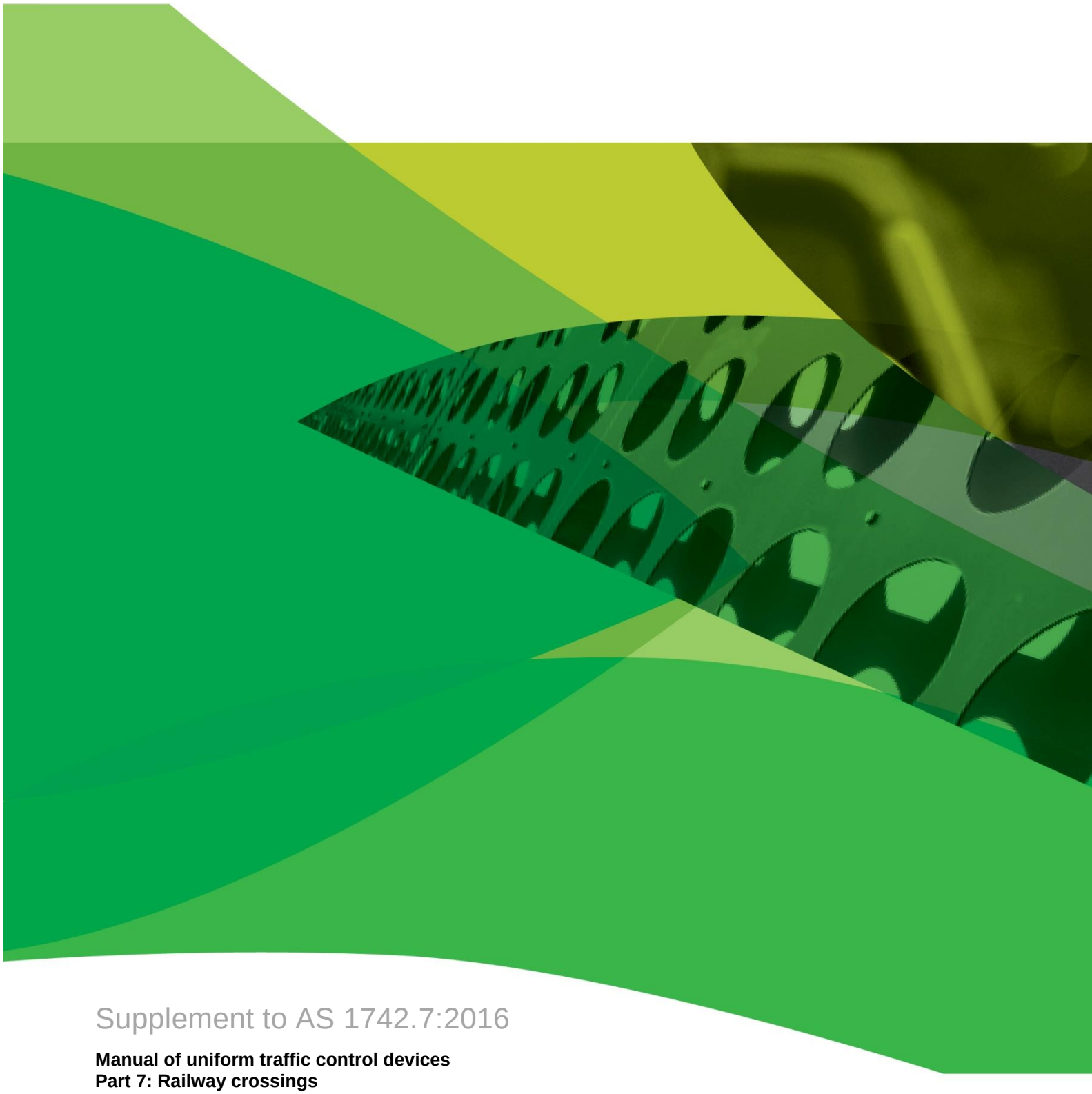

Supplement to AS 1742.7:2016

Manual of uniform traffic control devices
Part 7: Railway crossings

Edition 1

FEBRUARY 2018

vicroads.vic.gov.au

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1. Introduction

1.1 General

All road agencies across Australia are working towards greater consistency between States/Territories in how road networks are managed. In order to achieve this, the Austroads Guide to Traffic Management and Australian Standards relating to traffic management have been adopted to assist in providing that level of consistency and harmonisation across all jurisdictions. This agreement means that these Austroads Guides and the Australian Standards are the primary technical references.

Australian Standards AS 1742.7:2016 - *Manual of uniform traffic control devices – Part 7: Railway crossings* is a nationally agreed standards document outlining the use of traffic control devices on the road network and has been adopted by all jurisdictions, including VicRoads.

All jurisdictions will be developing their own supplement to clearly identify where its practices currently differ and to provide additional guidance to that contained within AS 1742.7:2016. This document is the VicRoads supplement and shall be read in conjunction with AS 1742.7:2016.

1.2 How to Use this Supplement

There are two key parts to this document:

- **Classification of Supplement Information:** this table classifies supplement information as a Departure, Additional Information or both. This information assists with identifying its hierarchy in relation to the Australian Standard.

- **Details of Supplement Information:** this section provides the details of the supplement information.

  - **Departures:** where VicRoads practices differ from the guidance in the Australian Standard. Where this occurs, these differences or 'Departures' will be highlighted in a box. The information inside the box **takes precedence** over the Australian Standard clause. The Australian Standard clause is not applicable in these instances.

  - **Additional Information:** all information not identified as a departure provides further guidance to the Australian Standard and is read and applied **in conjunction** with the Australian Standard clause.

Where a clause does not appear in the body of this supplement, the Australian Standard requirements are followed.

2. List of Differences

The classification of each clause as a Departure, Additional Information or both is shown in the table below.

Clause	Classification
1.6	Additional Information
2.2	Additional Information
2.2.1	Additional Information
2.2.2	Additional Information
2.2.4	Additional Information
2.2.6	Additional Information
2.3.7	Additional Information
3.1	Additional Information
3.3	Additional Information
3.4	Additional Information
3.6	Additional Information
4.1	Additional Information
Appendix A4	Additional Information
Appendix B3	Additional Information
Appendix D4	Additional Information

Australian Standard requirements are followed for clauses not shown in this table.

3. Details of Changes

Clause 1.6 – COOPERATION BETWEEN AUTHORITIES

Under the Rail Safety (Local Operations) Act 2006 (RSA), road authorities and rail infrastructure managers have a mutual obligation to jointly manage road / rail crossings. The RSA requires the preparation of a Safety Interface Agreement (SIA) for every public railway level crossing.

An overview of the roles and responsibilities of the various departments, agencies and stakeholder groups is presented in Table 1 below. Specific responsibilities for the management of the various items of infrastructure associated with a level crossing are set out in the relevant SIA.

Table 1: Agency roles and responsibilities

State Government	
Office of the National Rail Safety Regulator (ONRSR)	• Administers the RSA and regulations and other relevant transport safety legislation in Victoria. • Responsible for the accreditation of bus and rail (including tram) operators throughout Victoria. • Monitors duty holder performance against their responsibilities under the RSA through a system of compliance inspections, audits and investigations. • Monitors incident / accident data to identify trends and issues.
Public Transport Victoria (PTV)	• Establishes state-wide level crossing safety policy through the Victorian Railway Crossing Safety Steering Committee (VRCSSC). • Primary stakeholder and funding body for the State Level Crossing Upgrade Program through the VRCSSC, consultation with rail and road stakeholders, utilisation of Australian Level Crossing Assessment Model (ALCAM) results and consideration of available resources. • Manages Victorian rail operation franchises. • Oversees implementation of ALCAM in Victoria and advises the State Government on level crossing safety matters through the VRCSSC. • Monitors compliance of operators with the infrastructure lease obligations (including maintenance of railway level crossings). • Liaises with other government departments and other organisations to initiate and implement railway level crossing safety initiatives. • Organises and sponsors rail level crossing safety media campaigns. • Funds the reasonable cost of level crossing closures through the VRCSSC.

VicTrack	• Custodial owner of Victoria's rail land and infrastructure, established in 1997 as a State owned enterprise. • The majority of rail infrastructure is leased to Victoria's rail and tram operators via Public Transport Victoria • Administers the ALCAM database and the SIA website • Manages the contracts for ALCAM field surveys. • Delivers projects within the rail reserve on behalf of road managers and other state bodies. • Manages a program of level crossing safety, research and development initiatives. • Project manages the design and delivery of the State Level Crossing Upgrade Program and the Safer Country Crossings Program under the oversight of the VRCSSC. • Coordinates with rail infrastructure managers, councils and other road authorities on infrastructure projects, leasing of land and buildings and level crossing/road/bridge issues. • Rail infrastructure manager (as defined in the RSA) of a small amount of rail infrastructure, including some road/rail bridges in Victoria. • The responsible rail infrastructure manager for non-active rail lines. • Member of the VRCSSC and various sub-committees.
VicRoads	• Road manager (coordinating road authority) for freeways, arterial roads and non-arterial state roads that are listed on VicRoads' register of public roads. • Develops policy for road management in Victoria in coordination with state bodies, national bodies, local government and other stakeholders. • Duty holder under the SIA provisions in the RSA – shares safety management of railway level crossings and road / rail bridges with the relevant rail infrastructure manager(s) / other road authorities. • Implements measures to manage risks at railway level crossings and road / rail bridges as agreed in SIAs. • Delivers certain railway level crossing safety projects (e.g. installation of rumble strips and traffic signal coordination at / near level crossings). • Develops regulations, codes of practice, standards and guidelines for road management and road safety in Victoria. • Member of the VRCSSC and various sub-committees.

Victorian Railway Crossing Safety Steering Committee (VRCSSC)	• Advises the Minister for Public Transport on policy directions, level crossing safety strategies and actions plans and the management and standards for railway level crossings (both road and pedestrian crossings) in Victoria. • Oversees the State funded Level Crossing Upgrade Program (which includes both road and pedestrian crossings) utilising ALCAM risk ratings, incident data, and stakeholder (road and rail managers) input to determine priorities. • Oversees the development and delivery of other state-wide initiatives to improve rail level crossing safety. VRCSSC membership comprises: • Public Transport Victoria (PTV) (Chair) • VicTrack • VicRoads • TAC • VTA • RACV • ARTC • Municipal Association of Victoria (MAV) • Victoria Police • V/LineMetro Trains Melbourne (MTM) • Transport Safety Victoria (TSV) – observer

VRCSSC Sub-committees	**Railway Crossing Project Delivery Group (RCPDG)** • Oversees the delivery of the State road and pedestrian level crossing upgrade programs including level crossing closures. • Reviews the funding and priorities for crossing upgrades and monitors expenditure against budget. • Membership comprises VicTrack (Chair), PTV, VicRoads, rail infrastructure managers, TSV, MAV and the Rail, Tram and Bus Union (RTBU). **Railway Crossing Technical Group (RCTG)** • Responsible for advising and making recommendations to the VRCSSC on research and development initiatives which could enhance the safety of railway level crossings in Victoria. • Oversees trials of potential new technology for use at level crossings and other research and development programs. • Provides input into the review of Australian Level Crossing Standards AS 1742.7 and AS 7658. • Provides representation and input to national initiatives on level crossing safety and standards. • Provides input to national initiatives such as ALCAM. • Reviews and monitors ALCAM development and implementation. • Membership comprises VicTrack (Chair), PTV, VicRoads, rail infrastructure managers, TSV, MAV and RTBU. **Safety Interface Agreement (SIA) Working Group** • A sub-committee of, and reports to the RCTG. • Convenes as required to progress any SIA related matters. • Oversees any changes to the "template SIA" and related documents. • Membership comprises VicTrack (chair), VicRoads, PTV, rail infrastructure managers, and MAV. **Railway Crossing Safety Awareness Group (RCSAG)** • Responsible for developing and implementing communication and awareness campaigns that promote safety around railway level crossings. • Coordinates media communication activities (including press releases, media responses and PR activities). • Measures the impact and effectiveness of implemented campaigns and media activities. • Work in coordination with the other Victorian Railway Crossing Safety Steering Committee (VRCSSC) working groups to identify issues, and to share data and research. • Membership comprises V/Line (Chair), PTV, VicRoads, ARTC TAC, Victoria Police, VicTrack and Metro Trains Melbourne. **Railway Crossing Human Factors Group (RCHFG)** • Researches human factors that may influence road user behaviour at railway level crossings with a view to developing initiatives to improve safety. • Membership comprises MTM (Chair), TSV, VicRoads, V/Line, VicTrack and PTV.

Local Government	
Municipal Association of Victoria (MAV)	• The peak advocacy body for Victorian municipal councils. • Represents local government on the VRCSSC and the SIA Working Group. • State-wide coordination of municipal council input on the Level Crossing Upgrade Program, the SIA process and crossing closure strategies for local government. • Assists in setting targets for closures and SIA coordination and completion. • Liaises with VicTrack, TSV, rail operators and PTV as required for railway level crossing management issues. • Encourages and monitors local government compliance and performance relating to rail safety initiatives and the SIA process. • Member of the VRCSSC and various sub-committees.
Municipal Councils	• The road managers (coordinating road authorities) for municipal roads and other roads contained in each council's register of public roads. • Duty holders under SIA provisions in the RSA – shares the safety management of level crossings and road / rail bridges with the relevant rail infrastructure manager(s) / other road authorities. • Implement measures to manage risks at level crossings and road / rail bridges as agreed in SIAs. • Provide feedback to the MAV, VRCSSC and other organisations on rail safety issues.
Rail Infrastructure Managers	
Metropolitan Melbourne Rail Infrastructure Manager	**Metro Trains Melbourne (MTM)** • A private company accredited as rail infrastructure manager (and passenger rolling stock operator) for the metropolitan electrified network and the Frankston to Stony Point non-electrified rail line. • Duty holder under SIA provisions in the RSA – shares the safety management of the Melbourne metropolitan electrified rail network, including railway level crossings and road / rail bridges with road managers. • Member of the VRCSSC and various sub-committees.
Regional Victorian Rail Infrastructure Manager	**V/Line Pty Ltd** • A statutory corporation (established under the Rail Corporations Act 1996) which manages most intrastate regional passenger and freight rail lines and passenger services. • Duty holder under SIA provisions in the RSA – shares safety management of most regional railway level crossings and road / rail bridges (except those managed by ARTC and Heritage & Tourist railway operators) with the relevant road managers. • Member of the VRCSSC and various sub-committees.

Defined Interstate Railway Network (DIRN) Rail Infrastructure Manager	**Australian Rail Track Corporation (ARTC)** • Public company established by intergovernmental agreement to be rail infrastructure manager for the DIRN (the Commonwealth Government is the sole shareholder. • Responsible for the Victorian interstate rail corridors to Albury and to Wolseley on the Sydney and Adelaide corridors respectively. • Also responsible for the Maroona – Portland and Benalla – Oaklands grain lines. • Duty holder under SIA provisions in the RSA – shares safety management of railway level crossings and road / rail bridges with the relevant road managers on the DIRN and any other sections of the rail network managed by ARTC. • Member of the VRCSSC and various sub-committees.
Metropolitan Melbourne Tram Operator	**Yarra Trams (Keolis Downer EDI Rail Victoria)** • A private company accredited as rail infrastructure manager and rolling stock operator for the metropolitan tram network. • Duty holder under SIA provisions in the RSA – must establish SIAs for the limited number of intersections which fall within the definition of "road or rail crossing" for trams, including the three metropolitan Melbourne "tram squares" (where tram lines cross heavy rail lines at the following locations:, Riversdale Road, Camberwell, Glen Huntly Road, Glen Huntly and Glenferrie Road, Kooyong).
Heritage & Tourist (H&T) Rail Operators	H&T organisations are accredited (by TSV) for rail operations in Victoria. H&T operators are mostly small, volunteer run railways although some, such as the Emerald Tourist Railway Board ("Puffing Billy") and Bendigo Tramways, have larger, more frequent service operations Many (but not all) H&T operators have public railway level crossings and/or road/rail bridges on their networks Duty holders under SIA provisions in the RSA – must establish SIAs for any public railway level crossings and road / rail bridges More information on locations and operations of H&T railways is available from the Association of Tourist Railways Victoria (ATR) at www.atr.org.au

The key contacts within the agencies are as shown in Table 2 below.

Table 2: Agency contacts

Contact	Subject Area
Manager, Railway Crossing Safety, Projects and Technical Services Division, Public Transport Victoria (PTV)	Level Crossing Upgrade Program (excluding design and delivery of approved projects), general matters relating to railway level crossing policy and practices, VRCSSC matters
General Manager Engineering, Projects and Technical Services Division, Public Transport Victoria (PTV)	Rail infrastructure and general rail industry standards
Manager Technical Services, Project Delivery Group, VicTrack	ALCAM and SIA website related queries
Group Manager Signalling Track and Power, Project Delivery Group, VicTrack	Level Crossing Upgrade Program – design and project management of approved projects. Manages and provides estimates for works within the rail corridor for road managers and other organisations
Manager, Traffic Engineering, Network Design Services, VicRoads	Road related standards at level crossings (eg. signs, road markings, rumble strips)

The demarcation of responsibilities between the rail infrastructure manager and the road authority for the installation, maintenance and operation of level crossing infrastructure, including signs and pavement markings, is specified in the relevant Safety Interface Agreements (SIA). Unless the SIA states otherwise, the responsibilities for signs and pavement markings are as shown in Table 3. Any general queries relating to SIAs (e.g. demarcation responsibilities) can be made via VicTrack, Further information can also be found in the Code of Practice for Operational Responsibility for Public Roads under the Road Management Act 2004.

Table 3: Responsibilities for signs and markings

Item	Responsible Authority / Infrastructure Manager		Comments
	Maintenance/ Operation	**Construction**	
Signs at the Level Crossing	Rail	Rail and Road jointly (see note 1)	Includes: • rail crossing assembly (RX-1, RX-2, RX-5 & RX-6) • RAILWAY CROSSING and width marker assemblies (RX-9) • KEEP TRACKS CLEAR signs (G9-67-1 & G9-67-2) • RAILWAY CROSSING NOT IN USE signs (G9-74)
Signs on Road Approaches, including side road approaches	Road – the authority that is responsible for maintaining the road on which the sign is located (see note 2)	Rail, generally as part of a level crossing upgrade project (see note 1)	Includes active advance warning signs (AAWS)
Signs Within the Rail Reserve	Rail	Rail	Relates to signs for the information of rail personnel
Pavement Markings on Road Approaches	Road – the authority that is responsible for maintaining the road	Road, or Rail as part of a level crossing upgrade project	Includes: • stop and give way holding lines • RAIL X markings • lane lines • edge lines • associated raised reflective pavement markers
Pavement Markings Within a Level Crossing	Rail – MTM network Road – (area outside of the MTM network)	Rail – MTM network Road – (area outside of the MTM network)	Includes yellow box markings

Notes to Table 3:

1. ***A rail infrastructure manager must obtain a Memorandum of Authorisation (MoA) from the relevant road authority (VicRoads or the relevant municipal council) before erecting, removing or altering any permanent traffic control device. Details relating to the authorisation of major and minor traffic control devices are set out in Traffic Engineering Manual Volume 3 Part 2.02. A MoA may not be required for temporary traffic control devices used at worksites (refer to Regulation 11 of the Road Safety (Traffic Management) Regulations 2009)***

2. ***Where a railway level crossing is on a local side road that is close to an intersection with an arterial road (or vice versa), and advance warning signs are required on the arterial road, both the municipal council and VicRoads will have obligations relating to the signs that are located on the road for which they are the responsible authority.***

Clause 2.2 – PASSIVE CONTROL DEVICES

Transverse rumble strips may be used on the approaches to passive level crossings on sealed rural roads with a speed limit of 80 km/h. They act as a supplementary advance warning device to alert drivers of the presence of a potential hazard ahead. A study on the effectiveness of rumble strips at railway crossings can be found at https://www.vicroads.vic.gov.au/safety-and-road-rules/road-safety-programs/railway-level-crossing-safety

Layouts and profiles are summarised in Table 4 below. The standard profile consists of rumble strips that are 10 ± 2 mm high. Low profile strips are 7 ± 2 mm high.

Table 4: Rumble strip patterns and profiles

Case No.	Approach Alignment	Seal Width	Rumble Strip Pattern & Profile	Approach Speed	Figure Reference
1	Straight or curve radius ≥ 600 m	≥ 5.5 m	25 strips, standard or low profile	80 km/h	Figure 1
2	Straight or curve radius ≥ 600 m	< 5.5 m	25 strips, standard or low profile	80 km/h	Figure 2
3	Curve radius < 400 m	≥ 5.5 m	25 strips, standard or low profile	80 km/h	Figure 3
4	Curve radius 400m to 600m	≥ 5.5 m	5 strips, low profile	80 km/h	Figure 4

On roads which have a dividing line pavement marking, a barrier line shall be used and must commence at least 50 metres in advance of the first set of rumble strips encountered by a driver approaching the level crossing.

On roads which cannot accommodate a dividing line (i.e. width of seal less than 5.5 metres), the rumble strips should be placed across the full width of the seal in accordance with the narrow seal treatment (Case No. 2 in Table 4 above).

A modified pattern of rumble strips is required where there is an intersection within proximity of the level crossing and traffic on the road which crosses the level crossing is required to stop or give way at the intersection. Requirements in such circumstances are summarised in Table 5 below.

Table 5: Rumble strip layouts close to intersections

Seal Width	Distance from Level Crossing to Intersection (metres)	No. of Sets of Rumble Strips	Figure Reference
≥ 5.5 m	< 250	None	Figure 5
	250 to 300	1	
	301 to 350	2	
	351 to 450	3	
< 5.5 m	< 320	None	Figure 6
	320 to 380	1	
	381 to 420	2	
	421 to 600	3	

Notes to Table 5:

1. ***The spacing of the groups of rumble strips can be compressed if there is an intersection close to the level crossing as actual speeds are not likely to reach the speed limit.***
2. ***On roads with a seal width ≥ 5.5 m, rumble strips should be no closer than 50 m on the departure side of an intersection.***
3. ***For narrow seal roads (< 5.5 m), rumble strips should not be placed within 100 m of the stop / give way line at the road intersection.***

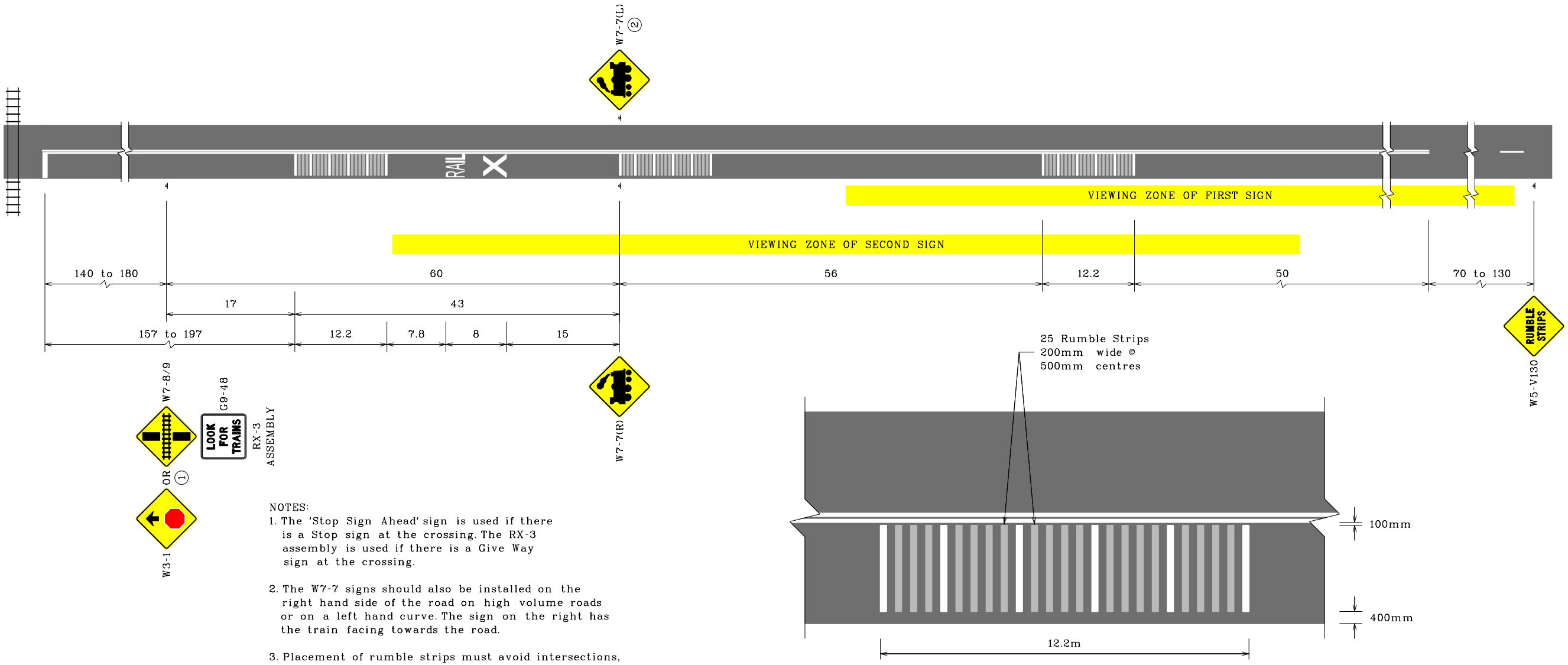
Rumble strips must not be placed within 150 metres of a level crossing. This is to ensure that the emergency braking zone for trucks is not compromised.

Noise generated from rumble strips can be a nuisance to nearby residents. Accordingly, if any houses are located within 150 metres of the preferred location of rumble strips the following options, in order of preference, should be considered:

- Locate the rumble strips so that they are at least 150 m from the closest point of a house. Layouts similar to Case No 3 (i.e. Figure 3) may be used where there are houses within 250 m of the level crossing.
- Replace the standard profile rumble strips with low profile strips.
- Replace the standard layout of 25 strips with the 5 strip treatment.
- Any combination of the above options.

If it is not practicable to install a set of rumble strips due to the proximity of houses, alternative treatments should be discussed with the VicRoads Manager - Traffic Engineering.

CASE 1 - 80km/h



NOTES:

1. The 'Stop Sign Ahead' sign is used if there is a Stop sign at the crossing. The RX-3 assembly is used if there is a Give Way sign at the crossing.

2. The W7-7 signs should also be installed on the right hand side of the road on high volume roads or on a left hand curve. The sign on the right has the train facing towards the road.

3. Placement of rumble strips must avoid intersections, major driveways and curves with radius <400m.

4. 400mm offset is to Edge of Seal.

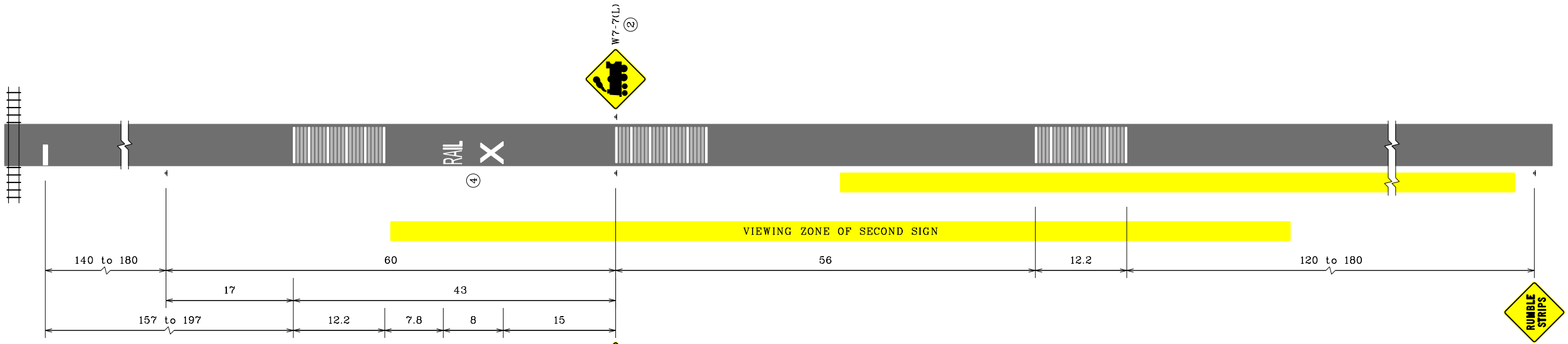
Detail - Set of Rumble Strips

Standard Profile: Strips 10 ± 2mm high

Low Profile: Strips 7 ± 2mm high

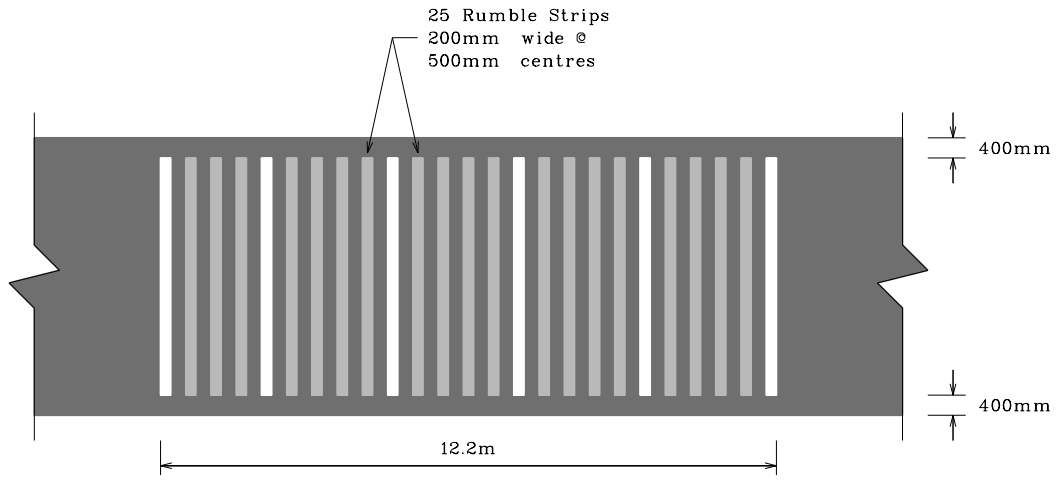
Figure 1: Rumble strips at level crossings - case 1: seal width > 5.5 m - 80 km/h

CASE 2 - 80km/h



NOTES:

1. The 'Stop Sign Ahead' sign is used if there is a Stop sign at the crossing. The RX-3 assembly is used if there is a Give Way sign at the crossing.
2. The W7-7 signs should also be installed on the right hand side of the road on high volume roads or on a left hand curve. The sign on the right has the train facing towards the road.
3. Placement of rumble strips must avoid intersections, major driveways and curves with radius <400m.
4. The RAILX marking is not used if the seal is less than 3.0m wide.
5. 400mm offset is to Edge of Seal.



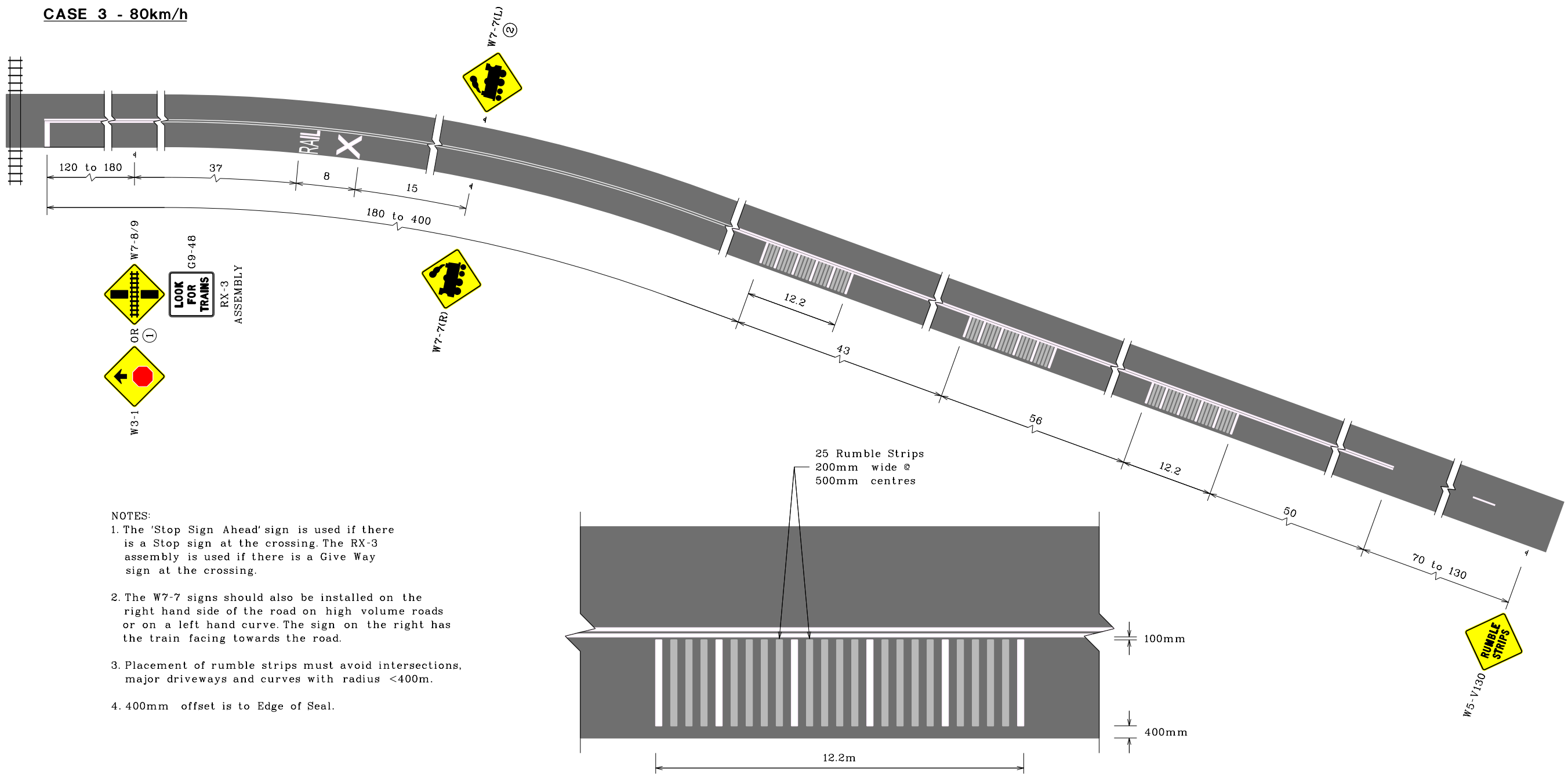
Detail - Set of Rumble Strips

Standard Profile: Strips 10 ± 2mm high

Low Profile: Strips 7 ± 2mm high

Figure 2: Rumble strips at level crossings – case 2: seal width < 5.5 m - 80 km/h

CASE 3 - 80km/h



NOTES:

1. The 'Stop Sign Ahead' sign is used if there is a Stop sign at the crossing. The RX-3 assembly is used if there is a Give Way sign at the crossing.
2. The W7-7 signs should also be installed on the right hand side of the road on high volume roads or on a left hand curve. The sign on the right has the train facing towards the road.
3. Placement of rumble strips must avoid intersections, major driveways and curves with radius <400m.
4. 400mm offset is to Edge of Seal.

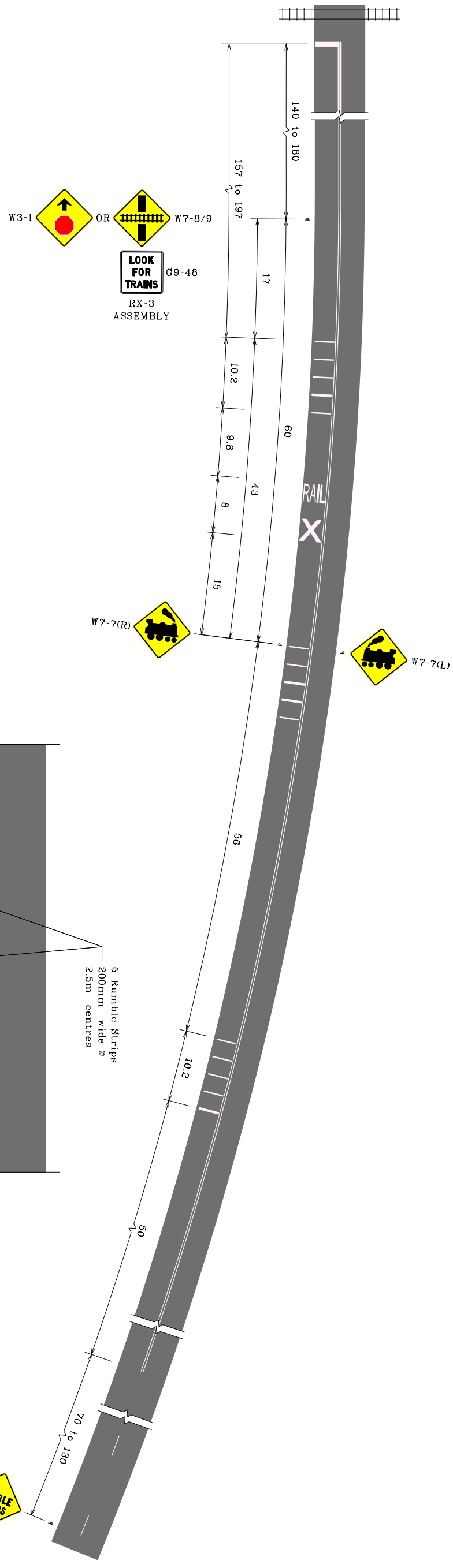
Detail - Set of Rumble Strips

Standard Profile: Strips 10 ± 2mm high

Low Profile: Strips 7 ± 2mm high

Figure 3: Rumble strips at level crossings - case 3: curved approach, seal width > 5.5 m - 80 km/h

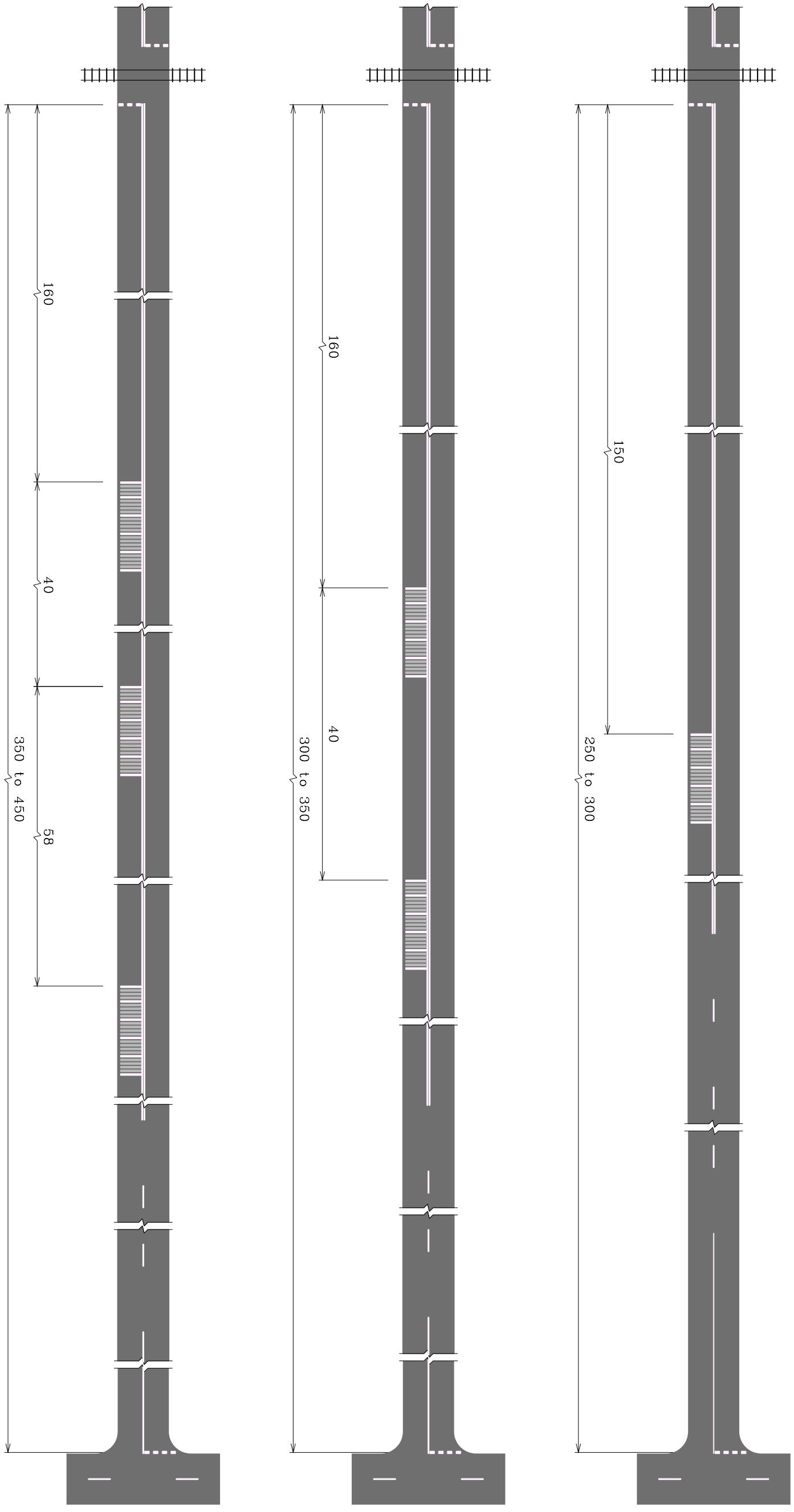
CASE 4 - 80km/h



NOTES:

1. The 'Stop Sign Ahead' sign is used if there is a Stop sign at the crossing. The RX-3 assembly is used if there is a Give Way sign at the crossing.
2. The W7-7 signs should also be installed on the right hand side of the road on high volume roads or on a left hand curve. The sign on the right has the train facing towards the road.
3. Placement of rumble strips must avoid intersections, major driveways and curves with radius <400m.
4. 400mm offset is to Edge of Seal.

Figure 4: Rumble strips at level crossings – case 4: curved approach, low profile seal width > 5.5 m - 80 km/h



NOTES:
1. Linemarking indicative only.

Figure 5: Rumble strips at level crossings close to intersection, seal width > 5.5 m

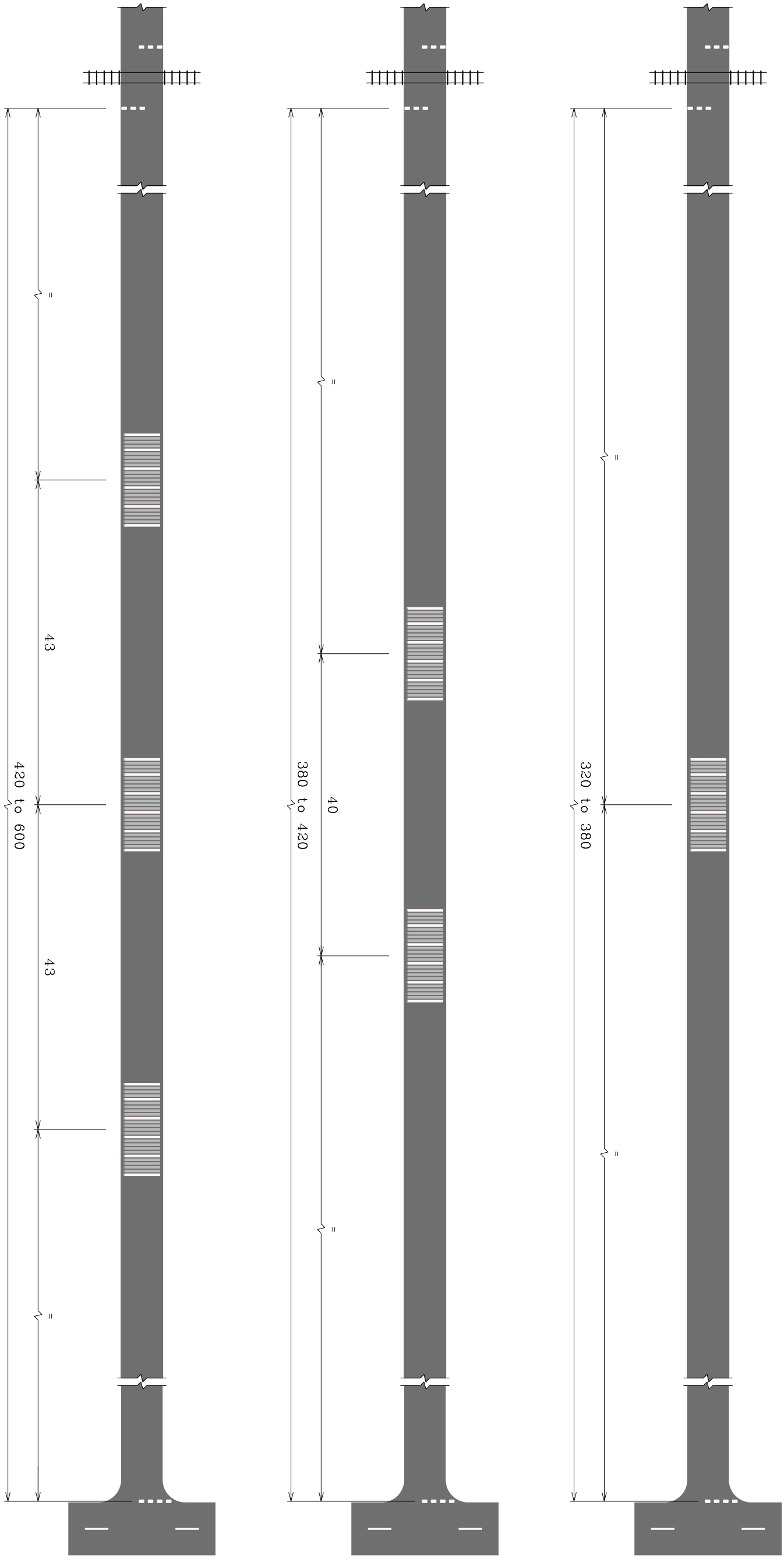


Figure 6: Rumble strips at level crossings close to intersection, seal width < 5.5M

Clause 2.2.1 – Railway crossing give-way assembly (RX-1)

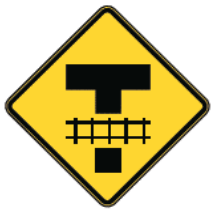
The RX-1 assembly is located within the railway reserve and the relevant rail infrastructure manager is responsible for the supply, erection and maintenance of these signs.

Clause 2.2.2 – Railway crossing stop assembly (RX-2)

The RX-2 assembly is located within the railway reserve and the relevant rail infrastructure manager is responsible for the supply, erection and maintenance of these signs.

Clause 2.2.4 – Railway crossing diagrammatic warning assemblies (RX-3-1, RX-3-2 and RX-3-3)

Where there is a T-junction immediately beyond the railway level crossing with passive control (Stop or Give Way sign), consideration may be given to replacing sign W7-8 or W7-9 with the On Side Road sign W7-12 (or a similar sign with an angled alignment of the rails, as appropriate), rotated anti-clockwise 90 degrees. This modification may also be made by using sign W7-13 for a cross road, but this shall not be done on any intersection approach controlled by a Stop or Give Way sign.



W7-12

(rotated)

W7-13

(rotated)

Guidelines for the use of symbolic intersection signs (refer Clause 2.9.2.1 of AS 1742.2:2009) shall be taken into consideration when assessing the use of these signs.

Alternatively, use of the W4-V107 sign is permitted in Victoria to warn of an intersection beyond the crossing. It may be used where the storage distance is less than 30 m or there is a likelihood of a queue extending to the crossing.

W4-V107

The W4-V107 sign is located within the road reserve the relevant road authority is responsible for the supply, erection and maintenance of these signs.

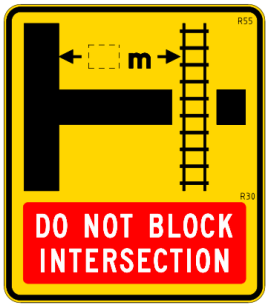
Refer to sign drawing W4-V107 in the VicRoads Supplement to AS 1743 for details regarding the design and dimensions of the sign.

Clause 2.2.6 – Diagrammatic warning signs, on side road (W7-12, W7-13)

As an example, the W7-12, W7-13 and W7-17 signs may be considered for use to assist in the warning of a passive control railway level crossing on a side road within 80 metres of the intersection, where the distance is too close to effectively install an advance warning sign on the side road (see Appendix D of AS 1742.2:2009).

The W7-12, W7-13 and W7-17 signs may also be rotated anti-clockwise (or clockwise for W7-17(R)) 90 degrees and used as described in Clause 2.2.4 of this Supplement.

Alternatively, use of the W4-V108 sign is permitted in Victoria. It may be used where the storage distance is less than 30 m or there is a likelihood of a queue extending to the crossing.



W4-V108(R)

The W4-V108 sign is located within the road reserve and the relevant road authority is responsible for the supply, erection and maintenance of these signs.

Refer to sign drawing W4-V108 in the VicRoads Supplement to AS 1743 for details regarding the design and dimensions of the sign.

Clause 2.3.7 – Active advance warning assembly (RX-11)

In Victoria, the design and dimensions of the RX-11 assembly shall be in accordance with sign drawing RX-11 in the VicRoads Supplement to AS 1743.

A study on active advance warning assemblies at railway crossings can be found at https://www.vicroads.vic.gov.au/safety-and-road-rules/road-safety-programs/railway-level-crossing-safety

Clause 3.1 – GENERAL

In addition to RAIL X markings, stop or give-way lines and no-overtaking lines, edge lines should be placed as isolated short lengths on the approaches to and within railway crossings where there is an evident need for extra delineation. This is subject to the sealed width on a two-way carriageway being at least 6.2 m and a dividing line is installed. For this application, the length of edge lines may be less than 500 m.

For additional information on the use of edge lines, refer to Clause 5.3.5 of AS 1742.2:2009.

Clause 3.3 – STOP LINE

At level crossings in Victoria, all solid stop lines (at STOP signs, flashing lights and gate control) shall be 600 mm wide. This line thickness provides enhanced conspicuity in adverse viewing conditions (e.g. wet weather) and distinguishes this stop line from other stop lines at non-signalised intersections.

Clause 3.4 – GIVE-WAY LINE

At level crossings in Victoria, all broken give-way lines (at GIVE WAY signs) shall be 600 mm wide. This line thickness provides enhanced conspicuity in adverse viewing conditions (e.g. wet weather) and distinguishes this give-way line from other give-way lines at normal intersections.

Clause 3.6 – YELLOW BOX MARKINGS

Yellow box markings supplement rule 123(e) of the Road Safety Road Rules 2017, which states that a driver cannot drive through a level crossing when the crossing, or beyond the crossing, is blocked. It is important to limit the use of yellow box markings in order to maintain the effectiveness in attracting drivers' attention, and improve the level of compliance with road rule 123(e). As such, yellow box marking shall not be used generally to denote the limits of railway level crossings, as the overuse of such markings may leave the impression that it is permissible to remain stationary within a level crossing where there is no yellow box marking.

In Victoria, yellow box pavement markings may also be used in the metropolitan area where trams are experiencing delays entering the road from their own right of way, or from a depot, due to traffic queues blocking their passage. As an evaluation of the effectiveness of these markings for this purpose has not been carried out, their installation should not be implemented without prior approval of Manager – Traffic Engineering.

In addition to the requirements of AS 1742.7, these markings shall only be used where:

- An engineering evaluation of the site has been carried out to maximise the effectiveness of such markings, e.g. the downstream limits of the markings should be visible to the driver of a passenger vehicle at the stop line of the rail crossing.
- Prior written agreement from the relevant road authority and the relevant rail infrastructure manager has been obtained. The responsibility for installation and maintenance of yellow box markings is covered in Table 3 of this Supplement.

Clause 4.1 – GENERAL

In Victoria, the recommended speed limit for sealed rural road level crossings is a maximum of 80 km/h.

Where a speed limit of 80 km/h has been applied, it should begin a minimum distance of 400 m on the approach to the level crossing and terminate 100 m on the departure from the level crossing. Split speed zones are permitted in this instance (i.e. the start and finish of the 80 km/h speed zone do not coincide for each direction of traffic).

It is not necessary to relocate railway crossing warning sign(s) (W7-4) and “RAIL X” pavement markings to suit an 80 km/h speed limit unless an assessment indicates that the risk will be increased by not doing so.

For sites with rumble strips, the only alteration to existing signs is that the “RUMBLE STRIPS” warning sign should be relocated and mounted on the same post as the first 80 km/h speed limit sign, as shown on the relevant typical layout. In addition, all advance warning signs are positioned to complement the rumble strips and so should not be relocated without discussion with the relevant rail infrastructure manager.

For situations not covered by the typical layouts, specific advice should be sought from the relevant VicRoads Regional office.

The application of signs and markings treatments for rural road level crossings with 80 km/h posted speed limit is provided with the following scenarios.

- Passive railway level crossings - *Figure* 7
- Short length of road between level crossing and adjacent intersection - *Figure 8*
- Passive railway level crossing with rumble strips - *Figure 9*
- Railway level crossings with active control (with or without boom barriers) - *Figure 10*
- Railway level crossings with active advance warning signs (with or without boom barriers) - *Figure 11*

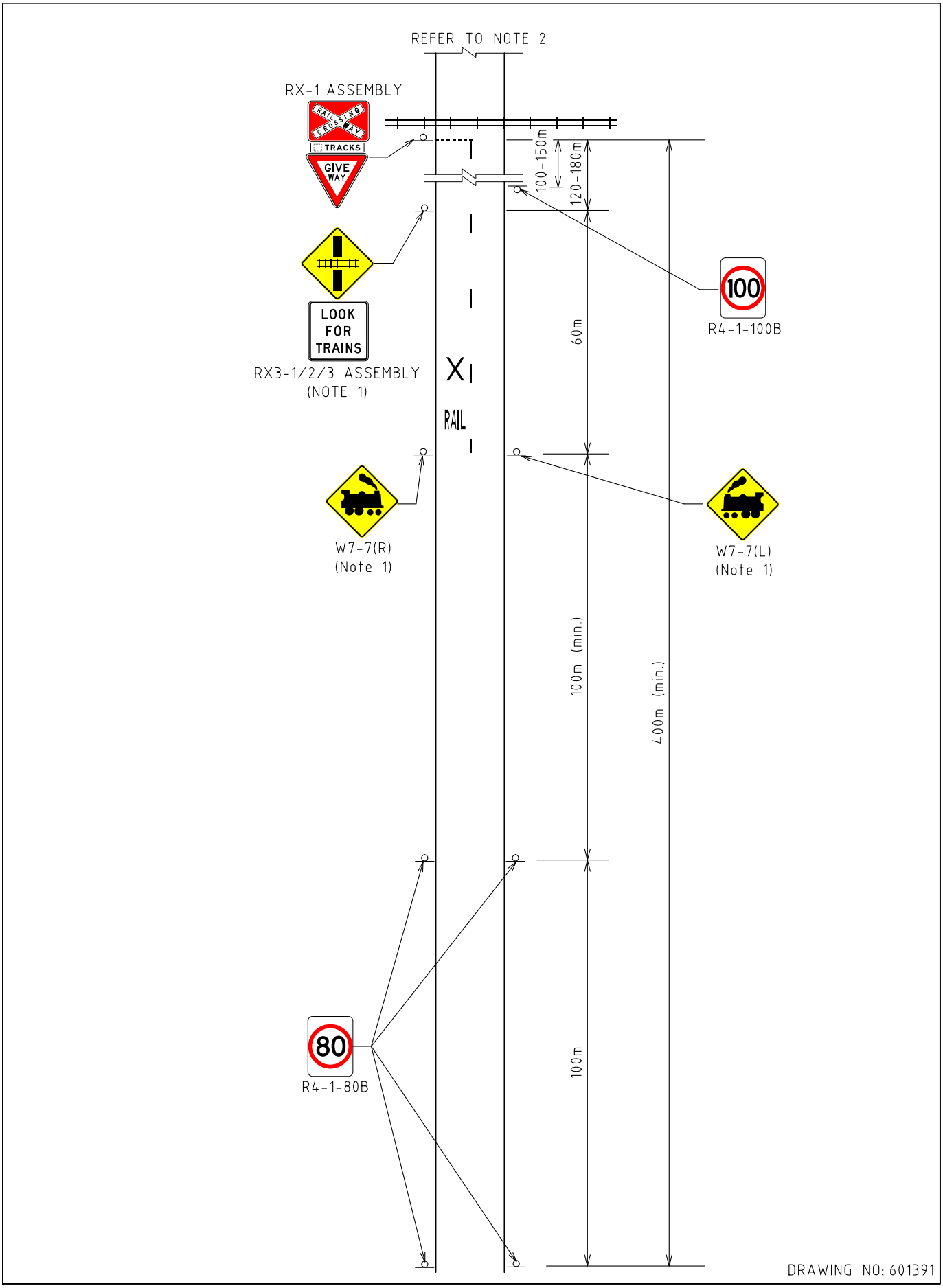


Figure 7: Passive railway level crossing - typical layout of signs for 80 km/h speed limit

Notes for Figure 7:

1. ***The level crossing warning signs and pavement markings shown are in accordance with Figure 4.3 of AS 1742.7-2016 for a speed limit of 80 km/h. The position of existing signs and pavement markings which were installed to suit a higher speed limit should not be adjusted when the speed limit is reduced to 80 km/h unless a risk assessment indicates that it is necessary.***
2. ***If the length of road between the departure side of a level crossing and the next intersection holding line is less than 2.4 km, refer to Drawing No. 601392.***
3. ***This layout applies also to level crossings with STOP control.***

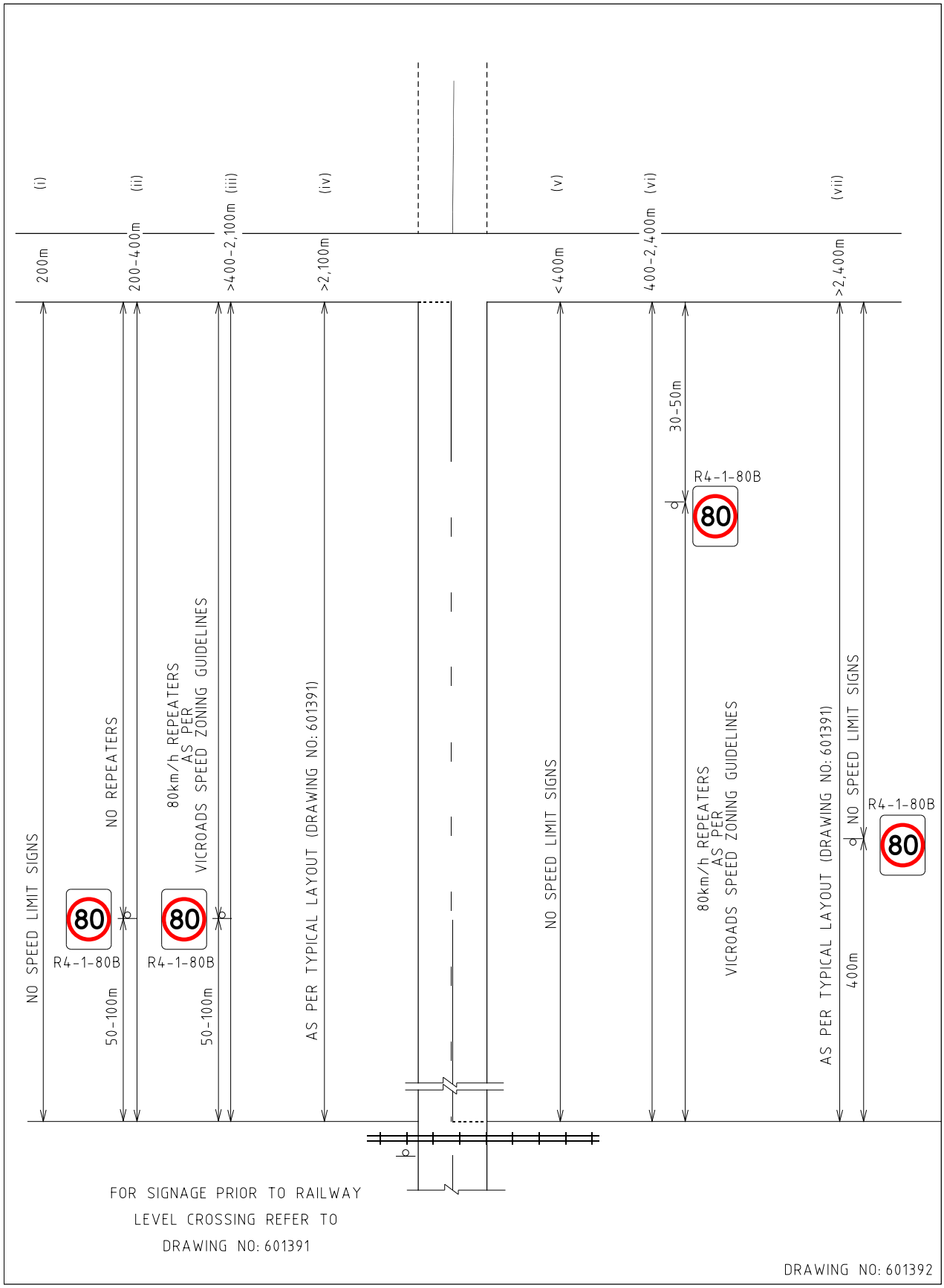


Figure 8: Typical layout of signs for 80km/h speed limit (for short length of road between level crossing and adjacent intersection)

4. Notes for

Figure 8**:**

1. The level crossing warning signs and pavement markings shown are in accordance with Figure 4.3 of AS 1742.7-2016 for a speed limit of 80km/h. The position of existing signs and pavement markings which were installed to suit a higher speed limit should not be adjusted when the speed limit is reduced to 80km/h unless a risk assessment indicates that it is necessary.

2. The layouts are applicable for passive and actively controlled crossings.

3. Railway level crossings not shown.

4. This Figure 8 only applies where there is a requirement for traffic approaching/departing the railway crossing to stop or give way at an adjacent intersection

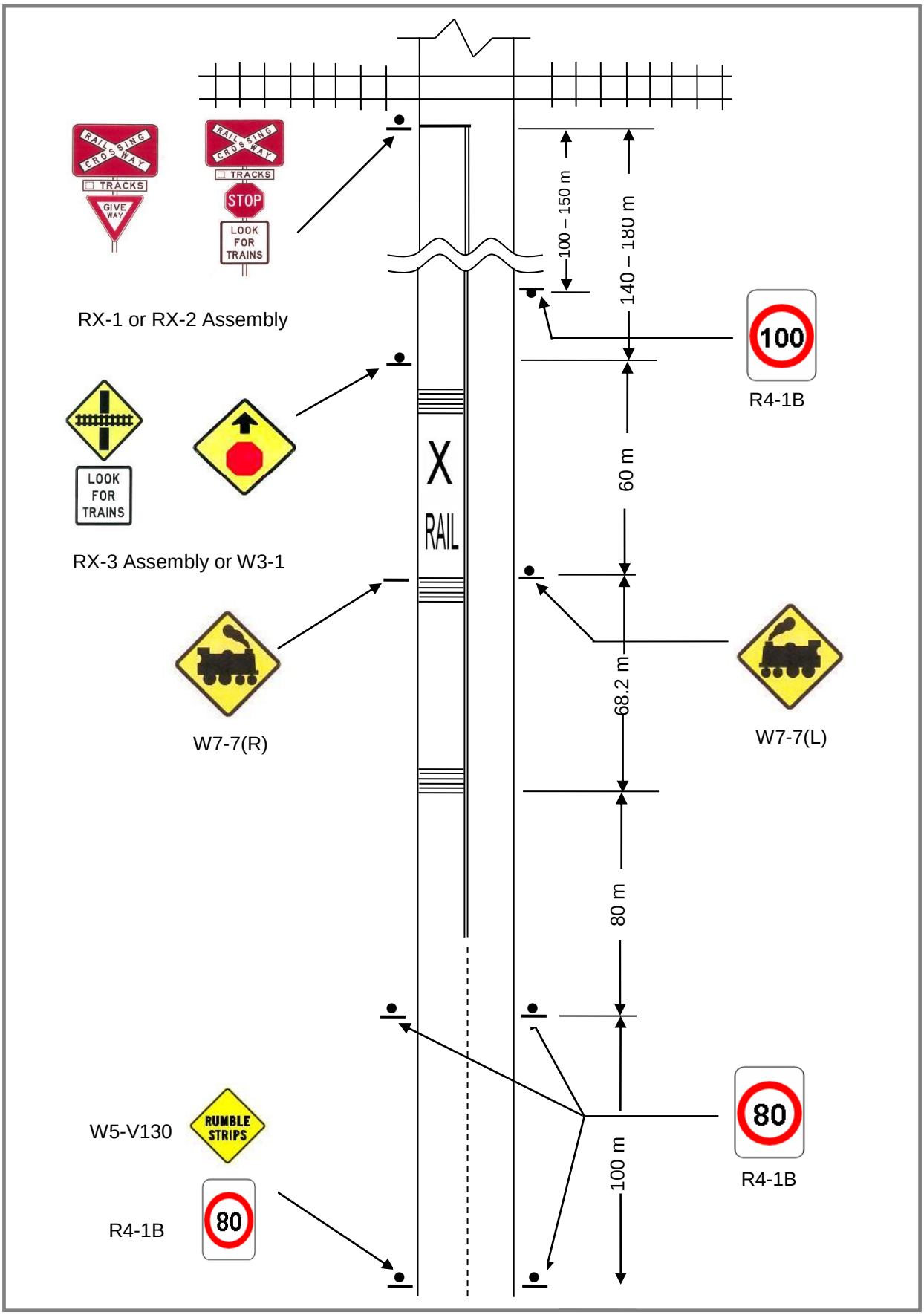


Figure 9: Passive railway level crossing with rumble strips - typical layout of signs for 80 km/h speed limit

Notes for Figure 9:

1. ***The level crossing warning signs, pavement markings and rumble strips are in accordance with for a straight road approach and speed limit of 80 km/h.***
2. ***At level crossings with a horizontal curve on the approach, the level crossing warning signs, pavement markings and rumble strips will be in accordance with VicRoads Drawing No. 541705 or 54708 as appropriate. In such cases the 80 km/h speed limit signs should be located relative to the first set of rumble strips as per the layout above.***

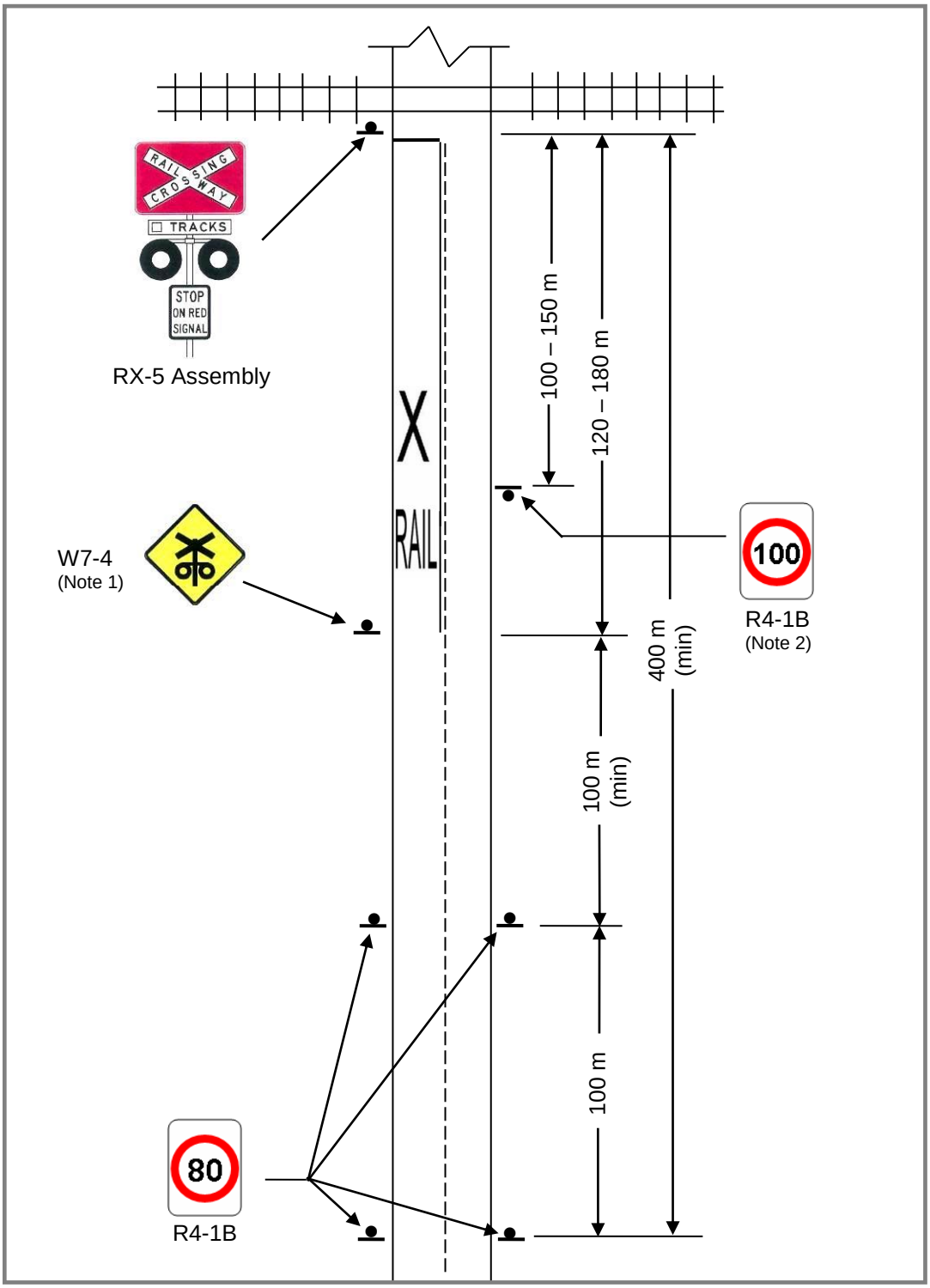


Figure 10: Railway level crossing with active control (with or without boom barriers) - typical layout of signs for 80 km/h speed limit

Notes for Figure 10:

1. ***The level crossing warning signs and pavement markings shown are in accordance with Figures 4.6 and 4.7 of AS 1742.7-2016 for a speed limit of 80 km/h. The position of existing signs and pavement markings which were installed to suit a higher speed limit should not be adjusted when the speed limit is reduced to 80 km/h unless a risk assessment indicates that it is necessary.***
2. ***If a duplicate W7-4 warning sign is located on the right hand side of the roadway at a suitable distance from the level crossing, the 100 km/h sign should be mounted on the same post.***

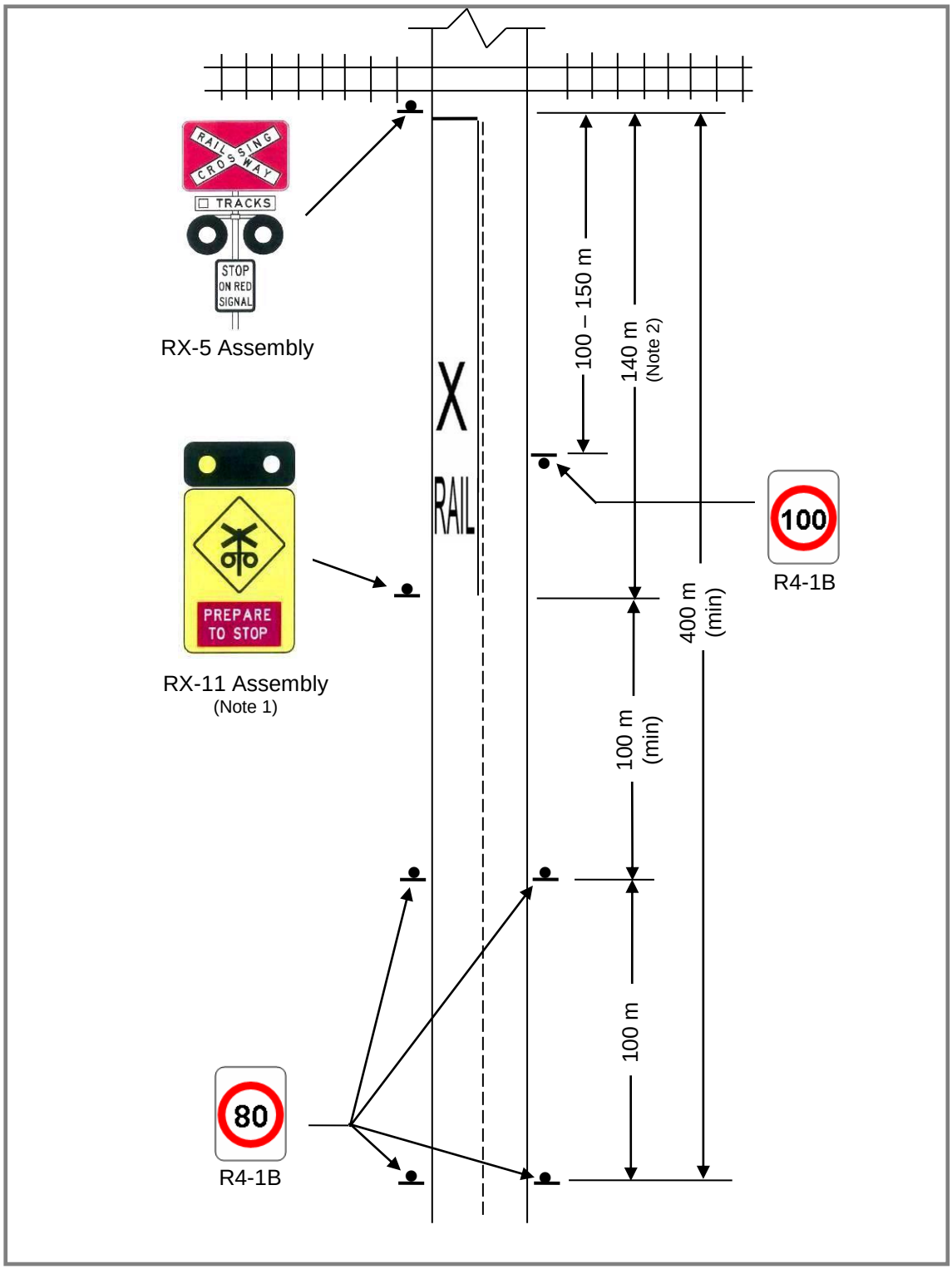


Figure 11: Railway level crossing with active advance warning sign (with or without boom barriers) - typical layout of signs for 80 km/h speed limit

Notes for Figure 11:

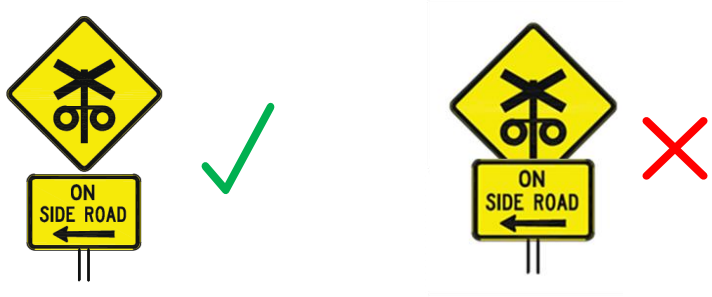
1. ***The level crossing warning signs and pavement markings shown are in accordance with AS 1742.7-2016.***
2. ***The location of the RX-11 assembly is shown for a level approach grade. The distance from the level crossing will vary for other approach grades as specified in Table E1 of AS 1742.7-2016.***

Clause A4 – MEANS OF REFLECTORIZATION

A list of approved sheeting materials for use on road signs is contained in VicRoads Standard Specification Section 860 - Manufacture of Road Signs.

Clause B3 – INSTALLATION

Supplementary signs shall be installed so that both the parent sign and supplementary sign are fully visible. The bottom of the parent sign shall not be covered by the top of the supplementary sign or vice versa, nor shall there be any noticeable vertical separation between the parent and supplementary signs.



Clause D4 – PASSIVE CONTROL CROSSINGS CONTROLLED BY GIVE WAY SIGNS – APPROACH VISIBILITY

In addition to the requirements of D4 in AS 1742.7:2016, adequate sight distance to an approaching train should also be available for the driver of a vehicle who has stopped at a crossing, regardless of whether the control is a STOP or GIVE WAY sign.

Furthermore, the installation of STOP signs shall be considered at level crossings at which there is insufficient sight distance for the driver of a road vehicle to see an approaching train, react and stop, if necessary, before reaching the crossing.

Prior to changing the control at a passive level crossing from GIVE WAY to STOP, an assessment of the relative risk of the options should be conducted to ensure that the lower risk treatment is implemented.

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For enquiries regarding this supplement, please contact the VicRoads Traffic Engineering team via tem@roads.vic.gov.au or 9854 2417.