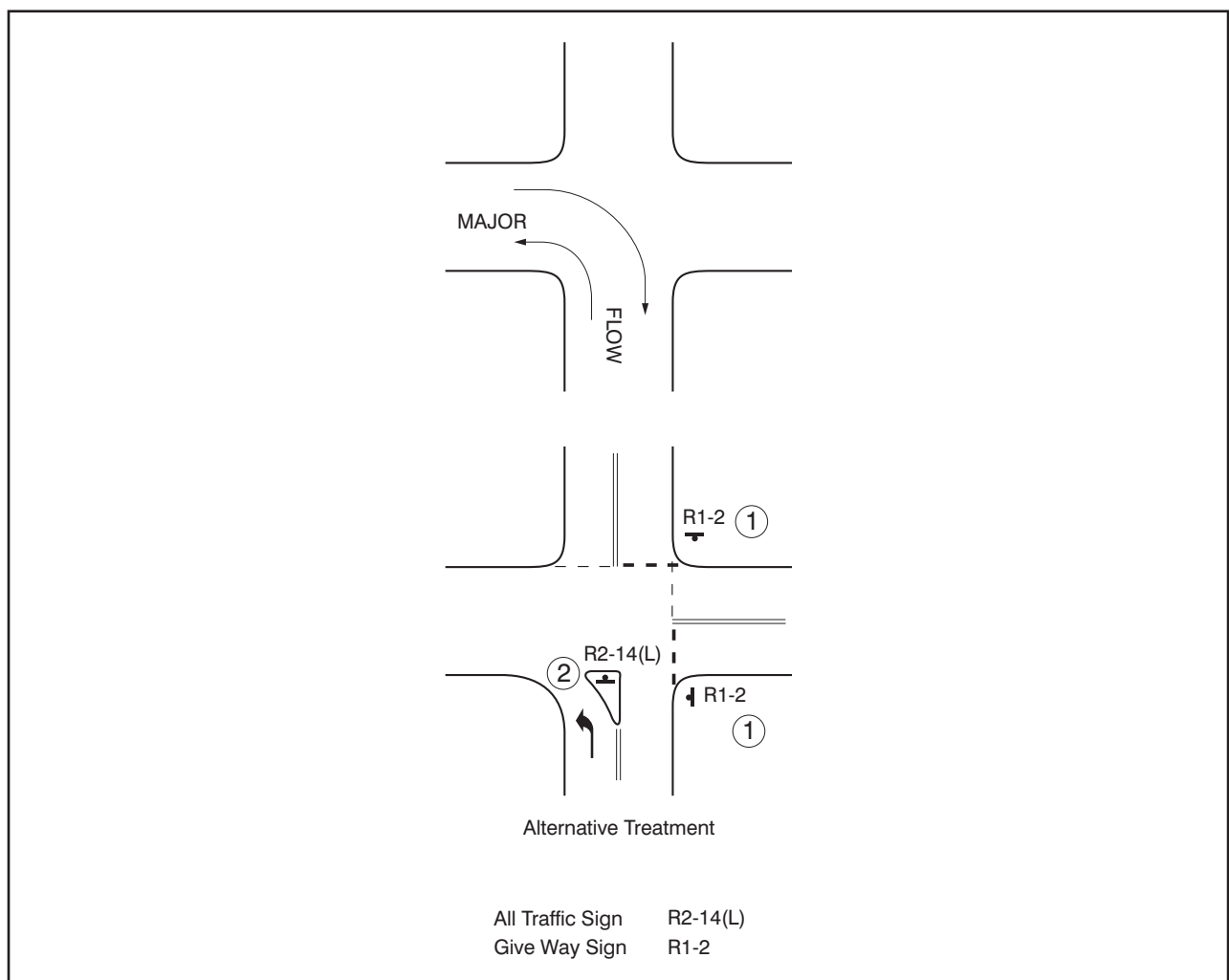
This Appendix sets out the special GIVE WAY and STOP sign control treatments which may be used in situations either where the major road does not pass through the intersection on straight or substantially straight alignment, or where modification of the intersection in accordance with Clause 9 to clearly define the major road path through the intersection is not practicable.

Special control treatments shall be limited to the functional arrangements illustrated in Figures C1 and C2. Users of this Part of the Manual are cautioned that special treatments not conforming with these may lead to unsafe, unexpected conflict situations (see Note 2 of Figures C1 and C2 below).

#### C2 4-WAY INTERSECTIONS

Special treatments are normally considered only where the major traffic flow turns at the intersection. They may be avoided if it is practicable to resolve the situation by controlling opposite legs. Arranging the controls so that the leg from which the heavier flow makes the left turn is controlled, usually results in less delay than if the heavy right turn is controlled.

If this desirable treatment is inappropriate, then the alternative treatment in Figure C1 may be considered.



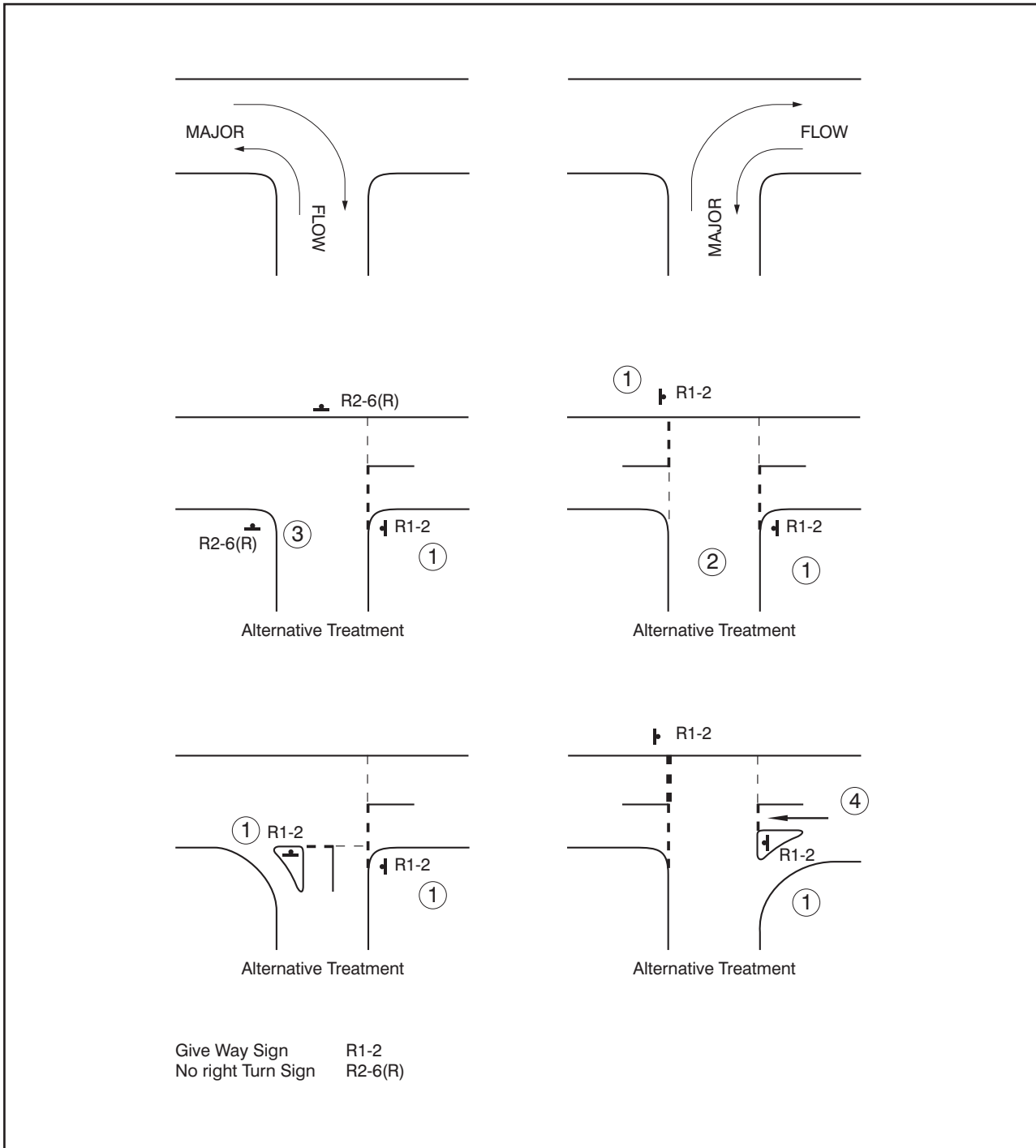
#### NOTES:

1. STOP sign is required if intersection sight distance is inadequate for a GIVE WAY sign (see Part 2 of this Manual).
2. Any conflicting movement with the major right turn flow must be controlled or prevented, as shown.

**Figure C1 SPECIAL CONTROLS AT A CROSS ROAD**

### C3 T-INTERSECTIONS

The desirable treatment at any T-intersection requiring GIVE WAY or STOP control is to place the control across the terminating leg, regardless of whether or not the major traffic flow turns at the intersection. In the event that neither this nor intersection modification is practicable, the alternative treatments in Figure C2 may be considered.



**NOTES:**

1. STOP sign is required if sight distance is inadequate for a GIVE WAY sign (see Part 2 of this Manual).
2. This treatment shall not be used unless the major flow is in the direction shown.
3. Right turn must be banned under this arrangement.
4. This movement must be controlled under this arrangement.

**Figure C2 SPECIAL CONTROLS AT T-JUNCTIONS**