

SECTION 2

PAVEMENT MARKINGS

Update August 2010

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Note: For chevron sight boards refer to MOTSAM Part 1 Section 6: PW-66, PW-67, PW-68 & PW-69.
For motorway markings refer to MOTSAM part 3.

Some related Technical Documents may be found at:

<http://www.nzta.govt.nz/resources/results.html?catid=257> and

<http://www.nzrf.co.nz/>

2.01 CENTRELINES

2.01.01 GENERAL

(a) Legislation:

The *Land Transport Rule: Traffic Control Devices 2004* Part 2 defines a centreline.

This Rule and its amendments may be seen at

<http://www.nzta.govt.nz/resources/rules/traffic-control-devices-index.html>

(b) Application:

A marked centreline is desirable on all paved rural roads and on all arterial/principal urban roads. As a minimum requirement a centreline should be marked in the following situations:

- **Rural State Highways:** Whenever the sealed pavements is greater than 5 m.
- **Other Rural Roads:** Refer to the Ministry of Transport/Transit New Zealand publication *RTS 5: Guidelines for Rural Road Marking and Delineation*. This is summarised in Table 2.1 below:

Extent of Centreline	Desirable Minimum Seal Width	Absolute Minimum Seal Width	Minimum AADT
Total Route	5.5 m	5.0 m	250
Isolated Sections *	5.5 m	5.0 m	100

Table 2.1: Rural Road Centrelines.

* *Isolated sections of rural road may require a centreline to be marked when:*

- *there are frequent horizontal and/or vertical curves*
- *there are substandard horizontal and/or vertical curves*
- *crash records indicate the need for a centreline*
- *there is a need for consistent road marking along a route, ie. continue the centreline markings used on the other sections of road which forming part of the route.*

- **Urban Roads:** On arterial/principal and collector roads carrying substantial volumes of non local traffic.

In some circumstances a centreline may be replaced by a flush or raised median. Refer to Sections 2.09 and 3.18 for flush median intersection details.

2.01.02 TWO-LANE ROADS (URBAN AND RURAL)

Refer to Section 3.02 for the treatment of centrelines on the approaches to intersections.

(a) Standard Marking:

Except where a solid white or yellow no-overtaking line is used (refer to Sections 2.01.03 and 2.05) a centreline shall be marked as a broken line in the following manner:

Refer to Figure 2.1(a)

Colour	:	Reflectorised white
Width	:	100 mm minimum
Stripe	:	3 m
Gap	:	7 m

(b) Sharp Curves:

A reflectorised continuous white centreline may be used on tight curves in urban areas where the standard broken centreline marking is considered unsuitable. A continuous white centreline may also be used in rural areas in special circumstances.

Colour	:	Reflectorised white
Width	:	100 mm minimum
Stripe	:	Continuous
Length	:	As appropriate

2.01.03 DUAL CARRIAGEWAY UNDIVIDED ROADS

The centreline on a multi-lane undivided road shall be marked as a continuous line or lines in the following manner:

(a) Normal Urban and Rural Roads:

Refer to Figure 2.1(b).

Colour	:	Reflectorised yellow
Width	:	Two 100 mm lines 100 mm apart
Stripe	:	Continuous except at intersections.

(b) Alternative for Roads where the Posted Speed Limit is 70 km/h or less:

In urban areas where there is extensive commercial or industrial development adjacent to the road a white continuous centreline marking may be used instead of the markings described in (a) above, providing it is not dangerous for vehicles to cross the centreline and the road controlling authority agrees to the alternative centreline marking.

Refer to Figure 2.1 (c).

Colour	:	Reflectorised white
Width	:	150 mm
Stripe	:	Continuous except at intersections.

**2.01.04 RAISED MEDIAN DIVIDED
DUAL CARRIAGEWAY ROADS**

Centreline are not normally necessary on dual carriageway roads with raised medians. The right hand side of the traffic lane nearest to a median should be defined by an edge line marked adjacent to the left hand side of the median.

Refer to Section 2.03.04 for the treatment of edge lines adjacent to raised medians.

**2.01.05 CENTRELINES IN ADVANCE
OF RAISED MEDIAN ISLANDS
AND PHYSICAL HAZARDS**

The centreline shall terminate to the left of raised median island or physical hazard. At intersections the centreline may be carried on adjacent to the left of the median island to terminate at the limit line.

Refer to Section 2.08 for the marking of centrelines in advance of raised medians and Section 5.03.02 for the marking of centrelines at physical hazards within the roadway (such as bridge abutments etc).

**2.01.06 CENTRELINES ON THE
APPROACHES TO
INTERSECTIONS**

Refer to Section 3.02 *Centrelines at Intersections* for typical centreline treatments for various traffic control and intersection configurations.

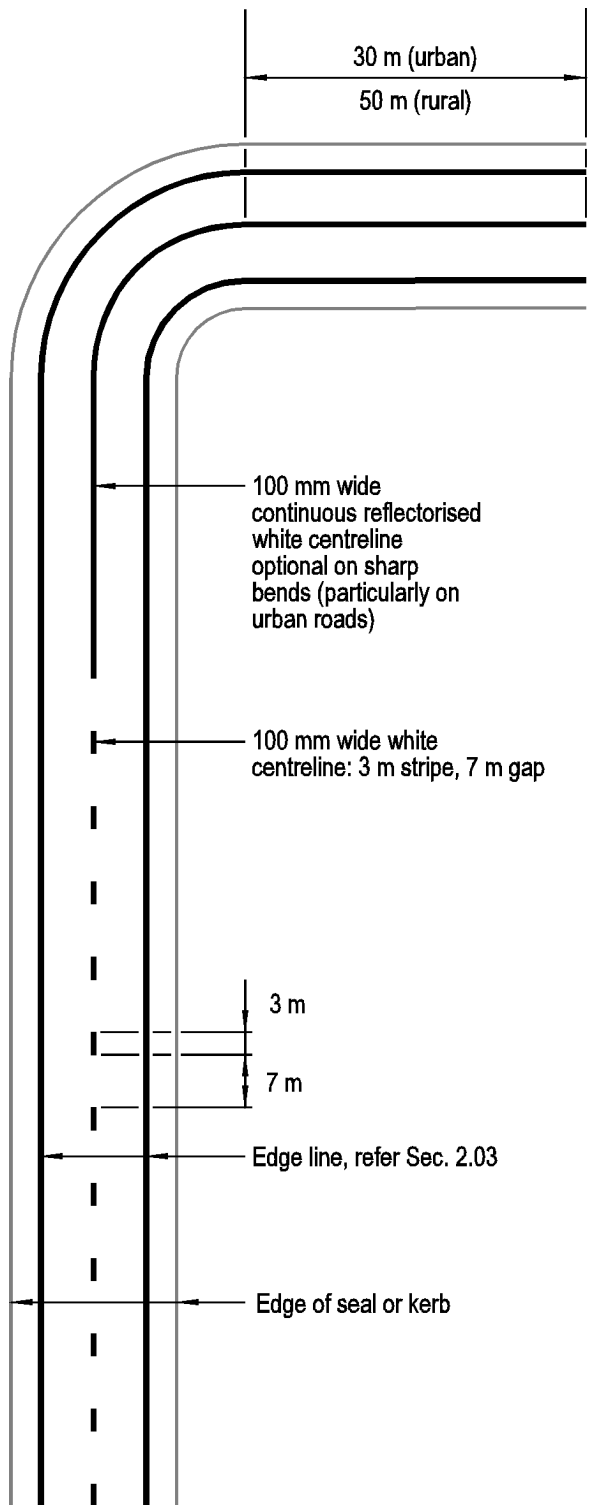
**2.01.07 CENTRELINE RAISED
PAVEMENT MARKERS**

Raised pavement markers, as described in Section 4.06.03, may be used to define the centreline on sections of road with a fine textured surface, instead of the normal centreline markings which are applied to the road surface.

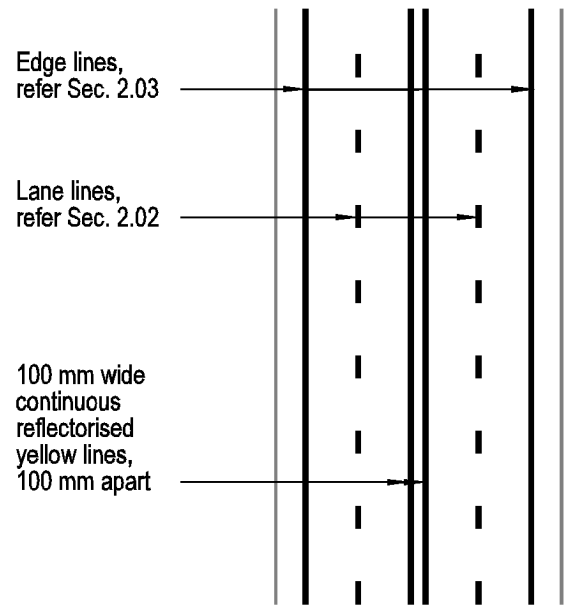
Raised reflective pavement markers, as described in Section 4.06.03, should be used to supplement the centreline markings.

**2.01.08 CENTRELINES TO ESTABLISH
PRIORITY ROUTES AT
INTERSECTIONS ON CURVES**

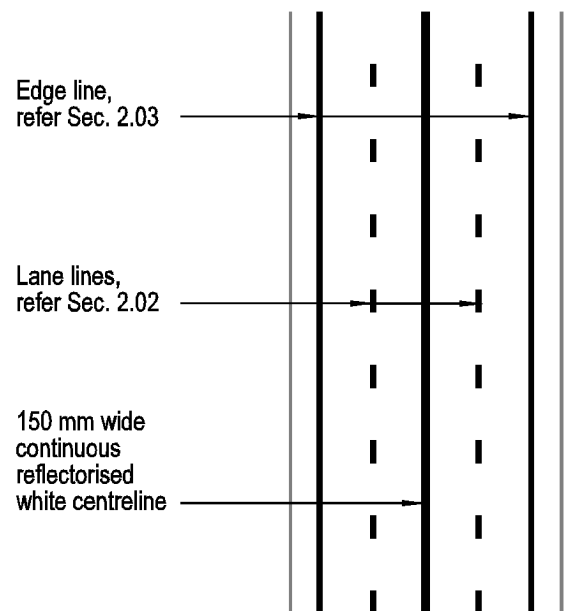
Refer to Section 3.02.05 for the marking of a centreline to establish the priority route at an intersection.



(a) CENTRELINE FOR TWO LANE ROAD: URBAN AND RURAL



(b) CENTERLINE FOR MULTI LANE ROAD (URBAN AND RURAL)



(c) CENTRELINE FOR MULTI LANE ROAD: URBAN ALTERNATIVE

Refer to Section 3.02 for Centreline Markings at Intersections

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2.02 LANE LINES

2.02.01 GENERAL

(a) Legislation:

The *Land Transport Rule: Traffic Control Devices 2004 Part 2* defines a lane.

This Rule and its Amendments may be seen at <http://www.nzta.govt.nz/resources/rules/traffic-control-devices-index.html>

(b) Application:

Where a road is designed to allow for the movement of more than one-lane of vehicles in the same direction traffic lanes must be clearly defined.

Lane lines are used to separate:

- adjacent through lanes
- a through lane from a right turn lane
- a through lane from a left turn lane
- lanes on the approaches to multi-lane intersections.

2.02.02 THROUGH LANE WIDTHS

The recommended widths for through lanes are:

(a) Rural State Highways:

The desirable state highway lane width is 3.5 m when the total seal width is greater than 7.0 m. Refer to Transit New Zealand's *State Highway Control Manual* for more details.

Lane width may need to be increased on curves to cater for the tracking requirements of heavy vehicles. Refer to Transit New Zealand's *State Highway Geometric Design Guide* and AUSTROADS *Rural Road Design, Guide to the Geometric Design of Rural Roads* for more details on lane width requirements.

(b) Other Rural Roads:

The desirable rural road lane width is 3.5 m and this may need to be increased on curves to cater for the tracking requirements of heavy vehicles.

Transit New Zealand's *State Highway Geometric Design Guide* and AUSTROADS *Rural Road Design, Guide to the Geometric Design of Rural Roads* contain more details on lane width requirements but individual road controlling authorities may use other guidelines.

(c) Urban Roads:

Refer to Section 2.10 for cycle lane widths.

When the seal width of an urban road between the centreline and kerb is greater than 4.5 m and edge line should be marked to define the traffic lane.

Refer to Section 2.03 for edge line treatment.

4.5 m is the desirable lane width:

- for arterial/principal two-lane roads without a flush median
- adjacent to the left hand kerb on multi-lane roads when parking is prohibited
- adjacent to a parking lane 2.5 m or less in width
- where through traffic is intended to pass right or left turning vehicles without disrupting the traffic flow
- where cyclists share the lane with motorised traffic.

3.5 m is the desirable minimum lane width in all other situations.

3.0 m is the absolute minimum lane width for through lanes where the road reserve is limited but efficient lane use is important, i.e. at signalised intersections, on bridges, in subways, etc.

Refer also to NZS 4404: 1981 *Code of Practice for Urban Land Subdivision*.

2.02.03 AUXILIARY LANE WIDTHS

(a) Rural Roads:

The recommended lane widths for left turn and right turn auxiliary lanes are:

3.5 m - desirable rural road auxiliary lane width

3.0 m - minimum rural road auxiliary lane width.

Minimum width auxiliary lanes should only be used where the road reserve is limited, i.e. at signalised intersections, on bridges, in subways, etc.

(b) Urban Roads:

The recommended lane widths for left turn or right turn auxiliary lanes are:

3.5 m - desirable urban road auxiliary lane width

2.5 m - minimum urban road auxiliary lane and also the legal minimum lane width.

Minimum width auxiliary lanes should only be used where the road reserve is limited, i.e. at signalised intersections, on bridges, in subways, etc.

2.02.04 LANE LINES ON MULTI-LANE ROADS

Lane lines separating through traffic on multi-lane roads shall be marked as follows:

Refer to Figure 2.2.

Colour	:	Reflectorised white
Width	:	100 mm
Stripe	:	3 m
Gap	:	7 m

Refer to Section 4.06.04 for comment on the use of profiled markings on multi-lane roads.

Refer to Section 3.04.01 for the treatment of lane lines on the approaches to intersections.

2.02.05 LINES SEPARATING LEFT TURN LANES FROM THROUGH LANES

Refer to Section 3.14 for pavement marking details for left turn lanes.

2.02.06 LINES SEPARATING RIGHT TURN LANES FROM THROUGH LANES

Refer to Section 3.15 for pavement marking details for right turn lanes in raised medians.

Refer to Section 3.16 for pavement marking details for right turn bays.

2.02.07 LANE LINES ON THE APPROACHES TO MULTI-LANE INTERSECTIONS

Refer to Section 3.04 for pavement marking details for lane line approaches to intersections.

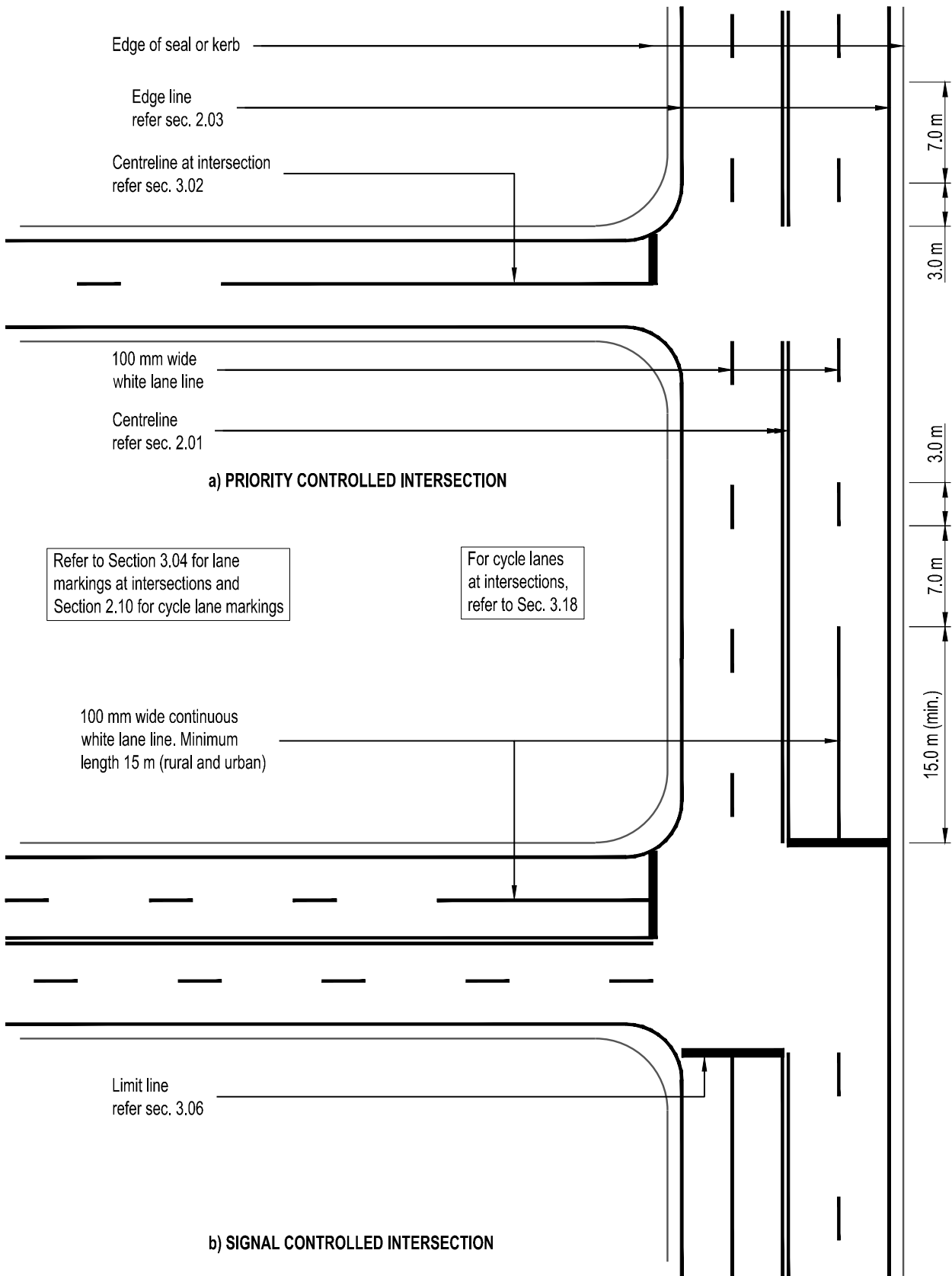
2.02.08 RAISED PAVEMENT MARKERS

On Sections of roadway with a fine textured surface, lane line markings may be replaced with raised pavement markers as described in Section 4.06.04.

Lane lines may be supplemented with raised reflective pavement markers as described in Section 4.06.04.

2.02.09 LANE LINES THROUGH INTERSECTIONS

Refer to Section 3.04.04 for the pavement marking of lane lines used to confirm priority for routes at intersections.



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2.03 EDGE LINES

2.03.01 GENERAL

Edge lines may be used to:

- delineate the edge of a traffic lane
- separate a paved shoulder from the traffic lane
- provide useful guidance to motorists at night and during inclement weather
- laterally position vehicles on wide pavements, particularly in urban areas
- indicate the roading hierarchy.

The marking of edge lines is recommended in the following situations:

(a) Rural State Highways:

Edge lines shall be marked on two-lane rural state highways where one or more of the following conditions apply:

- the seal width is 7.4 m or more;
- the seal width is 6.6 m or more and the AADT exceeds 750 vehicles per day;
 - special conditions such as difficult terrain, fog, mist or steam prevail.

(b) Other Rural Roads:

Edge lines should be marked as recommended in the Land Transport Safety Authority/Transit New Zealand publication *RTS 5: Guidelines for Rural Road Marking and Delineation*. These recommendations are summarised in Table 2.2 below.

Extent of Edge Line	Desirable Minimum Seal Width	Absolute Minimum Seal Width	Minimum AADT
Total Route	6.6 m	6.0 m	750
Isolated Sections *	6.6 m	6.0 m	250

Table 2.2: Rural Road Edge Lines

* *Isolated sections of road may require edge lines where:*

- there are frequent horizontal and/or vertical curves;
- there are horizontal and/or vertical substandard curves;
- accident records indicate a need;
- road edge maintenance is a problem;
- there is a need to provide continuity of road marking along a route.

(c) Urban Roads:

Edge lines should be marked on urban roads where one or more of the following conditions apply:

- the road is classified as an arterial/principal route in the district plan;
- seal width is considered to be excessive;
- the correct lateral positioning of through or turning traffic is desirable;
- additional side delineation of the traffic lane is required;
- there is conflict with kerb side parking.

Edge lines should be continuous and marked parallel to the road centreline except at intersections and lane drop/gain situations.

Edge lines should not be marked:

- within 1 m (0.6 m min) of a formally marked parking area (refer to Figure 2.14);
- within 0.6 m of no-stopping line markings;
- within 1 m (0.6 m min) of left hand kerb forming the edge of a traffic lane.

2.03.02 TWO-LANE ROADS

Edge lines on two-lane roads should be marked as follows:

(a) Rural Roads:

Refer to Figure 2.3 (a).

Colour : Reflectorised white
Width : 100 mm minimum.
Stripe : Continuous**

** *Continuous is deemed to include an application of material resembling paint that gives the impression of a line when viewed by a driver.*

(b) Urban Roads:

Refer to Figure 2.3 (b).

Colour : Reflectorised white
Width : 100 mm
Stripe : Continuous

2.03.03 UNDIVIDED MULTI-LANE ROADS

Undivided multi-lane roads in both urban and rural areas, including passing lanes, should be marked as follows:

Refer to Figure 2.3(c).

Colour	:	Reflectorised white
Width	:	100 mm or 150 mm
Stripe	:	Continuous**

2.03.04 MEDIAN DIVIDED DUAL CARRIAGEWAY ROADS

Lines defining the right hand edge of a traffic lane adjacent to a raised median and the left hand edge of the traffic lane adjacent to a shoulder:

- may be marked on median divided dual carriageway roads in urban areas,
- should be marked on median divided dual carriageway roads, and
- must be marked on all median divided motorways.

Edge lines on raised median divided roads shall be marked as follows:

(a) Left Hand (Shoulder) Edge Line:

The edge line separating a traffic lane from the shoulder on median divided roads shall be marked in the following manner:

Refer to Figure 2.3(d).

Colour	:	Reflectorised white
Width	:	100 mm urban; 150 mm rural
Stripe	:	Continuous

(b) Right Hand (Median) Edge Line:

The line defining the right hand edge of the traffic lane adjacent to a raised median or median barrier shall be marked in the following manner:

Refer to Figure 2.3 (d).

Colour	:	Reflectorised white
Width	:	100 mm urban; 150 mm rural
Stripe	:	Continuous**
Location	:	300 mm (min.) clearance to a kerb 500 mm (min.) clearance to a guard rail or other median barrier.

2.03.05 CONTINUITY LINES

Refer to Section 3.07 for details of continuity lines.

2.03.06 INTERSECTION APPROACHES

Refer to Section 3.03 for details of marking edge lines on the approaches to intersections.

2.03.07 EXTRA WIDE EDGE LINES

(a) Rural Roads:

Extra wide edge lines should be reserved for locations where the crash history indicates a specific problem with the definition of the road edge.

Where there is a problem with delineation, the use of red RRPM's (refer to Section 4.06.06) or standard width reflectorised edge lines should also be considered as alternatives to wider edge lines.

Extra wide edge lines in rural areas should be marked as follows:

Colour	:	Reflectorised white
Width	:	200 mm
Stripe	:	Continuous**

Extra wide edge lines should not narrow the existing traffic lane, the widening should be added to the outside side of the existing lane line.

(b) Urban Roads:

Extra wide edge lines may be used in isolated locations, at the discretion of the road controlling authority

Extra wide edge lines may be used on sections of road where:

- the accident history indicates a problem with definition of the road edge*;
- there is a conflict between parking and through traffic. (Refer to Section 2.11.05 Parking).

* Where there is a problem with delineation, the use of red RRPM's (refer to Section 4.06.06) or standard width reflectorised edge lines should also be considered as alternatives to wider edge lines.

2.03.08 RAISED PAVEMENT MARKERS

(a) Left Hand (Shoulder) Edge Line

Along corridors where there is a proven need for better route guidance, edgelines may be supplemented with red reflective pavement markers. Refer to section 4.06.06.

(b) Right Hand (Median) Edge Line

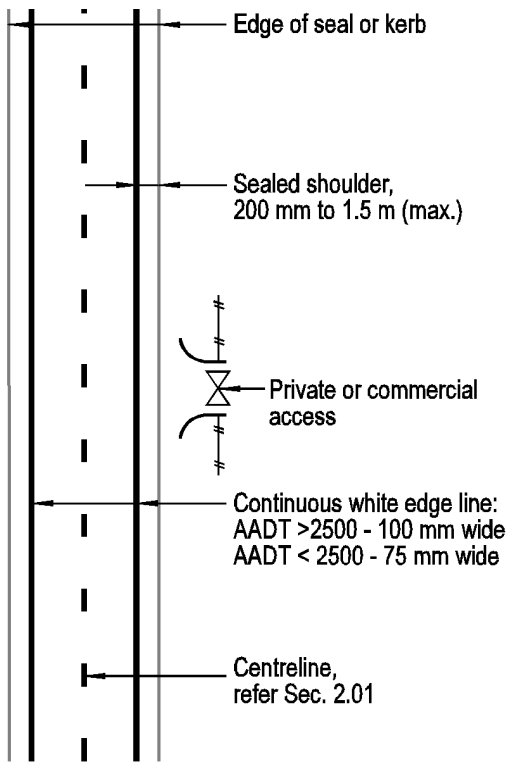
These edge lines serve a similar function to no overtaking lines and in unlit areas, should be supplemented with yellow reflective pavement markers. Refer to section 4.06.06.

2.03.09 PARKING

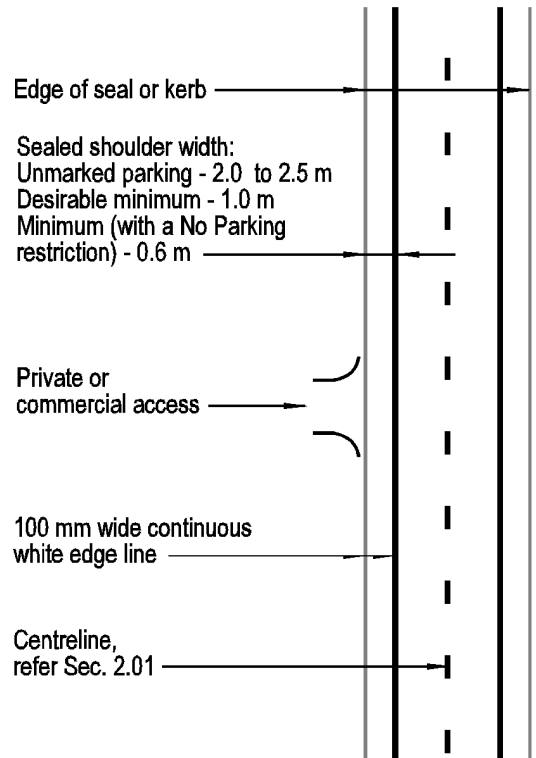
Refer to Figure 2.3 (b) for the recommended edge line marking where low demand unmarked parking is permitted on urban roads.

Refer to Section 2.11 for details of edge line markings used in conjunction with defined parking provisions on urban roads.

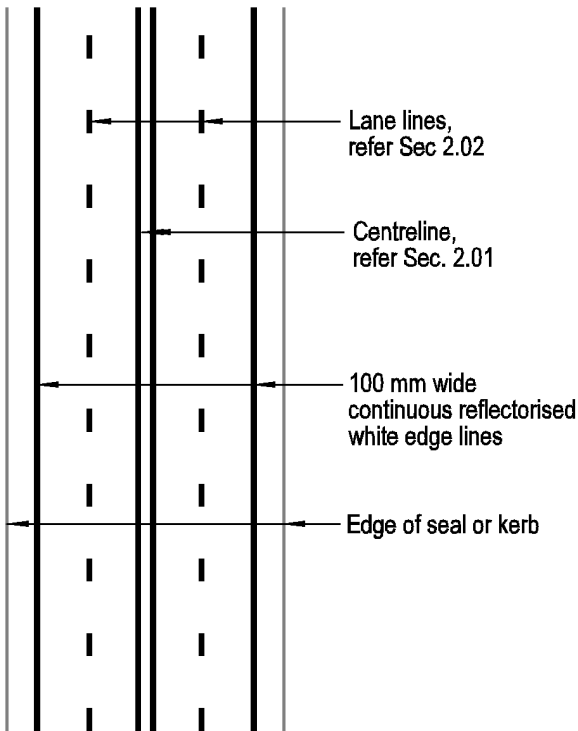
** Refer to section 2.03.02 (a)



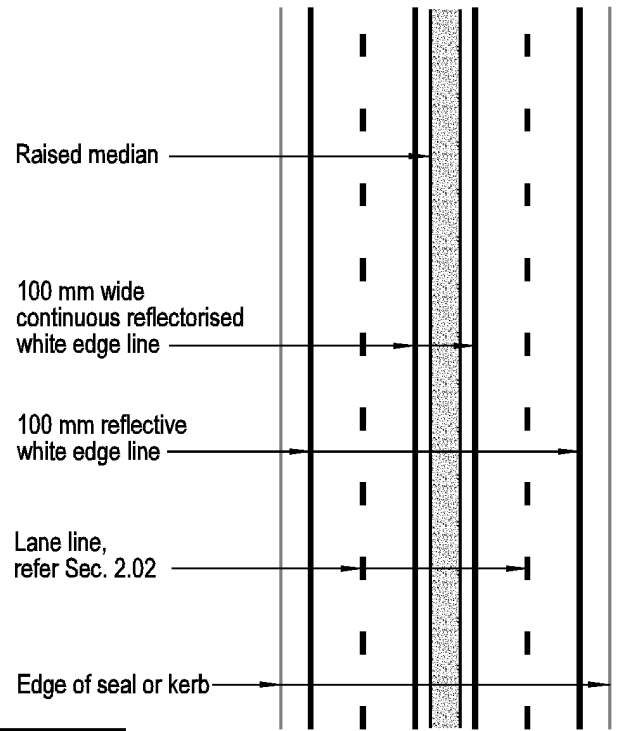
(a) TWO LANE RURAL ROAD



(b) TWO LANE URBAN ROAD



(c) MULTI LANE UNDIVIDED ROAD



(d) RAISED MEDIAN DIVIDED ROAD

Refer to Section 3.03 for edge lines at intersections

2.04 DIAGONAL SHOULDER MARKINGS

2.04.01 GENERAL

(a) Legislation:

The Land Transport Rule: Traffic Control Devices 2004 Part 2 defines a shoulder.

This Rule and its amendments may be seen at <http://www.nzta.govt.nz/resources/rules/traffic-control-devices-index.html>

(b) Application:

Diagonal shoulder markings should be provided where it is undesirable for traffic to use a wide sealed shoulder as an extra traffic lane.

Diagonal shoulder markings are used to indicate clearly the shoulder zone and to encourage traffic to use the traffic lanes.

It is advantageous to use a different surface texture on the shoulder from that on the traffic lanes. When selecting shoulder surface type consideration should be given to cyclist who may wish to travel on the shoulder.

2.04.02 RURAL ROADS

Sealed shoulders on rural roads which are less than 2.0 m wide should be marked with a white edge line only, in accordance with Section 2.03.

Sealed shoulders on rural roads which are greater than 2.5m in width must be marked with diagonal bars in the following manner:

Refer to Figure 2.4(a).

Colour	:	Reflectorised white
Bar Width	:	300 mm
Bar Slope	:	2:1
Spacing	:	100 m maximum
Edge Line	:	Refer to Section 2.03 for the appropriate edge line treatment.

No gap should be left between the diagonal bars and the edge line.

NOTE: *It is mandatory to mark sealed shoulders greater than 2.5 m in width because they may be mistaken for a traffic lane.*

2.04.03 URBAN ROADS

Diagonal shoulder markings may be required on urban roads where:

- (a) Sealed shoulders are 1.5 m or greater in width and parking is not utilised.
- (b) Sealed shoulders are 3.0 m or greater in width and parking is permitted, but is not marked as such. In these situations the area between the edge line to 2.0 m from the kerb may be marked with diagonal bars.
- (c) The distance between marked parking zones and the edge line is greater than 1.0 m.

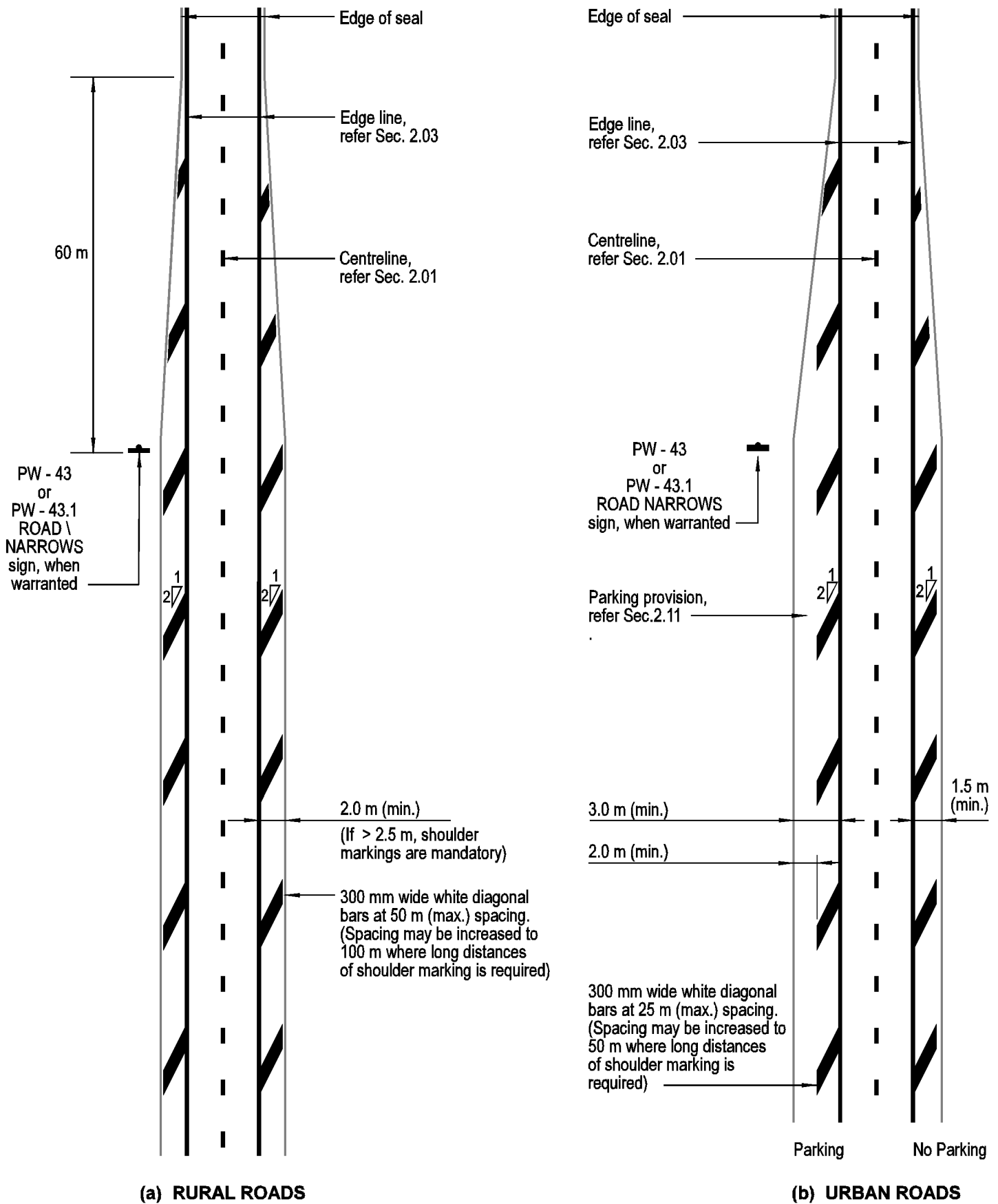
NOTE: *It is mandatory to mark sealed shoulders greater than 2.5 m in width because they may be mistaken for a traffic lane.*

Sealed shoulders on urban roads should be marked with diagonal bars in the following manner:

Refer to Figure 2.4(b).

Colour	:	Reflectorised white
Bar Width	:	300 mm
Bar Slope	:	2:1
Spacing	:	50 m maximum
Edge line	:	Refer to Section 2.03 for the appropriate edge line treatment.

A gap should not be left between diagonal bar shoulder markings and the adjacent edge line.



2.05 NO-OVERTAKING LINES

2.05.01 GENERAL

(a) Legislation:

On any length of road where the road controlling authority considers overtaking is dangerous it may mark a no-overtaking line - refer to the *Land Transport Rule: Traffic Control Devices 2004*

(b) Application:

- (i) No-overtaking lines shall be used:
- 1 on the approaches to raised traffic islands and medians that separate opposing traffic flows (*Refer to Section 2.08.02*),
 - 2 on the approaches to hazards or obstructions located within a carriageway and which separate opposing traffic flows (*Refer to Section 5.03.02*),
 - 3 on the approaches to railway level crossings, and
 - 4 as centrelines on undivided four lane rural roads.
- (ii) No-overtaking lines may be used:
- 1 where it is considered necessary to prohibit overtaking because drivers may not be aware of visibility restrictions caused by vertical curves,
 - 2 as remedial measures on lengths of roads with proven overtaking accident histories, and
 - 3 as centrelines on multi-lane undivided urban roads.

2.05.02 PAVEMENT MARKING DETAILS

Markings for no-overtaking lines are illustrated in Figure 2.5.

No-overtaking lines shall be marked as follows:

Colour	: Reflectorised yellow
Width	: 100 mm - offset 100 mm (nominally) from a normal centreline, a line of raised pavement markers (RRPM's), or another no-overtaking line *
Stripe	: Continuous
Length	: Rural roads: a minimum of 80 m Urban roads: a minimum of 30 m.

* This offset may be increased to 130 mm to allow for the installation of RRPM's, refer to NZTA Specification P/12 for more details

Two parallel no-overtaking lines should be offset 50 mm (nominally) each side of the road centreline.

At intersections, gaps should be left in no-overtaking lines, to indicate the positions where vehicles should turn into the side road(s).

2.05.03 TWO-LANE RURAL ROADS

(a) Visibility Criteria:

- (i) No-overtaking lines on two-lane rural roads should be marked where:
- 1 the visibility on the centreline of the road, from an eye height of 1.10 m to an object height of 1.25 m, is less than 330 m; **and**
 - 2 the length of restricted visibility exceeds 80 m; **and**
 - 3 the restricted visibility is due to vertical curvature alone.
- (ii) No-overtaking lines **may** also be marked when the Road Controlling Authority, the N Z Transport Agency and the Police Highway Patrol all agree that overtaking on a section of rural road should be prohibited because:
- 1 visibility is restricted by an unusual combination of vertical **and** horizontal curves, or
 - 2 there is a documented history of cross centre-line crashes, or
 - 3 there is a hidden traffic hazard(s).

(b) Length and Location of No-Overtaking Lines on Two-Lane Rural Roads:

- (i) The minimum length of any no-overtaking line on a rural road shall 80 m.
- (ii) In all cases no-overtaking lines shall be extended to ensure adequate visibility is available at their departure ends, irrespective of the alignment fault(s).
- (iii) Where the length of restricted visibility is:
- 1 **Less than 80 m** - no-overtaking lines shall not be marked.
 - 2 **Greater than 160 m** - no-overtaking lines shall start 80 m beyond the point where visibility is lost.
 - 3 **Between 80 m and 160 m** - no-overtaking lines shall be marked for a length of 80 m back from the point where visibility is regained.
- (vi) Where successive no-overtaking lines are located less than 150 m apart they shall be joined to form an unbroken length of no-overtaking line.

2.05.04 TWO-LANE URBAN ROADS**(a) Visibility Criteria:**

No-overtaking lines may be marked on two-lane urban roads where:

- (i) the visibility on the centreline of the road, from an eye height of 1.15 m to an object height of 1.15 m, is less than 165 m; **and**
- (ii) the length of restricted visibility exceeds 30 m, **and**
- (iii) the restricted visibility is due to vertical curvature alone.

Factors which also need to be considered when determining the need for marking overtaking lines on two-lane urban roads are:

- 1 the documented overtaking crash history, and
- 2 any hidden traffic hazards.

(b) Length and Location of No-Overtaking Lines on Urban Roads:

- (i) The minimum length of any no-overtaking line on an urban road shall 30 m.
- (ii) No-overtaking lines on urban roads shall normally start and end at points determined by the use of the visibility criteria given in Section 2.05.04 (a) above.

2.05.05 MULTI-LANE UNDIVIDED ROADS

Two parallel no-overtaking lines shall be used to define the centrelines of undivided multi-lane rural roads.

Two parallel no-overtaking lines may also be used to define the centrelines of undivided multi-lane urban roads.

Centrelines in these situations shall be marked as follows:

Colour	: Reflectorised yellow.
Width	: Two parallel 100 mm lines nominally 100 mm apart or, when RRPM's are installed, two parallel 100 mm lines nominally 130 mm apart. (<i>Refer to NZTA Specification P/12 for RRPM installation details</i>)
Stripe	: Continuous, except at intersections.

- NOTES:**
1. **An alternative marking for the centrelines of multi-lane undivided urban roads is detailed in Section 2.01.03 (b)**
 2. **Refer to Section 2.07.02 for the treatment of no-overtaking lines for passing lanes on rural roads.**

2.05.06 APPROACHES TO TRAFFIC ISLANDS, MEDIANS AND PHYSICAL HAZARDS

No-overtaking lines shall be marked on the approaches to traffic islands, medians and physical hazards located within the roadway. These lines shall terminate to the left side of traffic islands, medians and physical hazards.

Refer to Section 2.08.02 for typical details of no-overtaking line markings in advance of raised traffic islands and medians.

Refer to Section 5.03.02 for typical details of no-overtaking line markings in advance of physical hazards.

2.05.07 APPROACHES TO RAILWAY LEVEL CROSSINGS

Refer to Section 4.03.02 for typical details of no-overtaking line markings on the approaches to railway level crossings.

2.05.08 RAISED MEDIAN DIVIDED ROADS

No-overtaking lines are not applicable on raised median divided roads.

2.05.09 RAISED PAVEMENT MARKERS

Ceramic raised pavement markers shall not be used to indicate no-overtaking lines.

No-overtaking lines on roads with fine textured surfaces shall be supplemented with raised reflective pavement markers, as described in Section 4.06.05.

No-overtaking lines on roads with coarse textured surfaces (chip seals) may be supplemented with raised reflective pavement markers, as described in Section 4.06.05.

2.06 NO-OVERTAKING ADVANCE WARNING LINES

2.06.01 GENERAL

(a) Legislation:

Paragraph 7.3(3) of the *Land Transport Rule: Traffic Control Devices 2007* states:

“If practicable, a no-passing line must be preceded by a line not less than 100 mm wide and consisting of a series of yellow dashes, each of which is not longer than 15 m, to inform drivers of the existence of the no-passing line ahead.”

(b) Application:

No-overtaking advance warning lines are used to warn drivers of an overtaking restriction immediately ahead. The lines should be marked in advance of all no-overtaking lines, including those at traffic islands, traffic signals, etc.

The marking shall be a reflectorised yellow broken line adjacent to the left hand side of the normal centreline and immediately before the solid no-overtaking line.

No-overtaking advance warning lines are not normally used on multi-lane divided and undivided roads.

2.06.02 TWO-LANE RURAL ROADS

No-overtaking advance warning lines on rural roads should be marked as follows:

Refer to Figure 2.5(a).

Colour	:	Reflectorised yellow
Width	:	100 mm
Stripe	:	13 m (5 stripes)
Gap	:	7 m

The advance warning line shall commence 100 m before the start of the no-overtaking line, to the left of the centreline and so that each stripe spans from the start of one centreline stripe to the far end of the next centreline stripe.

2.06.03 TWO-LANE URBAN ROADS

No-overtaking advance warning lines in urban areas should be marked as follows:

Refer to Figure 2.5(b).

Colour	:	Reflectorised yellow
Width	:	100 mm
Stripe	:	13 m (3 stripes)
Gap	:	7 m

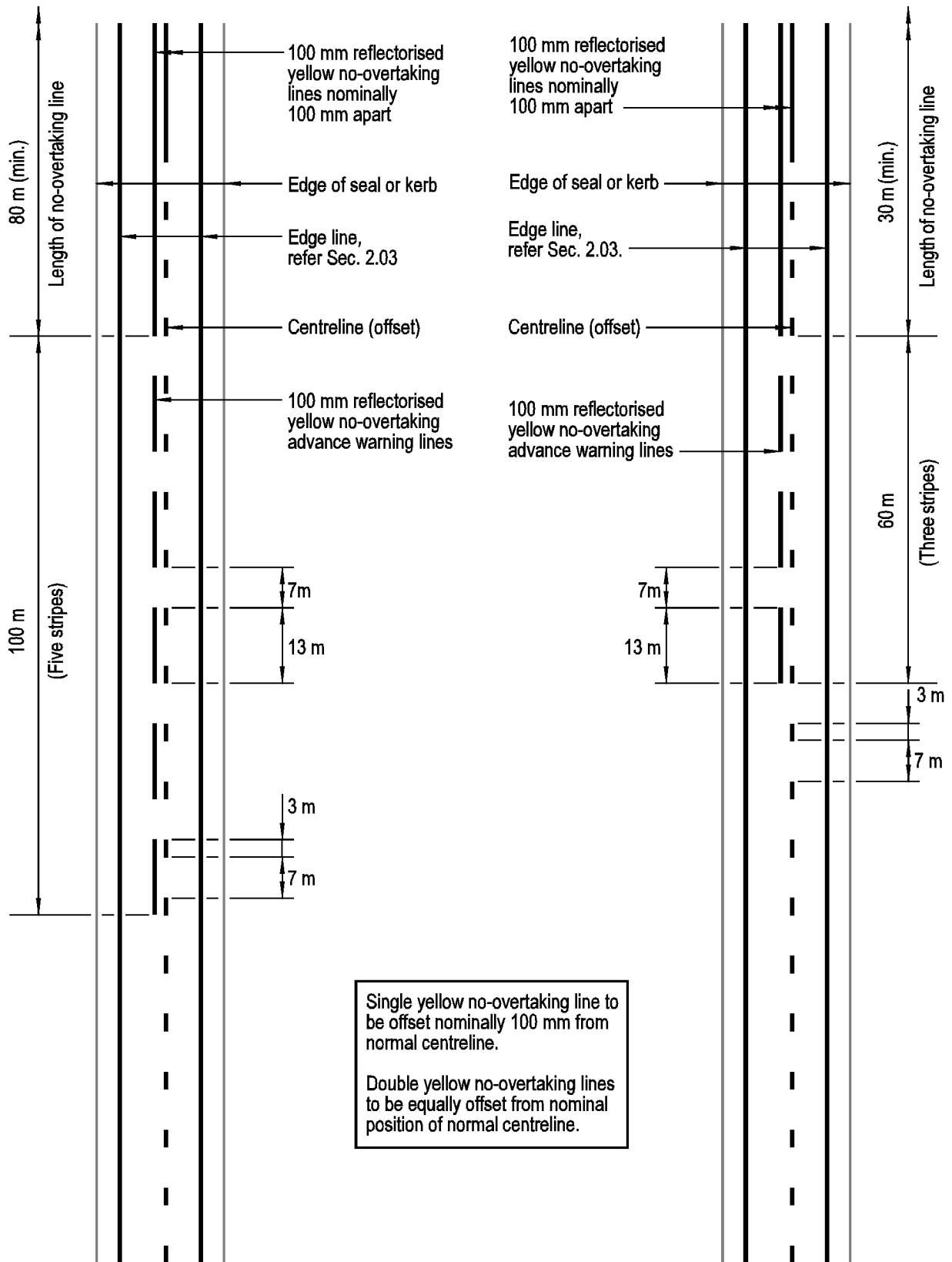
The advance warning line shall commence 60 m in advance of the no-overtaking line, to the left of the centreline and so that each stripe spans from the start of one centreline stripe to the far end of the next centreline stripe.

2.06.04 RAISED PAVEMENT MARKERS

Ceramic raised pavement markers shall not be used to indicate yellow no-overtaking advance warning lines.

No-overtaking advance warning lines on roads with fine textured surfaces shall be supplemented with raised reflective pavement markers as described in Section 4.06.05.

No-overtaking advance warning lines on roads with coarse textured (chip) surfaces may be supplemented with reflective raised pavement markers as described in Section 4.06.05.



Single yellow no-overtaking line to be offset nominally 100 mm from normal centreline.

Double yellow no-overtaking lines to be equally offset from nominal position of normal centreline.

(a) RURAL ROADS

(b) URBAN ROADS

2.07 PASSING LANES

2.07.01 GENERAL

(a) Legislation:

Refer to the *Land Transport Rule: Traffic Control Devices 2004*.

(b) Application:

Passing lanes should be provided where the volume, crash record and composition of traffic is such that it is desirable to provide an additional lane for overtaking heavy and slower moving vehicles.

Specific markings and signs are used to encourage and control overtaking within the limits of the passing lane.

Markings for passing lanes are not applicable to divided or undivided multi-lane roads.

(c) Design References:

- (i) Transit New Zealand: *State Highway Geometric Design Manual*.
- (ii) AUSTRROADS: *Guide to Road Design Part 3: Geometric Design Chapter 9, Auxiliary lanes*, and
- (iii) AUSTRROADS: *Guide to Traffic Management Part 5: Road Management and Part 10: Traffic Control & Communication Devices*.

The publications listed above contain guidelines for the provision of passing lanes based on Average Annual Daily Traffic (AADT) and percentage of slow vehicles.

(d) Length of Passing Lanes:

The length of passing lanes should be as recommended in AUSTRROADS *Guide to Road Design Part 3: Geometric Design*.

The desirable length for passing lanes on rural & urban roads is shown in Table 9.2 of this document. However, shorter lengths may often provide passing opportunities in hilly and mountainous terrain, particularly where slow vehicle bays are not appropriate.

Where a passing lane is located on an uphill grade the merge area should be located beyond the crests of the grade and in such a way that:

- (i) drivers of overtaking vehicles will have adequate visibility of the merge area, and
- (ii) slow vehicles will have sufficient distances beyond the crest of the grade to accelerate to a reasonable speed before the merge taper begins.

Passing lanes should also be located so that they do not either start or terminate where traffic conflict situations may occur, eg. at right turns into side roads, near large traffic generators such as produce stalls, etc.

(e) Lane Width:

The minimum lane widths recommended in passing lane situations are:

Passing lane	:	3.5 m
Through traffic lane	:	3.5 m
Opposing traffic lane	:	3.5 m

(f) Sealed Shoulder Width:

The sealed shoulder widths on a passing lane should be the same as the standard link sealed shoulder width for that section of road.

(g) Shoulder Width in Merge Areas:

The shoulder within the merge area at the end of a passing lane should be well defined and clear of road side hazards. The following treatments are recommended:

- (i) **Desirable Treatment:** On all new passing lanes a full width sealed shoulder should be extended through to the end of merge area, as shown in Figure 2.6. The shoulder should then be tapered at a rate of 1:50 back into to the existing shoulder width.
- (ii) **Minimum Treatment:** On existing passing lanes, and where physical constraints exist, the minimum treatment is to provide the standard link sealed shoulder width throughout the merge area.

2.07.02 RURAL ROADS

Pavement markings for passing lanes on rural roads are illustrated in Figure 2.6. They should be marked as specified below:

(a) No-Overtaking Lines:

Refer to Sections 2.05 and 2.06 for full details for markings for no-overtaking lines.

Colour	:	Reflectorised yellow.
Width	:	100 mm Minimum - offset nominally 100 mm from the normal centreline, a line of raised pavement markers (RRPM's), or another no-overtaking line.*
Stripe	:	Continuous

* This offset may be increased to 130 mm to allow for the installation of RRPM's.

A no-overtaking line for traffic travelling in the direction of the passing lane should normally commence prior to the diverge area and terminate beyond the merge area as per the following table:

Operating Speed (V_{85}) *	≤ 70km/h (Urban)	≥ 70 km/h (Rural)
Distance	30 m	100 m

* Operating speed (V_{85}) is the speed which 85% of vehicles do not exceed. These no overtaking lines will need to be extended when justified for other reasons.

The visibility criteria defined in section 2.05.03(a) shall be used to determine where a no overtaking line applying to traffic travelling in the opposing direction is also necessary.

In locations where the AADT exceeds about 10,000 - 12,000 vehs/day, consideration should be given to marking two parallel no overtaking lines regardless of visibility. #

Where a passing lane is provided in both directions of travel the centreline of the resulting four lane undivided road shall be marked with two parallel no-overtaking lines. Refer to Sections 2.01.03 and 2.05.05.

At intersections, gaps should be left in no-overtaking lines, to indicate the positions where vehicles should turn off into side road(s).

(b) Edge Lines:

Edge lines are described in Section 2.03 and should be marked as follows:

Colour	: Reflectoris white
Width	: 100 mm **
Stripe	: continuous

** Edge line width for the merge taper may be increased to between 150 to 200 mm, for increased delineation of the end of the passing lane and merge area.

(c) Diverge and Merge Tapers:

A sideways movement of approximately 1.0 m/sec is normally used for a diverging movement and approximately 0.6 m/sec for a merging movement.

The length of merge and diverge tapers should normally be determined by the following formulae:

(i) Diverge Taper: $L = V \times Y / 3.6$

(ii) Merge Taper: $L = V \times Y / 2.16$

Where:

- L = taper length (rounded to nearest 5 m)
- V = 85th percentile approach speed (km/h)
- Y = lateral shift, ie lane width (m)

NOTE: Refer to AUSTRO ADS guidelines for more information on how diverge and merge tapers may be altered to suit various site situations.

(d) Lane Lines:

Refer to Section 2.02.04 for details of marking lane lines on multi lane roads.

Colour	: Reflectoris white
Width	: 100 mm
Stripe	: 3 m
Gap	: 7 m

(e) Diverge Line:

A continuity line marking should be used for the diverge, refer to Section 3.07 for full details of continuity lines.

Colour	: Reflectoris white
Width	: Rural: 200 mm Urban: 150 mm
Stripe	: 1 m
Gap	: 3 m

The diverge line should normally be marked parallel to the diverge edge line and offset at minimum of 3.5 m from it. Where an approach traffic lane is greater than 5 m wide the diverge line should be marked to gradually reduce the traffic lane width over the length of the diverge taper.

(f) Delineation of the Merge Area:

The delineation of passing lane merge areas requires special attention. The recommended treatments are:

- (i) increase the merge taper edge line width to 200 mm and install red RRPMS at 10m centres,
- (ii) use an edge marker post spacing of 20 m for the merge taper, and
- (iii) where a wide sealed shoulder run off area is provided, mark diagonal shoulder stripes.

The diagonal shoulder stripes should be marked in the following manner:

Colour	: Reflectoris white
Stripe width	: 2 metres ***
Stripe slope	: 2:1
Spacing	: 20 m

*** measured parallel to the centre-line.

Agrees with Transit's Draft Passing & Overtaking Guidelines.

(g) Traffic Signs:

A summary of the signs required for passing lanes in rural areas is:

- (i) An IG - 6 PASSING LANE 400 m AHEAD sign, must be erected approximately 400 m in advance of each passing lane.
- (ii) An RG - 22 KEEP LEFT UNLESS PASSING sign must be erected approximately 15 m before the pavement widening for the passing commences.

RG - 22 signs may also be erected at approximately 400 m intervals along passing lanes. The last repeat sign must however be located at least 400 m in advance of the PW-43.2 ROAD NARROWS “_” AHEAD sign.

- (iii) A PW -43 ROAD NARROWS sign must be erected at the start of the merge taper at the end of a passing lane.

A PW-43.2 ROAD NARROWS “_” AHEAD sign must be located approximately 200 m in advance of the PW - 43 sign.

PW - 43 and PW-43.2 signs should be erected on both sides of the road, to improve sign visibility for drivers of overtaking vehicles.

- (iv) IG - 6.1 PASSING LANE “_” km AHEAD signs may also be erected in advance of passing lanes.

Refer to PART I of this manual for full details of these signs.

2.07.03 URBAN ROADS

(a) Pavement Marking:

Passing lanes in urban areas shall be marked in the same manner as passing lanes in rural areas, except that:

- (i) sight distance requirements for a 70 km/h operating speed shall apply,
- (ii) edge lines may not be needed, and
- (iii) additional shoulder widening and diagonal markings may not be required in the merge area

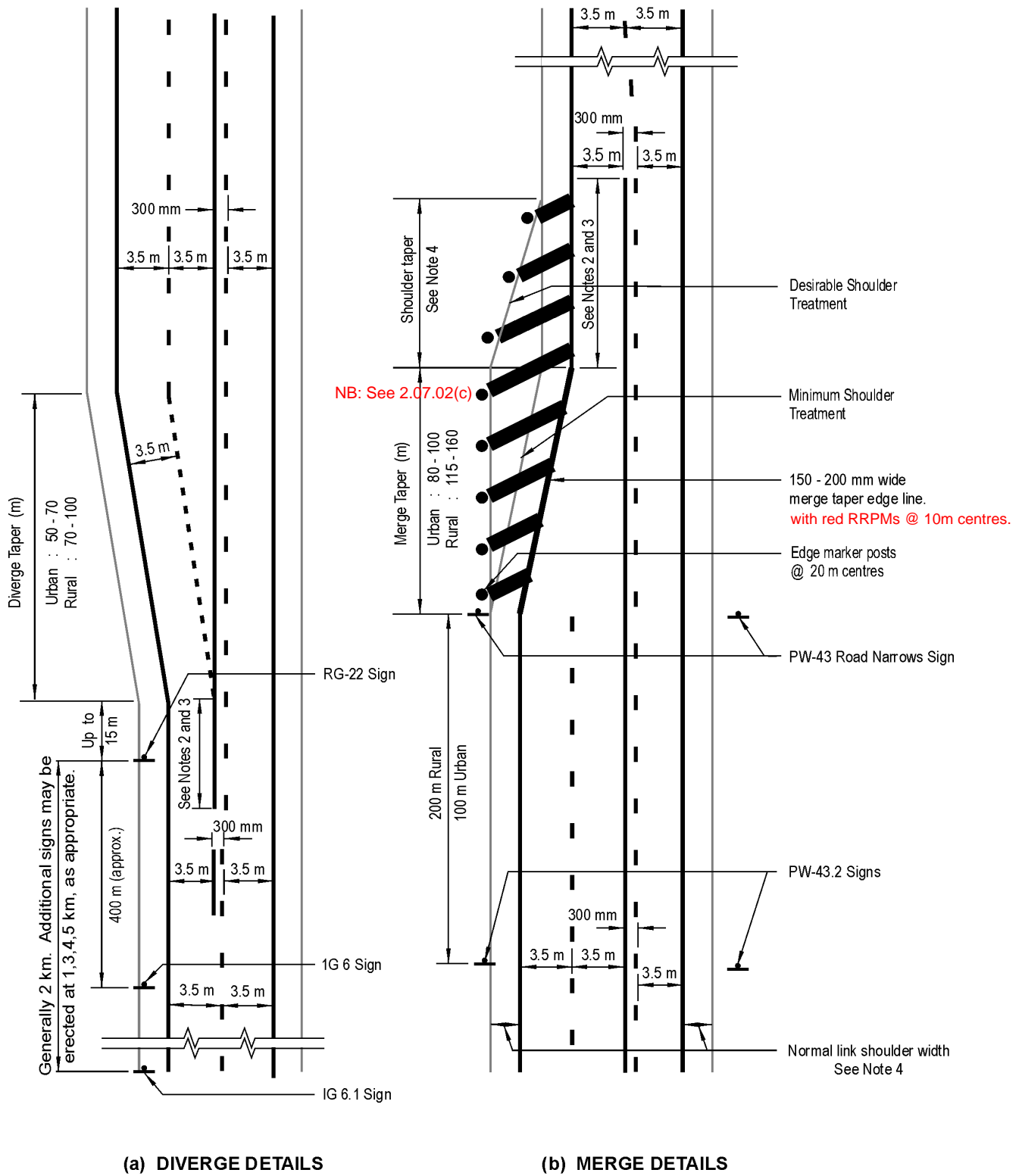
(b) Traffic Signs:

A summary of the signs required for passing lanes in urban areas is:

- (i) An IG - 6 PASSING LANE 400 m AHEAD sign, must be erected approximately 400 m in advance of a passing lane.
- (ii) An RG - 22 KEEP LEFT UNLESS PASSING sign must be erected approximately 15 m in advance of start of the passing lane diverge taper.
- (iii) A PW -43 ROAD NARROWS sign must be erected at the start of the merge taper at the end of a passing lane.

A PW-43.2 ROAD NARROWS “_” AHEAD sign should be located approximately 200 m in advance of the PW - 43 sign.

Refer to PART I of this manual for full details of these signs.



- NOTES**
1. Refer to PART I of the Manual for traffic sign details.
 2. Minimum length of no-overtaking line, refer to Section 2.07.02 (a).
 3. The no-overtaking line will need to be extended when the sight distance requirements of Section 2.05.03 (b) are not met.
 4. Sealed shoulder details, refer to Sections 2.07.01(f) and (g).

2.08 MARKINGS AHEAD OF RAISED TRAFFIC ISLANDS AND MEDIANS

2.08.01 GENERAL

(a) Legislation:

Refer to the *Land Transport Rule: Traffic Control Devices 2004*.

Any controlling authority may erect a raised traffic island to channelise streams of traffic or provide a refuge for pedestrians crossing the road.

The controlling authority shall erect any such signs as are necessary and shall paint and maintain such lines on the road surface in advance of the island as to warn drivers of its presence.

The controlling authority shall keep every raised island illuminated during the hours of darkness where street lighting is available, or shall mark the outline of the island with reflective signs or reflectors so it is clearly visible for a distance of 100 m.

(b) Application:

Raised traffic islands may be installed:

- to separate traffic streams at intersections and medians,
- as pedestrian refuges, and to
- guide traffic around obstacles located within the roadway, such as underpass piers, etc.

The start of the raised median in a divided road represents a traffic island between opposing traffic.

Markings are necessary in advance of raised traffic islands on the road surface to warn of the potential hazard.

Islands that separate diverging traffic should be marked differently from islands that separate opposing traffic.

2.08.02 RAISED ISLANDS SEPARATING OPPOSING TRAFFIC

Centrelines shall terminate to the left of raised median islands or hazards. At intersections the centreline may be carried on to the left of the median island terminating at the limit line.

Refer to Sections 5.03.02 and 5.04.03 for the treatment of hazards between lanes carrying opposing traffic.

Centrelines at raised traffic islands and medians (other than flush ones) shall be marked as specified below:

(a) Urban and Rural Roads:

• Two-lane Roads

Refer to Figure 2.7(a).

Colour	:	Reflectorised yellow
Width	:	100 mm, offset 100 mm from white or yellow centreline
Stripe	:	Continuous
Length	:	Rural areas - 50 m (min.) Urban areas - 30 m (min.)

An urban alternative (refer (b) below) may be used at the discretion of the road controlling authority.

• Multi-lane Roads

Refer to Figure 2.7(b).

Colour	:	Reflectorised yellow
Width	:	Two 100 mm lines 100 mm apart
Stripe	:	Continuous
Taper from centreline	:	Rural areas - 50 m (min.) Urban areas - 30 m (min.)

(b) Urban Alternative:

The following marking may be used in urban areas at the discretion of the road controlling authority.

• Two-lane Roads:

Refer to Figure 2.7(c)

Colour	:	Reflectorised white
Width	:	150 mm
Stripe	:	Continuous
Length	:	30 m (min.)

• Multi-lane Roads:

Refer to Figure 2.7(d)

Colour	:	Reflectorised white
Width	:	150 mm
Stripe	:	Continuous
Taper from Centreline	:	30 m (min.)

2.08.03 RAISED ISLANDS SEPARATING DIVERGING TRAFFIC

Advance marking at traffic islands separating diverging traffic should be marked with chevron markings. Chevron marking is also useful ahead of raised traffic islands which separate traffic turning left from straight through traffic.

Markings on approaches to raised islands separating diverging traffic shall be marked as follows:

Refer to Figure 2.8.

(a) Rural Roads:

Colour	:	Reflectorised white *
Border Width	:	200 mm
Bar Width	:	900 mm
Bar Spacing	:	10.00 m
Slope of Bars	:	2:1

** Raised traffic islands that have become proven accident problems or are deemed to have become hazardous for approaching vehicles may be marked with reflectorised yellow markings. However, every attempt should be made to rectify the problem by engineering measures first.*

Approaches to raised traffic islands should be marked so that the diagonal bars match into the border lines.

Kerb faces on the nose of raised traffic islands may be marked with reflective white material to enhance night time delineation of the island.

Refer to Sections 5.03.01 and 5.04.02 for the treatment of hazards between lanes carrying traffic in the same direction.

(b) Urban Roads:

Colour	:	Reflectorised white *
Border Width	:	100 mm
Bar Width	:	600 mm
Bar Spacing	:	6.00 m
Slope of Bars	:	2:1

** Raised traffic islands that have become proven accident problems or are considered to be hazardous for approaching vehicles may be marked with reflectorised yellow markings. However, every attempt should be made to rectify the problem by engineering measures first.*

Approaches to raised traffic islands should be marked so that the diagonal bars match into the border lines.

Kerb faces on the nose of raised traffic islands may be marked with reflective white material to enhance night time delineation of the island.

Refer to Sections 5.03.01 and 5.04.02 for the treatment of hazards between lanes carrying traffic in the same direction.

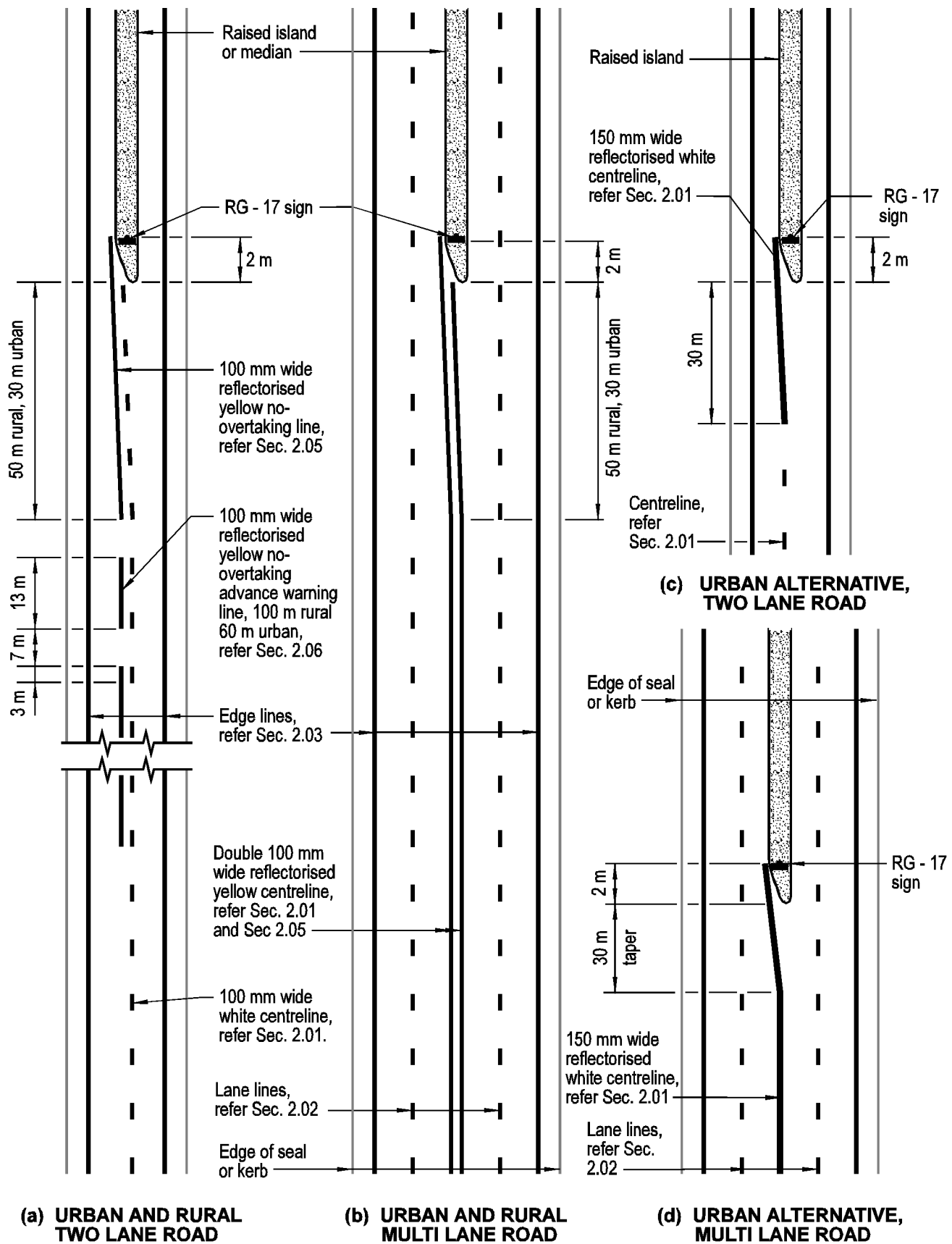
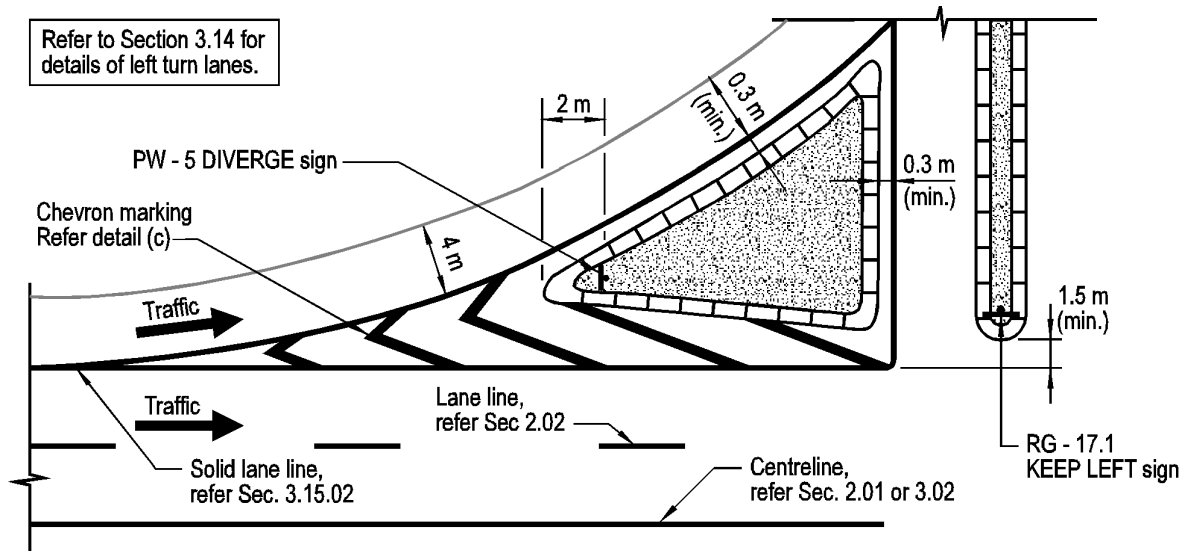
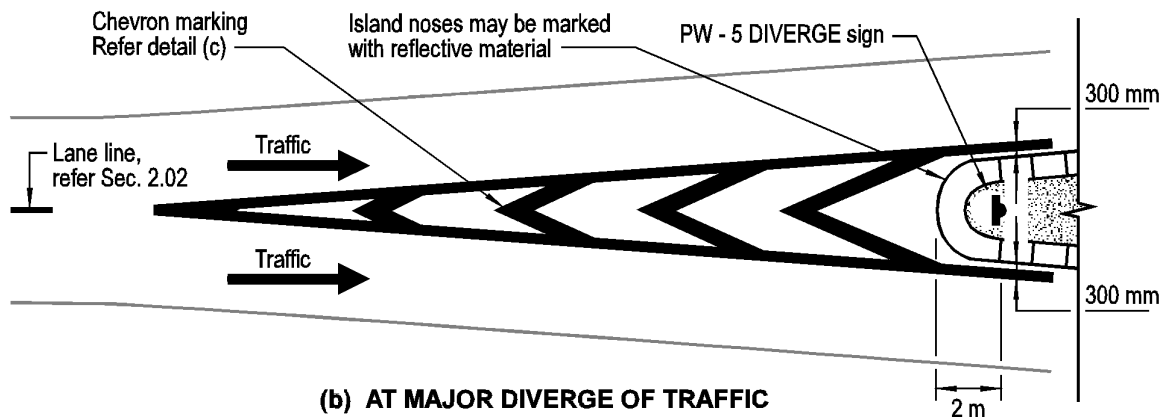


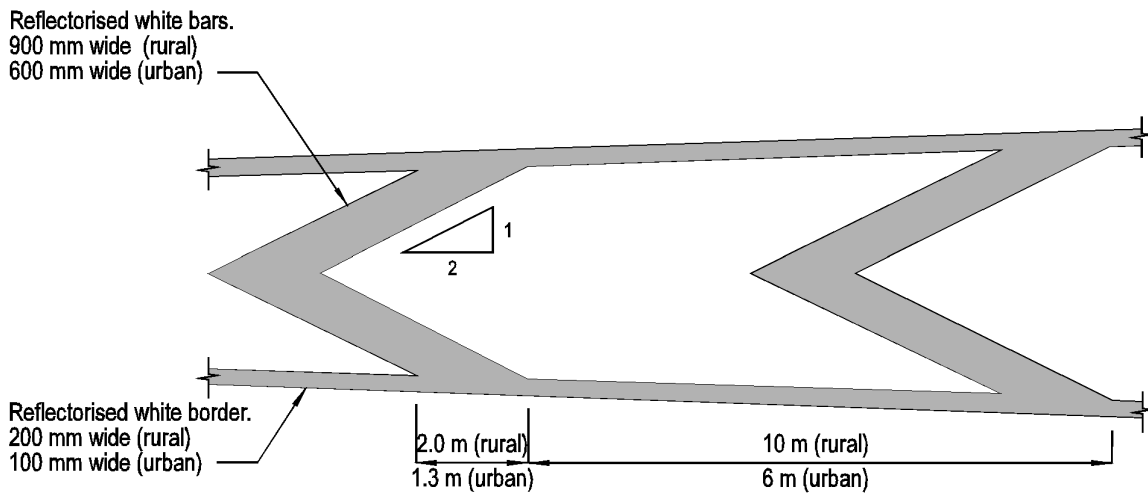
FIGURE 2.7 MARKINGS IN ADVANCE OF RAISED MEDIANS SEPARATING OPPOSING TRAFFIC FLOWS



(a) IN ADVANCE OF A RAISED LEFT TURN ISLAND



(b) AT MAJOR DIVERGE OF TRAFFIC



(c) CHEVRON MARKING DETAILS

MARKINGS IN ADVANCE OF RAISED TRAFFIC ISLANDS
SEPARATING DIVERGING TRAFFIC FLOWS

FIGURE 2.8

2.09 FLUSH MEDIANS

2.09.01 GENERAL

Refer to MOT/TNZ *RTS 4: Guidelines for Flush Medians*.

Refer to Section 3.18 for pavement marking details for flush medians at intersections.

Until recently, flush medians have been used sparingly for many years on New Zealand roads, generally to use up carriageway width on very wide roads.

Flush medians are now being used on arterial and occasionally sub-arterial roads where property access needs to be maintained but where there are seen to be safety benefits in removing turning vehicles from the through traffic stream, and in providing pedestrians with a place to pause while crossing the traffic stream.

Flush medians are intended primarily for urban (50 km/h) and semi urban (70 km/h) roads.

NOTE: *White is the only colour permitted on flush medians.*

Flush medians may be appropriate when:

- right turning traffic is interfering with through traffic causing accidents or problems with delays,
- pedestrians are having difficulty crossing a busy road,
- the carriageway is excessively wide, or
- property access needs to be maintained and any of the above conditions exist.

2.09.02 RURAL ROADS (Posted Speed Limit greater than 70 km/h)

Flush medians are not recommended for use on rural roads due to difficulties in controlling overtaking vehicles in higher speed environments.

Where in the special circumstances that flush medians are used in rural areas they shall be marked as follows:

Refer to Figures 2.9 and 2.10

(a) Diagonal Bars:

Colour : Reflectorised White
Bar width : 900 mm
Bar spacing : Refer to Section 2.09.04
Slope of Bars : 2:1

(b) Border Lines:

Colour : Reflectorised White
Width : 100 mm
Stripe : Continuous.

Diagonal bars should match directly into the border line, ie with no gap. *(This recommendation varies from RTS 4, but provides consistency with markings in other Sections of this manual).*

Flush medians shall have a minimum width of 1.0 m, and a desirable maximum width of 2.5 m. The absolute maximum width for flush medians is 3.5 m, but care must be taken to prevent vehicles using the median for overtaking purposes.

2.09.03 URBAN ROADS (Posted Speed Limit 70 km/h or less)

Flush medians on these roads should be marked as follows:

Refer to Figures 2.9 and 2.10

(a) Diagonal Bars:

Colour : Reflectorised White
Bar width : 600 mm
Bar spacing : Refer to Section 2.09.04
Slope of Bars : 2:1

(b) Border Lines:

Colour : Reflectorised White
Width : 100 mm
Stripe : Continuous.

Flush medians should be marked with the diagonal bars matching directly into the border line, ie with no gap. *(This recommendation varies from what is given in RTS 4, but is consistent with the markings detailed in other sections of this manual).*

Flush medians shall have a minimum width of 1.0 m, and a desirable maximum width of 2.5 m. The absolute maximum width for flush medians is 3.5 m, but care must be taken to prevent vehicles using the median for overtaking purposes.

2.09.04 BAR SPACINGS FOR FLUSH MEDIANS

The recommended ranges for bar spacing on flush medians are listed in Table 2.3 below:

Median Length	Recommended Range for Bar Spacing
Less than 100 m	6 m to 12 m
100 m to 500 m	10 m to 15 m
More than 500 m	12 m to 20 m

Table 2.3: Bar Spacing

2.09.05 END TREATMENTS

Border lines on flush medians should be tapered as indicated by the following formulae:

(a) Approach Taper:

Based on a side ways movement for approaching traffic of approximately 0.6 m/sec:

$$L_a = V \times \frac{Y_a}{2.76}$$

(b) Departure Taper:

Based on a side ways movement for departing traffic of approximately 0.6 m/sec:

$$L_d = V \times \frac{Y_d}{2.76}$$

Where:

- L = taper length (rounded to nearest 5 m)
- V = 85th percentile traffic speed (km/h)
- Y_a, Y_d = lateral shift (median width, in metres, as measured from the road centreline).

2.09.06 INTERSECTIONS

Refer to Section 3.17 for details of flush median treatments at intersections.

2.09.07 REFLECTIVE RAISED PAVEMENT MARKERS

Refer also to Section 4.06: Raised Pavement Markers.

The placement of reflective raised pavement markers on flush medians should be as shown in figure 2.10 and as defined below:

- **Only white RRPM's are permitted on flush medians.**
- The minimum spacing of RRPM's on median border lines is 10 metres.
- The minimum spacing of RRPM's on median diagonal bars is 20 metres.
- Where the bar spacing is less than 10 m, the central RRPM's should be located on every third bar. The border line RRPM's should be located at every third bar and one midway between. Refer to Figure 2.10(c).
- RRPM's shall be laid at least 50 mm clear of adjacent paint or thermoplastic marking.

2.09.08 PEDESTRIAN CROSSINGS

(a) Legislation:

Refer to the *Land Transport Rule: Traffic Control Devices 2004*.

(b) Application:

In situations where pedestrian crossings are used, the following notes should be followed.

Refer to Section 4.02.2(d) Pedestrian Crossings.

It is desirable to minimise the number of pedestrian crossings on sections of road with flush medians.

Where pedestrian crossings are marked, a raised pedestrian refuge similar to that shown in Figure 2.9(c) should be installed in the flush median to divide the crossing into two sections.

Refer to Figure 2.9(C) for marking flush medians around pedestrian refuges and other central islands.

Allow a 300 mm (min.) gap between the outside of the border line and the central island.

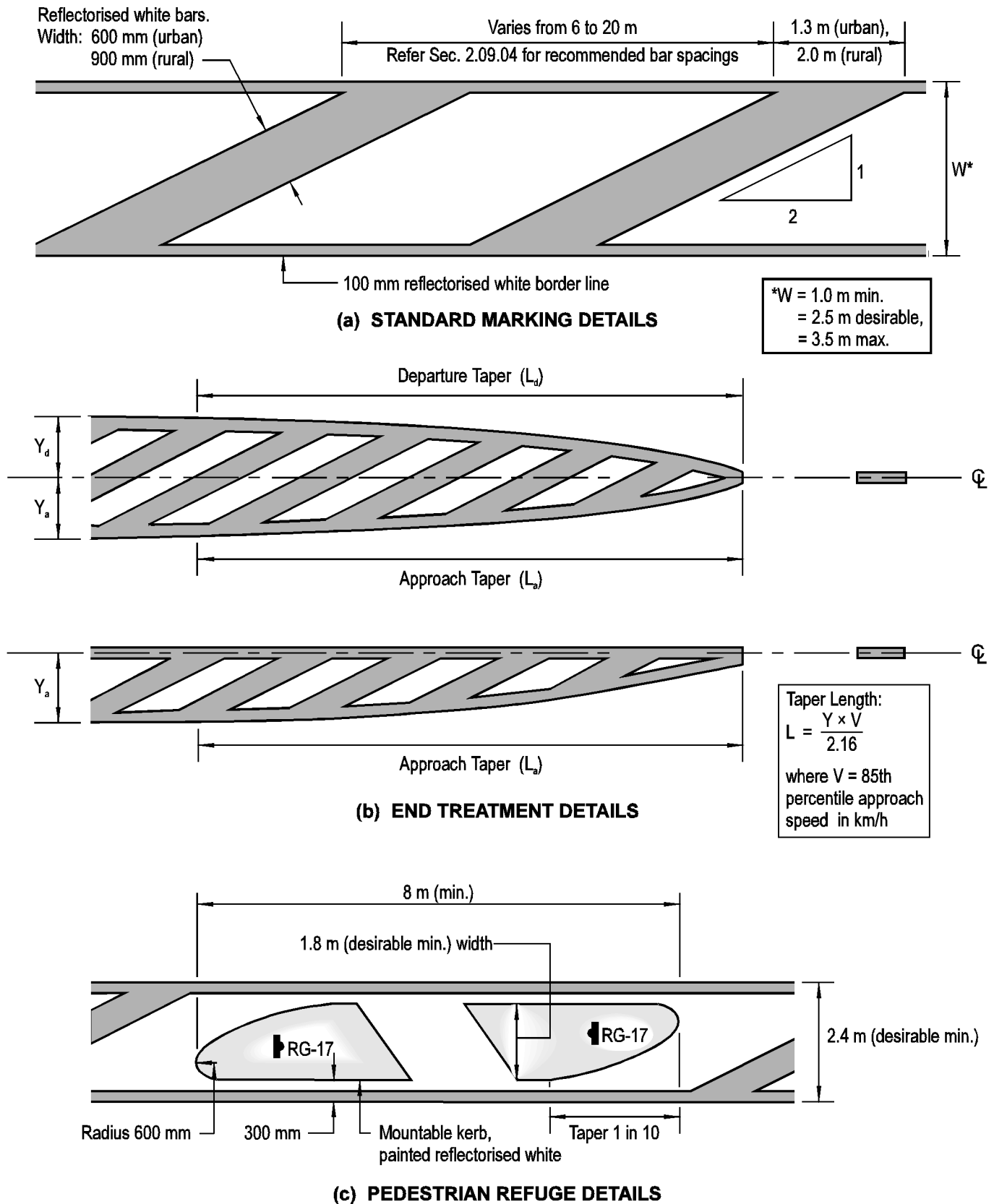
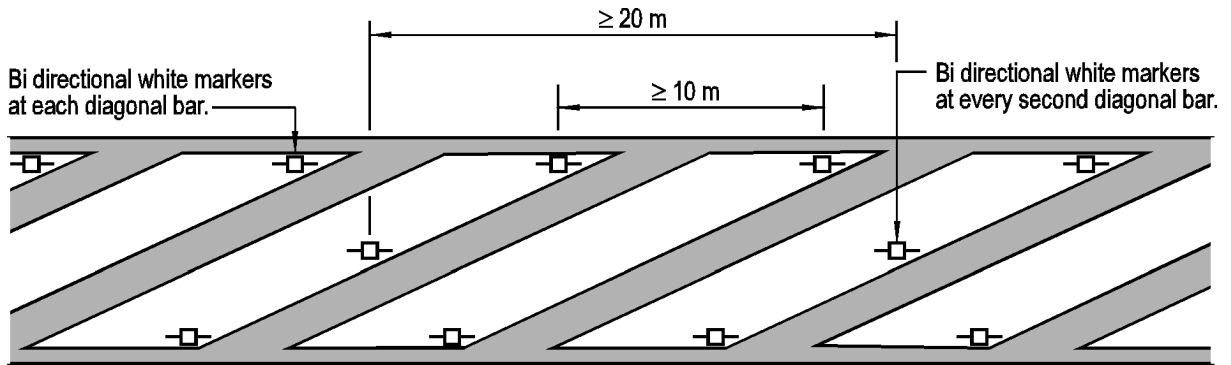
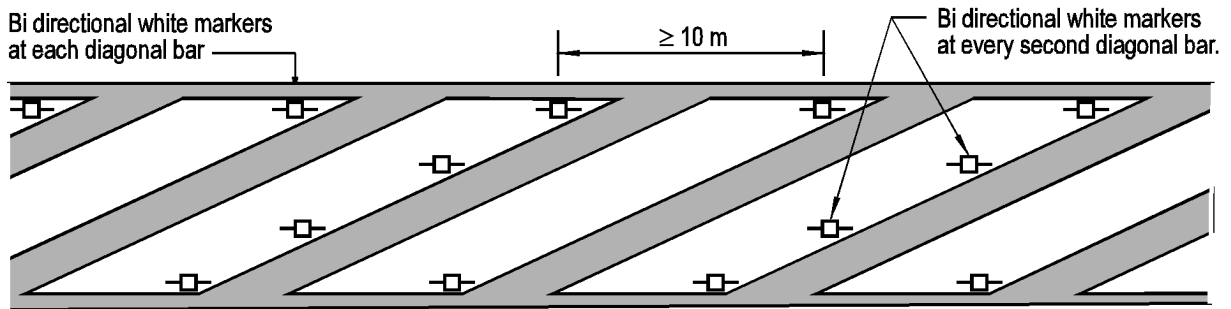


FIGURE 2.9

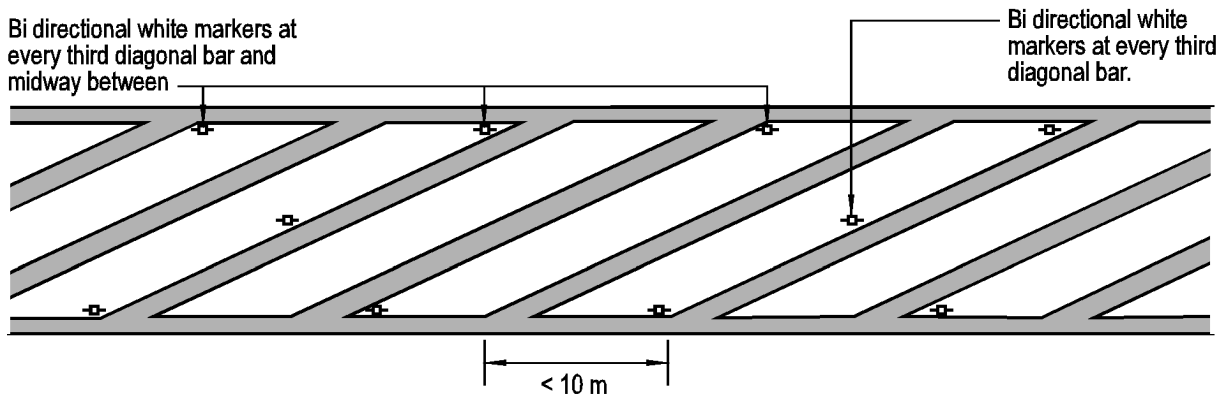
MARKINGS FOR FLUSH MEDIANS



(a) RRPM ARRANGEMENT FOR MEDIAND 1.0 m TO 2.4 m IN WIDTH



(b) RRPM ARRANGEMENT FOR MEDIANS 2.5 m TO 3.5 m IN WIDTH



(c) RRPM ARRANGEMENT FOR MEDIANS WITH BAR SPACINGS <math>< 10\text{ m}</math>

NOTE: Only white RRPMS are permitted on flush medians

Refer to Section 4.06 Raised Pavement Markers

REFLECTIVE RAISED PAVEMENT MARKER LAYOUTS FOR FLUSH MEDIANS

FIGURE 2.10

2.10 CYCLE LANES

2.10.01 GENERAL

(a) Legislation:

Refer to the Land Transport Rule:

Traffic Control Devices 2004.

(b) Application:

Cycle lanes are provided where road space is to be formally allocated to cyclists. Where possible, cycle lanes should be provided on both sides of a road.

Refer to PART I of this manual for the appropriate signing policy and location requirements for RG - 26 CYCLE LANE signs.

2.10.02 RECOMMENDED CONFIGURATIONS FOR CYCLE LANES

The following recommendations are a basic guide to the provisions for cycle lanes. For further reference material for use when designing cycle lanes refer to the following guides. In case of conflict between the guides, the information in the NZ Supplement prevails:

- AUSTRROADS *Guide to Traffic Engineering Practice - Part 14: Bicycles*, and
- NZ Supplement to the above guide, available at : <http://www.transit.govt.nz/technical/manuals.jsp>.

(a) General Lanes:

Refer to Section 2.02.02 for recommended lane widths for urban and rural roads.

Lanes over 4.5 m wide may have marked cycle lanes to discourage two vehicles using the same lane side by side.

Lanes where cyclists share with motorised traffic should ideally be between 4.1 m and 4.5 m wide. The minimum width for a general lane outside a cycle lane is 3.5 m, but can be reduced to 3.0 m if the road is not a State Highway, or is not a heavy vehicle route, or has low traffic volumes. The minimum lane width can be further reduced to 2.8 m minimum if the lane is located adjacent to a flush median.

(b) Parking Lanes:

Refer to Section 2.11 and the NZ Supplement for recommended parking widths.

Parking lanes should desirably be 2.5 m wide. Where the combined width of a parking and a cycle lane is limited, the parking lane should be kept narrow, so that good parking discipline is encouraged, allowing cyclists to avoid opening car doors. The normal minimum width of a parking lane is 2.0 m, but this width should only be used if parked cars can easily park up against the kerb, with 1.9 m the absolute minimum width. Wider parking lanes should be provided on roads with steep camber, or on curved sections (where parking next to the kerb is difficult), where there is excess road space available or where heavy vehicle parking is common.

(c) Cycle Lanes next to Kerb or Road Edge or between General Traffic Lanes:

Refer to the NZ Supplement for recommended provisions for cycle lanes next to the kerb or edge of seal (Table 4-1 and associated footnotes), or where cycle lanes are placed between two traffic lanes (e.g. at an intersection). A kerbside cycle lane should be measured from the usable point, which could be the kerb face (where there is no vertical lip (>5mm) formed between the carriageway and the fender) or the edge of a dish channel. An allowance also needs to be made where ramps, that have been provided at vehicle access ways, extend into the cycle lane.

When greater than 2.5 m of sealed shoulder exists, painted/flush diagonal bars should be provided between the general lane and the cycle lane to suggest a cycling area of between 1.5 m and 2.0 m in width and to separate the cycling area from the general traffic lane. In such cases, the diagonal bars should be at least 1.0 m wide (refer Figure 2.11 a). A solid line is required on the left hand edge of the diagonal bars.

(d) Cycle Lanes next to Parking:

Refer to the NZ Supplement for recommended dimensions for cycle lanes adjacent to parallel and angle parking (Supplement Tables 4-2 and 4-3 respectively, plus associated footnotes). Figures 2.11 c and d illustrate the general configurations and buffer zone.

(e) Cycle lanes at pedestrian crossings:

Refer to Figure 4.4 for recommended cycle lane layouts at a typical pedestrian crossing with kerb extensions. It is important that the cycle lane is not terminated prior to the kerb extension and that a taper of not less than 1 in 30 is achieved for the cycle lane where it tapers from a kerbside alignment. Where kerb extensions are provided to ensure sufficient intervisibility, but result in insufficient cycle lane width, more upstream parking could be removed or the general lane narrowed.

2.10.03 CYCLE LANE LINES

The right hand side of a cycle lane should be marked by a continuous white line.

The line should be located as per the recommended ranges given in Section 2.10.02 outside:

- the edge of the roadway usable to cyclists, or
- where parking is permitted, a continuous white edge line, or parking ticks, or a continuity line.

Refer to Figure 2.11.

(a) Cycle lane:

The lane line separating motor vehicle traffic from cyclists should be marked as follows:

Colour:	Reflectorised white
Width:	100 mm
Stripe:	Continuous

(b) Edge line:

Where parking is provided, the left hand edge of the cycle lane should be marked at an absolute minimum of 1.9 m (refer section 2.10.02) from the kerb face, or the edge of the usable road space (e.g. at a dish channel), and consist of a continuous or broken white line as specified below:

Colour:	Reflectorised white
Width:	100 mm
Stripe:	Continuous or broken (stripe 1m, gap 2m)

2.10.04 CYCLE LANE SYMBOL

The cycle lane symbol shall be marked at the start of a cycle lane and immediately beyond each intersection or other break in the lane (e.g. a bus stop, refer section 2.10.09).

Cycle lane symbols should be located at not more than 100 m spacing in an urban area, and not more than 300 m in a rural area. Spacing symbols between 50 m and 100 m within an urban area is desirable.

The cycle symbol may be marked on a rectangle of coloured surface (just exceeding the size of the cycle symbol itself) to aid conspicuity.

The symbol shall be marked as follows:

Refer to Figure 2.12 (taken from Schedule 2 of the Traffic Control Devices Rule 2004)

Colour:	Reflectorised white.
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The following scale factors are recommended:

For cycle lanes where the speed limit is up to 60 km/h:

$$X = 60 \text{ mm}$$

(This results in a cycle logo 1080 mm wide and 1680 mm high.)

For cycle lanes where the speed limit is above 60 km/h:

$$X = 80 \text{ mm}$$

(This results in a cycle logo 1440 mm wide and 2240 mm high. This is also the appropriate symbol size for ASBs (refer section 3.18.08).)

For narrow cycle lanes where the speed limit is up to 60 km/h:

$$X = 40 \text{ mm}$$

(This results in a cycle logo 720 mm wide and 1120 mm high.)

For shared cycle and pedestrian pathways:

$$X = 20 \text{ mm}$$

(This results in a cycle logo 360 mm wide and 560 mm high.)

2.10.05 DIAGONAL BARS

Diagonal bars should not be marked within a cycle lane.

2.10.06 COLOURED SURFACING

At particular locations where motorists may be unaware of the likely presence of cyclists, or where cyclists are likely to feel under stress from potential conflicts with motor vehicles, cycle lanes should be given a distinctive pavement surface colour. Typical locations for such treatment in mid-block locations are at curves (especially where the road curves to the left) and along-side parking (see Figure 2.11c).

Colour: Green - Use AS 2700 S 1996 colour G13 Emerald or similar*.

2.10.07 INTERSECTIONS

For the treatment of cycle lanes at intersections refer to Section 3.18.

2.10.08 NO-STOPPING LINES

Cycle lanes marked adjacent to the kerb are not legally required to have no-stopping lines. However several Road Controlling Authorities have found this to not be sufficient and it may thus be desirable to continue marking no-stopping lines. Having a mixture of some kerbside cycle lanes with, and some without no-stopping lines in the same district should be avoided.

2.10.09 BUS STOPS

Bus stops may be marked where cycle lanes are in a kerbside position if buses are not frequent (fewer than about 10 buses per hour) and if buses stop only briefly. A "layover" bus stop blocking a cycle lane must not be provided. In legal terms, a cycle lane stops where the bus stop starts, and commences again beyond the bus stop.

*Ref: http://www.tmr.qld.gov.au/~media/business-and-industry/technical-standards-and-publications/traffic-and-road-use-management-manual/august-2010-amendment-14/1_34.pdf

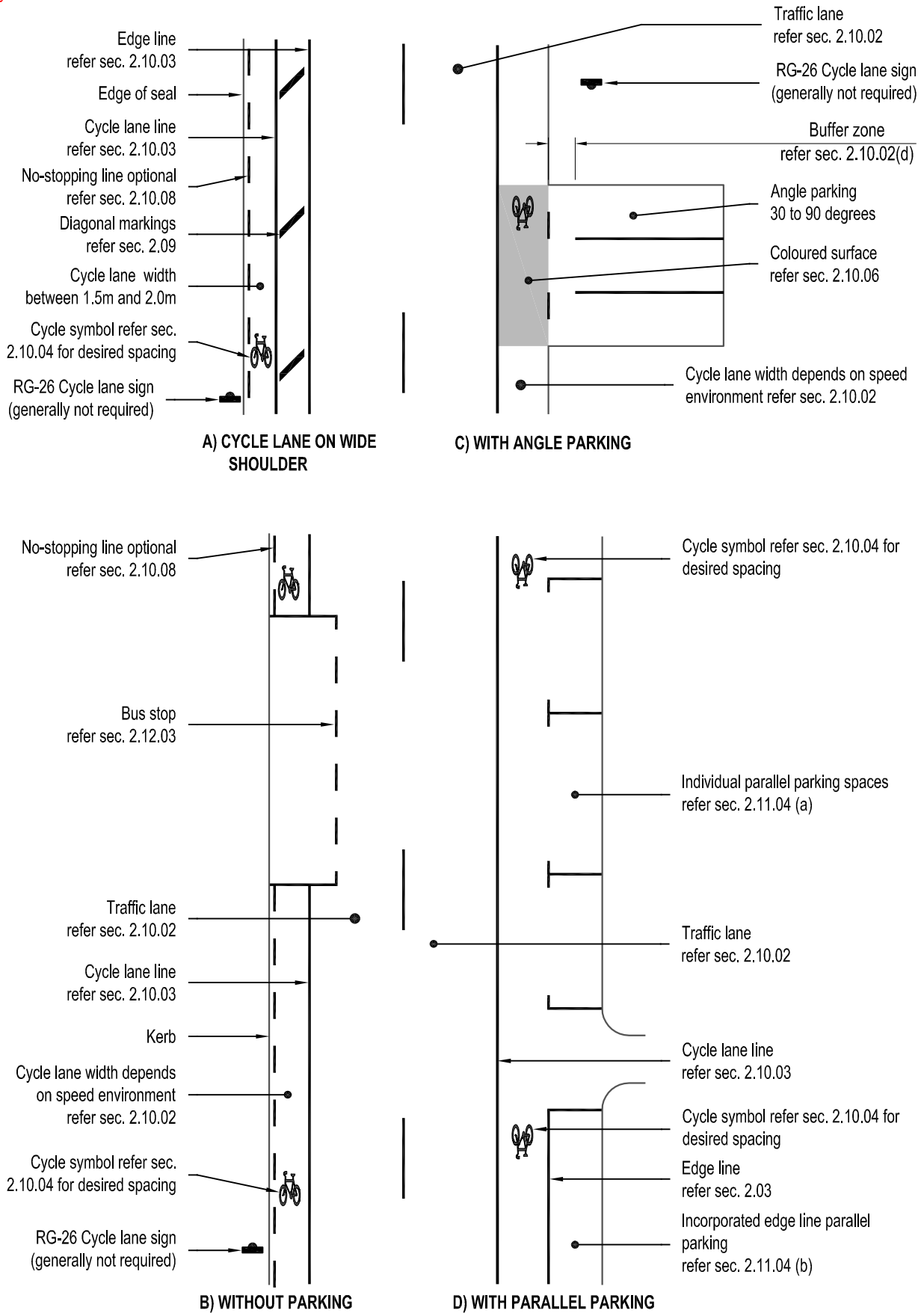
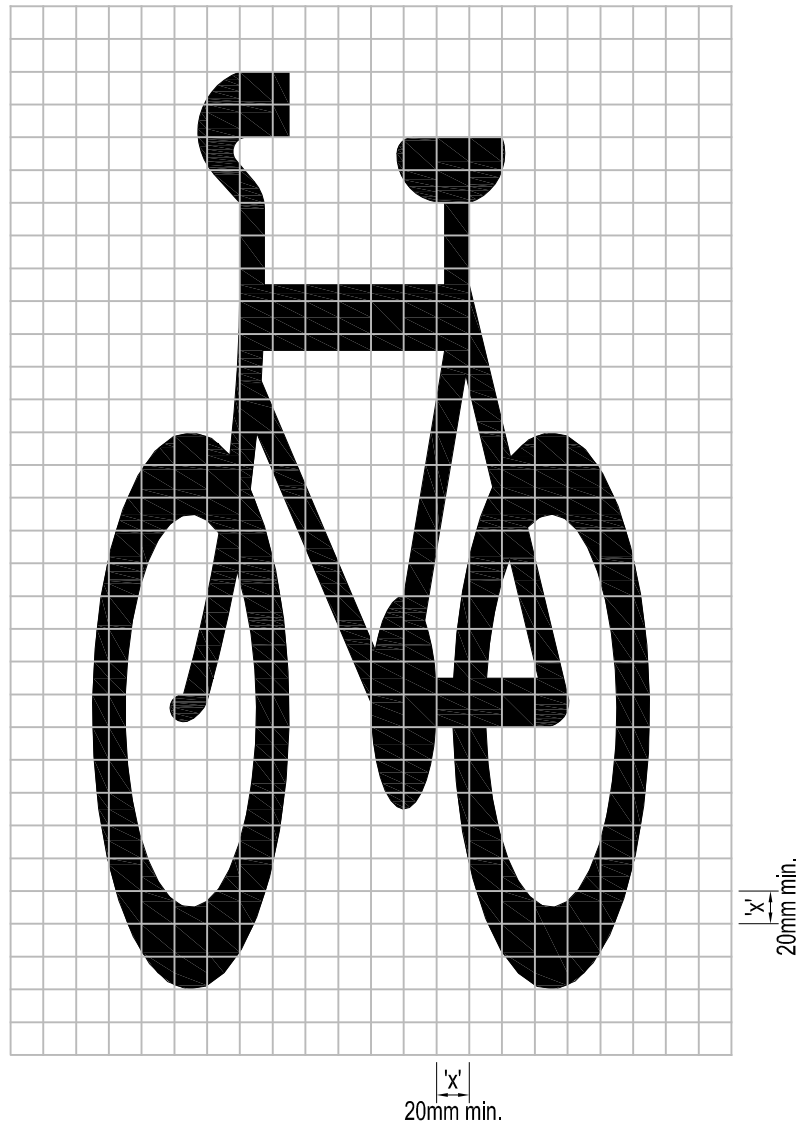


FIGURE 2.11 MARKINGS FOR CYCLE LANES



Refer to sec. 2.10.04 for dimensions 'x'

<http://www.landtransport.govt.nz/rules/traffic-control-devices-2004-schedules.html#schedule2>

2.11 PARKING

2.11.01 GENERAL

(a) Legislation:

Refer to the Land Transport Rule:

Traffic Control Devices 2004.

Parking markings are used to define correct parking orientation of vehicles and to avoid disruption to the flow of through traffic.

White markings shall be used where parking is permitted. Yellow markings shall be used where no-stopping restrictions apply.

For the design of on street parking spaces refer to *AS/NZS2890.1: 2004 Parking Facilities* and also *AUSTROADS Guide to Traffic Engineering Practice - Part 11: Parking*.

When designing parking spaces consideration must be given to:

- vehicle dimensions,
- the parking demand,
- expected parking turnover,
- abutting land use,
- road function,
- the width of road available,
- speed characteristics of through traffic,
- manoeuvring space and
- the presence of cycle lanes.

2.11.02 NO-STOPPING

No-stopping restrictions shall be indicated by either:

- RP - 1 or RP - 1.1 signs, or, where the road surface permits, a no-stopping line marked parallel to the kerb.
- RP - 1 or RP - 1.1 signs and no-stopping lines should not generally be used together. The marking is preferred as giving a clearer indication of the stopping restriction.

No-stopping lines shall be marked as follows:

Refer to Figure 2.13(a)

Colour:	Yellow
Width:	100 mm
Stripe:	1.0 m
Gap:	1.0 m *

Where a no-stopping restriction is greater than 30 m a 2.0 m gap may be used.

The no-stopping line should be marked parallel to and between 0.4 m and 1.0 m out from the kerb face, but typically as close as practicable to the fender, so that space for cyclists does not appear to be overly constrained by a no-stopping line.

2.11.03 PARALLEL PARKING WITHOUT INDIVIDUAL PARKING SPACES (Parking Zones)

(a) Low Parking Demand:

Where there is low parking demand a parallel parking zone may be marked by a 100 mm wide continuous white line parallel to and at a distance of between 1.9 m and 2.5 m from the kerb.

Refer to Section 2.03.09 for edge line pavement marking details.

(b) Moderate Parking Demand:

Where there is moderate parking demand the following markings may be used:

Refer to Figure 2.13(b) where the distance between the parking zone and the traffic lane is greater than 1.0 m.

Refer to Figure 2.14(a) where the distance between the parking zone and the traffic lane is less than or equal to 1.0 m.

The extent of parking at intersections and access ways should be marked with the inverted "L" or parking tick markings as defined in Section 2.11.04. The markings should be located between 1.0 and 2.0 m (desirably around 1.5 m) from the edge of driveways and should extend between 1.9 m and 2.5 m from the kerb.

To provide further indication of the parking zone, 100 mm reflectorised white lines with a 1 m stripe and 5 m gap may be marked parallel to the kerb at a distance matching that of the parking tick markings. Refer to Figure 2.13(b).

If required, edge lines may desirably be marked 1 m (0.3 m minimum) from the parking zone and comply with the requirements of Sections 2.02.02 and 2.03. Refer to figures 2.13(b) and 2.14(a).

If the edge line is marked further than 1 m from the parking zone diagonal shoulder markings may be marked as shown in Figure 2.13(b). Refer to Section 2.04.03 - Shoulder markings for urban roads.

Refer to Figure 2.13(c) where a cycle lane is provided. Refer to Section 2.10.02(d) for cycle lanes next to parking.

2.11.04 PARALLEL PARKING WITH INDIVIDUAL SPACES

Where parking is metered or where there is high parking demand, individual parking spaces should be marked.

For parallel parking design details refer to *AS/NZS2890.1: 2004 Parking Facilities* and also *AUSTROADS Guide to Traffic Engineering Practice - Part 11: Parking*.

Parallel parking spaces should be marked as follows:

Parking spaces should be 5.0 m long where access is possible from an end or 6.0 m long when between other parking spaces or where access is restricted.

Parking spaces should commence a minimum distance of 6.0 m from any side road.

Parking spaces should be between 1.9 m and 2.5 m wide.

(a) Individual Spaces with no adjacent cycle lane:

Refer to Figure 2.14(a) for individual spaces with no adjacent cycle lane.

Parking ticks, or inverted "L" or "T" markings are used to define the end of each parking space. They are recommended for use in situations where delineation of the through lane is not required or where the road width allows a white edge line to be marked outside the parking spaces.

Refer to Section 2.03 for recommended lane widths and pavement marking detail for edge lines.

Parking spaces should be marked with a perpendicular inverted "L" between 1.0 and 2.0 m (desirably around 1.5 m) from the edge of driveways.

The width of space should be indicated by an intersecting 100 mm wide 1 m long white stripe parallel to the kerb forming the shape of an inverted "T". The first and last parking space shall be indicated by a 0.5 m intersecting stripe forming the shape of an inverted "L".

(b) Individual Spaces with Incorporated Edge Line:

Refer to Figure 2.14(b) for individual spaces incorporating an edge line.

Parking spaces marked with an incorporated edge line are used in situations where delineation of the through lane is required but the available road width does not allow a normal white edge line to be marked outside the parking spaces.

Refer to Section 2.02.02 for traffic lane widths and Section 2.03 edge line details.

The front and rear limits of each parking space should be defined by 100 mm wide white lines at right angles to the kerb.

The width of parking should be indicated by an intersecting 100 mm wide continuous white edge line parallel to the kerb.

The continuous white line should not continue across driveways. Continuity may be provided across gaps greater than 15 m by marking white continuity lines.

Refer to Section 3.07 continuity lines.

(c) Individual Spaces next to a Cycle Lane:

Refer to Figure 2.14(c) for individual spaces next to a cycle lane.

Refer to Section 2.02.02 for traffic lane widths, Section 2.10.03 edge line details and Section 2.10.02 for cycle lane details.

The front and rear limits of each parking space should be defined by 100 mm wide white lines at right angles to the kerb.

Parking spaces combined with a cycle lane should be marked with a perpendicular inverted "L" between 1.0 and 2.0 m (desirably around 1.5 m) from the edge of driveways.

The width of space should be indicated by an intersecting 100 mm wide continuous white edge line parallel to the kerb.

The continuous white line should not continue across access ways. Continuity may be provided across gaps greater than 15 m by marking white continuity lines.

Refer to Section 3.07 continuity lines.

2.11.05 ANGLE PARKING

For safety reasons it is recommended that angle parking be used with caution.

Angle parking should not be used on high volume roads such as arterial or principal roads.

Angle parking should only be used where adequate manoeuvre space is available completely clear of the through traffic lane. Refer to MOT (1976) "Metric Parking Dimensions" or the local authority district scheme for appropriate manoeuvre space dimensions.

For angle parking design details refer to MOT *Metric Parking Dimensions* or AUSTRROADS *Guide to Traffic Engineering Practice - Part 11: Parking*.

The following markings should be used for angle parking:

Refer to Figure 2.14.(c)

- Angle parking shall be indicated by 100 mm wide white lines with a minimum length of 3.0 m marked at the desired angle to the kerb.
- A continuous 150 mm wide white edge line may be marked to define the through lane and to define the manoeuvre space for entering and exiting vehicles.
- Raised islands are recommended to protect the parked vehicles and to allow side road limit lines to be moved forward to increase intervisibility for side road traffic.

Refer to Figure 2.11(c) where angle parking is to be combined with a cycle lane.

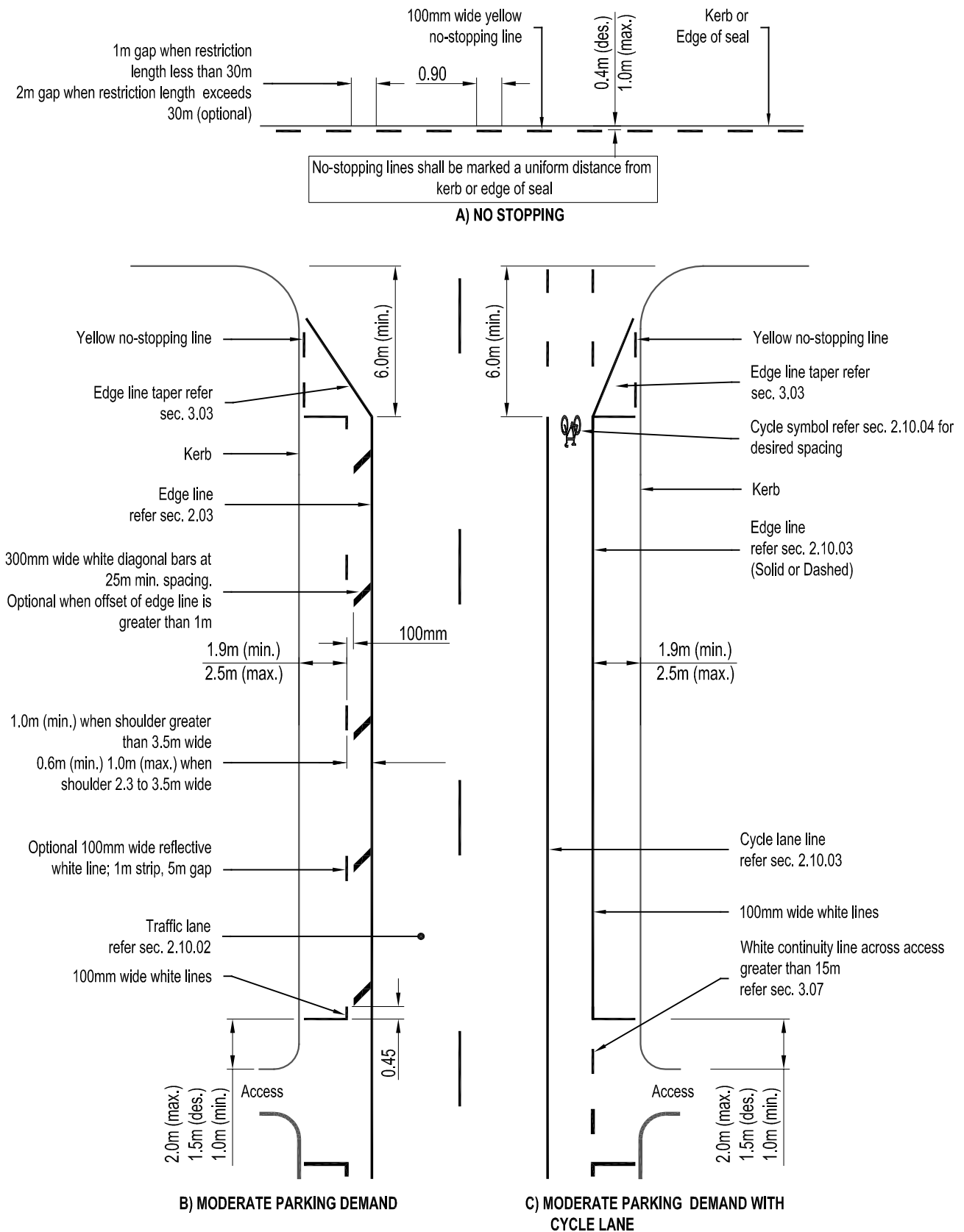
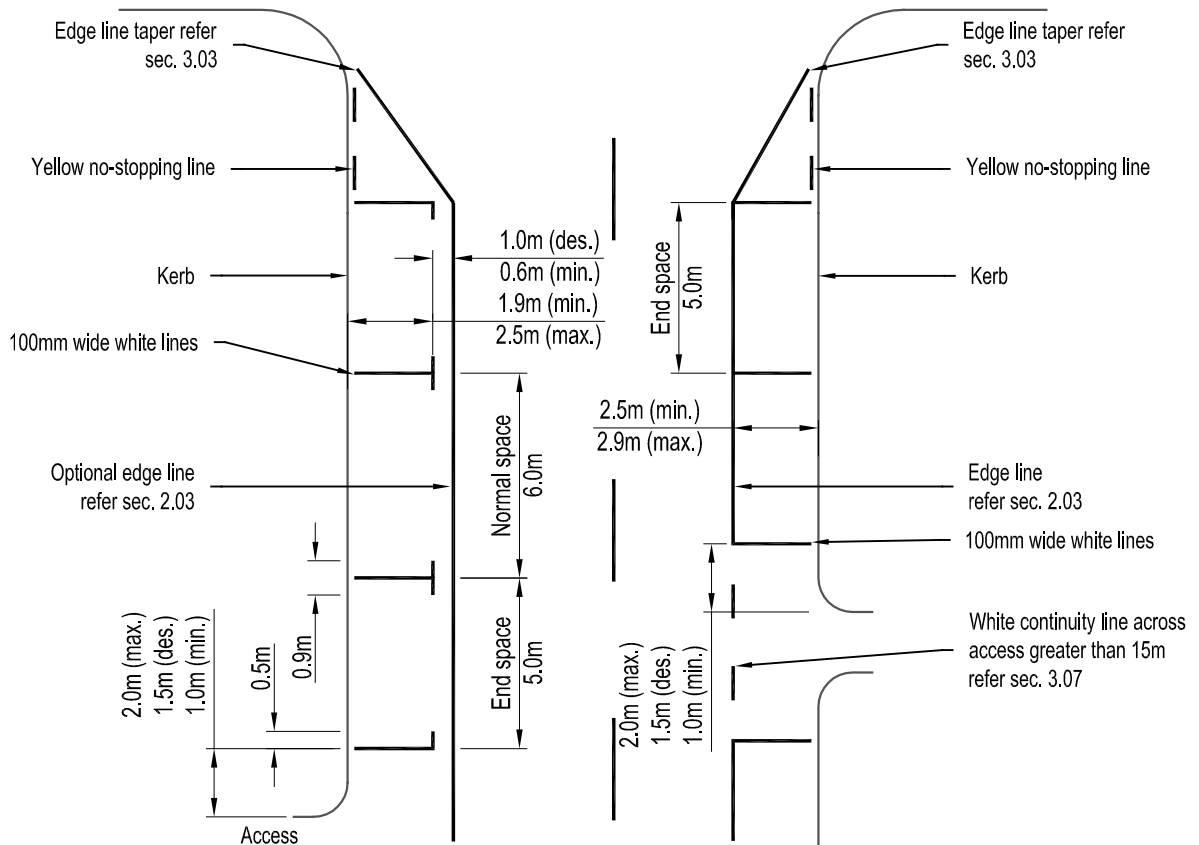
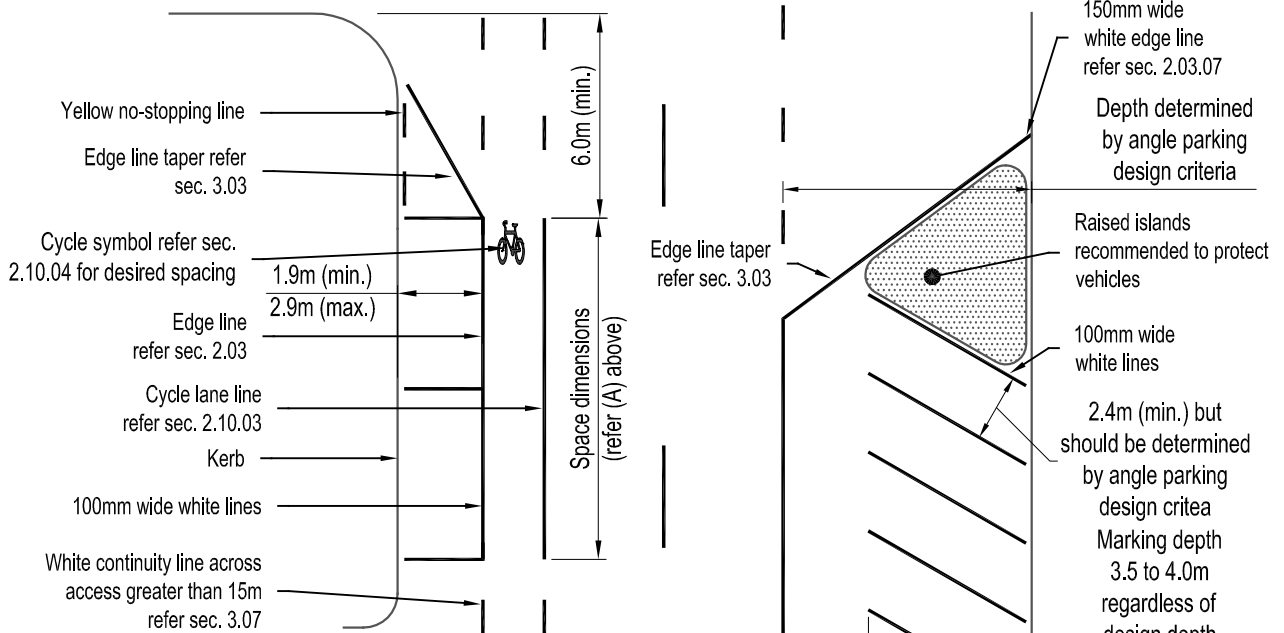


FIGURE 2.13 MARKINGS FOR PARKING ZONES



A) PARALLEL PARKING - INDIVIDUAL SPACES
NO CYCLE LANE

B) PARALLEL PARKING
- INCORPORATING EDGE LINE
NO CYCLE LANE



C) PARALLEL PARKING - INCORPORATING EDGE LINE
AND CYCLE LANE

D) ANGLE PARKING

2.12 SPECIAL VEHICLE PARKING AREAS

2.12.01 GENERAL

Refer to the *Land Transport Rule: Traffic Control Devices 2004*.

(b) Application:

Special vehicle parking areas are used in areas where parking is restricted to a certain class of vehicle. The markings should only be used in conjunction with appropriate regulatory signs as defined in Part I of this manual.

2.12.02 TAXI STAND

Where the road surface is suitable, taxi stands are to be marked on a Section of road that the road controlling authority has authorised to be reserved for a taxi stand. Taxi stands shall be marked in conjunction with RP - 6 or RP - 6.1 signs as defined in PART I of this manual.

Taxi stands shall be marked as follows:

Refer to Figure 2.15(a).

Colour : Yellow
Width : 100 mm
Stripe : 1.0 m
Gap : 1.0 m *

**Up to 2.0 m gaps are optional over long lengths.*

The broken yellow line should be marked parallel to and between 2 and 3 m from the kerb.

The pavement message "*TAXI STAND*" may be marked in 1.2 m high yellow letters and positioned inside the stopping area. Refer to Section 4.01.03 for letter proportions and spacing.

2.12.03 BUS STOPS

Where the road surface is suitable, bus stops should be marked on a section of road that the road controlling authority has authorised to be reserved for a bus stop. Bus stops shall be marked in conjunction with RP - 5 or RP -5.1 signs as defined in PART I of this manual.

Bus stops should be marked as follows:

Refer to figure 2.15(b).

Colour : Yellow
Width : 100 mm
Stripe : 1.0 m
Gap : 1.0 m *

** Up to 2.0 m gaps are optional over long lengths.*

The broken yellow line should be marked parallel to and between 2.5 m and 3.0 m from the kerb. Where a bus stop is not indented and a cycle lane is provided adjacent to a parking lane, the bus stop markings may protrude into the cycle lane.

The pavement message "*BUS STOP*" may be marked on the road in 1.2 m high yellow letters and positioned inside the stopping area. Refer to Section 4.01.03 for letter proportions and spacing

2.12.04 LOADING ZONE

Where the road surface is suitable, loading zones are to be marked on a section of road that the road controlling authority has authorised to be reserved for a loading zone.

Loading zones shall be marked in conjunction with RP-7, RP - 7.1 or RP - 7.2 signs as defined in PART I of this manual.

Loading zones shall be marked as follows:

Refer to Figure 2.15(c).

Colour : Yellow
Width : 100 mm
Stripe : 1.0 m
Gap : 1.0 m *

** Up to 2.0 m gaps are optional over long lengths.*

The broken yellow line should be marked parallel to and between 2.5 and 3 m from the kerb unless generally used by cars when the width should be 2 m.

The pavement message "*LOADING ZONE*" may be marked on the road in 1.2 m high yellow letters and positioned inside the stopping area. Refer to Section 4.01.03 for letter proportions and spacing.

2.12.05 MOTORCYCLE PARKING

When the road surface is suitable, motorcycle parking zones are to be marked on a section of road that the road controlling authority has authorised to be reserved for motorcycles.

Motorcycle parking zones shall be marked in conjunction with RP-8 or RP-8.1 signs as defined in PART I of the manual.

Motorcycle parking zones shall be marked as follows:

Refer to Figure 2.15(d).

Colour	:	Yellow
Width	:	100 mm
Stripe	:	1 m
Gap	:	1 m *

* Up to 2 m gaps are optional over long lengths.

The broken yellow line should be marked parallel to and between 2.0 and 3.0 m from the kerb

2.12.06 BICYCLE STANDS

Where the road surface is suitable, bicycle stands are to be marked on a section of road that the road controlling authority has authorised to be reserved for bicycles.

Bicycle stands shall be marked in conjunction with RP-9 or RP-9.1 signs as defined in PART I of the manual.

Bicycle stands shall be marked as follows:

Refer to Figure 2.15(d).

Colour	:	Yellow
Width	:	100 mm
Stripe	:	1 m
Gap	:	1 m *

* Up to 2 m gaps are optional over long lengths.

The broken yellow line should be marked parallel to and between 2.0 and 3.0 m from the kerb

2.12.07 DISABLED PARKING SPACE

Where a parking space has been specifically allocated as disabled persons parking space and RP - 10 signs are erected, a yellow disabled access symbol may be marked in the parking space as per Figure 2.16

Parking spaces for the disabled shall:

- provide a flat surface not less than 3.5 m wide to allow for a car and wheelchair to be on the same level when a person is transferring. Where the parking space is parallel and adjacent to a footpath that is on the same level, the width of the common footpath may form part of the parking space,
- provide flat access between each parking space and the adjoining footpath. If there is a change in level from the parking space to the footpath a ramp shall be provided, and
- be next to a pedestrian access route and located as close as practicable to entrances of facilities and covered footpaths.

Parking spaces should be marked in yellow material.

Refer to NZS 4121:(2001) "Design for Access and Mobility: Buildings and Associated Facilities."

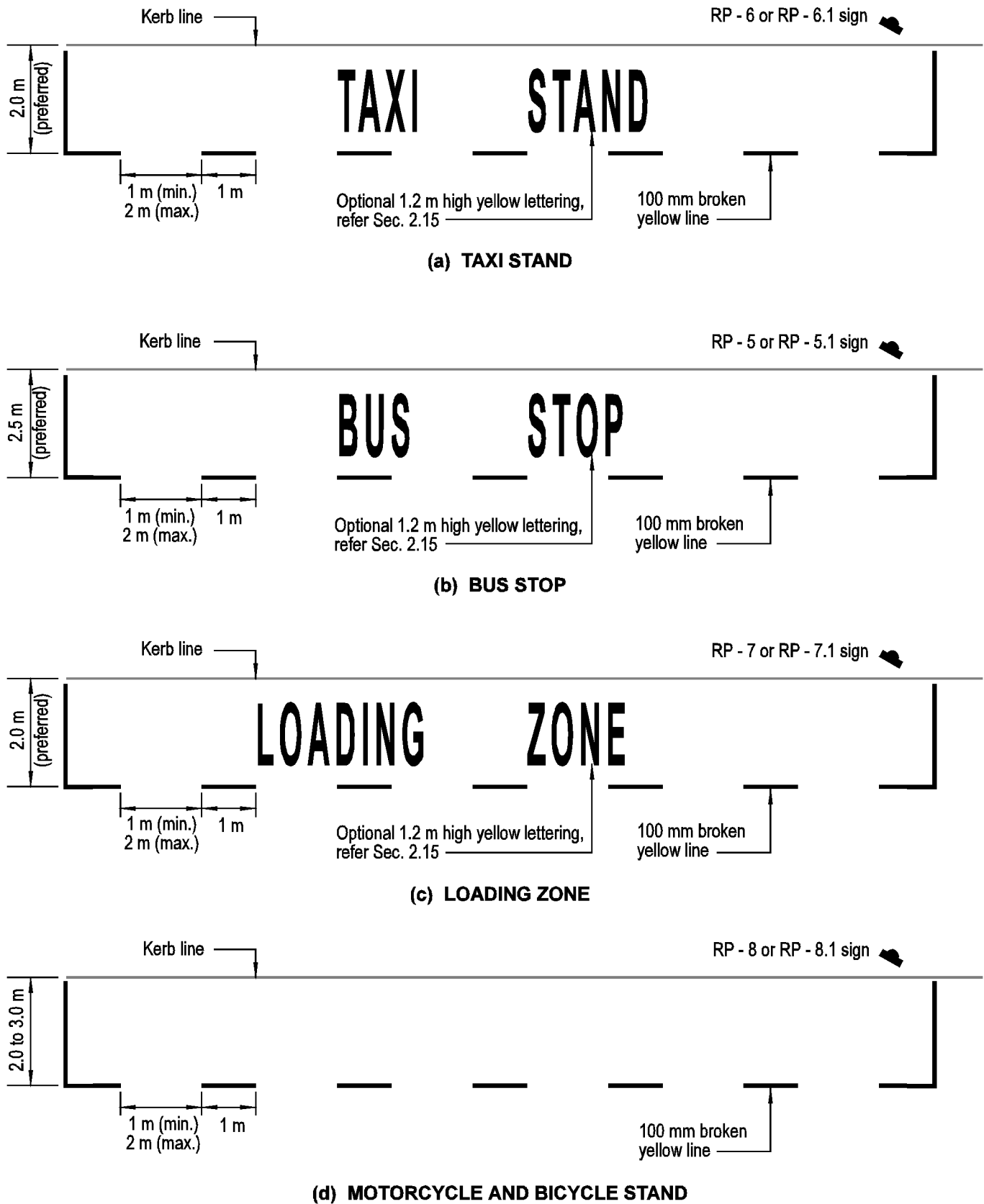
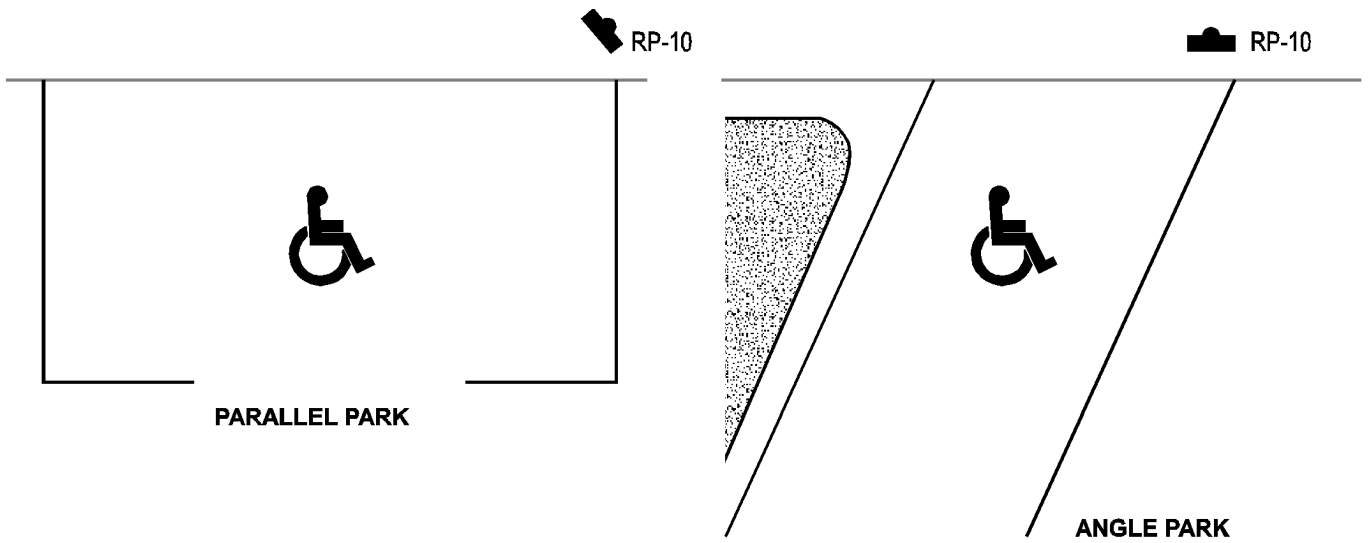


FIGURE 2.15

MARKINGS FOR SPECIAL VEHICLE STOPS



(a) LOCATION OF SYMBOL

Refer to Section 2.12.07
for parking dimensions

Refer to:

<http://www.landtransport.govt.nz/roads/tcd/sign-s-category-symbol.html>

(b) SYMBOL DETAILS

2.13 SLOW VEHICLE BAYS

2.13.01 GENERAL

Slow vehicle bays are sometimes referred to as "turnouts" or "passing bays" in international literature.

Slow vehicle bays are the formalised use of very short lengths of widened, unobstructed sealed shoulder on two-lane rural roads, to allow slow moving vehicles to pull out of a traffic lane and give following vehicles an opportunity to pass. **Drivers of vehicles in slow vehicle bays do however have to ensure that their way is clear before they can re-enter the traffic lane.**

Slow vehicle bays are short, usually less than 300 m, when compared to passing lanes which should be at least 600 m in length. **Slow vehicle bays are not passing lanes but on roads with lower traffic volumes they can provide some of the benefits of passing lanes.**

To avoid driver confusion, slow vehicle bays and passing lanes should not be closely interspersed along a section of road.

To maximise the use of slow vehicle bays they should be located where the drivers of slow-moving vehicles are able to use them without adding unacceptable delays to their total journey time.

NOTE: Unless the conditions noted in Section 2.13.02 (a), (b), (c), (d) and (e) below are ALL met short lengths of widened shoulder on two-lane rural roads be made and signed as conventional, but short, passing lanes, because motorists are more familiar with them. Refer to Section 2.07 for passing lane details.

2.13.02 APPLICATION / LOCATION

Slow vehicle bays are rarely used by trucks, except on very steep grades where the trucks are reduced to crawl speeds. Slow vehicle bays are more suited to recreational and/or tourist routes where drivers of slow vehicles are usually more willing to let faster vehicles past.

The provision of slow vehicle bays may be considered on winding two-lane rural roads in mountainous, coastal and scenic areas where **ALL** of the following conditions are met:

- (a) Long platoons of vehicles are rare, **and**
- (b) normal traffic flows are low, ie. AADT is less than 2000 vpd, **and**
- (c) traffic flows contain a high proportion of slow moving vehicles, ie. at least 10% of AADT, **and**
- (d) the slow-moving vehicles are mainly recreational/tourist vehicles such as campervans, cars towing caravans and/or boats, etc, **and**
- (e) passing opportunities are limited.

Where practicable, a series of slow vehicle bays should be provided, to give regular passing opportunities.

The development of proposals to provide slow vehicle bays should include careful consideration of traffic flows and their composition, the need to minimise queue lengths, minimum sight distance requirements and the relative costs/benefits of providing other types of passing opportunities.

Ideally, slow vehicle bays should be located so they end at the crests, or on the down sides, of hills. It is essential that they do not end abruptly just prior to, or just beyond, blind horizontal curves or just over the crests of hills, ie. where drivers do not have an adequate view of a slow-moving vehicle reentering the traffic lane immediately ahead of them.

Similarly, drivers of vehicles exiting from slow vehicle bays should have a clear view of vehicles approaching from behind, refer to Section 2.13.03 (d) Sight Distance Requirements.

Where slow vehicle bays are located on a sustained grade they should be sufficiently long, or located frequently enough, to reduce the probability of slow-moving vehicles having to stop completely to allow following queued vehicles to pass.

There are advantages in locating slow vehicle bays on right hand horizontal curves, when sight distance requirements can be met, because passing vehicles have shorter distances to travel and better inter-visibility between vehicles.

It is not advisable to locate slow vehicle bays on left hand horizontal curves because passing vehicles will have longer distances to travel and poor inter-visibility between vehicles.

Preferably, slow vehicle bays should not be located in the vicinity of parking areas, rest areas and scenic outlooks. When they are, great care must be taken with signs and markings to ensure that slow vehicle bays are clearly distinguished from other trafficable areas.

2.13.03 GEOMETRIC DESIGN

The geometric design of slow vehicle bays should be related to the mean traffic speed on the section of road under consideration and the length and location of each bay determined in respect to horizontal and/or vertical curve sight distance limitations.

(a) Bay Length:

Desirably, slow vehicle bays should be kept short in length, to ensure that approaching drivers will have a clear view of the full length of each bay

Normally, the length of a slow vehicle bay should be:

- (i) not less than 60 m, even on very low speed roads, **and**
- (ii) not more than 300 m, because drivers may treat it as a conventional passing lane.

The minimum lengths recommended for slow vehicle bays, in relation to mean traffic speed on the road in the vicinity of the bay exclusive of entry/exit tapers, are given in Table 2.4 below.

Mean Traffic Speed (km/h)	Minimum Length of Slow Vehicle Bay * (excluding entry and exit tapers) (m)
30	60
40	60
50	70
60	80
70	100
80	135
90	175

Table 2.4: RECOMMENDED MINIMUM LENGTHS FOR SLOW VEHICLE BAYS

* Minimum bay length is based on the assumption that a vehicle will enter a slow vehicle bay travelling at least 8 km/h slower than the mean speed of traffic on that section of road and it will be able to stop, if necessary, within in half the length of the bay while using a deceleration rate not exceeding 3 m/sec².

(b) Entry and Exit Tapers:

Due to the nature of slow vehicle bays, entry and exit tapers can often be shorter than the diverge and merge tapers recommended for passing lanes. Typical entry and exit tapers for slow vehicle bays are:

Entry Taper : 1 in 5 minimum
Exit Taper : 1 in 10 minimum

Entry and exit tapers should be lengthened and extra shoulder widening provided in situations where speeds in the slow vehicle bay exceed about 70 km/h.

(c) Bay Width:

The desirable minimum seal width for slow vehicle bays must allow for 3.5 m traffic lanes plus a standard width sealed shoulder outside that.

When the adjacent through traffic lane is less than 3.5 m wide a slow vehicle bay may be reduced to the same width as the traffic lane.

When necessary, extra widening for the off-tracking of large vehicles on small radii horizontal curves should be added to the normal width of a vehicle bay and its adjacent traffic lanes.

(d) Sight Distance Requirements:

Slow vehicle bays should not be located where horizontal and/or vertical curves limit safe stopping sight distance (SSSD), particularly in the exit taper/merge areas, refer to Section 2.13.02: APPLICATION / LOCATION.

The sight distance on the approach to slow vehicle bays should be at least equal to the SSSD required for the 85th percentile operating speed of traffic on the road. SSSD requirements are detailed in the AUSTROADS RURAL ROAD DESIGN - Guide to the Geometric Design of Rural Roads.

Drivers approaching a slow vehicle bay should have a clear view through the full length of the bay, so they can determine whether the bay is available for use or a vehicle in the bay is about to reenter the traffic lane.

Slow vehicle bays that cannot be clearly seen by approaching drivers are unlikely to be well used.

2.13.04 SIGNING

Refer to figure 2.17 for the location of signs used for slow vehicle bays.

The correct signing is necessary to maximise the use of slow vehicle bays, and to ensure safe and efficient traffic operations. The signs listed below are used for slow vehicle bays:

- (a) An **IG - 8 SLOW VEHICLE BAYS NEXT 'x' km** sign **may** be erected in advance of a series of slow vehicle bays. The sign should be located at least 100 m in advance of the **IG - 9** sign for the first slow vehicle bay in the series.
- (b) An **IG - 9** sign, with the legend modified to read **SLOW VEHICLE BAY 'x' km**, **may** be erected 1 or 2 km in advance of each slow vehicle bay, particularly when an **IG - 8** sign is not used.
- (c) An **IG - 9 SLOW VEHICLE BAY 'xxx' m** sign **shall** be erected approximately 300 m in advance of each slow vehicle bay.
- (d) An **IG - 10 SLOW VEHICLE BAY** sign **shall** be erected 15 m in advance of the start of each slow vehicle bay.
- (e) **PW - 43 ROAD NARROWS** signs **must** be erected at the start of the merge taper.

Refer to The Manual of Traffic Signs and Markings, Part I: Traffic Signs, Section 10: GENERAL INFORMATION SIGNS for details of **IG - 8**, **IG - 9**, **IG - 10** and **PW - 43** signs.

2.13.05 MARKINGS

Refer to Figure 2.17 for details of the road markings for slow vehicle bays.

Slow vehicle bays should be marked as specified below

(a) Edge Lines:

Edge lines, including the entry and exit tapers, should be marked as follows:

Colour	:	Reflectorised white
Width	:	100 mm minimum
Stripe	:	Continuous

The width of an exit taper edge line may be increased to 150 or 200 mm, to provide increased definition and delineation of the exit area.

(b) Continuity Lines:

A continuity line marking is used to define the edge of the through traffic lane adjacent to a slow vehicle bay.

The line is marked for the full length of a slow vehicle bay **excluding** the exit taper, as indicated in Figure 2.17.

Continuity lines should be marked as follows:

Colour	:	Reflectorised white
Width	:	200 mm
Stripe	:	1 m
Gap	:	3 m

(d) Centrelines:

A standard centreline for a two-lane rural road, as defined in Section 2.01.02 (a), should be marked on sections of road where slow vehicle bays are provided.

A no-overtaking line **MUST** be marked in the direction of the slow vehicle bay. One may also be marked in the opposite direction if the standard criteria are met.

2.13.06 DELINEATION

The delineation of slow vehicle bays should be equivalent to, or better than, the delineation of the roads on the approaches to the bays, so that night time delineation for drivers is not adversely affected.

The normal delineation requirements for slow vehicle bays on state highways are specified in (a) and (b) below

The delineation provided on some rural roads may be to a lesser standard than that specified for a rural state highway. The delineation standard for slow vehicle bays on these roads should match the standard of delineation provided on the approaches to the bays.

(a) Edge Marker Posts:

Type A edge marker posts, as detailed in FIG 5.9 (a) of this manual, should be installed at 50 m spacings along the left edge of slow vehicle bays, and offset no more than 1 m from the edge of seal.

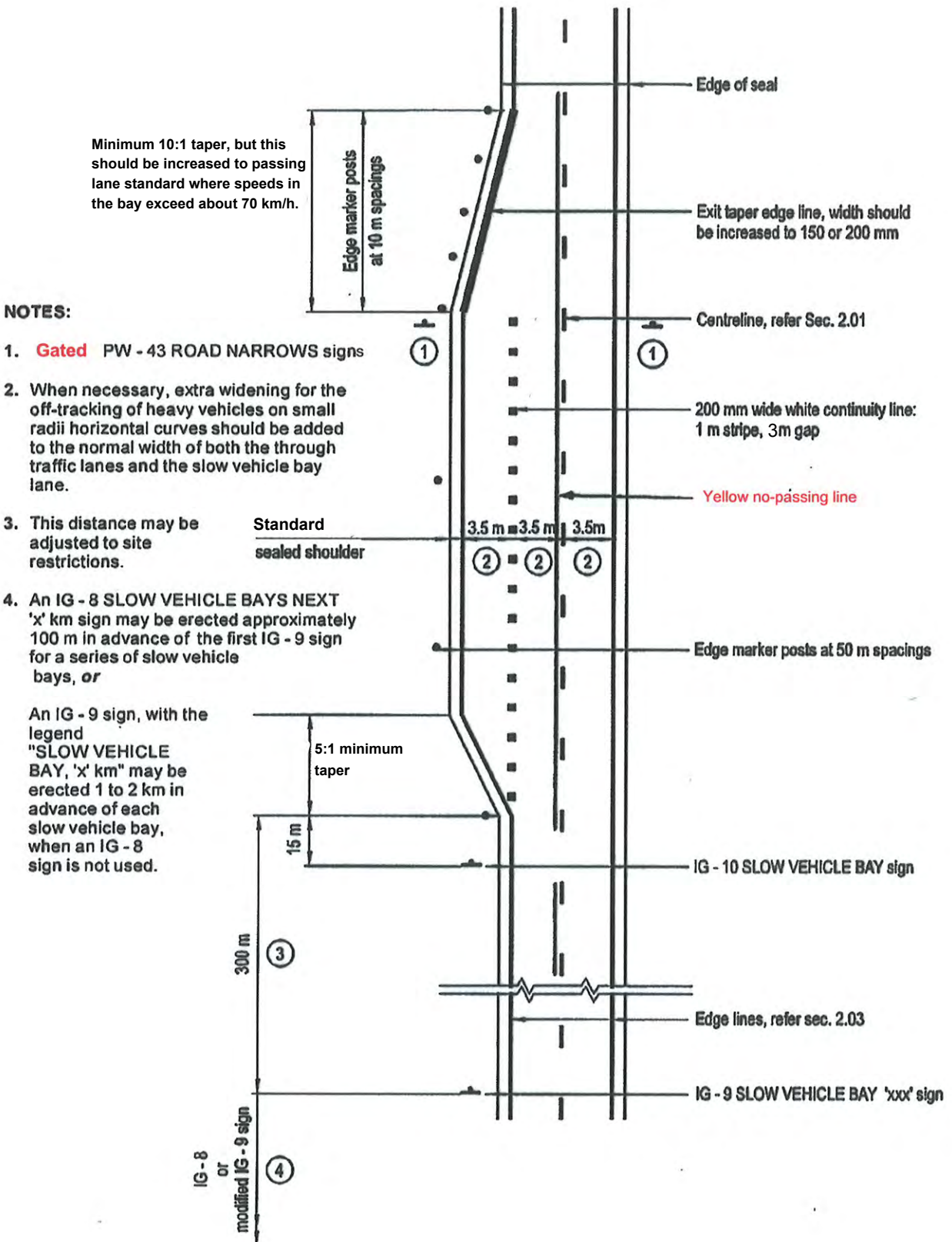
Post spacing should be decreased to 10 m along exit tapers.

(b) Reflective Raised Pavement Markers:

Red reflective raised pavement markers (Red RRPM's) may be used to define the left edge of slow vehicle bays, **but only when it is not possible to install edge marker posts.**

Red RRPM's should be installed at 20 m intervals along slow vehicle bays, and at 10 m intervals along exit tapers.

Red RRPM's shall not be installed on continuity lines which separate slow vehicle bays from the adjacent through traffic lanes.



MARKINGS FOR SLOW VEHICLE BAYS

FIGURE 2.17