

Manual of Uniform Traffic Control Devices

Part 10 Pedestrian Control and Protection

2003 Edition

First Issue 1st August, 2003

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Queensland Government

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PREFACE

Part 10 of the Manual sets out the traffic control devices to be used for the control and protection of pedestrians. Treatments provided include pedestrian crossings, pedestrian refuges, shared zones, school zones, pedestrian malls and facilities for pedestrians with disabilities.

Pedestrian safety depends to a large extent upon public understanding of accepted methods for traffic control. This principle is particularly important in relation to the control of pedestrians and vehicles near schools, where pedestrian safety can be a highly sensitive subject.

Safe and effective traffic control is best obtained through the uniform application of realistic policies, practices and standards which have been developed through traffic engineering studies. It is important that traffic control devices are used in accordance with the conditions prescribed in this Part of the Manual, as uniformity of treatment for comparable situations promotes uniformity of behaviour on the part of both motorists and pedestrians.

Where possible, symbolic legends are used in association with pedestrian facilities. Symbolic legends are used in lieu of worded legends to increase the legibility of the signs.

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**DEPARTMENT OF TRANSPORT AND MAIN ROADS
Queensland**

Manual of Uniform Traffic Control Devices

PART 10 – PEDESTRIAN CONTROL AND PROTECTION

1 SCOPE

This Part of the Manual sets out requirements for traffic control devices to be used in the control and protection of pedestrian traffic on roads. It specifies the way in which these are used to achieve pedestrian control.

Details of pedestrian control at roadworks, on footpaths shared with bicycles and in Local Area Traffic Management (LATM) schemes are not included in this Part of the Manual. For these types of control reference should be made to Part 3, Part 9 and Part 13 of the Manual respectively.

2 REFERENCED DOCUMENTS

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

AS

- 1158 The lighting of urban roads and other public thoroughfares
- 1158.4 Supplementary lighting at pedestrian crossings
- 1428 Design for access and mobility
- 1428.1 General requirements for access – Buildings
- 1743 Road Signs - Specification
- 2144 Traffic signal lanterns
- 2353 Pedestrian push-button assemblies

AUSTROADS Guide to traffic engineering practice Part 7: Guide to the design of traffic signals installations'

3 DEFINITIONS

For the purpose of this Manual the following definitions apply:

3.1 Children's crossing

An area of road at a place with stop lines marked on the road and -

- (a) children crossing flags; and
- (b) indicated by 2 red and white posts erected on each side of the road; and
- (c) extending across the road between the posts.

3.2 Crossing supervisor

An authorised person appropriately trained, who controls vehicle and pedestrian crossing manoeuvres at children's crossings or at other crossings where children cross roads.

3.3 Exclusive pedestrian phase

A signal phase allocated exclusively to pedestrian traffic.

3.4 Loading island

A clearly defined portion of a roadway where pedestrians may stand (at a bus stop) and normally indicated –

- (a) by lines marked on the roadway; or
- (b) by an island or a structure erected on the roadway.

3.5 Mall

See Clause 3.12 Pedestrian mall.

3.6 Pedestrian

Includes any person walking, running, standing, sitting or being otherwise in or upon a road.

NOTE: Persons in a toy vehicle or in a pram or an invalid in a wheelchair not capable of exceeding 10 km/h are normally treated as pedestrians.

3.7 Pedestrian actuated traffic signals (mid block)

A signal installation (other than at an intersection) at which changes of aspect are initiated by a pedestrian, usually by pressing a button.

3.8 Pedestrian aspect

A signal aspect displayed to pedestrians in the form of words or symbols of the appropriate signal colour.

3.9 Pedestrian crossing (zebra)

An area of roadway delineated by white stripes approximately parallel to the centre of the roadway, and indicated by the display to vehicular traffic of Pedestrian Crossing signs (R3-1).

3.10 Pedestrian crossing (zebra) at school

A pedestrian crossing (zebra) in respect of which:

- (a) official traffic signs bearing a legend including the words 'CHILDREN CROSSING' are displayed; and
- (b) where the crossing is supervised, an official traffic sign in the form of a hand-held banner inscribed with the word 'STOP' in black lettering on a fluorescent red or fluorescent orange background is held across or partly across the roadway.

3.11 Pedestrian interval

A time interval during which pedestrians are given the opportunity to cross the road at a traffic signal or an intersection signal.

3.12 Pedestrian mall

An area set aside for the use of pedestrians in which the use by vehicles is strictly controlled, usually by permit.

3.13 Pedestrian phase

A signal phase during which pedestrians may cross a roadway. (See also Clause 3.3 Exclusive pedestrian phase.)

3.14 Pedestrian push button

A device by which a pedestrian phase is activated by a pedestrian.

3.15 Pedestrian refuge

An island provided as a staging area for pedestrians crossing a road.

3.16 Pelican crossing

A type of pedestrian actuated traffic signal which incorporates a flashing yellow aspect to vehicular traffic during which a motorist is required to stop only if necessary to give way to a pedestrian on the crossing. This type of crossing is NOT APPROVED FOR USE IN QUEENSLAND.

3.17 Safety zone

A loading island alongside or adjacent to any tramline and indicated by a SAFETY ZONE sign.

3.18 School zone

A school zone is a signposted section of road, adjacent to or in the vicinity of a school, along which a reduced speed limit applies during specified times.

3.19 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.

3.20 Zebra crossing

See Clause 3.9 Pedestrian crossing (zebra).

3.21 85th percentile speed (V_{85} km/h)

The speed at or below which 85 percent of vehicles are observed to travel under free-flowing conditions past a nominated point.

NOTE: A guide to the determination of 85th percentile speed is set out in Part 4 of this Manual, Appendix C and Appendix G.

4 CLASSIFICATION AND TYPE OF PEDESTRIAN FACILITIES

The control of pedestrian/vehicle interaction can be achieved by means of one or more of the following strategies:

- (a) Time separation.
- (b) Physical (or spatial) separation.
- (c) Adequate control where integration of pedestrians with vehicles is acceptable.

Pedestrian facilities whose objectives are to further these strategies, are set out in Table 1.

Within each of the categories given in Table 1 the listed treatments may be applied to individual cases as follows:

- (a) Time separated facilities are installed whenever the degree of hazard or conflict between motorists and pedestrians is sufficient to warrant imposing specific regulatory controls on the driver or, in some circumstances, on the pedestrian.
- (b) Physical pedestrian aids are used to reduce the exposure of pedestrians to vehicular traffic. They may be used on wide high volume roads where the numbers of pedestrians crossing are insufficient to warrant a time separated facility.
- (c) Physically separated facilities are used when the degree of hazard or conflict is so high as to require that vehicles and pedestrians do not have to share the same roadway. Physical separation may be lateral, (e.g. pedestrian malls) or vertical (e.g. bridges and subways), depending upon particular circumstances.
- (d) Integrated facilities are applied to conditions where the presence of pedestrians, or pedestrians with a special characteristic, (e.g. school children), may not be obvious but where the degree of potential hazard or general conflict does not warrant time or spatial separation of the two traffic elements.

Table 1 CLASSIFICATION OF PEDESTRIAN FACILITIES

Classification	Objectives	Treatments	Reference
Time separated facilities	To minimise conflict between pedestrians and vehicles by allotting short time periods for use of a section of road by pedestrians alternating with periods for use by vehicles	Pedestrian crossings (zebra) Children's crossings Pedestrian actuated traffic signals (mid-block) Pedestrians at signalised intersections	Clause 6.2 Clause 6.3 Clause 6.4 Clause 6.7 Clause 6.5
Physical pedestrian aids	To increase the safety of pedestrians by use of physical aids within the roadway so as to reduce conflict between vehicles and pedestrians and simplify the decisions which both pedestrians and drivers have to make	Pedestrian refuges Traffic islands Medians Kerb extensions Loading islands Safety zones Pedestrian fencing	Clause 7.2 Clause 7.2 Clause 7.2 Clause 7.3 Clause 7.4 Clause 7.4 Clause 7.5
Physically separated facilities	To increase the safety of pedestrians by eliminating conflict between vehicles and pedestrians	Subways and bridges Pedestrian malls	Clause 8.1 Clause 8.2
Integrated facilities	To provide an environment in which pedestrians and vehicles may share existing road space in a largely unsupervised manner	Pedestrian warning signs Shared zones School zones Local area traffic management schemes Lighting	Clause 9.1 Clause 9.2 Clause 9.3 Clause 9.4 Clause 14

5 SIGNS

Signs used to warn motorists of pedestrians or pedestrian facilities and signs used to control vehicular traffic on the approaches to such facilities are listed in Table 2. For detailed specifications for the manufacture of these signs, refer to AS 1743.

Signs which are intended to convey messages during the hours of darkness shall be either illuminated or reflectorised so that they display colours and shapes by night as by day (see Part 1 of this Manual).

The way in which the signs are used is specified in Clause 10. For guidance on the installation and location of signs refer to Part 1 of this Manual.

6 TIME SEPARATED FACILITIES

6.1 General

When considering the use of time separated facilities, it is desirable to ensure that control devices are only provided where sufficient pedestrian demand exists, as drivers who use the route regularly will tend to ignore the presence of a device if they never see it used. Similarly, pedestrians tend to ignore or misuse a device if vehicle volumes are so low as to make its use unnecessary on most occasions. However, frequent random interruptions to a dense traffic stream may create congestion and increase the likelihood of vehicle accidents. These factors highlight the need for care in the setting and observance of pedestrian volume guidelines for each type of crossing facility.

For maximum usefulness it is important that the crossing facility be placed on, or as close as practicable to, the pedestrian desire line.

Stationary vehicles near a crossing can seriously limit visibility between drivers and pedestrians. The distances shown in Figures 1 to 3 over which stopping is prohibited may therefore need to be increased in some cases.

Time separated facilities may be used in conjunction with kerb extensions (see Clause 7.3).

6.2 Pedestrian crossings (Zebra)

6.2.1 Installation

The pedestrian crossing (zebra) consists of the markings specified in Clause 11.2 across the full width of the roadway together with the Pedestrian Crossing sign (R3-1) (see Clause 10.1.3) displayed at each end, as shown in Figure 1.

The sign R3-1 shall be repeated on the right-hand side of the roadway. It may also be mounted overhead. If overhead, the sign is illuminated.

The advance warning sign, Pedestrian Crossing Ahead (W6-2) (see Clause 10.2.3) is used in advance of pedestrian crossings (zebra). This sign may be supplemented by pavement markings in advance of the crossing (see Clause 11.5).

Where a pedestrian crossing (zebra) is on a side road and is too close to the intersection to provide the appropriate distance required for the erection of the Pedestrian Crossing Ahead sign (W6-2) in the side road, the Pedestrian Crossing Ahead sign (W6-2) is supplemented with the ON SIDE ROAD sign (W8-3L or R). This assembly is positioned on the major road 30 m-100 m in advance of the side road. This general signing arrangement may also be used at left turn slip lanes where visibility of the crossing is restricted (see Part 2 of this Manual).

Table 2 SIGNS USED FOR PEDESTRIAN FACILITIES

Sign	Sign Number	Size mm
KEEP LEFT	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
Pedestrian crossing	R3-1A	600 dia.
	R3-1B	750 dia.
	R3-1C	900 dia.
SAFETY ZONE	R3-2A	450 dia.
	R3-2B	600 dia.
CHILDREN CROSSING (flag)	R3-3	600 x 600
Speed restriction	R4-1A	450 x 600
	R4-1B	600 x 800
Shared zone	R4-4	450 x 750
End shared zone	R4-5	450 x 750
School zone speed limit (see Note 1)	R4-Q01A	450 x 1400
	R4-Q01B	600 x 1900
	R4-Q01C	900 x 2800
SCHOOL ZONE	R4-8A	450 x 300
	R4-8B	600 x 400
No stopping	R5-35	225 x 300
	R5-36	225 x 450
Hand STOP banner	R6-7A	450 dia.
	R6-7B	600 dia.
No bicycles	R6-10-3A	450 x 450
	R6-10-3B	600 x 600
BUSES EXCEPTED	R9-2A	450 x 300
	R9-2B	600 x 400
AUTHORISED VEHICLES EXCEPTED	R9-4A	450 x 450
	R9-4B	600 x 600

Table 2 (continued)

Sign	Sign Number	Size mm
Signals ahead	W3-3	
Pedestrians (see Note 2)	W6-1	600 x 600
Pedestrian crossing ahead (see Note 2)	W6-2	750 x 750
Children	W6-3	900 x 900
SCHOOL	W6-4	
PLAY GROUND	W8-13	600 x 400
CROSSING AHEAD	W8-22	750 x 500
REFUGE ISLAND	W8-25	900 x 600
SCHOOL	W8-14	
AGED	W8-18	600 x 200
BLIND	W8-19	750 x 250
DISABLED	W8-20	900 x 300
PRESCHOOL	W8-24	
BUS STOP	W8-Q03	650 x 400
	W8-Q03	800 x 500
	W8-Q03	950 x 600
Pedestrian direction	G5-7 G5-8	variable

NOTES:

- The size of the R4-Q01 sign refers to the sign face. It does not include the fluorescent retroreflective orange target board edge strip. These details are included in Appendix A.
- The A size (600 x 600) of the signs Pedestrians (W6-1) and Pedestrian Crossing Ahead (W6-2) is not used on arterial roads. The signs W6-1A and W6-2A are used only on roads with low speed environments.

It is necessary to ensure that lighting is adequate to provide visibility of a crossing as well as of pedestrians on the crossing. Floodlighting to provide direct illumination of pedestrians may be necessary (see Clause 14).

A pedestrian crossing (zebra) may be supervised during the time when it is used by significant numbers of school children, in which case the hand STOP Banner (R6-7) is used (see Clause 10.1.10).

6.2.2 Guidelines for installation

Pedestrian crossings (zebra) are installed on two-lane, two-way roadways where all of the following conditions are met:

- In two separate one hour periods of a typical weekday,
 - the number of pedestrians (P) crossing within 25 m of the proposed site exceeds 60 persons per hour, and
 - during the same hours, the number of vehicles per hour (V) passing along the roadway at the point where the pedestrians cross exceeds –
 - 600 in Brisbane and suburbs;
 - 500 anywhere else in Queensland, and
 - for each hour the product of P x V exceeds –
 - 90,000 in Brisbane and suburbs;
 - 60,000 at any other place in Queensland.

NOTE: If a satisfactory pedestrian refuge is available or can be provided within a roadway, these figures are applied separately to the traffic stream on each side of the refuge. These figures are also applied to the provision of a pedestrian crossing (zebra) on a left turn slip lane facility.

- There is adequate visibility of the crossing as well as of pedestrians on it.

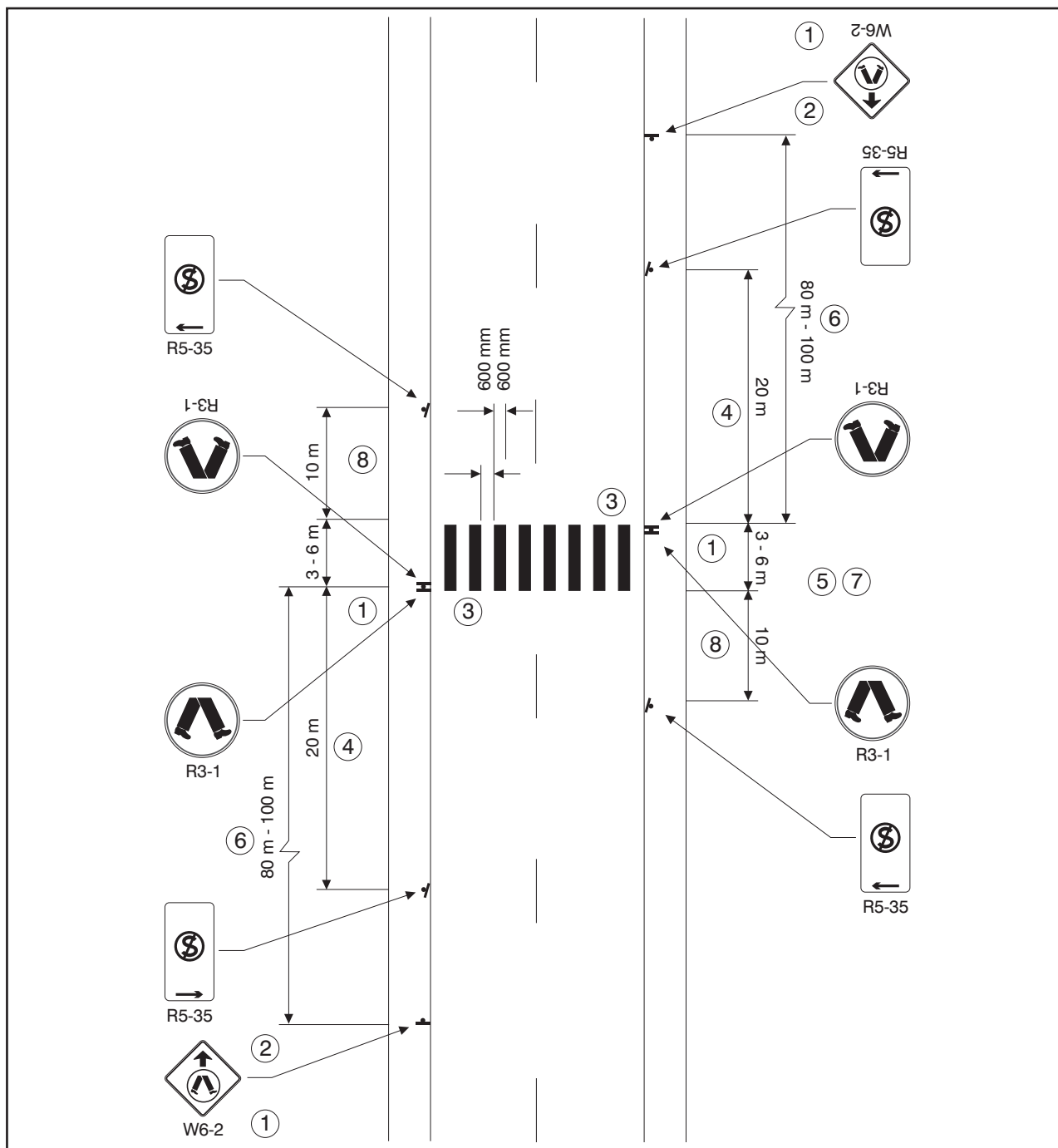
(c) The posted speed limit of the road is not more than 60 km/h.

Pedestrian crossings (zebra) are not recommended for use on multilane roads (undivided or divided) on safety grounds. Where exceptional circumstances indicate the provision of such a crossing, the following conditions shall be met:

- (a) The conditions specified in (a), (b) and (c) for two-lane, two-way roadways above, except that on multilane, divided roadways the figures in (a) (i), (ii) and (iii) are applied separately to the traffic stream on each side of the median; and
- (b) No more than four lanes of moving traffic (generally representing a 15m pavement width) are to be encountered by the pedestrian in any one stage of the crossing.

Signing for pedestrian crossings (zebra) on multilane undivided roads is the same as for two-lane, two-way roads. On multilane divided roads, the R3-1 sign shall be duplicated in the median; it may also be mounted overhead. If overhead the sign is illuminated. The Pedestrian Crossing Ahead sign W6-2 is duplicated in the median if sufficient width is available.

Notwithstanding these provisions, a pedestrian crossing (zebra) on multilane roads is the exception rather than the rule and alternative higher levels of treatment e.g. midblock signals, should be considered in lieu of a pedestrian crossing (zebra).



NOTES:

1. Pedestrian crossings (zebra) at schools.
 - (a) The Pedestrian Crossing Ahead sign (W6-2) may be supplemented with a SCHOOL plate (W8-14), or SCHOOL warning sign (W6-4) shall be erected in advance of the Pedestrian Crossing Ahead (W6-2) sign.
 - (b) If the crossing is supervised, a CHILDREN CROSSING flag (R3-3) shall be mounted on each of the Pedestrian Crossing (R3-1) signs and hand STOP banners (R6-7) shall be used by the supervisors. The CHILDREN CROSSING flags (R3-3) shall be mounted as for Children's Crossings; a line may be painted on the footpath to indicate where pedestrians should wait (see Figure 2).
2. The Pedestrian Crossing Ahead sign (W6-2) is always used in advance of pedestrian crossings. The sign may be supplemented with advance pavement messages (see Clause 11.5).
3. No stop line is to be used.
4. In 'Central Traffic Areas', may be reduced to 9 m.
5. Where there is significant night time use, streetlighting should be provided (see Clause 14).
6. The Pedestrian Crossing Ahead sign (W6-2) should be located 80 m-100 m in advance of the crossing. This distance may be reduced to 30 m minimum in low speed environments.
7. Pram/bicycle ramps should be installed.
8. In 'Central Traffic Areas', may be reduced to 6 m.

Figure 1 PEDESTRIAN CROSSING (ZEBRA)

6.3 Crossings at schools

6.3.1 Children's crossings

6.3.1.1 Installation

The distinctive feature of a children's crossing is its part-time nature, being designed to operate as a crossing only at such times as when one or more CHILDREN'S CROSSING flags (R3-3) (see Clause 10.1.5) are displayed to vehicular traffic.

Children's crossings are usually installed near school locations where the requirements for such a facility arise only during specific and limited times of the school day.

A children's crossing may be supervised during the times when it is operational, in which case the hand STOP Banner (R6-7) is used (see Clause 10.1.11).

Children's crossings should not be installed on roads where the posted speed limit is greater than 70 km/h or where there is inadequate sight distance to the pavement at the crossing for the motorist from one of the approaches.

A typical installation of a children's crossing is illustrated in Figure 2.

6.3.1.2 Guidelines for installation

Children's crossings are warranted at schools where: –

- (a) numbers of school children cross a roadway, and
- (b) the crossing can be located in the near vicinity of a school, and
- (c) an undertaking can be obtained to:
 - (i) operate and maintain a crossing supervisor during normal crossing periods while displaying CHILDREN CROSSING flags (R3-3) and hand STOP banner (R6-7) as detailed in Clauses 10.1.5 and 10.1.11, or
 - (ii) display the CHILDREN CROSSING flags (R3-3) as specified in Clause 10.1.5, during the period when school children are likely to be crossing the roadway proceeding to or from school. It is strongly recommended that a crossing supervisor operates at crossings of this nature during periods when the CHILDREN CROSSING flags (R3-3) are displayed. This would necessitate the use of hand STOP banners as in (i) above.

6.3.2 Pedestrian crossing (zebra) at schools

6.3.2.1 Installation

Pedestrian crossings (zebra) at schools may be installed where there is substantial pedestrian use other than school children during and outside school hours. Where such pedestrian use is not substantial, a children's crossing is installed.

For information relating to signing and marking for pedestrian crossings (zebra) at schools refer to Figure 1.

6.3.2.2 Guidelines for installation

Pedestrian crossings (zebra) are warranted at schools: –

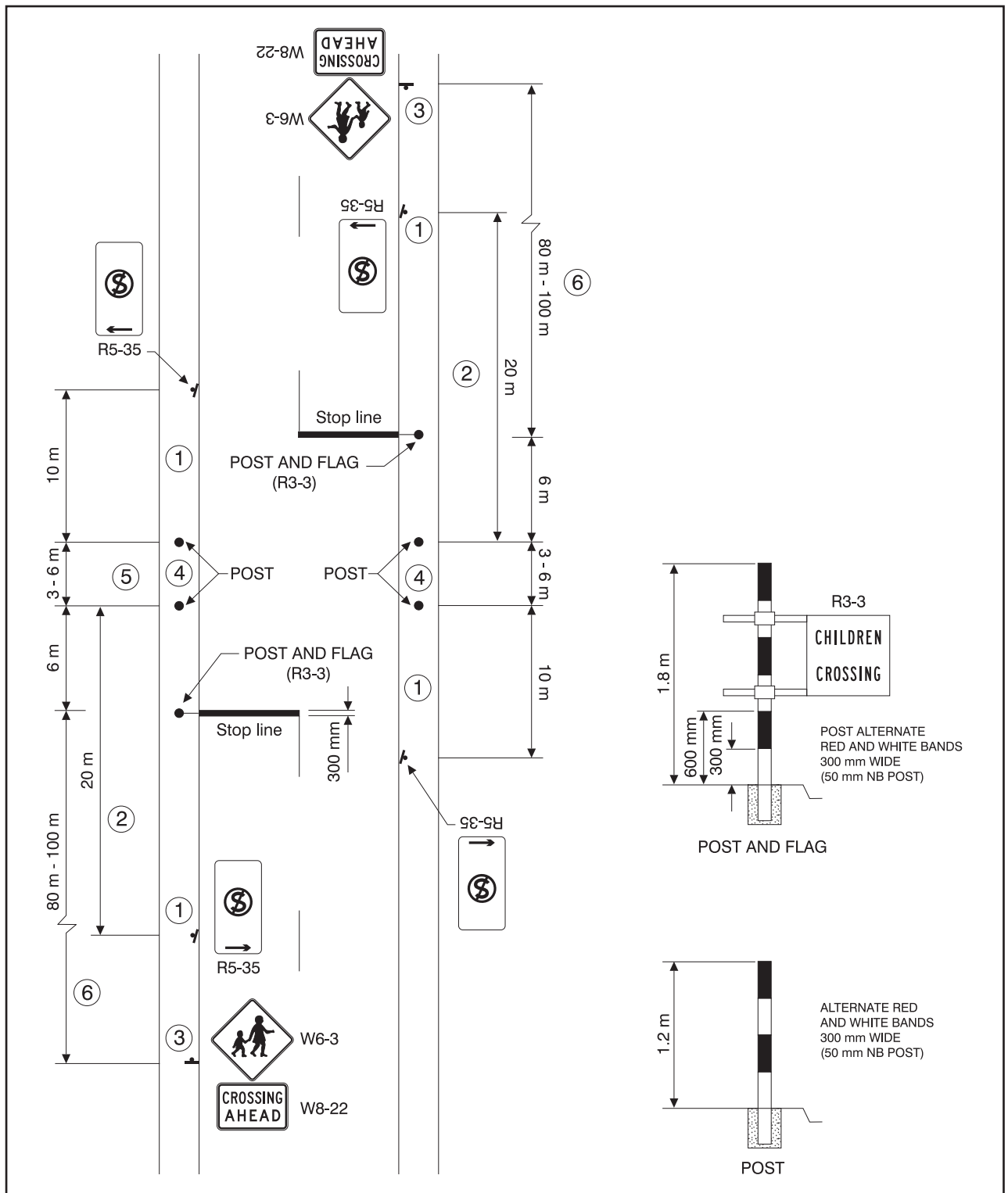
- (a) on high volume roads, or
- (b) where pedestrian use other than school children occurs during and outside of normal school hours,

and where: –

- (a) numbers of school children cross a roadway, and
- (b) the crossing can be located in the near vicinity of a school, and
- (c) an undertaking can be obtained to:
 - (i) on high volume roads, operate and maintain a crossing supervisor during normal school crossing periods while displaying CHILDREN CROSSING flags (R3-3) and hand STOP banner (R6-7) as detailed in Clauses 10.1.5 and 10.1.11.
 - (ii) elsewhere, display the CHILDREN CROSSING flags (R3-3) as specified in Clause 10.1.5, during the periods when school children are likely to be crossing the roadway proceeding to or from school.

It is strongly recommended that a crossing supervisor operates at crossings of this nature during periods when the CHILDREN CROSSING flags (R3-3) are displayed. This would necessitate the use of hand STOP banners as in (i) above.

Careful consideration should be given before installing a pedestrian crossing (zebra) on a high volume road. They are not recommended for use on multilane roads (undivided or divided) on safety grounds.



NOTES:

1. Times of operation may be specified by use of sign R5-36 (see Clause 10.1.9) if required.
2. Where stationary vehicles near a crossing seriously limit visibility between drivers and pedestrians, an increase in these distances may be required.
3. Advance signs may be supplemented with advance pavement messages (see Clause 11.5).
4. A line (approximately 100 mm wide) may be painted on the footpath - 0.5 m behind the face of the kerb - to indicate the position where pedestrians should wait until directed to cross the roadway. Where used, this line extends the width of the sealed apron connecting the footpath and kerb or a distance of 3-6 metres i.e. between the crossing posts (without flags).
5. Pram/bicycle ramps should be installed.
6. The Children (W6-3)/CROSSING AHEAD (W8-22) sign assembly should be located 80-100 m in advance of the crossing. This distance may be reduced to 30 m minimum in low speed environments.

Figure 2 CHILDREN'S CROSSING

6.4 Pedestrian actuated traffic signals (mid-block)

6.4.1 Installation

Pedestrian actuated traffic signals (mid-block) shall comply with AS 2144 and pedestrian push buttons with AS 2353. Reference should be made to Part 14 of this Manual which describes the various signal aspects and gives guidance on signal timing.

The line marking and sign arrangement for a mid-block pedestrian actuated traffic signal installation is shown in Figure 3. The principles for installation of the signals are given in Part 14 of this Manual.

A signalised crossing may be supervised during the times when it is used by significant numbers of school children. The hand STOP Banner is NOT used at traffic signals.

6.4.2 Guidelines for installation

6.4.2.1 Pedestrian-actuated traffic signals

Pedestrian actuated traffic signals may be provided where: –

- (a) The pedestrian volume exceeds 350 persons per hour for each of 3 hours on an average day, and during each of the same 3 hours the traffic volume exceeds 600 veh/h (total both directions), or 1000 veh/h (total both directions) where there is a central pedestrian refuge.
- (b) For each of 8 hours of an average day –
 - (i) the traffic volume on the road exceeds 600 veh/h (total both directions), or 1000 veh/h (total both directions) where there is a central pedestrian refuge; and
 - (ii) during the same 8 hours the pedestrian volume is 175 or more persons per hour; and
 - (iii) there is no other pedestrian crossing, footbridge or subway within a reasonable distance.
- (c) The guidelines for a pedestrian crossing (zebra) are met and the site is either –
 - (i) adjacent to a railway level crossing,
 - (ii) close to a signalised intersection on an arterial road, or
 - (iii) in or adjacent to a co-ordinated traffic signal system, and the pedestrian-actuated traffic signals can be operated as part of the co-ordinated system.

If it is necessary to install mid block signals in such close proximity to an intersection or railway level crossing that queuing is likely to occur across the intersection or railway level crossing, the signal controls at the two points should be co-ordinated to obviate such queuing. The need to keep pedestrian delays to a minimum should also be considered.

- (d) A pedestrian crossing exists and two or more reported casualty accidents of a type susceptible to correction have occurred on or near the crossing within the past three years.

6.4.2.2 Pedestrian-actuated traffic signals at schools

Pedestrian-actuated traffic signals at schools may be provided where: –

- (a) In two separate 1 hour periods of a typical school day, there are no fewer than 50 persons crossing the roadway and at least 600 vehicles pass the site subject to the product of the number of pedestrians per hour and vehicles in the same hour exceeding 40,000; or
- (b) The pedestrian and traffic volume is sufficient to justify a pedestrian crossing but an unsignalised crossing would cause hazard to school children by reason of the width of the roadway or the speed or the volume of vehicles, and the number of adequate gaps in the traffic stream during the period the children are using the crossing is less than the number of minutes in the same period.

For signals which cater mainly for persons with particular disabilities, e.g. aged, vision or hearing impaired persons, the above guidelines may be modified to make allowance for the different characteristics of the pedestrian traffic.

6.5 Traffic signals at intersections – pedestrian volume

6.5.1 Installation

Intersection traffic signals provided on the basis of pedestrian volume shall comply with AS 2144 and pedestrian push buttons with AS 2353.

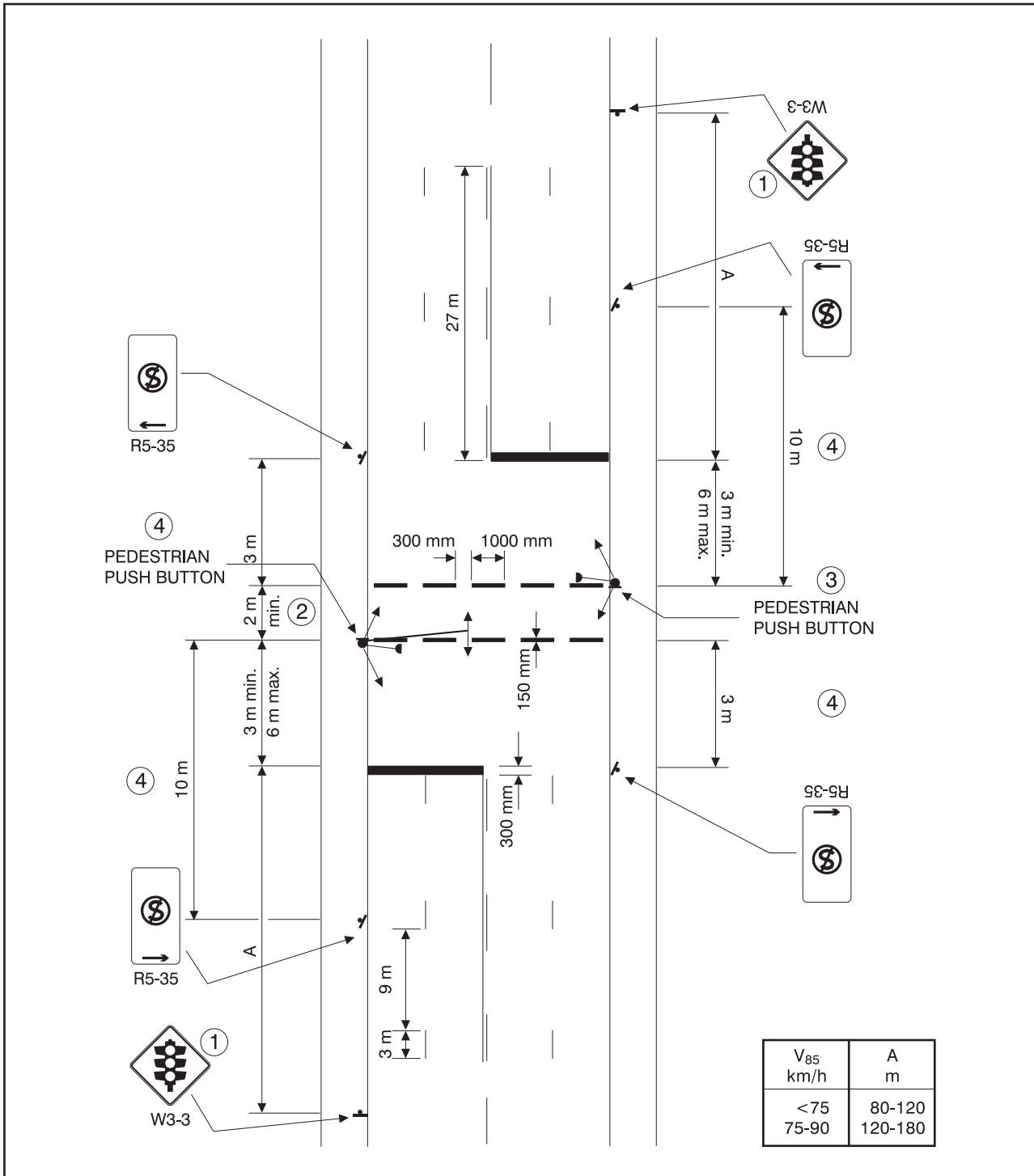
Typical pavement marking and traffic sign arrangements for signalised intersections are shown in Part 2 of this Manual.

6.5.2 Guidelines for installation

To assist the safe and efficient movement of pedestrians, intersection signals may be considered where, for each of four hours of an average day, 600 or more vehicles enter the intersection from the major road and 150 or more pedestrians cross this movement, and provided that there is no alternative and reasonably accessible pedestrian crossing facility.

Where there is a raised median island 1.2 m or more in width, higher vehicular volumes are acceptable and 1000 veh/h should be attained rather than 600 veh/h.

Where the 85th percentile speed on the major road exceeds 70 km/h, the above vehicular volume requirements may be reduced to 450 veh/h and 750 veh/h respectively.



NOTES:

1. Sign W3-3 to be used only when required, see Clause 10.2.1 (Sign W6-2 is not to be used).
2. Normal crosswalk width, 3.5 m.
3. Pram/bicycle ramps should be installed.
4. Where parking of vehicles close to the crossing may cause difficulties (viz. reduced sight distance, activation of traffic detectors), this distance may be increased.
5. For pedestrian-actuated traffic signals (mid-block) at schools, a SCHOOL warning sign (W6-4) shall be erected in advance of the SIGNALS AHEAD sign.

Figure 3 PEDESTRIAN-ACTUATED TRAFFIC SIGNALS (MID-BLOCK)

6.6 Pelican Crossings

This type of crossing is NOT APPROVED FOR USE IN QUEENSLAND.

6.7 Provision for pedestrians at signalised intersections

6.7.1 Installation

Separate displays for pedestrians may be installed at signalised intersections where it is desired to provide assistance to pedestrians crossing at an intersection.

The stop line should be placed not less than a clear 1 m distance in advance of the pedestrian crosswalk lines. This may have to be increased to provide sufficient safety margin between the pedestrians and vehicles which overshoot the stop line.

Pedestrian crosswalk markings should be as follows:

- (a) *Position.* Crosswalk markings should conform as far as practicable with pedestrian desire lines at the intersection. It is desirable that the position selected allows drivers intending to turn to see the pedestrians.
- (b) *Width of crosswalk.* Where pedestrian volume is large, the width provided becomes an important factor. The time a group of pedestrians will take to leave the kerb may be calculated from the estimated width occupied by each pedestrian (500 mm) and the time interval between each row of people leaving the kerb (1.5 seconds). Rather than increase the pedestrian green time, it may be preferable to increase the basic width of 2 m between lines.

Pedestrian push buttons should be conveniently located near each end of crosswalks where pedestrian actuation is required. The face of the push button unit should be aligned parallel to the direction of pedestrian travel and at a height of approximately 1 metre. Where two crosswalks, oriented in different directions, end at or near the same location, the positioning of pedestrian push buttons should clearly indicate which crosswalk signal is actuated by each push button. Additional push buttons may be required on islands or medians.

Audio-tactile devices may be installed on push buttons, where appropriate, following consultation with the Guide Dogs for the Blind Association. Because of noise nuisance to nearby residents, these devices are not installed on all pedestrian push buttons. Where audio-tactile devices are installed, there should be only one push button per signal post to avoid confusion as to which device is operating. Arrows are to be provided on push buttons to indicate the direction of the crosswalk. A double headed arrow is used for this purpose in the median.

A signalised intersection crosswalk may be supervised during the times when it is used by significant numbers of school children. The hand STOP Banner is NOT used at traffic signals.

6.7.2 Guidelines for installation

Pedestrian signals at signalised intersections may be provided where occasional pedestrian movement exists and there is inadequate opportunity to cross a road without undue delay, or where pedestrian movement exists but would not have adequate crossing time during the green interval.

Pedestrian volumes of 60 or more over two separate 1 hour periods of an average day would normally indicate the provision of a crosswalk. Crosswalks may be installed at locations where pedestrian volumes are lower, particularly where the crosswalk is used by children, aged or pedestrians with a disability, or where the roadway is excessively wide.

For guidelines to the provision of pedestrian signals at mid-block locations, see Clause 6.4.2.

6.7.3 Exclusive pedestrian phase

An exclusive pedestrian phase may be provided at intersections with particularly high pedestrian volumes and high turning movement. In this instance, the crosswalk markings closest to the centre of the intersection are omitted to allow for diagonal movement. This type of pedestrian facility is normally applicable only at central city locations.

6.8 Provision for pedestrians at railway crossings

Guidelines for the provision for pedestrians at railway crossings are given in Part 7 of this Manual.

7 PHYSICAL PEDESTRIAN AIDS

7.1 General

Physical (or spatial) separation of pedestrians from vehicles within the roadway may be achieved by providing pedestrian refuges, medians, and safety zones, within the pedestrians' path across the traffic stream. The provision of street lighting in association with these aids should be considered.

7.2 Pedestrian refuges, traffic islands and medians

7.2.1 General

Pedestrian refuges are used where there is a need to provide a place of safety for a concentration of pedestrians in circumstances where it is difficult to cross the full width of a roadway in one stage. A typical installation is shown in Figure 4.

7.2.2 Installation

Pedestrian refuges are usually located centrally in the roadway. They should be constructed and protected in accordance with the principles detailed below, but it is particularly important to avoid having objects on the island which will obstruct the visibility of pedestrians, particularly small children. Islands should be raised with kerbing but may have walk-through sections at pavement level to facilitate passage of prams, wheelchairs, aged and infirm pedestrians etc. (see Figure 4).

Channelising islands, medians and median islands may also be designed to act as refuges for pedestrians.

Pedestrian refuges are generally constructed on wide or high volume roads where it is desirable to provide designated staging areas for pedestrians.

Refuges may also be constructed at signalised intersections or pedestrian crossings where signal duration may not give a pedestrian sufficient time to cross the full width of road before cross traffic is allowed to proceed. At unsignalised pedestrian or children's crossings, refuges enable vehicles to proceed without having to wait for pedestrians to cross the entire width of the road. They may also be used at busy or wide legs of unsignalised intersections where a pedestrian would otherwise have difficulty in finding a safe gap simultaneously in traffic streams in both directions.

If pedestrian refuges are needed at a number of successive closely spaced intervals along a street, consideration should be given to providing a continuous median treatment instead of a number of separate islands.

The width required for pedestrian refuges or other islands or medians used by pedestrians is desirably not less than 2 m between traffic lanes although an island as narrow as 1.6 m can, in restricted situations, still afford more protection for pedestrians than no island at all.

A central refuge island should be at least 10 m long, except where the refuge island is located adjacent to an intersection. In this case, the length of the island nearest to the intersection may be reduced to 1.8 m to accommodate turning traffic.

Approach linemarking is needed to ensure that vehicles are safely guided past the island. Refuges should not unexpectedly constrict the road width. The number of traffic lanes should be maintained past the island by modifying linemarking. Also, parking controls must be introduced to provide a clear area for pedestrians to cross the road and adequate visibility of the crossing area (see Figure 4). Bus stops and loading zones need to be located carefully to ensure safe traffic operations in the vicinity of the refuge.

Signing of a pedestrian refuge (as specified in Figure 4) is used at an isolated pedestrian refuge. Pedestrian refuge signing is not provided where channelising islands, medians or median islands are designed to act as pedestrian refuges.

On refuge islands, with a width of at least 2 m, pedestrian fencing may be used to channel the movement of pedestrians across the island (see Clause 7.5).

7.2.3 Pedestrian refuge islands

Refuge islands are particularly useful where: –

- (a) four or more traffic lanes have to be crossed in any one stage of the crossing, or on wide roadways (15 m or more in width).
- (b) at signalised crossings, the pedestrian interval is insufficient to allow all pedestrians to cross the full width of the roadway.

- (c) numbers of pedestrians wish to cross the road, but the guidelines for installation of a pedestrian crossing (zebra) are not met.
- (d) the 85th percentile speed of traffic is greater than 60 km/h.
- (e) at a pedestrian crossing, the two-way traffic volumes or width of the roadway make the crossing difficult.
- (f) the conditions exist to justify the installation of a pedestrian crossing (zebra) but, due to the traffic volume or the speed or visibility of approaching traffic, such a crossing may increase the potential hazard to pedestrians. In this case, a pedestrian refuge may be a more suitable facility.

7.3 Kerb extensions

Kerb extensions can be constructed at any point along a kerb where the kerbside lane is required neither for moving traffic nor as a bicycle lane, but are most common at intersections and at mid-block sites where a crossing facility exists. They minimise the width of roadway to be crossed, and they usually place the pedestrian in a position where visibility of approaching traffic is not impeded by kerbside obstacles or parked vehicles.

It is not normally necessary to sign kerb extensions unless the signs are required for an associated pedestrian facility. However, they should be suitably delineated to avoid vehicles colliding with them.

Where kerb extensions are used in association with a pedestrian crossing facility, the parking restrictions specified in this Manual associated with such a facility may be reduced. Sufficient visibility between approaching drivers and pedestrians about to cross the road on the facility (refer to Part 2 of this Manual) must be provided.

7.4 Loading islands and safety zones

Loading islands are provided at bus stops where there is significant interruption to traffic flow caused by large numbers of passengers boarding or leaving public transport vehicles from the kerbside, or where it is impracticable to have public transport stops at the kerbside (see Figure 5).

A loading island should desirably be at least 2 m wide. When required to accommodate a large number of pedestrians, it may have fencing to separate pedestrians from an adjacent traffic stream, and to channelise pedestrian movement to prevent indiscriminate crossing of the road between island and kerbside. It may require a pedestrian crossing for the protection of pedestrians moving to and from the kerb (refer guidelines, Clause 6.2).

The signs KEEP LEFT (R2-3) (see Clause 10.1.1) and BUSES EXCEPTED (R9-2) (see Clause 10.1.13) are required on the island to prohibit the use of the bus facility by other vehicles.

Islands alongside or adjacent to any tramline provided for pedestrian refuge or loading purposes may be designated as safety zones by the installation of the SAFETY ZONE sign (R3-2) (see Clause 10.1.4) on the island facing approaching traffic.

Refuges which are only required for part-time use may consist of painted islands and be designated as safety zones by portable SAFETY ZONE (R3-2) signs.

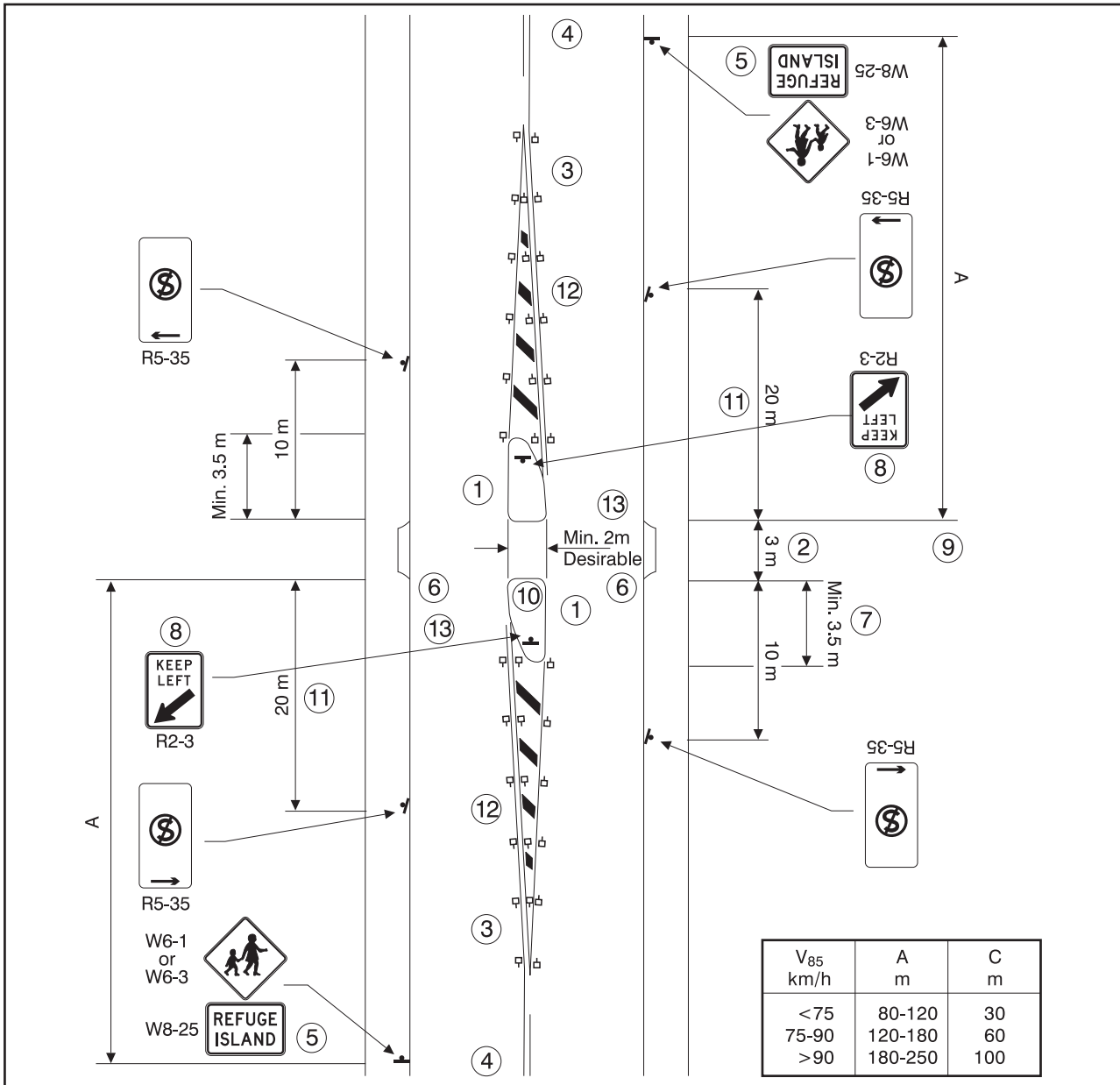
7.5 Pedestrian fencing

Fencing may be used at the kerb side to direct pedestrians to a crossing point and to prevent pedestrians from crossing at other nearby points. It is generally used only as a last resort because of the restrictions it imposes on pedestrians. It also discourages motorists from parking close to a crossing point.

It is important therefore that all relevant factors should be considered before a decision is made to install pedestrian fencing. Also, it should be ensured that such fencing would not be a potential hazard to road users (e.g. horizontal components, rails, which might break loose on vehicle impact should be avoided).

Fencing may be used on medians to control pedestrian movements. When used at staged crossings, it should be so aligned that pedestrians will face oncoming traffic as they are about to leave the median.

Particular attention should be given to the height and placement of the fence, and to the material used in its construction so as to minimise the potential sight obstruction between drivers and children about to cross the road. Fence material and construction should also be such as to minimise injuries to road users in the event of a collision.



NOTES:

1. Island kerbs may be painted white. Minimum width island should be 1.6 m (preferred width 2 m or greater). For refuges at schools, the edge line should be continued across the crossing point.
2. If refuge is used in conjunction with a marked crossing, the spacing between the islands should be increased accordingly.
3. Length of painted median should be increased or other delineation devices considered if visibility to the island is reduced by vertical or horizontal alignment. Raised retroreflective pavement markers are provided at 5.0 m spacings.
4. Painted median is preceded by barrier line extending for a distance 'C' shown in the table.
5. Where isolated refuges are used, Pedestrians or Children warning signs W6-1 or W6-3 (minimum size B) (see Clauses 10.2.2 and 10.2.4), as appropriate, are erected together with supplementary plate REFUGE ISLAND (W8-25) (see Clause 10.2.6)) in advance of the refuge.
6. Pram ramps should be constructed if practicable.
7. When used at intersections, the length of the innermost island may be reduced to accommodate turning traffic. A suggested minimum length is 1.8 m.
8. A hazard marker D4-3 may be used under the Keep Left (R2-3) sign. Mounting heights need to be selected to avoid obscuring visibility of child pedestrians.
9. Street lighting where provided should be in accordance with AS 1158 (see Clause 14).
10. Pedestrian assist handrails may be provided on the island at the pedestrian crossing point provided the island is at least 2 m wide. If provided they shall be frangible.
11. In 'Central Traffic Areas' the approach No Stopping zone may be reduced to 9 m and the depart No Stopping zone to 6 m.
12. Consider the need to break double barrier line opposite access driveways to permit crossing.
13. On two lane roads, the minimum width past the island is 3.3 m. For four lane roads, the minimum width past the island is 6.0 m.

Figure 4 PEDESTRIAN REFUGE

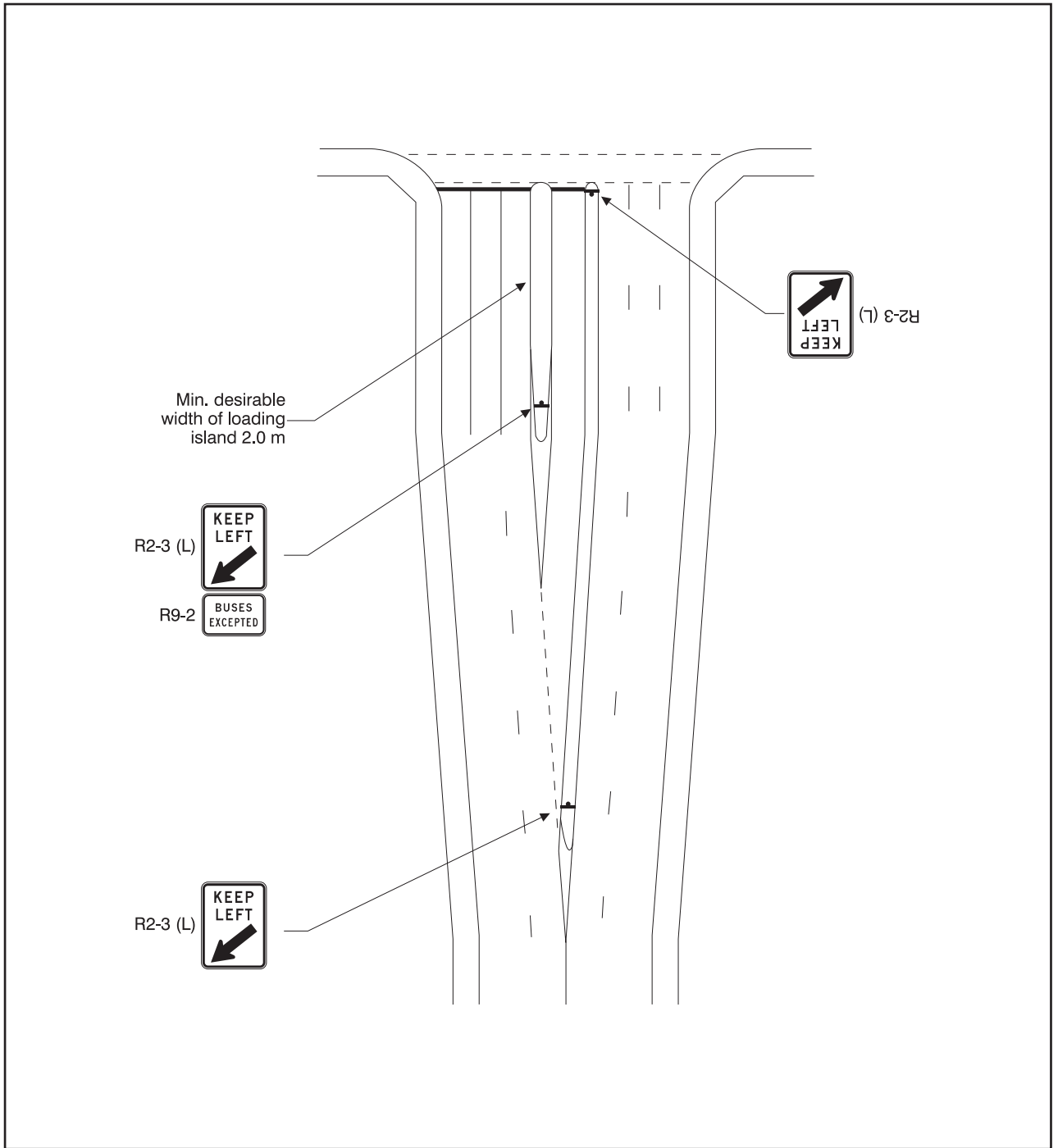


Figure 5 LOADING ISLAND

8 PHYSICALLY SEPARATED FACILITIES

8.1 Subways and bridges

8.1.1 General

Subways and bridges provide the highest degree of protection from traffic for pedestrians and minimum disruption to road traffic, but there are practical limitations to their installation. They are usually expensive, their cost being considerably influenced by site restrictions such as existing buildings and major utility services. They may require pedestrians to travel up to twice the distance they would otherwise have to walk if crossing the road at grade. Careful consideration needs to be given to the installation of subways, particularly in relation to ensuring individual security for users. A perceived lack of personal safety may well result in poor usage of the facility notwithstanding the provision of measures to discourage pedestrians from crossing the road at grade.

The provision of subways and bridges can be facilitated if they are to be part of the initial road construction in developing areas and where they can form part of pedestrian ways. Access for people with disabilities should also be considered. (See Clause 12 and AS 1428.1.)

8.1.2 Installation

In the design of subways and bridges, due consideration should be given to the need to make access attractive to encourage pedestrian usage. Adjustment of property access points (school gates, etc), and of bus zones, may be necessary. In some cases, it may be necessary to provide fences to prevent pedestrians crossing the road at grade (see Clause 7.5). Pedestrian Direction signs G5-7 or G5-8 (see Clause 10.3) are used to direct pedestrians to the subway or bridge.

8.1.3 Guidelines

In assessing the need for subways and bridges, account should be taken of site conditions, accident history, pedestrian and vehicular volumes and delays, and likely usage by school children and people with disabilities.

When comparing the cost with that of possible alternatives, savings attributable to the following should be taken into account –

- (a) reduction of accidents;
- (b) reduction of delay to vehicular and pedestrian traffic; and
- (c) elimination of any existing pedestrian facility, if appropriate.

8.2 Pedestrian malls

Pedestrian malls are areas reserved for pedestrian traffic to the exclusion of all or most motor vehicles during part or all of the day. Where some motor vehicles are allowed, e.g. vehicles for loading/unloading of goods or for maintenance of buildings in the mall, they are usually controlled by permit. Provision needs to be made for emergency vehicles.

Signs prohibiting entry to all or specific classes of traffic may be needed at the entry to the mall, e.g. the NO ENTRY sign (R2-4) (see Clause 10.1.2) with supplementary plate AUTHORISED VEHICLES EXCEPTED (R9-4) (see Clause 10.1.15). Likewise the No Bicycles sign (R6-10-3) (see Clause 10.1.12) may be required.

9 INTEGRATED FACILITIES

9.1 Warning signs

9.1.1 General

Warning signs may be used to warn motorists of the likely presence of pedestrians on or crossing the road other than at a specific pedestrian facility.

The sign used is one of the following:

- (a) Pedestrians (W6-1) (see Clause 10.2.2).
- (b) Children (W6-3) (see Clause 10.2.4).
- (c) SCHOOL (W6-4) (see Clause 10.2.5).

Where appropriate, these signs may be used with one of the following supplementary plates (see Clause 10.2.6) to give information about the attributes or characteristics of the pedestrians –

SCHOOL	(W8-14)
AGED	(W8-18)
PRESCHOOL	(W8-24)
BLIND	(W8-19)
DISABLED	(W8-20)

Warning signs are a most readily applied device on any class of road. However, there is a tendency to oversign for pedestrians. Signs should not be provided where the likely presence of pedestrians is obvious, for instance, there should not normally be a need to place pedestrians signs at a shopping centre.

9.1.2 Installation

Warning signs are installed in accordance with the requirements of Part 2 of this Manual.

9.1.3 Guidelines for installation

Warning signs alone will normally be necessary only where –

- (a) pedestrian volumes are significant but insufficient to justify a pedestrian crossing (zebra) or traffic signals;
- (b) the presence of pedestrians may not be expected; or
- (c) the pedestrian demand extends over a length of road.

The Children sign (W6-3) with supplementary plate BUS STOP (W8-Q03) is used in advance of school bus stops in rural areas where visibility for approaching drivers of any children waiting at the stop is less than 200 m. It is not intended that these signs should be generally used at school bus stops. Consideration should be given to relocation of the stop to a location with adequate visibility.

9.2 Shared zones

9.2.1 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.

9.2.2 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 paving between property lines and by judicious and aesthetic placement of planters and other landscaping. In considering the needs of people with disabilities in a shared zone, reference should be made to Clause 12 and AS 1428.1.

Shared zones are provided on roads in commercial or shopping areas. They are appropriate where all of the following conditions exist: –

- (i) the road is not a through route,
- (ii) pedestrian movement predominates,
- (iii) reasonable vehicle movement is required, and
- (iv) it is desired to clearly establish the priority of pedestrian movement.

Entry to a shared zone is not restricted i.e. it is not controlled by permit, although particular classes of vehicle may be prohibited e.g. large trucks. Parking bays are marked to control parking of vehicles within the shared zone.

The signs SHARED ZONE (R4-4) and END Shared Zone (R4-5) (see Clause 10.1.7) are required to establish a shared zone. A typical shared zone treatment is shown in Figure 6.

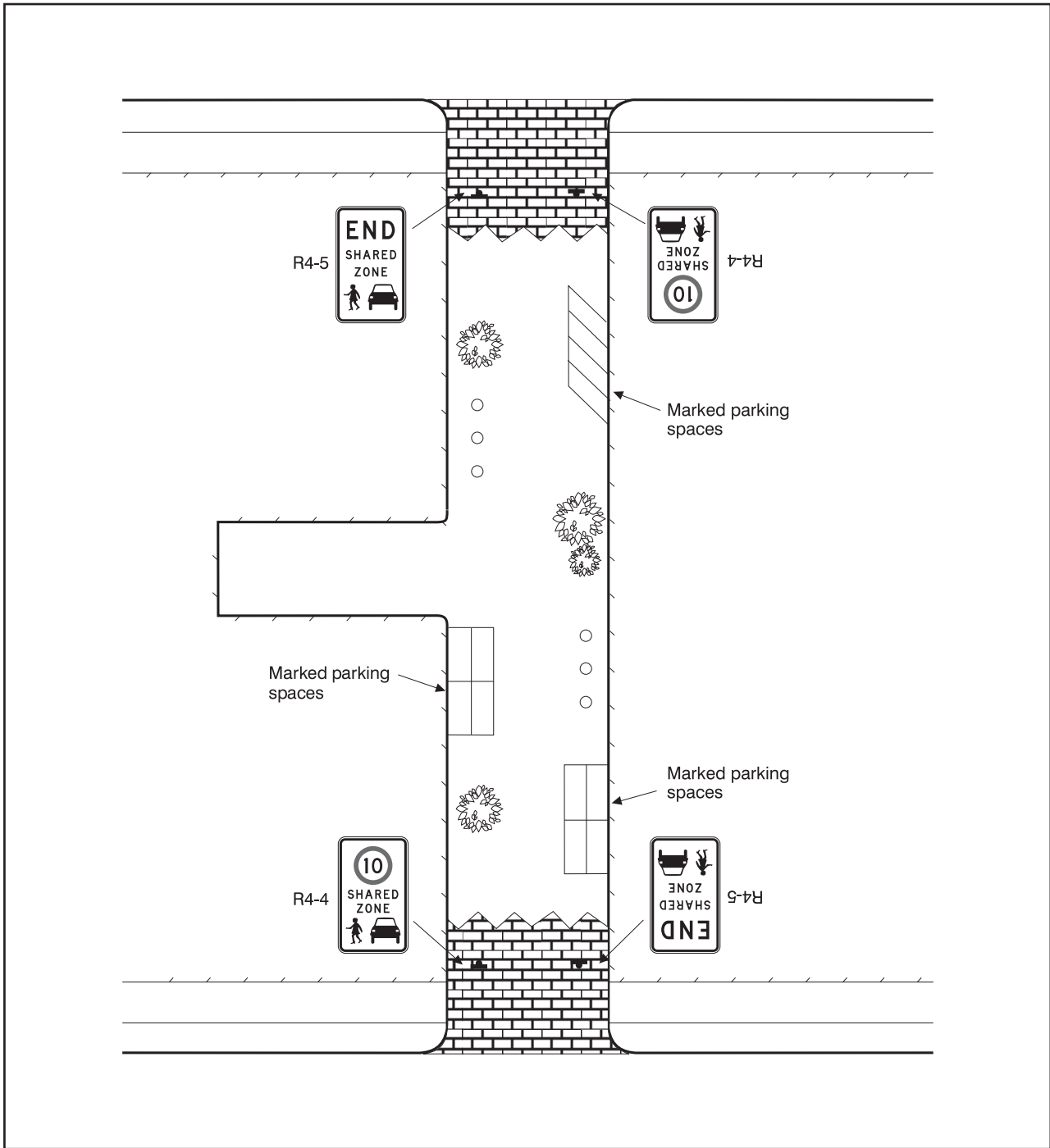


Figure 6 SHARED ZONE

9.3 School zones

9.3.1 General

Speed limits for use at school zones are as follows:

- (i) 40 km/h school zone speed limit - 50, 60 and 70 km/h speed zones
- (ii) 60 km/h school zone speed limit - 80 km/h speed zone
- (iii) 60 km/h school zone speed limit - 90, 100 km/h speed zone where there is school related activity on the road
- (iv) 80 km/h school zone speed limit - 90, 100 and 110 km/h speed zone

9.3.2 Installation

A school zone is designated at the beginning by a School Zone Speed Limit (R4-Q01) sign (see Clause 10.1.16). It is usual to use the words SCHOOL DAYS with the times of operation except where the zone is required to operate on other days. Alternatively, variable speed limit signs displaying the appropriate school zone speed limit and surmounted by the SCHOOL ZONE WHEN FLASHING (R4-Q08) sign may be used to designate a school zone (see Clause 9.3.7). Variable speed limit signs shall be in accordance with Part 4 of this Manual. In special circumstances, Enhanced School Zone Speed Limit signs may also be used (see Clause 9.3.6).

The end of a school zone is indicated by use of the Speed Restriction (R4-1) sign showing the limit applying beyond the zone except when the school zone ends at a tee intersection in which case it is not necessary to install the Speed Restriction (R4-1) sign.

9.3.3 Guidelines for installation

School zones are only permitted on roads adjacent to schools where the school is readily visible to motorists and there is significant school related activity on and beside the road. However, a school zone may be permitted on a road from which the school is not readily visible if:

- (a) the school has direct access to the road; and
- (b) the access is a main student entry to the school; and
- (c) there is significant school related activity on and beside the road.

School zones are not permitted:

- (i) on multi-lane arterial roads or dual carriageway/divided roads, except where a divided road has only one traffic lane in each direction and the speed limit is not more than 60 km/h;
- (ii) on roads where kerbside parking is prohibited during the proposed school zone times over a substantial section of the proposed school zone and pedestrian actuated signals or grade separated facilities have been installed; and
- (iii) at tertiary institutions, pre-schools, kindergartens or day care centres. An exception would be where one of these facilities is next to an eligible school, in which case the school zone may be extended to include the facility. However the times of operation of the school zone shall not be extended to beyond the times required for the adjacent school.

Where used, school zones should extend for at least the length of the school frontage. However in 50 and 60 km/h zones, the minimum length of a school zone should be 200 m and the school zone should not extend more than 100 m beyond the limits of the school frontage in either direction. In speed zones of 70 km/h and above, the minimum length of a school zone should be 300 m.

Where possible, the point where most children cross should be centered within the school zone.

A typical school zone treatment is shown in Figure 7.

9.3.4 School zone signing

Signing associated with school zones i.e. Pedestrian Crossing (R3-1), School Zone Speed Limit (R4-Q01), Pedestrian Crossing Ahead (W6-2), Children (W6-3), SCHOOL (W6-4) and supplementary plates SCHOOL (W8-14) and CROSSING AHEAD (W8-22), shall comprise fluorescent retroreflective yellow/green signs in combination with a fluorescent retroreflective orange target board. For details of these signs refer to Appendix A.

In 90 to 110km/h speed zones, the following requirements shall apply:

- (i) a SCHOOL ZONE AHEAD sign (R4-Q03) shall be installed at least 300m in advance of the school zone on each approach; and

- (ii) the SCHOOL ZONE SPEED LIMIT signs (R4-Q01) shall be size C. In some situations it may be necessary to install these signs (R4-Q01 and R4-Q03) on both sides of the road.

Where a side road terminates within a school zone, a School Zone Speed Limit (R4-Q04) sign may be installed opposite the terminating road, facing drivers on the terminating road if:

- (a) there are significant volumes of non-local traffic using the terminating road; and
- (b) it is considered necessary to advise drivers on the terminating road that they are entering a school zone; and
- (c) repeater School Zone Speed Limit signs are not required within the school zone.

Where installed opposite a terminating road, the School Zone Speed Limit sign (R4-Q04) incorporates a double arrow on the SCHOOL ZONE component.

9.3.5 Times of Operation of school zone

Times of operation for school zones must be for a minimum of 1 hour in the morning and 1 hour in the afternoon, but the recommended period is 2 hours morning and afternoon with the recommended hours being between 7:30am - 9:30am and 2:00pm - 4:00pm on school days. These hours may vary in accordance with local requirements, taking account of peak times when students are entering and leaving school grounds. To minimise confusion for motorists, all schools in a local area should have the same school zone times wherever possible, particularly for schools on the same road. Times of operation must be in multiples of half an hour.

Extended, "all day" times of operation for school zones, generally within the hours of 7:30am - 4:00pm, may be considered where:

- (a) a school has facilities on both sides of a road; and
- (b) significant numbers of students cross the road regularly throughout the day.

It is recommended that Enhanced or Changeable School Zone Speed Limit signs be used at "all day" school zones to draw motorists' attention to the extended times.

9.3.6 Enhanced School Zone Speed Limit Sign

An Enhanced School Zone Speed Limit sign consists of a standard School Zone Speed Limit sign incorporating a flashing inner annulus that can be controlled to operate only during the times of operation shown on the sign. Although only one flashing device/component is required, multiple flashing devices/components may be used. Externally mounted flashing lights are not permitted.

It is not intended that all existing school zone signs where externally mounted alternating flashing lights are installed be replaced immediately by the Enhanced School Zone Speed Limit signs. Enhanced School Zone Speed Limit signs should be phased in where existing externally mounted flashing lights are due for replacement.

Enhanced School Zone Speed Limit signs may only be used:

- (a) at "all day" school zones; or
- (b) where driver awareness of the school zone may be reduced by the horizontal or vertical geometry or by the volume of traffic; or
- (c) where speed surveys have shown unsatisfactory levels of compliance with the standard School Zone Speed Limit sign; or
- (d) where there are significant numbers of motorists who are not regular users of the road, and the presence of a school zone could be unexpected.

In addition, Enhanced School Zone Speed Limit signs shall not be installed at any site unless full Consistent Colour signage has previously been installed and, in a properly conducted assessment, found to be ineffective in controlling vehicle speeds.

9.3.7 Changeable School Zone Speed Limit Sign

The following two formats are permitted for Changeable School Zone Speed Limit signs:

- (a) a variable speed limit sign incorporating a flashing inner annulus. The sign shall be able to be controlled to show the school zone speed limit only during the times of operation of the school zone. The School Zone When Flashing sign (R4-Q08) shall be mounted below the variable speed limit sign to indicate to motorists that the school zone is in operation when the lower speed limit is displayed and the annulus is flashing.

- (b) a variable speed limit sign surmounted by a changeable message sign showing the words SCHOOL ZONE and incorporating a flashing device/component. The sign shall be able to be controlled to show the school zone speed limit and the words SCHOOL ZONE only during the times of operation of the school zone.

Outside the times of operation of the school zone, the display on a Changeable School Zone Speed Limit sign shall be as follows:

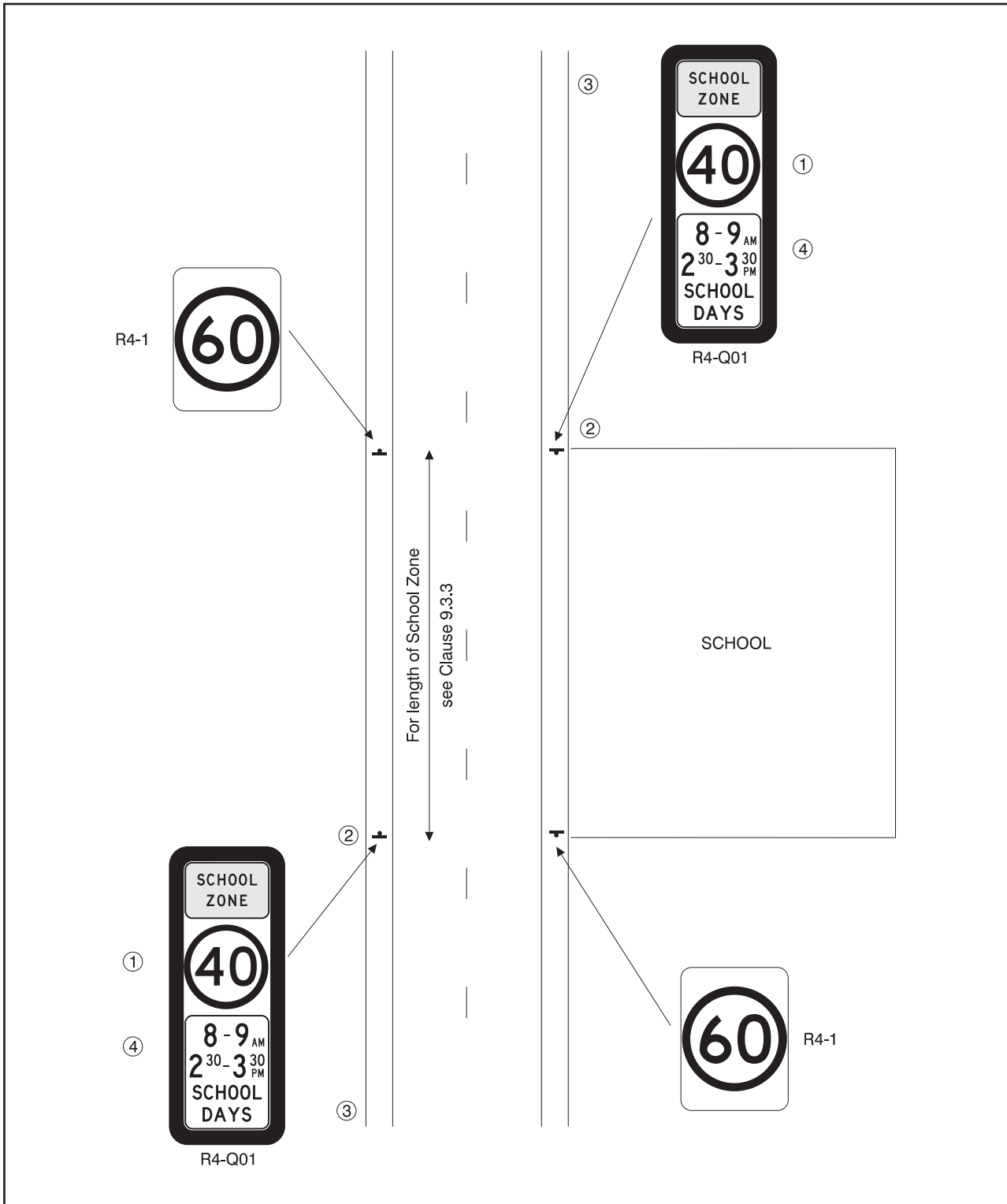
- (a) For roads to which the 50km/h local street speed limit applies, the display shall be blank;
- (b) Elsewhere, the display shall show the usual speed limit for the road.

The flashing device/component on a Changeable School Zone Speed Limit sign shall flash only during the times of operation of the school zone. Two typical examples of flashing devices/components are a flashing red annulus and inbuilt flashing yellow lights. Externally mounted flashing lights are not permitted. Although only one flashing device/component is required, multiple flashing devices/components may be used.

Changeable School Zone Speed Limit signs may only be used:

- (a) at "all day" school zones; or
- (b) where driver awareness of the school zone may be reduced by the horizontal or vertical geometry or by the volume of traffic; or
- (c) where speed surveys have shown unsatisfactory levels of compliance with the standard School Zone Speed Limit sign; or
- (d) where there are significant numbers of motorists who are not regular users of the road, and the presence of a school zone could be unexpected; or
- (e) where the school zone starts at a major intersection and it is not practical to provide both a Speed Restriction sign and a standard School Zone Speed Limit sign.

In addition, Changeable School Zone Speed Limit signs shall not be installed at any site unless full Consistent Colour signage has previously been installed and, in a properly conducted assessment, found to be ineffective in controlling vehicle speeds.



NOTES:

1. For appropriate school zone speed limit see Clause 9.3.1.
2. The School Zone Speed Limit sign should be located not less than 0.6V (V=85th percentile speed in km/h) in advance of the advance crossing signs e.g. W6-3/W8-22.
3. Where advance warning of the school is proposed e.g. W6-4 SCHOOL sign, it is erected in advance of the School Zone Speed Limit sign.

Figure 7 SCHOOL ZONE

9.4 Local area traffic management schemes

As pedestrian accidents in local areas are widely dispersed, site specific accident countermeasures are generally not feasible. Instead, a local area traffic management scheme which will lessen the amount of unnecessary traffic in the area and reduce the speed of traffic, may be introduced.

Research has shown that local area traffic management schemes, aimed at reducing traffic volumes and/or speeds, have often resulted in a reduction in accidents in these areas. Where an accident does occur in an area which has been treated using local area traffic management techniques, it occurs at a lower speed and is therefore generally much less severe than an accident at higher speed.

While local area traffic management may utilise many of the pedestrian facilities specified in this Part of the Manual, the LATM process is concerned with the total effect of traffic management proposals on a local area. To provide an integrated approach to local area treatments, reference should be made to Part 13 of this Manual, Local Area Traffic Management.

10 APPLICATION OF SIGNS

10.1 Regulatory signs

10.1.1 Keep left and keep right (R2-3)



R2-3 (L)

The KEEP LEFT and KEEP RIGHT signs shall be used where a physical obstruction exists and it is necessary for all vehicles approaching the obstruction to pass it on one side only. Common applications are where pedestrian refuge or loading islands are constructed at intersections or mid-block as an aid to pedestrians (see Clauses 7.2 and 7.4).

The sign should be located not closer than 600 mm to the approach end of the obstruction but in certain circumstances it may be necessary to place it 8 m or more from the approach end.

10.1.2 No entry (R2-4)



R2-4

The NO ENTRY sign is used to prohibit the entry of unauthorised traffic into pedestrian malls (see Clause 8.2).

The supplementary plate AUTHORISED VEHICLES EXCEPTED (R9-4) (See Clause 10.1.15) is normally used with this sign in this application.

10.1.3 Pedestrian Crossing (R3-1)



R3-1

The Pedestrian Crossing sign shall be used at or in the immediate vicinity of a pedestrian crossing (zebra) (see Clause 6.2). Pavement markings for the crossing shall comply with the requirements of Clause 11.2. Signs shall be erected on both sides of the roadway facing each approach.

NOTE: For sign details for schools refer to Appendix A.

10.1.4 Safety zone (R3-2)



R3-2

The SAFETY ZONE sign shall be used to designate pedestrian refuge and loading islands as safety zones (see Clause 7.4).

10.1.5 Children crossing (R3-3)



R3-3

The CHILDREN CROSSING flag shall be located on the approach side of a children's crossing (see Clause 6.3) and is placed on both sides of the road to face oncoming traffic. This flag is used in conjunction with the warning sign Children (W6-3) (see Clause 10.2.4) used with a CROSSING AHEAD supplementary plate (W8-22) (see Clause 10.2.6). This flag is also used at pedestrian crossings (zebra) at schools (see Clause 6.3).



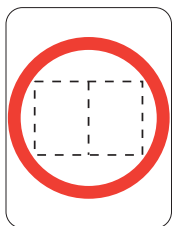
R3-4

The CHILDREN CROSSING flag shall be displayed at crossings only at such times as children are likely to cross, regardless of whether or not the crossing is supervised. When displayed, the flags shall be mounted on posts provided at or near the stop line(s) at children's crossings so as to be clearly visible to approaching traffic but not to obscure the child's view of oncoming traffic (see Figure 2). When used at a pedestrian crossing (zebra) at schools, the flag is mounted on the same post as the Pedestrian Crossing (R3-1) sign.

The hand STOP banner (R6-7) shall be used by the crossing supervisor (see Clause 10.1.11.).

The CHILDREN CROSSING WHEN LIGHTS FLASHING sign (R3-4) is NOT APPROVED FOR USE IN QUEENSLAND.

10.1.6 Speed restriction (R4-1)



R4-1

A Speed Restriction sign shall be used to indicate the end of a school zone, in which case it indicates the continuing speed limit along the road.

Repeater Speed Restriction signs may be needed on roads into which traffic leaving a shared zone has just turned, if the type of road or abutting development might appear inconsistent with the zoned speed limit.

10.1.7 Shared zone signs (R4-4, R4-5)



R4-4

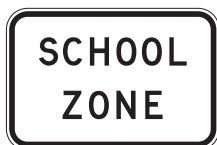


R4-5

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. (see Clause 9.2).

The END Shared Zone sign (R4-5) is used to indicate the end of a shared zone.

10.1.8 School zone (R4-8)



R4-8

Use of the SCHOOL ZONE sign(R4-8) has been discontinued in Queensland.

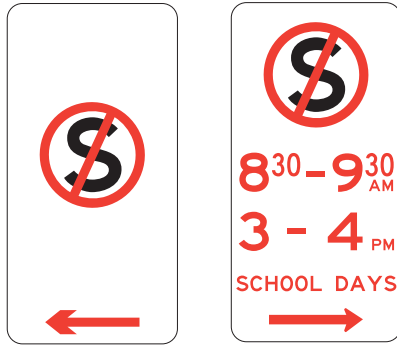
10.1.9 School zone when flashing (R4-Q08)



R4-Q08

The SCHOOL ZONE WHEN FLASHING sign (R4-Q08) shall be used below a variable speed limit sign where used, to indicate the beginning of a school zone in which the speed restriction applies (see Clause 9.3). The variable speed limit sign shall display the appropriate school zone speed limit when the inner circle of the annulus is flashing.

10.1.10 No stopping (R5-35, R5-36)



R5-35

R5-36

The No Stopping sign (R5-35) is used to indicate the section of road adjacent to pedestrian and children's crossings where stopping of vehicles is prohibited.

The sign R5-36 is used where it is desired to show times of operation of the stopping prohibition.

10.1.11 Hand stop banner (R6-7)



R6-7

The Hand STOP Banner (R6-7) with a fluorescent red or fluorescent orange background shall be used by authorised personnel in daytime only, and is used for the control of traffic movement at children's crossings and at pedestrian crossings (zebra) (see Clause 6.3).

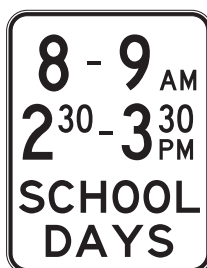
10.1.12 No Bicycles (R6-10-3)



R6-10-3

The No Bicycles sign is used at the entrance to a pedestrian mall (see Clause 8.2) where it is necessary to prohibit bicycles from travelling in the mall.

10.1.13 Times of operation supplementary plate (R9-1-2)



R9-1-2

A Times of Operation supplementary plate (R9-1-2) may be used as required below another regulatory sign. At school zones, the times of operation are incorporated into the School Zone Speed Limit sign R4-Q01 and R4-Q04 (see Clause 10.1.16) where used. For times of operation for school zones refer to the Department of Transport and Main Roads guidelines.

10.1.14 Buses excepted (R9-2)



R9-2

The BUSES EXCEPTED supplementary plate is mounted below a regulatory sign where buses are exempted from the control indicated by the sign. A typical use at a loading island is shown in Figure 5.

The width of the plate should match the width of the sign with which it is used.

10.1.15 Authorised vehicles excepted (R9-4)



R9-4

The AUTHORISED VEHICLES EXCEPTED supplementary plate is mounted below the NO ENTRY sign (R2-4) at the entry points to pedestrian malls where certain vehicles are exempted (generally by permit) from the control indicated by the sign (see Clause 8.2).

The width of the plate should match the width of the sign with which it is used.

10.1.16 School zone speed limit (R4-Q01)



R4-Q01

A School Zone Speed Limit sign is used to indicate the beginning of a school zone (see Clause 9.3). Where the School Zone Speed Limit sign alone is not considered to be adequate, a variable speed limit sign may be used in lieu (see Clause 9.3.2).

Where installed opposite a terminating street, the School Zone Speed Limit sign (R4-Q04) shall be used. This sign incorporates a double ended arrow below the words SCHOOL ZONE.

For sign details refer to Appendix A.

10.2 Warning signs

10.2.1 Signals ahead (W3-3)



W3-3

The Signals Ahead sign is used in advance of pedestrian-actuated traffic signals (mid-block) where –

- (i) visibility is restricted i.e. where the sight distance to the signal installation is less than the stopping distance given in Part 2 of this Manual;
- (ii) high speeds require advance warning; or
- (iii) signal installations are unexpected.

10.2.2 Pedestrians (W6-1)



W6-1

The Pedestrians sign is used to warn of the presence of pedestrians on or crossing the road under the conditions and according to the guidelines given in Clause 9.1.

Supplementary plates shown in Clause 10.2.6, describing particular classes of pedestrians such as aged or vision impaired, may be used in conjunction with this sign if approved.

If the need for these signs is limited to certain periods of the year, e.g. camps, they shall be removed when not required.

10.2.3 Pedestrian crossing ahead (W6-2)



W6-2

The Pedestrian Crossing Ahead sign is used in advance of pedestrian crossings (zebra).

To provide advance warning of a pedestrian crossing (zebra) at schools, the supplementary plate SCHOOL (W8-14) is used with the Pedestrian Crossing Ahead sign (see also Clause 10.2.5 and Figure 1).

NOTE: For sign details for schools refer to Appendix A.

10.2.4 Children (W6-3)



W6-3

The Children sign is used where it is necessary to give warning of children on or crossing the road under the conditions and according to the guidelines given in Clause 9.1.

NOTE: For sign details refer to Appendix A.

Supplementary plates shown in Clause 10.2.6, describing particular classes of child pedestrians, such as school children or children with disabilities may be mounted beneath the sign.

The supplementary plate CROSSING AHEAD (W8-22) (see Clause 10.2.6) is used with this sign to provide advance warning of a children’s crossing (see Clause 6.2 and Figure 2).

10.2.5 School (W6-4)



W6-4

The SCHOOL sign may be used where it is necessary to give warning of children on or crossing the road in the vicinity of a school under the conditions and according to the guidelines given in Clause 9.1.

NOTE: For sign details refer to Appendix A.

This sign may be used in addition to the Pedestrian Crossing Ahead sign (W6-2) to provide advance warning of a pedestrian crossing (zebra) at schools (see Clause 10.2.3 and Figure 1).

10.2.6 Supplementary plates



W8-3 (L)

On Side Road



W8-13

Playground



W8-14

School



W8-Q03

Bus Stop



W8-18

Aged



W8-19

Blind



W8-20

Disabled



W8-22

Crossing Ahead



W8-24

Preschool



W8-25

Refuge Island

The PLAYGROUND, SCHOOL, PRESCHOOL and CROSSING AHEAD supplementary plates, as appropriate, are mounted below the Children sign (W6-3).

NOTE: For sign details for SCHOOL (W8-14) and CROSSING AHEAD (W8-22) supplementary plates for schools refer to Appendix A.

REFUGE ISLAND, BLIND and DISABLED supplementary plates, are mounted below either the Pedestrians sign W6-1 or the Children sign W6-3 as appropriate.

The AGED supplementary plate is mounted below the Pedestrians sign.

The BUS STOP supplementary plate (W8-Q03) is mounted below the Children sign (W6-3), see Clause 9.1.3.

The ON SIDE ROAD supplementary plate (W8-3 L or R) is mounted below a Pedestrian Crossing Ahead sign (W6-2) where a Pedestrian Crossing is on a side road (see Clause 6.2.1).

10.3 Pedestrian direction signs



G5-7



G5-8



G5-8

Pedestrian direction signs (G5-7 and G5-8) are used to guide pedestrians to destinations such as tourist information services, community facilities, major road crossing facilities, car parks and major public transport stops (see Clause 13).

Where the direction to be indicated is clearly to the left or right, a G5-7 type sign is used. A G5-8 type sign is used where a chevron does not adequately indicate the direction i.e. for up, down or angled indications. A distance may be added to these signs.

The size of these signs should take account of legibility distance and conspicuity requirements.

11 PAVEMENT MARKINGS

11.1 General

All pavement markings associated with pedestrian crossings as given below shall be white and shall be reflectorised.

11.2 Pedestrian crossing (zebra) markings

Pedestrian crossings (zebra) markings shall consist of a series of longitudinal bars 600 mm wide and generally not less than 3.5 m long. The bars are placed parallel to the centre line of the road with gaps of 600 mm between bars. Whilst the crossing is usually at right angles to the line of the road, it may be angled by not more than 30 degrees where local circumstances require. (See Figure 1).

11.3 Crosswalk markings

Crosswalk lines shall only be used in conjunction with mid-block or intersection signals. They comprise two parallel broken lines not less than 2 m apart, 150 mm in width, 1 m line segments separated by gaps of 300 mm. (See Figures 3 and 8.)

11.4 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 is legally required to stop. It indicates the point behind which vehicles must stop when required.

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

11.5 Pavement messages

The use of pavement messages in advance of pedestrian facilities should be restricted to sites where driver awareness of the facility may be reduced by the horizontal or vertical alignment or by volume of traffic. If used, a message should, if possible, be confined to one line. Where two or more lines are required they should be designed as follows:

- (a) On high-speed roads, generally speed zones higher than 80 km/h, a separation of four times the character height should be used, and the message should be arranged to read sequentially, i.e. with the first word nearest to the driver.
- (b) For low-speed, urban situations the separation between lines may, if necessary, be from one-half to one times the character height, in which case the message should be arranged to read from top to bottom i.e. with the first word farthest from the driver.

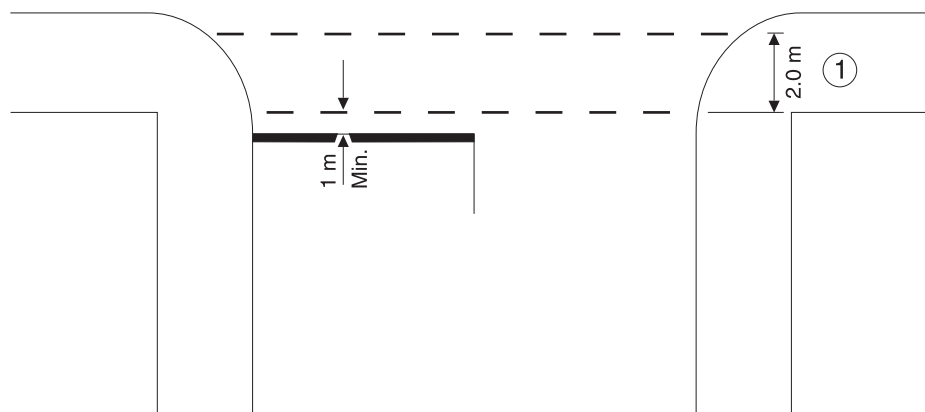
Where the message is an advance warning the word AHEAD, if used, should be added at the end of the message.

Word messages for use on road pavements near crossings are as follows:

PED X.
SCHOOL X.
SCHOOL.

Pavement marking may be used in association with the School Zone sign. The only worded message used for this purpose is SCHOOL ZONE. Pavement markings indicating the school zone speed limit are not permitted.

For detailed design of word messages see Part 2 of this Manual.



NOTE: 1. Crosswalk width may be increased where warranted by high pedestrian volumes.

Figure 8 CROSSWALK LINES AT A SIGNALISED INTERSECTION

12 PROVISIONS FOR PEDESTRIANS WITH DISABILITIES

12.1 General

General information about providing services for people with disabilities is given in AS 1428.

In addition, the following points should be specifically considered when providing for pedestrians with disabilities.

12.2 Kerb crossings

Kerb crossings should be provided without a drainage lip. Where pedestrian refuges are provided the crossing point should not have kerbing but should be at the same level as the adjacent road surface. For the design of kerb crossings for pedestrians with disabilities see AS 1428.

12.3 Audio-tactile signals

Vision impaired pedestrians can be assisted to locate pedestrian actuated signals, and to know when the pedestrian phase is operating, by the installation of audio-tactile devices in the pedestrian button assembly. These devices emit an audible clicking sound and may include a tactile pulse. During the pedestrian phase the device operates at a much higher frequency than when in its resting mode thus providing a clear message to vision impaired pedestrians. For details of installation, see Clause 6.7.1.

12.4 Tactile paving

Tactile paving has been designed for use on footpaths and refuges in the vicinity of crossings to impart information to people with sight impairment by means of a specially textured surface.

The tactile paving assists vision impaired pedestrians to locate the crossing point and the pedestal carrying the pedestrian push-button (where pedestrian signal control is provided); and indicates the appropriate direction of movement. The last function is of particular importance where a ramp and dropped kerb have been provided for the benefit of wheelchair users and people with baby carriages, as the raised kerb no longer provides this cue.

The surface used for this purpose needs to meet several requirements. It must be detectable underfoot, because guide-dogs and long canes are searching for obstacles rather than for changes in the surface; and it must be reliably detectable even to people wearing thick soled shoes or those who suffer from reduced sensitivity in their feet. It should be simple and cheap to install and maintain; should contrast in colour from adjacent surfaces and needs to be distinct from surfaces used for other purposes.

A number of textured paving bricks or tiles are now available. One type has a grid pattern of raised nodules, either on a brick or on a flat tile. The other type has parallel ridges running across the brick or tile.

At pedestrian refuge islands, two or three rows of textured slabs may be laid across the pedestrian's path through the island flush with the roadway surface.

Wherever it is proposed to install textured surfaces, local organisations representing people with disabilities should be consulted.

13 PEDESTRIAN DIRECTION SIGNS

Pedestrian direction signs (G5-7, G5-8) (see Clause 10.3) are used to guide pedestrians to specific destinations such as tourist information services, community facilities, major road crossing facilities, car parks and major public transport stops, from locations where significant numbers of pedestrians are likely to be seeking those destinations. Signing should guide pedestrians along a safe and convenient route to the destination using additional signs as necessary at intersections or decision points along the route.

Pedestrian direction signs incorporate a pedestrian symbol, the destination and either a chevron for left or right direction indications, or arrow for up, down or angled indications. The destination shall be indicated by brief wording or standard symbols and a distance may be added. Where the route provides alternative access for people with disabilities, the symbol of access is to be included.

Signs are normally positioned above a pedestrian route, with a minimum clearance to the lower edge of the sign of 2.5 m (see Part 2 of this Manual).

14 LIGHTING

Route lighting along a road is based on providing a uniformly illuminated pavement against which pedestrians and other objects may be seen in silhouette i.e. a dark or outlined object against a lighter background. It is provided in accordance with AS1158.

At intersections, junctions etc. where the driving task is generally more complex, and at locations where pedestrian activity occurs in sufficient concentrations to justify the installation of specific pedestrian control devices e.g. pedestrian crossings, loading islands etc., lighting is based on illuminating the pedestrian or object by direct illumination (reverse silhouette) i.e. a bright well defined object against a darker background.

Where additional lighting is considered necessary due to high levels of pedestrian activity viz. at pedestrian crossings (zebra), supplementary lighting is provided in accordance with AS 1158.4.

NOTE: It should be noted that generally AS1158 specifies minimum lighting requirements i.e. light technical parameters.

In residential and other areas where the lighting does not meet the requirements of the appropriate level of lighting as defined in AS1158, and pedestrian movements are significant, consideration may be given to upgrading the lighting to conform to AS 1158.

APPENDIX A

SIGNS USED AT SCHOOLS

A1 SCOPE

This Appendix specifies the design and dimensions of signs associated with schools.

A2 DESIGN AND DIMENSION OF SIGNS

A2.1 General

Fluorescent retroreflective yellow/green has been adopted as the standard colour for a number of pedestrian and school related signs. These are Pedestrian Crossing (R3-1), Safety Zone (R3-2), Pedestrian Crossing Ahead (W6-2), Children (W6-3), School (W6-4) and supplementary plates School (W8-14) and Crossing Ahead (W8-22).


A2.2 School Signing

At schools, the Pedestrian Crossing (R3-1), Pedestrian Crossing Ahead (W6-2), Children (W6-3) and School (W6-4) signs incorporate a fluorescent retroreflective orange target board edge strip. In addition, the School Zone Speed Limit Sign (R4-Q01) incorporates a similar orange target board edge strip.

A2.3 Sign design and dimensions

The design and dimensions of signs associated with schools are listed in Table A1.

Table A1 DESIGN AND DIMENSION OF SIGNS AT SCHOOL ZONES

LEGEND	SIGN SIZE (no target board)	SIGN SIZE (with target board)
	<p>R4-Q01A 450 x 1400</p> <p>R4-Q01B 600 x 1900</p> <p>R4-Q01C 900 x 2800</p>	<p>R4-Q01A 600 x 1550</p> <p>R4-Q01B 800 x 2100</p> <p>R4-Q01C 1200 x 3100</p>
	<p>R4-Q03A 450 x 950</p> <p>R4-Q03B 600 x 1250</p> <p>R4-Q03C 900 x 1900</p>	<p>R4-Q03A 600 x 1100</p> <p>R4-Q03B 800 x 1450</p> <p>R4-Q03C 1200 x 2200</p>
	<p>W6-2A 600 x 600</p> <p>W6-2B 750 x 750</p> <p>W6-2C 900 x 900</p>	<p>W6-2A 750 x 750</p> <p>W6-2B 900 x 900</p> <p>W6-2C 1200 x 1200</p>
	<p>W6-3A 600 x 600</p> <p>W6-3B 750 x 750</p> <p>W6-3C 900 x 900</p>	<p>W6-3A 750 x 750</p> <p>W6-3B 900 x 900</p> <p>W6-3C 1200 x 1200</p>
	<p>W6-4A 600 x 600</p> <p>W6-4B 750 x 750</p> <p>W6-4C 900 x 900</p>	<p>W6-4A 750 x 750</p> <p>W6-4B 900 x 900</p> <p>W6-4C 1200 x 1200</p>
	<p>R3-1A 600 dia.</p> <p>R3-1B 750 dia.</p> <p>R3-1C 900 dia.</p>	<p>R3-1A 750 dia.</p> <p>R3-1B 900 dia.</p> <p>R3-1C 1200 dia.</p>