Fiji Roads Authority

FIJI ROADS AUTHORITY SIGNS AND MARKINGS

PART 1 – SECTION 1 INTRODUCTION

March, 2019

FRA's Traffic Signs and Markings
Part 1 - Section 1
Introduction

Updates Record

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Acknowledgement: FRA gratefully acknowledges the generosity of the Association of Australian and New Zealand Transport and Traffic Authorities(Austroads) in allowing FRA, to use and reference much of the material used in this *Guide.*

Unless specifically identified in the *Guide*, all diagrams and tables have been sourced from the various VicRoads, NZTA and Austroads Design Guides and relevant Australian Standards.

CHAPTER TITLES

1 INTRODUCTION

1.1 General

Traffic signs are an important part of the roading system. They are provided to aid the safe and orderly movement of traffic and may contain:

- regulatory instructions which road users are required to obey,
- warnings of temporary or permanent hazards which may not be self-evident,
- directions and distances to destinations on the road ahead or on an intersecting road,
- an indication of road user services and tourist features/establishments adjacent to the road ahead, or on an intersecting road,
- other information which is likely to be of general interest to road users.

Clear and efficient signing is therefore essential and a road with poor and/or badly maintained signing is an unsatisfactory road in the user's view. To be effective, traffic signs must be readily recognised, and:

- be co-ordinated with geometric road layout so they are conspicuous by day or night,
- have messages which can be quickly read and understood, and
- be located far enough in advance of the situation to give sufficient time for the road user to take the appropriate action.

To help achieve these goals a combination of message, distinctive shape and colour is used. The message may be either a legend, a symbol, or both. Standardisation of design, colour, shape, size and location helps to ensure that drivers will readily recognise the various classes of traffic signs.

Signs should be erected only where there is a demonstrated need, because unnecessary signs detract from the effectiveness of those that are required. It is most important therefore to ensure that extraneous, non-essential signs, eg. commercial advertising signs, are controlled and do not compete with traffic signs.

When traffic signs are required, only those with approved legends and symbols may be erected.

1.2 Document Structure

FRA has developed the following Signing, Linemarking and Lighting guides as part of a set of Traffic Engineering documents. These are summarised below:

FRA Signs and Marking, Part 1 – Section 1: Introduction
FRA Signs and Marking, Part 1 – Section 2: Regulatory Signs General
FRA Signs and Marking, Part 1 – Section 3: Regulatory Signs Parking
FRA Signs and Marking, Part 1 – Section 4: Permanent Warning Signs
FRA Signs and Marking, Part 1 – Section 5: Direction Signs
FRA Signs and Marking, Part 1 – Section 6: Tourist and Service Signs
FRA Signs and Marking, Part 2 – Linemarking

FRA Road Lighting Design Guide
FRA Road Lighting Standards

1.3 Reference Documents

The following documents form part of FRAs FSAM. These are:

AS 1742.1 - General introduction and index of signs
AS 1742.2 - Traffic control devises for general use
AS 1742.6 - Tourist and Services Signs
AS 1742.12 - Bus, transit, tram and truck lanes
AS 1742.14 - Traffic Signals
AS 1742.15 - Direction signs, information signs and route numbering
AS 1743 - Road Signs – Specifications
Fiji Regulations

Austroads Guide to Traffic Management, Part 10: Traffic control and communications devices

Further standards governing the design of sigs are:

AS 1744 - Standard alphabets for road signs
AS 2700 - Colour standards for general purposes
ISO 7001 - Graphical symbols—Public information symbols

Further standards governing the manufacture of signs are:

AS 1397 - Continuous hot-dip metallic coated steel sheet and strip—Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 1562 - Design and installation of sheet roof and wall cladding
AS 1562.1 - Metal 1742 Manual of uniform traffic control devices 1742.1 Part 1: General introduction and index of signs
AS 1734 - Aluminium and aluminium alloys—Flat sheet, coiled sheet and plate
AS 1906.1 - Retroreflective materials and devices for road traffic control purposes
AS 1906.2 - Retroreflective materials

The New Zealand Signing Guides also form a key part these guides and are important reference documents.

1.4 Basis of Documents

For historical and legislative reasons, FRA documents are based on a range of standards. These are summarised below:

Manual of Traffic Signs and Marking, Part 1 – Section 1: Introduction
- Stand alone document developed using NZ MOTSAM as a guide

Manual of Traffic Signs and Marking, Part 1 – Section 2: Regulatory Signs General
- Stand alone document generally based on NZ standards and Fiji Regulations

Manual of Traffic Signs and Marking, Part 1 – Section 3: Regulatory Signs Parking
- Stand alone document generally based on NZ standards and Fiji Regulations

Manual of Traffic Signs and Marking, Part 1 – Section 4: Permanent Warning Signs
- Stand alone document generally based on NZ standards

Manual of Traffic Signs and Marking, Part 1 – Section 5: Direction Signs
- Design Supplement based on AS 1742.15

Manual of Traffic Signs and Marking, Part 1 – Section 6: Tourist and Service Signs
- Guideline document that adopts AS 1742.6 for standards

Manual of Traffic Signs and Marking, Part 2 – Linemarking
- Design supplement based on AS 1742.2

2 Traffic Sign Classification and Function

2.1 General

Traffic signs have been classified by function into five main groups. These are:

- Regulatory: General, Parking and Heavy Vehicle
- Warning: Temporary and Permanent
- Direction
- Motorist Service
- Tourist

2.2 Regulatory Signs (FSAM Part 1, Section 2 & 3)

Regulatory signs, including parking signs, are covered by legislation which makes it illegal for a driver to disobey the sign message.

Road controlling authorities are responsible to ensure that every regulatory sign fully complies with the legal requirements regarding dimension, shape, colour/reflectorisation, location and authority for erection.

Regulatory signs have legal significance and must be readily distinguishable from all other signs. It is not practical to standardise by shape alone and distinction is made by using specific combinations of shape and colour. Table 1 illustrates the principal shape and colour combinations adopted for the regulatory and warning sign groups.

There are two types of regulatory sign:

- Prohibitory, and
- Mandatory.

(a) Prohibitory Signs

These indicate that a road user must not take a particular action, eg. the RG-7 NO RIGHT TURN sign.

(b) Mandatory Signs

These indicate that a road user must take a certain action, eg. the RG-12 TURN LEFT sign.

SHAPE	COLOURS			SIGN GROUP
	Legend or symbol	Background	Border	
	Black	White	Red	**Regulatory general** (RG–1 to RG–4, RG–7 to RG–9, RG–15, RG–16, RG23, RG–24)
	White	Red	White	**Regulatory general** (RG–5)
	Red	White	Red	**Regulatory general** (RG–6)
	White	Black	Red	**Regulatory general** (RG–22, RG–27, RG–29) **Regulator heavy vehicle** (RH–1, RH–2 etc.)
	White	Blue	White	**Regulatory general** (RG–10 to RG–13, RG–25, RG–26 etc.)
	Red	Blue	Red	**Regulatory parking** (NO STOPPING—RP–1)
	Red or black	White	Red	**Regulatory parking** (STOPPING RESTRICTION—Clearway, Bus Stop, Taxi Stand, etc.)
	White	Blue	White	**Regulatory parking** (PARKING RESTRICTION—permitted restricted parking.)
	Black	Orange	Black	**Temporary warning** (TW signs)
	Black	Yellow	Black	**Permanent warning** (PW signs)
	Black	White	—	**Permanent warning** (PW–14 and PW–15 RAILWAY CROSSING)

SHAPE	COLOURS			SIGN GROUP
	Legend or symbol	Background	Border	
	White	Red	White	Route marker sign
	White	Green	White	Guide sign
	White	Blue	White	Motorist service sign
	White	Brown	White	Tourist sign

Table 1 – Sign Types

2.3 Permanent Warning Signs (FSAM Part 1, Section 4)

Warning signs inform road users of unusual or hazardous conditions on the road ahead. They have a standard diamond shape, except for a few cases where this is not practical. There are two types of warning sign:

- Temporary, and
- Permanent.

(a) Temporary Warning Signs

These have black symbols on reflectorised orange backgrounds. A few temporary warning signs do not conform to this general form, eg. the TW-31 STOP/GO paddle.

When necessary a sign combination is formed by supplementing the symbolic sign with an approved word message, on an additional rectangular sign of the same colour.

(b) Permanent Warning Signs

These have black symbols on reflectorised yellow backgrounds. A few permanent warning signs do not conform to this general form, eg. a PW-14 RAILWAY LEVEL CROSSING - POSITION INDICATOR sign.

When necessary a sign combination is formed by supplementing the symbolic sign with an approved word message, on an additional rectangular sign of the same colour.

2.4 Direction Signs (FSAM Part 1. Section 5)

Direction signs inform road users of the direction and distances to places on the road ahead and/or on intersecting roads. These signs should give road users a directional message clearly and at the correct time.

The three main types of guide sign are:

- Advance Direction,
- Intersection Direction, and
- Reassurance Direction Signs.

(a) Advance Direction Signs

These signs are located on the approaches to intersections and indicate destinations on the roads leading away from the intersection.

(b) Intersection Direction Signs

These signs are located at the intersection or the point where drivers must make a turn off the main route. They show:

- the general directions of the roads leading away from the intersection,
- destinations on those roads, and
- distances to destinations, if confirmation direction signs are not provided on the side roads.

(c) Reassurance Direction Signs

These signs are located beyond intersections and reassure drivers that they are travelling towards their intended destination(s). Distances to places indicated are also shown.

2.5 General Information Signs (FSAM Part 1, Section 5)

General information signs are to convey information of interest, such as the names of towns, rivers, streams or forests, and other information useful to a traveller.

These signs provide road users with information of general interest such as:

- names of rivers and streams,
- local authority boundaries, and
- other miscellaneous information that may be useful to a traveller.

2.6 Motorist Service and Tourist Signs (FSAM Part 1, Section 6)

(a) Motorist Service Signs

These signs may be used to identify services which are commonly required by travellers, can be identified by internationally recognised symbols and are located adjacent to the road, or a reasonable distance alongside the road.

(b) Tourist Signs

These signs may be used to indicate:

- tourist features,
- tourist establishments,
- major tourist attractions, and
- tourist drives.

NOTE: Normal guide signs rather than tourist signs should be used to direct road users to established tourist areas.

3 Sign Design

3.1 Sign Size

3.1.1 General

As a general rule, sign size is determined by the following factors:

- the type of sign,
- urban or rural situation,
- two lane or a multilane road,
- lateral offset, from a driver's position to the sign, and
- actual vehicle speeds at the sign site.

3.1.2 Dimensions of Signs

Refer to Part 1 - Sections 2 to 6 for more details on determination of sign size.

3.1.3 Alternative Size Signs

The appropriate size for the following signs should be determined in the manner described below:

(a) RG-5, RG-6 and RG-6R Signs:

Sizes are defined in the detailed specifications for each sign.

(b) Circular Disc RG (Regulatory General) Signs and the RP-1 NO STOPPING Sign:

(i) Urban areas:

1. The minimum allowable sign size is 400 mm diameter. This size shall only be used where:
   - the sign is not primarily intended for motorists, eg. RG-23, RG-24, RG-25, RG-26 signs,
   - the sign is illuminated and used in conjunction with a traffic signal, or
   - physical restrictions of a site do not allow the use of a larger sign.
2. The normal sign size where operating speeds are 50 km/h or less is 600 mm diameter. The only exception is the RG-17.1 KEEP LEFT sign which is a pair of vertically stacked 300 mm discs.
3. 750 mm diameter or larger signs should be used on median-divided roads and where operating speeds exceed 50 km/h.

(ii) Rural areas:

1. The normal sign size is 750 mm diameter.
2. 900 mm diameter signs should be used on median divided roads and where operating speeds are very high.

(iii) Large signs: 1200 mm, or larger, diameter signs should be considered for:

- critical locations where there is a speed limit change, and
- the leading ends of median islands.

(c) Permanent Warning Signs (except CURVE WARNING and CURVE ADVISORY SPEED signs)

(i) Urban areas:

1. The normal sign size is 600 mm × 600 mm.
2. 750 mm × 750 mm or larger signs should be used on median-divided roads and where operating speeds exceed 50 km/h.

(ii) Rural areas:

1. The normal sign size is 750 mm × 750 mm.

2. 900 mm × 900 mm or larger signs should be used on median-divided roads where operating speeds are very high.

(d) Permanent Curve Warning and Curve Advisory Speed Signs

Sign size is determined by the methods detailed in Part 1 - Section 4.

(e) Direction, Motorist Service, Tourist and General Information Signs

Sign size is determined by the design rules for each type of sign which define:

- the number of lines of legend allowed on a particular type of sign,
- the symbols required and/or allowed on a sign,
- the clearances between the legend and edges of the sign, and
- border allowances.

Design and layout requirements for these signs are covered in Part 1 - Sections 5 and 6.

3.2 Colours

Refer to Clause 1.3 and appropriate Sections for colour standards.

- conform to the colour requirements of the joint Australian/New Zealand standard AS/NZS 1906.1 & 1906.2: 2007. Retroreflective materials and devices for road traffic control purposes: See PART 1: Retroreflective Materials, and
- be approved by FRA

3.3 Lettering

3.3.1 Alphabets

Two alphabet styles are used for the lettering on signs detailed in this Manual, the Standard Alphabets for Road Signs which are defined AS1744.

Most alphabets details are given in Appendix A: Standard Alphabets and the Series A to Modified E/lower case alphabets are fully detailed in AS 1744-1975.

3.3.2 Letter Size and Style

Letter size and style for the various sign classifications are as follows:

(a) Regulatory and Warning Signs

Letter size and style is defined in the standard details specified for each sign.

(b) Direction Signs

The minimum letter size is specified for each road classification in Part 1 - Section 5. The actual letter size required may be larger and shall be determined for each individual sign by the method given in Part 1 - Section 5.

Letter sizes for direction signs are determined by considering the following factors:

- the speed of vehicles approaching the sign,
- the number of lines of legend on the sign,
- the type of font that will be used on the sign, and
- the lateral and vertical position of the sign in relation to a driver.

The requirements for guide sign lettering, alphabet styles, legend layout, and typical sign examples are given in Part 1 - Section 5.

(c) Motorist Service and Tourist Signs

The general layout requirements for Motorist Service and Tourist sign lettering and typical examples are given in Part 1 - Section 6.

3.4 Legends

3.4.1 Regulatory and Warning Signs

The legends for these signs are fully defined in the individual sign details.

3.4.2 Direction Signs

The detailed design rules specify what legend and which symbols may be shown on each particular type of guide sign.

(a) Main Road Direction Signs

The mandatory stage/destination names for use on guide signs is provided in Part 1 - Section 5. The names finally adopted on the maps have been chosen on the basis of "places likely to be known to many drivers and/or shown prominently on most road maps".

Only the approved stage and destination names may be used. Once a stage or destination or another minor /intermediate place name has been introduced, it must be shown on all subsequent guide signs until that place is reached.

(b) Additional Names

Design rules for guide signs limit the numbers of lines of legend on each type of sign. When minor or intermediate place names need to be shown in addition to the approved stage/destination name, and this results in too many lines on a sign, place names should be introduced on a "sequential, distance from sign basis" , up to the maximum allowed. When the first minor or intermediate place is reached it shall be replaced with the next place name in sequence, and so on.

3.5 Distances

When distances are shown they should be given as follows:

Distance	Increment	Shown as
Up to 500 metres	50 metre	"xx m"
Between 500 metres and 1 kilometre	100 metre	"xxx m"
1 kilometre or more	Nearest kilometre	"xx km"

Table 2 - Distances

4 Sign Location

4.1 General

Signs are to be located on the near or left hand side of the road wherever practicable. They should be prominently displayed there because this is where approaching drivers will expect to find them. In some special circumstances, however, signs may need to be duplicated on the right side of the road or mounted over the roadway.

Signs should always be positioned so they do not obscure other signs or restrict a driver's visibility, particularly at intersections.

Signs should not normally be erected in medians unless they refer to traffic travelling in the median lane. A median sign may be required to supplement a similar sign on the left side of the road in some conditions, eg. on very wide roads. In urban situations, where there are wide medians and roadside development, mounting signs in the median may be unavoidable.

At channelised intersections some signs may need to be positioned on traffic islands, and/or the right side of some roadways. They should, if possible, be located within a driver's normal line of vision as they approach the intersection. If this is not practicable, they should be positioned where drivers are most likely to be looking when making their required manoeuvres at the intersection.

Care must be taken, however, to ensure signs never obscure a driver's view of traffic approaching along a conflicting path, or of pedestrians crossing the road.

When it is necessary to have two or more different types of sign at one position, separate signs, located a minimum of (0.6V85) m apart should be used. V 85 is the 85^{th} percentile speed of traffic, in km/h, at the sign location.

As a general rule, only one type of sign should be mounted on each post, except where:

- another of the same size and shape is mounted on the reverse side and is intended to be seen by opposing traffic,
- one sign supplements the other, or
- route or directional signs need to be grouped.

When a sign is located in an exposed position, consideration should be given to the use of supports with a frangible or break-away type of construction, for safety reasons.

Any sign located within the 'Clear Zone' must:

- have a breakaway or frangible support system,
- be protected by a road safety barrier,
- be re-located to be behind a guardrail erected for another purpose, if that is an appropriate location for the sign.

Where a large sign needs to be positioned in an urban footpath or berm area, the sign and its supports should present a pleasing appearance. Supports should not be erected where pedestrians are likely to walk into them at night.

Structures which completely span a footpath with supports on each side are undesirable. A single post mounting, ie. a flag type sign, should be used in such cases.

Large roadside signs, unusual road layouts and/or difficult adjacent topography may require special location considerations and warrant departures from the general sign positioning rules. Environmental and aesthetic requirements also need to be carefully considered when locating signs.

Final sign location must be decided at the actual site, by night and day trial runs in a motor vehicle.

4.2 Longitudinal Position

(a) Regulatory Signs

Regulatory signs should normally be located at the legally defined position for the sign. If this is impractical, they should be located as close as possible to the position where the prohibitory or mandatory action indicated by the sign must be made. The following regulatory signs must, however, be located within the tolerances specified below:

(i) **Speed Restriction Signs:** Within ± 20 m of their legally defined positions.
(ii) **STOP and GIVE WAY Signs:** Closer than 9 m to the edge of the main roadway.

(b) Warning Signs

Warning signs should be located sufficiently in advance of an unusual or hazardous situation for a driver to react in the appropriate manner. The distance between the sign and the situation should be either:

- the distance required to decelerate from the 85th percentile vehicle speed at the sign location to the speed required at the situation, or
- the distance required to decelerate from the 85th percentile vehicle speed at the sign location to a stop condition, when the sign is an advance warning of a STOP or GIVE WAY control at the next intersection.

Table 3 shows the deceleration distances which should be used when locating a warning sign in advance of a stop condition or an unusual or hazardous situation.

Speed at sign location V85* (km/h)	Deceleration distance (m), between the sign location and the unusual or hazardous situation, to achieve a speed of:							
	Stop	**20**	**30**	**40**	**50**	**60**	**70**	**80**
50	60	55	45	30	-	-	-	-
60	80	75	65	50	30	-	-	-
70	100	95	80	70	55	35	-	-
80	120	110	105	95	80	65	40	-
*** V85 is the 85th percentile speed.**								

Table 3

(c) Direction, Motorist Service, Tourist and General Information Signs

These signs are positioned according to their function.

4.3 Lateral Clearance

Signs should be positioned as far as practicable away from the edge of the roadway, subject to:

- any maximum and minimum dimensions specified, and
- any constraints on visibility due to roadside obstructions.

Lateral clearance shall be measured from the edge of the sign nearest the road to:

- the kerb line,
- the outer edge of the road shoulder or the nearest lane line, whichever is the critical dimension, or
- the face of the guardrail or the nearest lane line, whichever is the critical dimension.

Lateral clearances for use in the following typical roading situations are:

(a) Kerbed Roads

(i) A minimum of 300 mm where non-mountable kerbs are used.

(ii) Desirably, a minimum of 500 mm where mountable kerbs are used, eg. at traffic islands.

Where the minimum lateral clearance cannot be achieved, the sign mounting height for shall be increased to at least 4.6 m. This is the minimum height for a sign located over a road shoulder or parking lane and it will ensure an adequate vertical clearance to all legal height vehicles.

(b) Un-Kerbed Roads in Urban Areas

For these types of road, and also kerbed urban arterial roads intended for express-way type traffic operations, the lateral clearances specified for roads in rural areas should be used.

(c) Un-Kerbed Roads in Rural Areas

(i) A minimum of 600 mm from the outer edge of the road shoulder, line of edge marker posts or face of guardrail.
(ii) A maximum of 5 m from the nearest lane line.

(d) Kerbed Roads in Rural Areas

A minimum lateral clearance of 500 mm shall be provided where kerbs are used, eg. at channelised intersections. Figures 1.3 and 1.4 show lateral clearances for typical sign locations.

4.4 Mounting Height

Signs must be located clear of roadside vegetation and be visible to approaching drivers, by day and night. To achieve this, sign mounting heights may need to be varied to suit local site conditions.

Minimum mounting heights are given in Table 4.

Mounting Situation	Minimum Mounting Height (m)
General minimum[1]	1.5
Rural Areas[1]	1.5
Urban Areas[1 2]	2.0
Over a footpath[3]	2.5
Overhead signs[4]	5.3

Notes:
1. Mounting height shall be measured from the underside of a sign, or the lowest sign in an assembly of signs, to the surface of the adjacent road, trafficable shoulder or top of kerb, whichever is the critical dimension.
2. Mounting heights need to be increased in urban areas to help prevent sign visibility problems caused by parked vehicles.
3. Mounting height shall be measured to the ground surface or footpath immediately beneath the sign.
4. Overhead sign mounting height is particularly important when there is no alternative route for over height loads. Mounting height shall be measured to the road surface immediately beneath the sign. Overhead sign mounting height may be reduced to an absolute minimum of 4.6 m if the sign is located over an emergency shoulder or parking lane.

Table 4 Sign Mounting Heights

5 Supports

5.1 Support Requirements

(a) Pole Colour

All other traffic sign poles should be white coloured but, if made of aluminium or galvanised steel, may be left unpainted.

(b) Signs Erected on Other Poles

With the consent of the owner of the pole, a traffic sign may be erected on any telegraph pole, electric-power pole, or other pole.

(c) Signs Erected on Buildings, Walls or Fences

Where there is no room to erect a traffic sign pole and no other pole is available, signs may, with the consent of the owner, be erected on any adjacent building or wall or fence.

(d) Multiple Signs on One Pole

A traffic sign may only be installed with another sign on the same pole or in the same location on the same building, wall or fence, if:

- each sign is installed so that its message is seen only by traffic for which the message is intended, and
- the shape, size or orientation of any sign does not obscure the sign, or mislead or distract road users from the sign intended to be seen by traffic moving in another direction.

(e) Traffic Signals

One or more of the following traffic signs may be installed on a pole supporting a traffic signal at an intersection:

1. an RG-17 or RG-17.1 KEEP LEFT sign,
2. an RG-27 TURNING TRAFFIC GIVE-WAY TO* PEDESTRIANS sign,
3. an IG-2 TURN LEFT AT ANY TIME WITH CARE sign;
4. a sign prohibiting, absolutely or conditionally, pedestrians, vehicles or classes of vehicle from moving in a specific direction,
5. a sign requiring, absolutely or conditionally, pedestrians, vehicles or classes of vehicle to move in a specific direction,
6. a sign or notice directed solely towards pedestrians and not generally visible to approaching vehicles, warning or advising pedestrians on the use of the traffic signals or of the controlled area,
7. a street name sign.

(f) Pedestrian Crossings

No other traffic sign other than a fluorescent, reflectorised orange sign in the form of a disk that is 300 mm or more in diameter shall be erected on a pole installed at a pedestrian crossing.

(g) Railway Level Crossings

1. If a level crossing is controlled by a stop sign or give-way sign, a rail access provider may install the following combination of signs on the same pole:
   - an RG-5 STOP or RG- 6 GIVE WAY sign, and
   - a PW-14 "Crossbuck" sign, and
   - if appropriate, a PW-59 LOOK FOR TRAINS sign or a PW-15 "__" TRACKS sign, or both.
2. If a level crossing is controlled by traffic signals, a rail access provider may install the following signs on the poles supporting the traffic signals:
   - a PW-14 "Crossbuck" sign; and
   - if appropriate, a RG-STOP ON RED SIGNAL or a PW-15 "__" TRACKS sign, or both.
   -

5.2 Sign Support Methods

(a) Roadside Signs

Typical methods for supporting roadside-mounted traffic signs are shown in Figures 1.3 and 1.4.

(b) Overhead Signs

Typical methods for supporting overhead traffic signs are shown in Figure 1.5.

(c) Number and Size of Supports

The size and number of supports required for roadside mounted direction signs, typical mounting details and spacings between posts, is given in AS 1742.2, Appendix D.

(d) Frangible Supports

All sign supports likely to be struck by vehicles should be of a frangible or breakaway type construction.

f) Posts in sockets

Where a sign is to be erected in paved areas or in a location where it could be expected to be struck from time to time by vehicles, such as on an urban median end; or where it may need to be removed occasionally to accommodate the swept path of Over Dimensional vehicles when turning, the post should be inserted into a socket cast into the ground. Suitable socket sizes for posts are shown below:

Post Size	Socket Size
32 mm nom. bore pipe (hazard markers) 50 mm nom. bore pipe	50 mm nom. bore pipe 65 mm nom.

Table 5 - Sockets

The socket should be set into the ground to the same depth as the post would otherwise have been set and should protrude approximately 50 mm above an earth surface, or 25 mm above a concrete or bitumen surface.

The socket may be blocked off so that the sign post penetrates a minimum of 450 mm into the socket. The sign post should be securely fixed into the socket by an approved vandal proof method.

g) Single post mounting for large signs

The mounting of large signs on two posts in some locations in urban areas, for example, above a footpath, may present a problem in that the structure may be aesthetically displeasing, or one of the posts may be an obstruction to pedestrians or otherwise difficult to site.

Designs for standardised single post, side mounted sign structures utilising 114 mm, 140 mm or 165 mm OD galvanised steel posts are provided in Attachment A. The designs are suitable for mounting heights (ground to lower edge of sign) up to about 2.6 m, and subject to certain signboard shape limitations (width/depth ratio), the post may be offset by up to 400 mm from the edge of the sign.

Single post mountings for large signs are more costly than a conventional two-post mounting and are not frangible.

g) Sign Post Fittings

Typical sign fittings are shown in Appendix B.

6 Orientation

Except for some parking signs, all traffic signs, including stand mounted temporary warning signs, shall be erected in a vertical plane and oriented at approximately right angles to, and facing, an approaching driver's line of sight.

On curved alignments, sign orientation should be determined by an approaching driver's view of the sign, rather than the alignment of the road at the sign position.

Reflectorised signs must be turned about 5 degrees away from the driver's line of sight. Chevron boards need to turned about 10 degrees away. This is to help reduce undesirable specular reflection from reflectorised sign surfaces. Figure 2 shows details of how to orientate reflectorised signs correctly on site.

After signs are installed it is good practice to check their performance, by day and night trial runs in a motor vehicle.

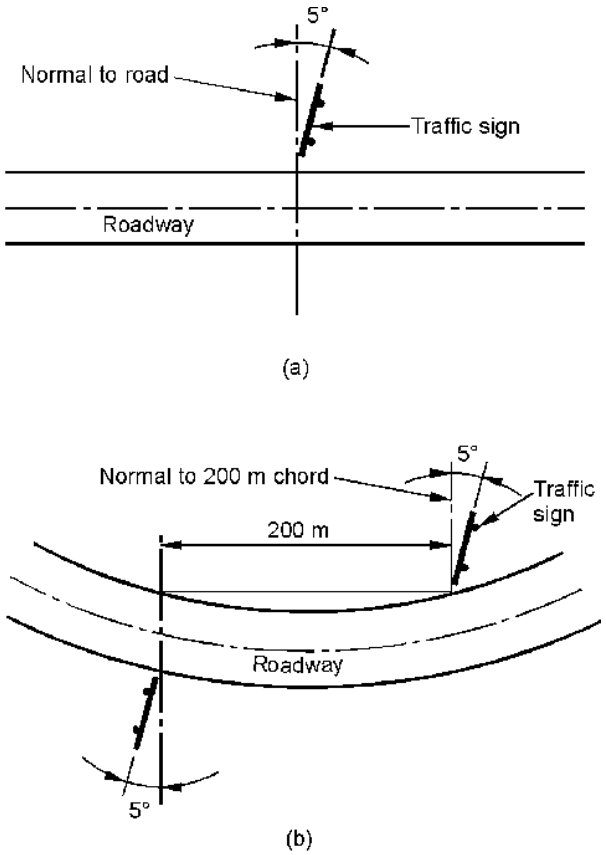

Figure 2: Methods of Avoiding Specular Reflection on a Road Sign

7 Construction

7.1 General Requirements

Signs shall comply with the requirements of FRA's Specification for Traffic Signs, Posts and Fittings in respect of:

- materials,
- methods of construction,
- erection, and
- serviceability.

7.2 Sign Face Materials

All sign face materials shall comply with the day time viewing colour requirements and when retroreflective also the photometric properties and night-time viewing colour requirements of AS 1906.1:2007 and 1906.2:2007 - Retroreflective materials and devices for road traffic control purposes.
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8 Reflectorisation

8.1 General

The FRA must approve, all reflective materials used on traffic signs.

The standard of reflectorisation required for signs on their roads shall be based on a consideration of:

- the conspicuity requirements for each type of sign or sign series, and
- the cost-effective service life of the various types of sign face materials.

8.2 Special Requirements

If the location or function of a sign requires that the standard of sign face reflectorisation should differ from the normal specification, then that may be specified, subject to compliance with LTA Regulations.
.

8.3 Reflective Materials

The photometric performance of red, green, brown and blue reflectorised materials is much lower than that of white and yellow.

The classes of retroreflective sheeting are defined in AS/NZS 1906.1:2007 and 1906.2: 2007. The characteristics and use of the various classes of sheeting are summarised in Appendix B of AS/NZS 1906.1:2007.

8.4 Choice of Material

Class 1 sheeting will usually be most appropriate for general use on permanent urban and rural road signs which are side mounted, close to the roadway and the required reading distance by approaching motorists does not exceed about 175 metres.

Class 1W sheeting should be specified for fully retroreflectorised signs where long distance viewing is necessary, and for signs which are substantially offset, either horizontally or vertically from the driver's line of sight.

Class 2 sheeting has a lower reflective performance than those above and is not normally suitable for use on traffic signs aimed at motorists which could be travelling at speeds of 70 km/h or more.

9 Inspection and Maintenance

Regular inspection of all traffic signs should be made under both day and night conditions to ensure that:

- signs remain fully effective for the purposes for which they were installed, and
- maintenance and replacement requirements are regularly assessed.

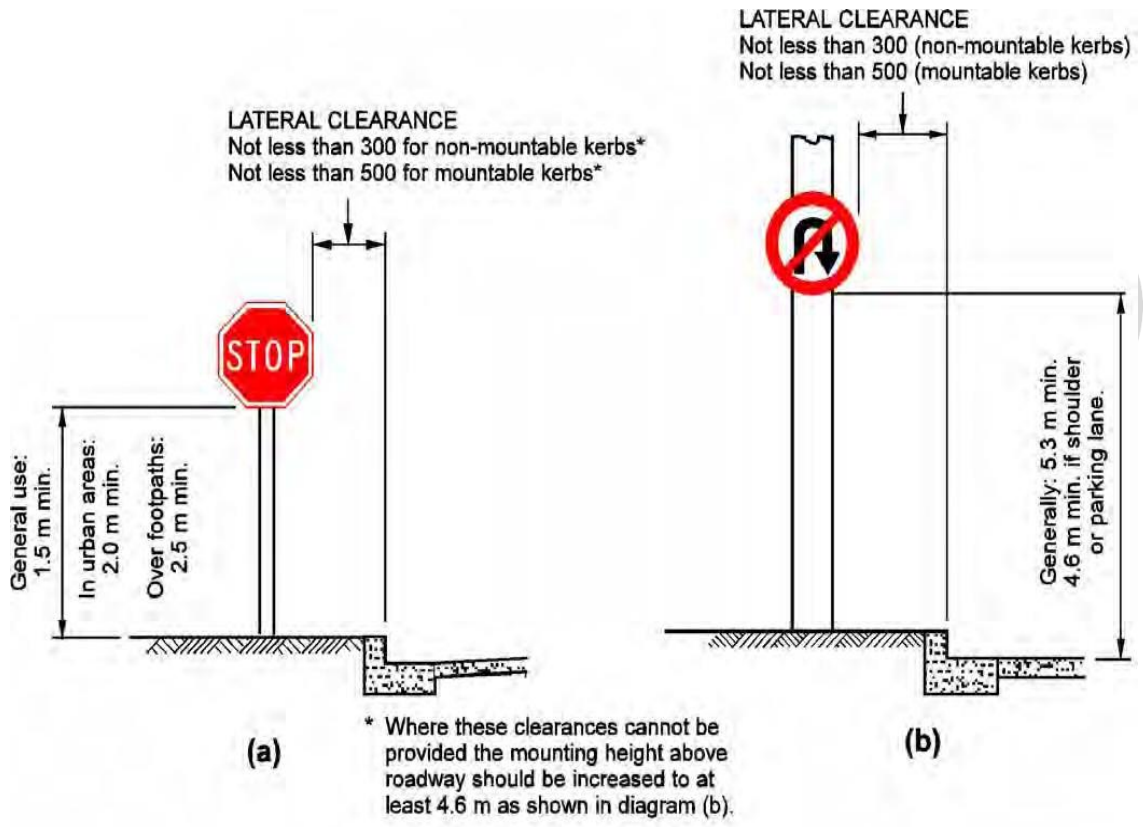
During inspections, particular attention should be given to the following points:

- the need for the sign still exists,
- visibility is not obscured by vegetation,
- the sign has not been vandalised or otherwise damaged,
- the sign is still legible, and
- that retroreflective materials are still effective.

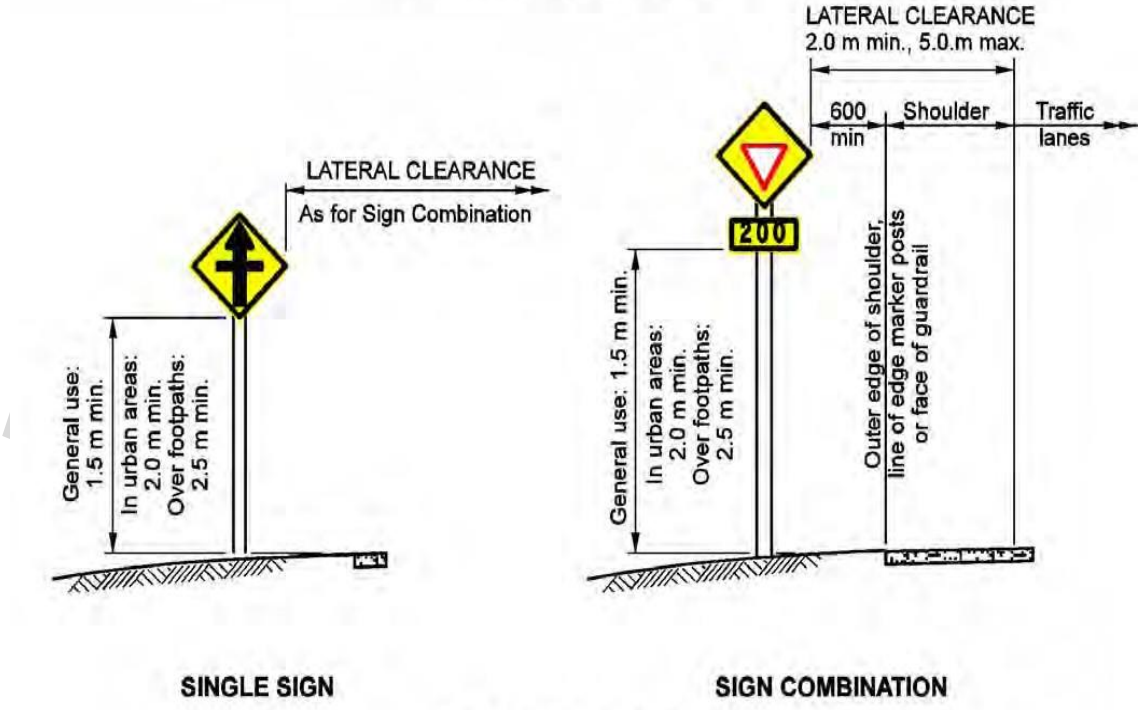
The benefits of a regular sign cleaning programme should also be considered, especially for low mounted signs that are in the splash zone of passing traffic. More cost effective signing can often be achieved through regular cleaning.

10 Typical Sign Details

Refer to Figures 3, 4 and 5 on the following pages.



KERBED ROADWAYS

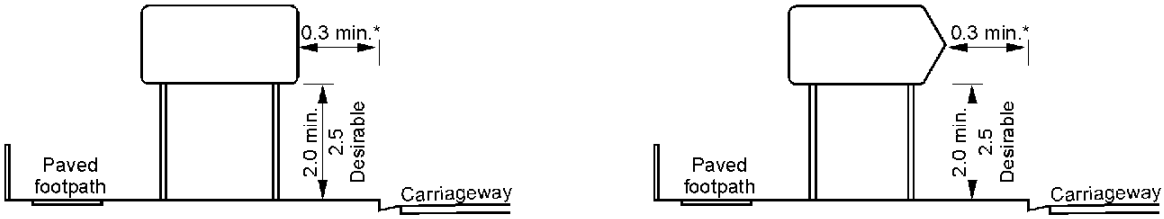


SINGLE SIGN **SIGN COMBINATION**

UN-KERBED ROADWAYS

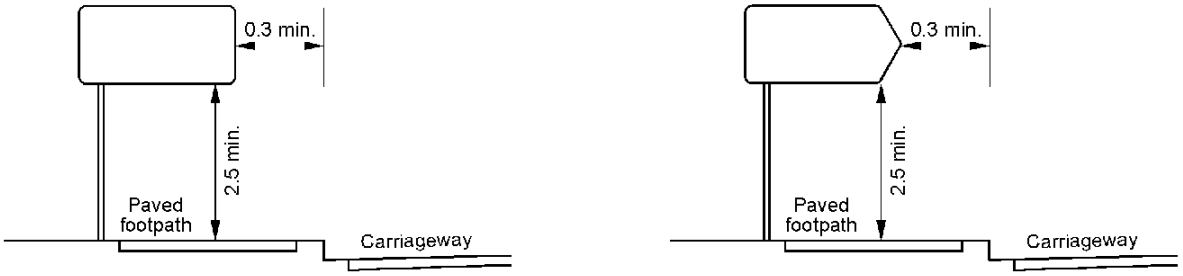
TYPICAL DETAILS FOR ROADSIDE MOUNTED SIGNS
(REGULATORY AND WARNING SIGNS)
FIGURE 3

(a) URBAN LOCATION, SINGLE-POLE SUPPORT.

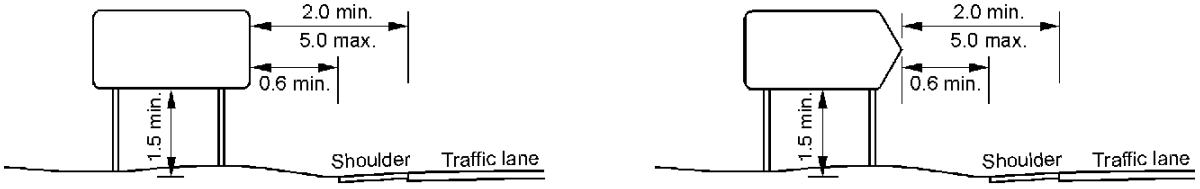


*0.5 min. if located in a median or traffic island

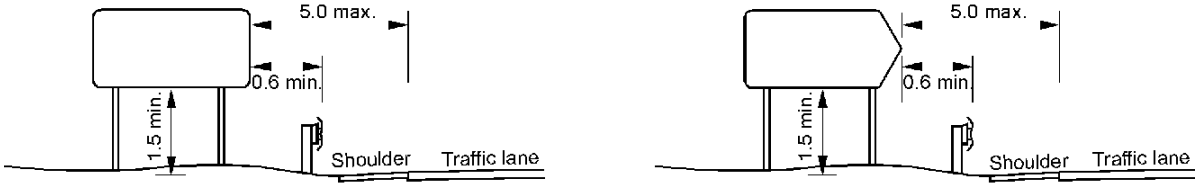
(b) URBAN LOCATION, TWO-POLE SUPPORT.



(c) URBAN LOCATION, OVER A FOOTPATH.

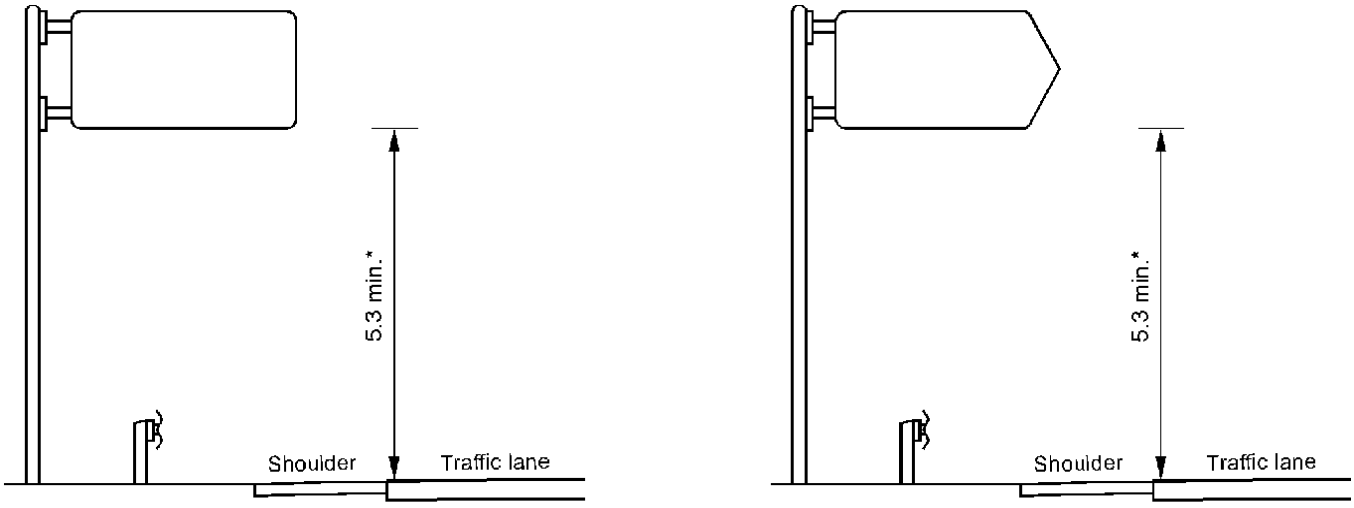


(d) RURAL LOCATION, STANDARD TWO-POLE SUPPORT.



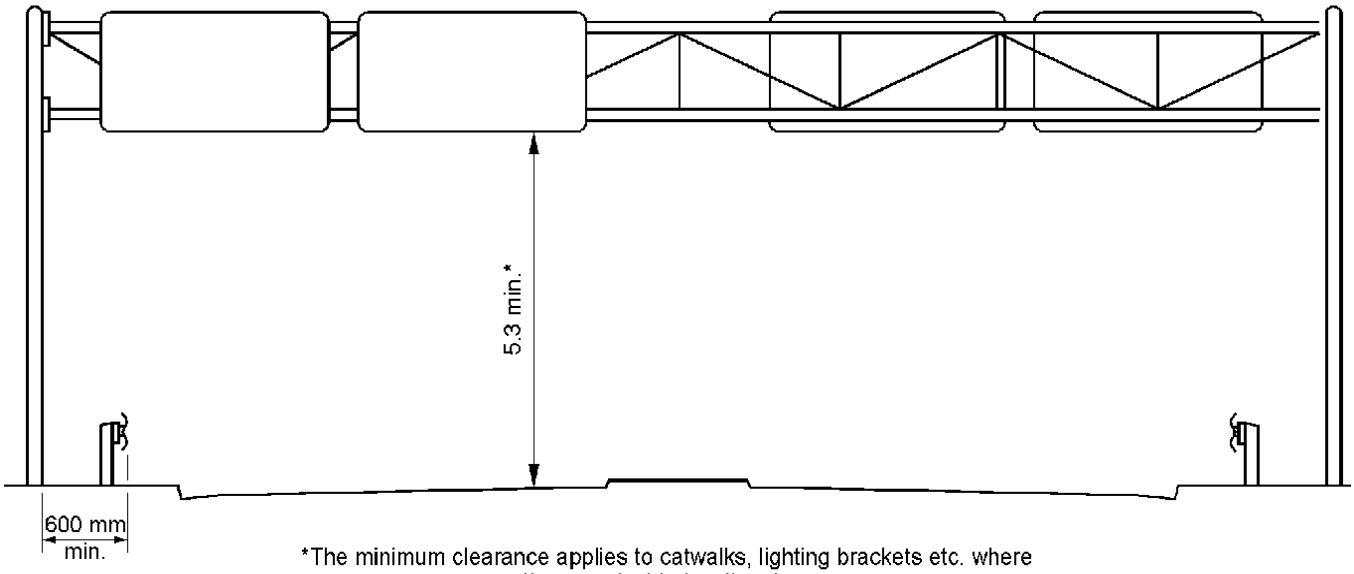
(e) RURAL LOCATION, BEHIND A GUARDRAIL.

TYPICAL DETAILS FOR ROADSIDE MOUNTED SIGNS
(GUIDE, MOTORIST SERVICE AND TOURIST SIGNS)
FIGURE 4



*Where the sign does not overhang the carriageway the minimum may be reduced to 4.6 m.

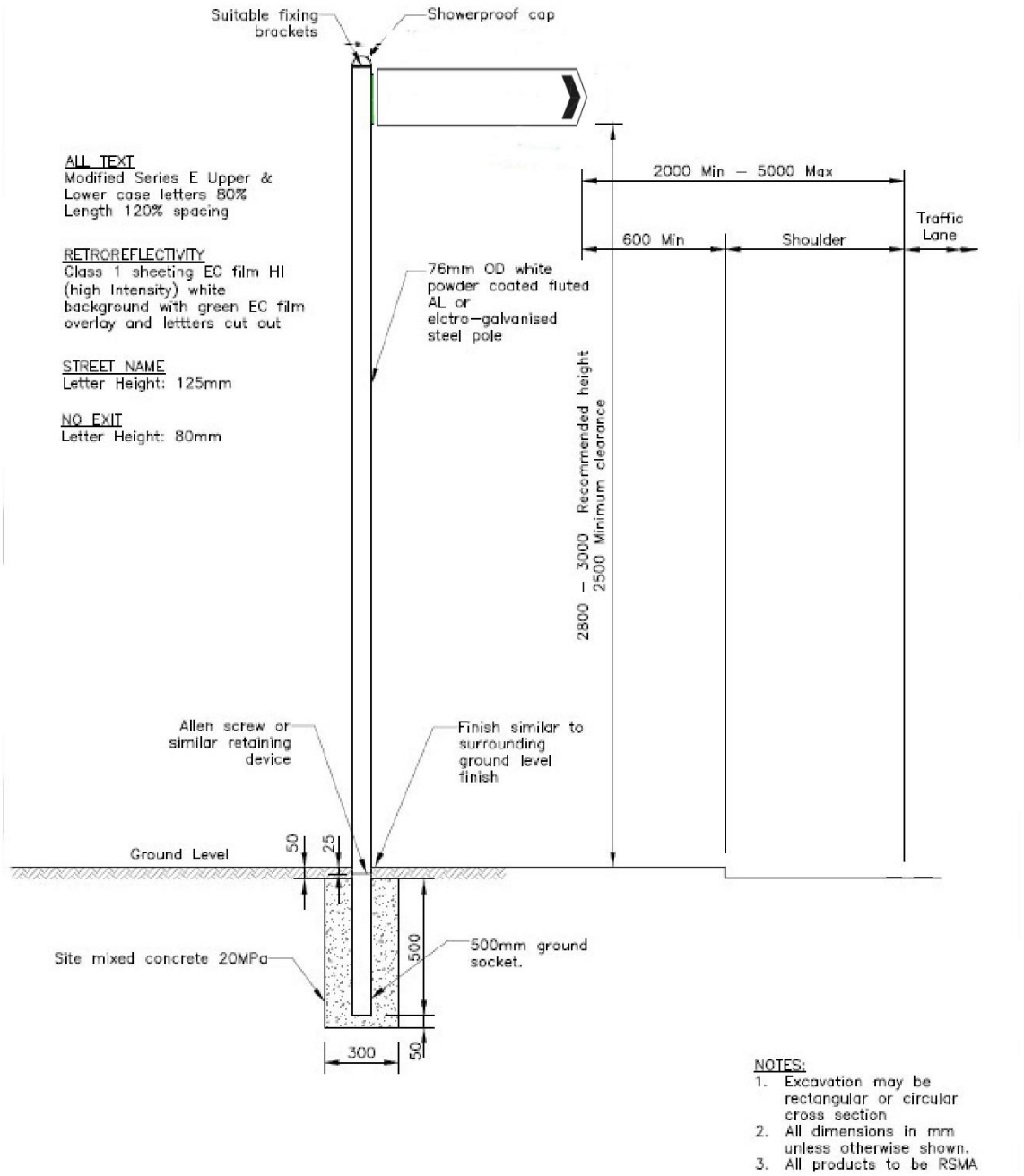
(a) CANTILEVER SUPPORT



*The minimum clearance applies to catwalks, lighting brackets etc. where these project below the sign.

(b) GANTRY SUPPORT

TYPICAL DETAILS FOR OVERHEAD MOUNTED SIGNS
FIGURE 5



TYPICAL DETAILS FOR ROAD NAME PLATE
FIGURE 6

11 Dual Name Signing Policy

11.1 General

This section sets out the requirements for the signing of Dual Names on road signs and must be read in conjunction with the other relevant Sections.

Only those places and features that have been accorded official dual name status may be shown on FRA signs.

Dual names may be shown on:

- Guide signs,
- Tourist signs, and
- General information signs.

Application of the principles and details specified in this policy will ensure the consistent addition of dual names on traffic signs throughout Fiji.

11.2 Dual Naming Convention

(a) The FRA convention for identifying dual names is to show the primary name separated from the secondary name with a "/" character, ie. Primary name/Secondary name.

(b) It is not often possible to show dual names on traffic signs, even for two short names.

The method adopted by FRA is to show dual names on traffic signs is to:

- show the primary name in the standard manner and lettering style generally used for that type of sign,
- show the secondary name in italic CAPITAL lettering 0.75 times the size of the initial capitals used for the primary name,
- position the secondary name immediately beneath, and horizontally centred on, the primary name.

This method groups the names but distinguishes the primary name from the secondary name and also limits increases in sign size.

(c) Where a secondary name is longer than a primary name, its letter size should be reduced to make its length approximately equal to that of the primary name.

(d) When letter size reduction cannot reduce the length of a secondary name sufficiently one of the following alternative methods may be employed:

(i) The secondary name may be shown on two lines, if it can be conveniently split in an approved manner.

(ii) The primary name may be centred horizontally above the secondary name which is shown in the minimum permissible lettering size. If necessary, the sign size must be adjusted to accommodate the longest name shown on the sign and to retain the standard edge, symbol, direction arrow spacings and edge clearances.

APPENDIX A - Design Standards for Single Post Mounting of Large Signs

a) General

The following charts are used to determine whether a sign can be mounted on a single post utilising 114 mm, 140 mm or 165 mm OD galvanised steel posts.

b) Post size selection procedure

With reference to Figure A:

- Determine the area of the sign (Ax B) and mounting height "H1".
- Determine the offset "S" and select the appropriate Figure 93, Figure 94 or Figure 95, rounding up to the next whole number offset.
- Determine the post size by projecting horizontal and vertical lines for the calculated mounting height and sign area. The post size required is the one above the intercept point.

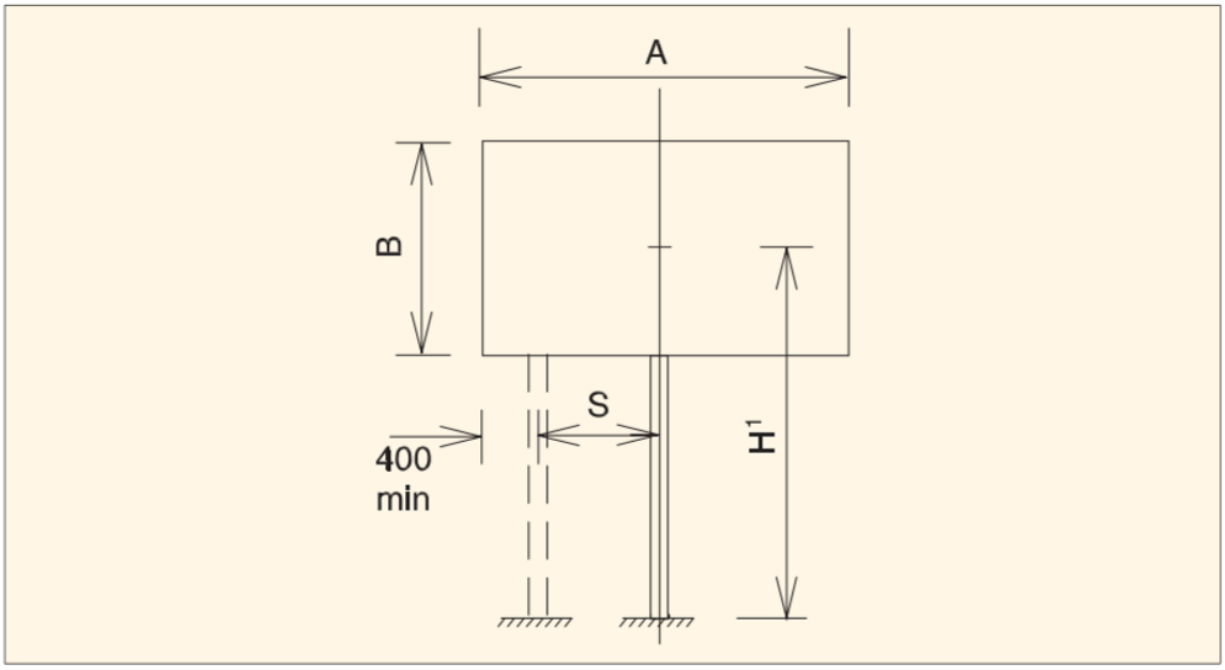


Figure A: Typical single post mounting arrangement

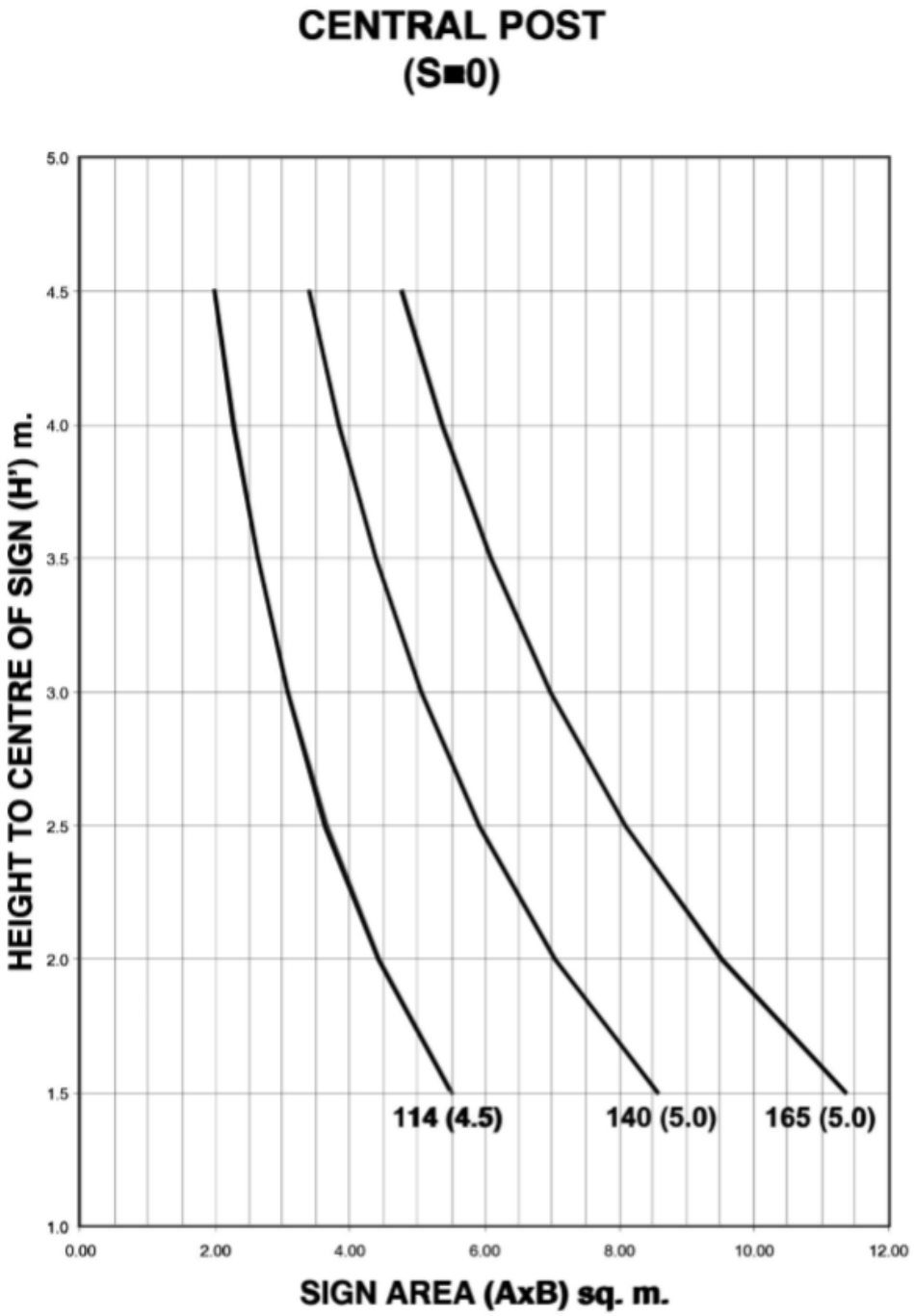


Figure B: Post size selection - zero offset

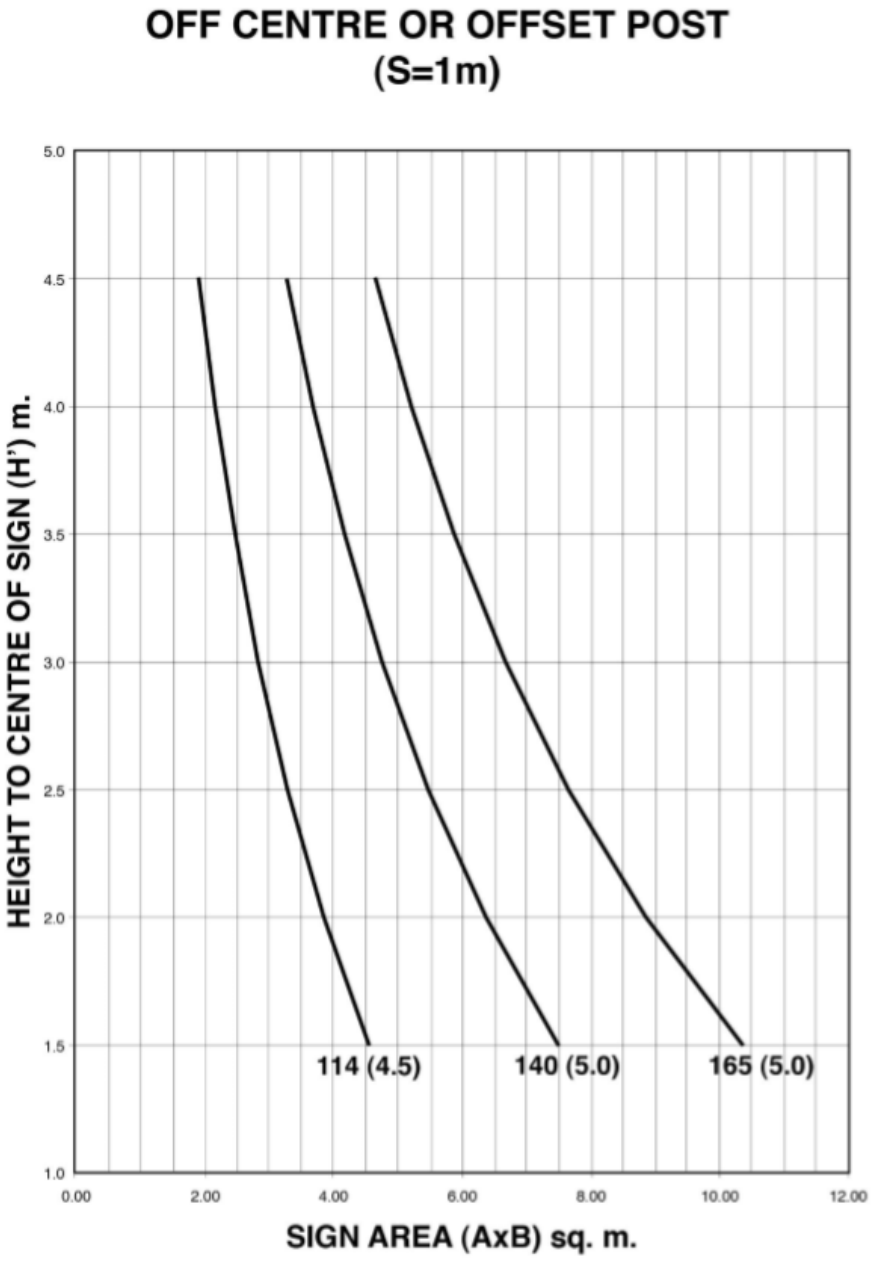


Figure C: Post size selection - 1m offset

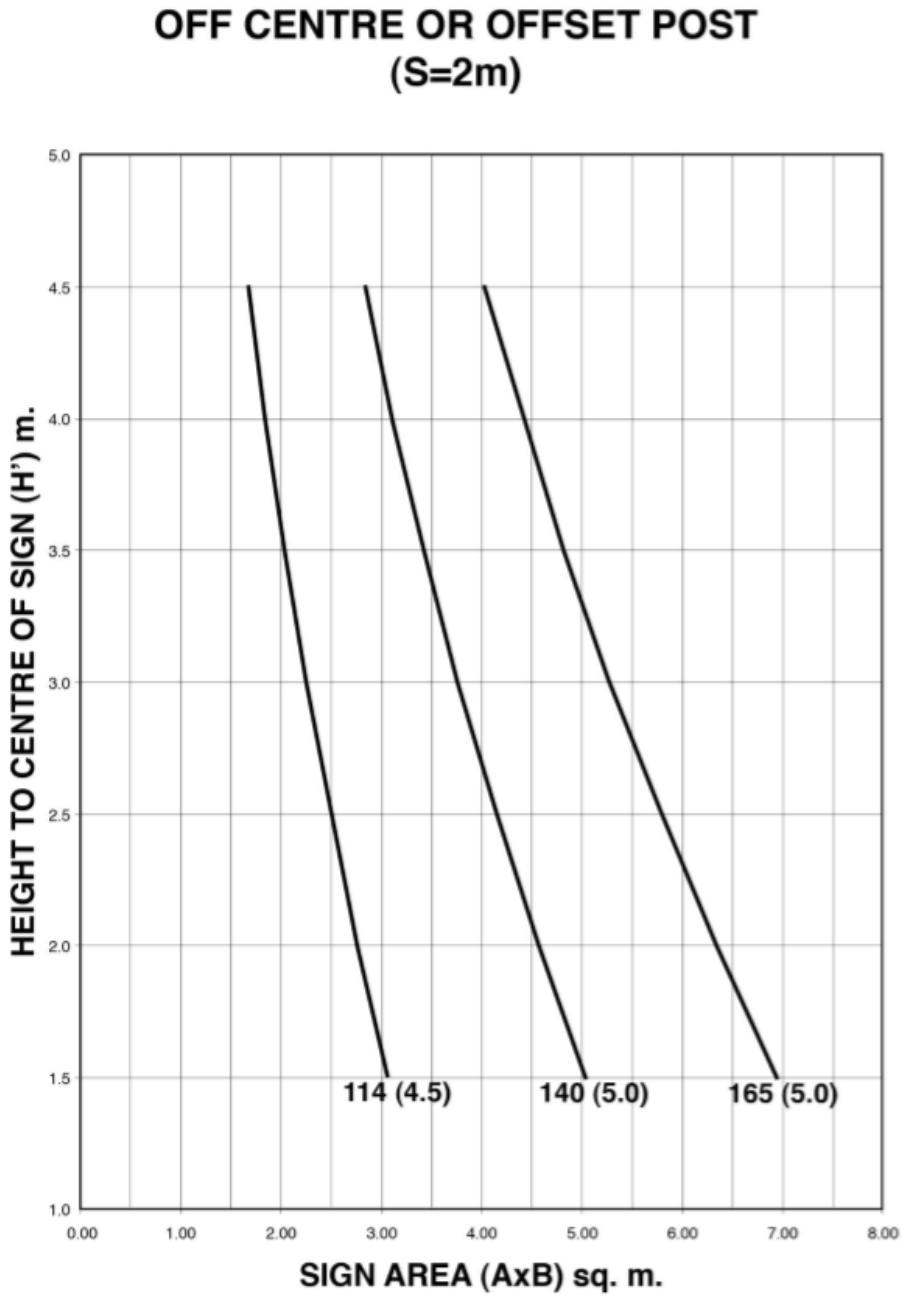


Figure D: Post size selection - 2m offset

c) Channel size selection procedure

Single post mounted signs require larger horizontal sign stiffening sections as these signs are cantilevered.

- Determine the outreach - the horizontal distance from the centre of the post to the furthest edge of the sign.
- For the sign depth "B", determine from Figure 96 the number and size of stiffening sections required.

Upon erection of the sign, the 41 mm x 41 mm channel section transport bracing shall be retained, but cut to provide 50 mm clearance inside the top and bottom edges of the sign.

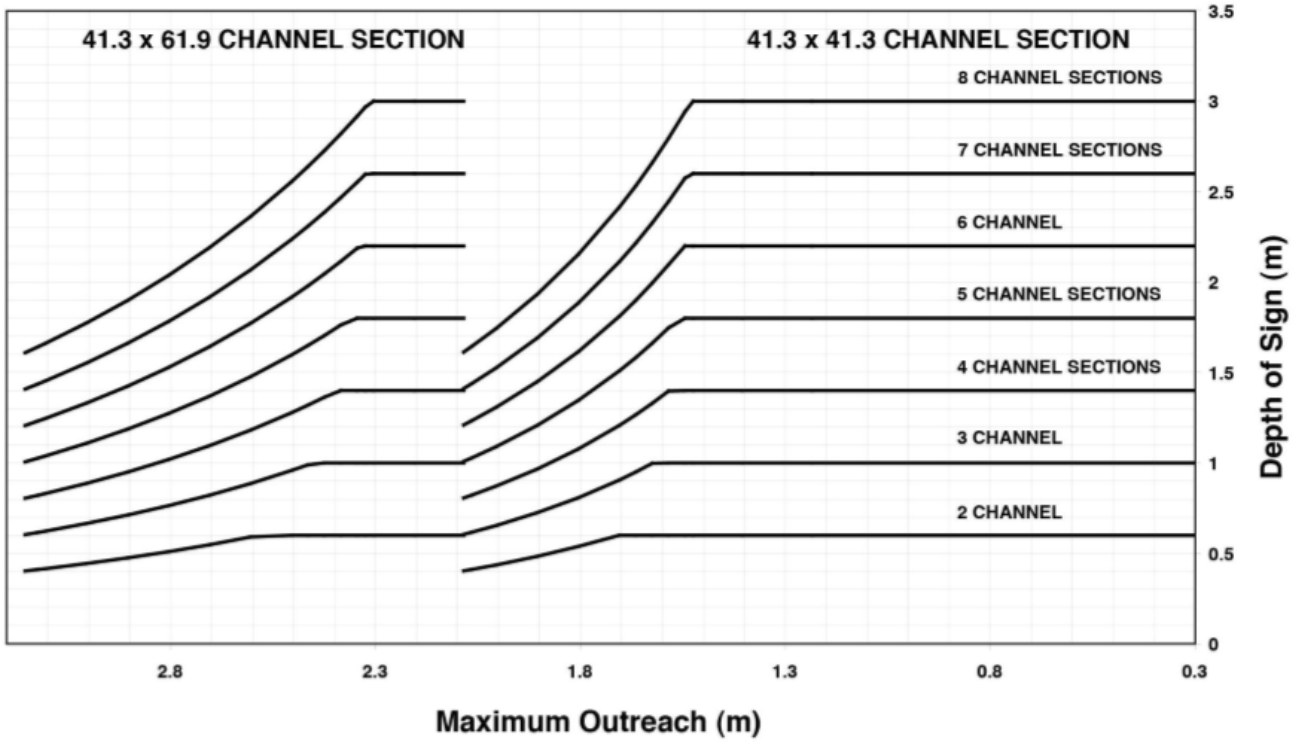


Figure E – Maximum Outreach

d) Maximum sign areas

The following table shows the maximum sign areas that can be supported for various post sizes, taking into account the mounting height and offset mounting arrangement.

Post	165 CHS			140 CHS			114 CHS		
Height (m)	Offset (m)								
	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0
1.5	11.36	10.36	6.94	8.57	7.50	5.03	5.51	4.56	3.06
2.0	9.51	8.86	6.35	7.05	6.37	4.57	4.43	3.85	2.77
2.5	8.09	7.65	5.79	5.92	5.48	4.16	3.66	3.29	2.50
3.0	6.98	6.68	5.28	5.06	4.76	3.78	3.08	2.84	2.26
3.5	6.10	5.88	4.82	4.39	4.17	3.44	2.64	2.47	2.04
4.0	5.38	5.22	4.41	3.84	3.69	3.13	2.28	2.17	1.85
4.5	4.78	4.66	4.04	3.39	3.28	2.85	1.99	1.91	1.67

Figure F – Maximum Areas

APPENDIX B – Sign Fittings

For Unbraced Signs

For Strutted or Braced Signs

Banding for Large Diameter Poles

Figure 80: Sign post fittings