City of Ryde

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City of Ryde
Development Control Plan 2014

Part: 8.3
Driveways

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إذا تعذر عليك فهم محتويات هذه الوثيقة، نرجو الحضور إلى موكز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحًا والساعة 4.30 بعد الظهر، أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابةً عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Ռայտ Սիվիք Սենթըր, 1 Տելվին փողոց, Ռայտ, (Ryde Civic Centre, 1 Delvin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Ռայտ Քաղաքապետարանին հետ կապ հաստատէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին։

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員爲你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رایدRyde Civic Centre, 1 Devlin Street, مراجعه کنید یا به سرویس مترجم تلفنی شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رایدRyde شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend. No.	Date approved	Effective date	Subject of amendment

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1.0 INTRODUCTION

This section shall be read in conjunction with the City of Ryde Car Parking and Driveways Technical Material (refer Schedule attached to this Part).

1.1 Objectives

Objectives

1. To set standards and minimum requirements for vehicular access/ egress to and from off street parking areas in domestic, residential and commercial areas within the City of Ryde.
2. To ensure that parking areas are readily accessible useable and adequately provide for circulation and manoeuvring of vehicles.
3. To ensure smooth transition between the public road and the access driveway and parking areas to prevent scraping of vehicles using the driveways.
4. To encourage the efficient flow of traffic through carparks to minimise the potential for pedestrian and vehicular conflict.
5. To ensure that off-street parking facilities do not interfere with traffic flow and safety in adjacent streets or endanger pedestrian traffic on or off the site.
6. To ensure that parking areas and associated facilities are of an acceptable appearance by imposing construction standards and landscaping requirements.

1.2 Application

This Part applies to:

1. New buildings;
2. Alterations and additions to any existing building, whether or not such additions or alterations involve any change in the purpose for which such buildings are used; and
3. A change of use which under this part, would require the provision of a realigned or configured driveway or car-parking facilities.

2.0 DESIGN STANDARDS

Layout and design of the driveway and/or parking facility shall take into account the following:

- Frontage access, including sight distance and minimum disturbance to through traffic and pedestrian safety;
- Ensure minimum conflicts within the car park area and the provision for circulating capacity during peak periods;
- Ensure pedestrian and road user safety at points of conflict;
- Ensure no scraping of vehicles will occur;
- A maximum of two crossings will be permitted to any public road and the crossing widths of crossings shall be in accordance with details in the technical section;
- The footway crossing should be located so as not to be influenced by any existing obstruction that may adversely affect sight lines ingress and aggress and vehicular and pedestrian safety;
- The required width of any footway crossing across the public footway shall be sized based on the location of the crossing, the traffic volume using the crossing and the type of road. Full details of these are set out in the technical section;
- All traffic management measures deemed necessary by Council's traffic engineer and/or the traffic committee are to be provided by the developer to Council's satisfaction; and
- Vehicle Turning Templates according to AS290.1:2004 and AS2890.2-2002.

3.0 EXISTING FOOTWAY CROSSINGS

Controls

3.1 Using an Existing Footway Crossing

a. Existing footway crossings slabs and laybacks may only be used:
   i. When they provide access to a maximum of two dwellings;
   ii. The existing crossing is in the correct location, at the right level, has adequate width and in good condition to enable safe access to and from the site; and
   iii. The existing crossing is not a bridge or piped crossing.

Otherwise, the crossing may have to be removed and a new crossing constructed.

3.2 Disused Footway crossings

a. Footway crossings slabs, or parts of footway crossings slabs, that become redundant are to be removed and the footway area restored to Council requirement. Disused gutter crossings are to be removed and the kerb reinstated.

b. Any existing unused gutter crossings and footway crossing slab will also need to be removed, irrespective of the fact that it may have not become redundant as a consequence of the current application.

c. Removing a disused gutter crossing is generally completed by Council. The applicant may organise for their contractors to do this work only if the total amount of internal concrete driveways and parking areas being constructed exceeds 150 m^2.

d. Details for kerb and gutter construction are given in the City of Ryde Car Parking and Driveways Technical Material (refer schedule attached to this Part).

4.0 DESIGNING INTERNAL ACCESS ROADS AND PARKING SPACES

Controls

4.1 General

a. Where the development must provide on-site parking facilities, the design of all parking spaces, circulation roads and manoeuvring areas on the property must conform to the minimum requirements outlined below and the design criteria in *AS 2890.1-2004 Parking Facilities, Part1 Offstreet Parking* and *AS 2890.2 –2002, Part 2, Commercial Vehicle Facilities Part 3 Bicycle parking Facilities* and *City of Ryde Car Parking and Driveways Technical Material* (refer Schedule attached to this Part). In so far as any inconsistency exists between criteria outlined below and the Australian Standards, the criteria in this document shall apply.

4.2 Design of Parking Spaces

a. Parking spaces and driveway widths for all vehicles shall comply with A.S.2890 except where modified by the City of Ryde Car Parking and Driveways Technical Material (refer Schedule attached to this Part).

b. Provision must be available within the property to enable vehicles (85th percentile vehicle) to enter and leave the designated parking space in a single 3 point turn manoeuvre. A 99th percentile vehicle shall be used for disabled vehicles.

c. All vehicles must be able to enter and leave in a forward direction. This provision may be waived where the garage is located at the front of a dwelling and there is insufficient space within the front setback to provide a turning area. Turning templates are supplied in the appendix. A clearance of 300 mm should be added to both sides of the turning path.

d. Concrete wheel strips may be used along straight sections of the driveway. However a transition pavement must be constructed at both the ends of the strips to facilitate access into the parking area and onto the strips. Wheel strips are inappropriate for use in areas where vehicles are turning. Wheel strips dimensions are to suit the largest type of vehicles using the access way and shall be in accordance with details specify in the technical section.

e. Where the access road circulates, the dimensions shall comply with Section 2.5 of *AS2890.1:2004, Design of Circulating Roadways and Ramps*.

4.3 Gradients for Cars and Small Rigid Trucks.

a. The access driveway from the centreline of the public road to the parking space is to be designed to minimise entry hazards from the road, account for pedestrian safety and prevent scraping of vehicles using the access.

b. Driveway profiles for maximum rise and fall are shown in *City of Ryde Car Parking and Driveways Technical Material* (refer Schedule attached to this Part). Council is to be consulted and a vehicular crossing application made to obtain driveway levels.

5.0 CONSTRUCTION STANDARDS

a. Construction standards are set out in the City of Ryde Car Parking and Driveways Technical Material (refer Schedule attached to this Part).

b. Generally, gutter crossings may only be constructed or extended by Council. The applicant may organise for their contractors to do this work only if the total amount of internal concrete driveways and parking areas being constructed exceeds 150 m^2.

c. Bridge crossings will no longer be permitted; except in cases where the Council considers that it is not practical to construct a standard layback.

d. Gravel driveways are inappropriate for use in the Ryde area due to the low permeability of the underlying soils. Gravel may be used as a finish treatment over a concrete driveway provided the driveway grade does not exceed 5% and edge restraints are provided to ensure the gravel is not washed from the drive.

6.0 STANDARDS ENFORCEMENT

Plans submitted to the Principle Certifying Authority should show:

- The location of all driveways and car parking spaces;
- Existing gutter levels at either side of the footway crossing;
- The level of all proposed car parking spaces;
- A longitudinal section of the driveway access from the centreline of the public road to the parking area; and
- Construction details of the crossover.

The certifier will check:

- The location to ensure compliance with the development standards;
- Levels of the garage against the property alignment levels to ensure access can be achieved without exceeding maximum permissible grades or grade changes; and
- Safe pedestrian and traffic sight distance have been achieved.

If the development standard is not met, the unsatisfactory components of the driveway will need to be removed and reconstructed. Unsatisfactory sections of regarded footway will need to be repaired. If turf is dead, it will need to be replaced and maintained by the applicant for a further two month period after which, a further compliance certificate is required.

SCHEDULE - DRIVEWAY AND CARPARKING TECHNICAL MATERIAL

S1.0 Objectives

- To set standards and minimum requirements for vehicular access/ egress to and from off street parking areas in domestic, residential and commercial areas within the City of Ryde.
- To ensure that parking areas are readily accessible useable and adequately provide for circulation and manoeuvring of vehicles.
- To encourage the efficient flow of traffic through carparks to minimise the potential for pedestrian and vehicular conflict.
- To ensure that off-street parking facilities do not interfere with traffic flow and safety in adjacent streets or endanger pedestrian traffic on or off the site.
- To ensure that parking areas and associated facilities are of an acceptable appearance by imposing construction standards and landscaping requirements.

S2.0 Design Standards

S2.1 Design Considerations

Layout and design of the driveway and/or parking facility shall take into account the following:

- Frontage access, including sight distance and minimum disturbance to through traffic and pedestrian safety;
- Ensure minimum conflicts within the car park area and the provision for circulating capacity during peak periods; and
- Ensure pedestrian and road user safety at points of conflict.

S2.2 Vehicular crossing Widths

The width of any footway crossing to a residential property with less than 10 parking spaces is to be a minimum of 3.0 metres and a maximum of 5.0 metres. Wheel strips are not suitable across the public footway.

Footway crossings with a maximum width of six (6) metres will be permitted to facilitate access to two adjacent garages or carports if the distance between the parking space and the street frontage is less than 5.0 metres.

Footway crossings with a maximum width of six (6) metres may be permitted into residential properties containing three or more dwellings where they obtain access from a collector, sub-arterial or arterial road to minimise disruption to traffic vehicles wishing to enter the property.

Footway crossings into non-residential properties and residential properties with ___ or more parking spaces shall be designed in accordance with the following tables:

Road Frontage	Number of Car Parking Spaces Served by the Driveway					
	Less than 25	25-100	101-300	301-600	More Than 600	Heavy Vehicles
Major	1-2	2-3	3-4	4	5	7
Minor	1	1-2	2-3	3-4	4	6

Table 1 Driveway Types

Type	Entry Width (metres) W	Exit Width (metres) W	Minimum Separation of Driveways (metres)	Splay at Kerbline (metres) R
1	3-6	Combined	NA	0.45
2	6-9	Combined	NA	0.45
3	6	4-6	1-3	0.45
4	6-8	8-10	1-3	0.45
5	Direct feed from a controlled intersection via a dedicated public roadway			
6	8-10	8-10	3	0.45
7	10-12	10-12	3	0.45

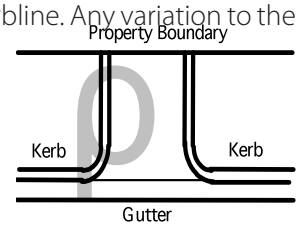
Table 2 Driveway Widths

S2.3 Layout

Vehicular crossings are to be placed to keep conflicts between frontage road traffic and car park traffic to an acceptable minimum. The following points specify some of the design criteria for vehicular crossings.

1. A maximum of two vehicle crossings are permitted to any public road provided the minimum separation between footway crossings is 1 m and the sum of the widths of all access footway crossings to any street frontage does not represent more than 30% of the total width of the total width of the property frontage to that street.

2. Dual Occupancy (attached) may be permitted to have two footway crossovers where the location of the garages on the property do not permit the use of a shared crossover. The crossover width may exceed 30% of the property frontage for a dual occupancy (attached) development.
3. All footway crossovers are to be constructed perpendicular to the kerbline. Any variation to the perpendicular angle is to be approved by Council's traffic engineer.
4. Generally, kerbs are not be returned to the property boundary.
5. Kerb returns to the property alignment may be permissible if:
   a. the access is to an arterial or sub-arterial road;
   b. the development generates a large amount of traffic;
   c. the drive is used by heavy vehicles; and
   d. If kerb returns are permitted/required, kerb ramps will need to be provided to facilitate pram and wheelchair movements.
6. Auxiliary Lanes and Turning Bays will not be permitted unless they are considered necessary by the Local or Area Traffic Committee.
7. In certain circumstances, the Traffic Committee may restrict property access to left in - left out movements only. It will be necessary to erect appropriate signs and may be necessary to construct a median island within the road reserve to ensure compliance.
8. If separate footway crossings are provided for entering and exiting traffic they shall be signposted with "in" or "entrance" or "out" or "exit" as appropriate.



S2.4 Vehicular Crossing Location

Properties fronting onto major or arterial roads are to gain access from a residential road frontage if available.

For residential and long term parking areas at signalised intersections, the minimum distance is to be beyond the influence of the queue lengths at the intersection. If this cannot be achieved then

1. an arrangement may be made to confine access to left only when either entering or leaving the car park; and
2. or a signalised driveway or other approved means to provide safe site access may be considered.

For residential and long term parking areas at non signalised intersections the driveways are to be located in accordance with the requirements of section 3.2.3 of AS2890.1 :2004. Generally a driveway is to be located not less than 6 m from the kerb tangent point measured along the front property boundary and/or 6 m from the end of a median strip at the intersection measured along the front property boundary. Exceptions to this rule include driveways at or near signalised intersections and properties that would otherwise be denied access due to physical constraints.

Driveways for access to short term high turn over parking at shopping centres and parking for disable people shall comply with section 3.2.3 of AS2890. 1:2004.

Vehicular crossings should be located so minimum sight distances are provided to traffic and pedestrians. Minimum traffic sight distances are outlined in the desirable sight distance (DSD) column of table 3 below.

Sight distances as low as those given in the approach sight distance (ASD) column ma-y be acceptable provided no reasonable alternative exists for improving sight distances. Sight distance to pedestrians shall be met by providing clear sight lines in the areas indicated by Figure 1.

S2.5 Sight Distances for Traffic and Pedestrians

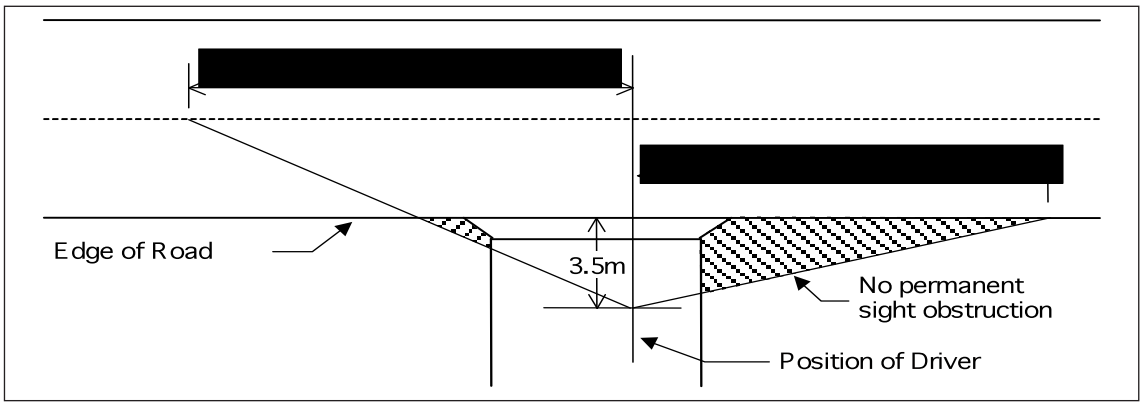


Figure 1 **Traffic Sight Distance**

Approach Speed of through road (km/hr)	ASD (m) (5 s reaction time)	DSD (m)
40	55	30
50	69	40
60	83	55
70	97	70
80	111	95

Table 3 **Traffic Sight Distance**

These figures do not include cumulative specific allowance for gradients, variations in road surface, quality of street lighting and similar factors all of which, from a safety point of view must be taken into consideration. Where there are variations to ideal conditions, the applicant must demonstrate that there is sufficient sight distance to enable the driver of a vehicle waiting to exit a property via a footway crossing to select a gap in the through traffic and join the traffic flow without causing a major disruption or conducting an unsafe or illegal manoeuvre. The above table may be used in residential and commercial areas. This is normally the desirable sight distance (DSD). The notes in figure 3.2 of AS2890.1:2004 are to be consulted to determine the sources of the above numbers for residential areas and section 3.4.5 of AS2890.2-2002 for commercial areas.

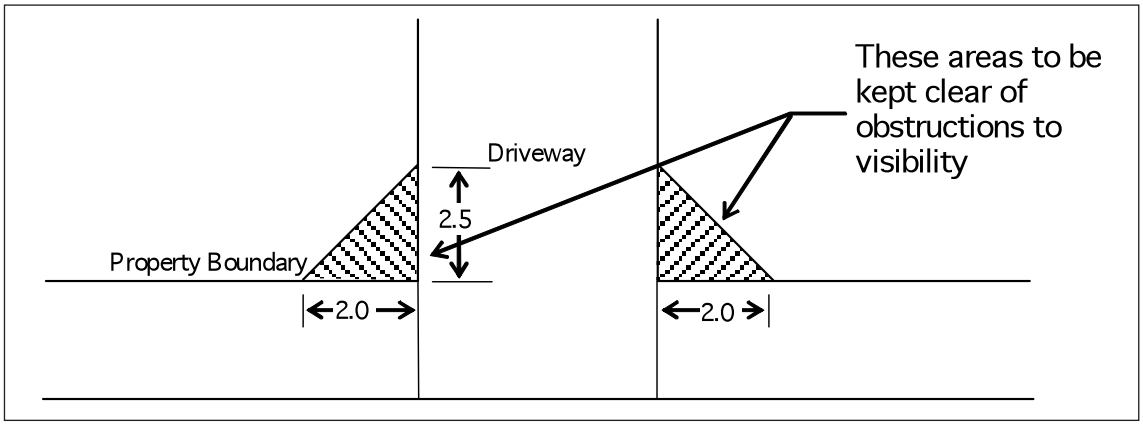


Figure 2 **Minimum Sight Lines for Pedestrian Safety**

S2.6 Conflicts with Existing Structures or Obstructions

The following points are to observed with regard to footway crossings and existing structures and/or obstructions.

1. The footway crossing should be located so as not to be influenced by any existing obstruction that may adversely affect sight lines ingress and aggress and vehicular and pedestrian safety. Typical obstructions include but are not limited to street trees, earth mounds, bus shelters and overland flow paths.
2. Council may give consideration to moving an existing bus shelter to another location in front of the property, or constructing a new bus shelter in another location, where it will adversely impact on the sight lines of vehicles using the proposed footway crossing. All costs associated with such work will be borne by the applicant.
3. The footway crossing shall be located clear of existing kerb inlet pits. Removing or reducing the length of a pit lintel is not permitted.
4. Provided the pit is not a sag pit, Council may give consideration to moving a kerb inlet pit and lintel to another location in front of the property, in order to facilitate construction of the footway crossover. All costs associated with such work will be borne by the applicant.
5. The footway crossing is not to disturb existing services without permission from the relevant service authority. All costs associated with the services are to be borne by the applicant.

S2.7 Other Traffic Measures

All traffic management measures deemed necessary by Council's traffic engineer and/or the traffic committee are to be provided by the developer to Council's satisfaction.

S3.0 Existing Footway Crossings

S3.1 Using an Existing Footway Crossing

Existing footway crossings slabs and laybacks may only be used:

1. When they provide access to a maximum of two dwellings;
2. The existing crossing is in the correct location, at the correct level and in good condition; and
3. The existing crossing is not a bridge or piped crossing.

Otherwise, the crossing may have to be removed and a new crossing constructed.

S3.2 Disused Footway crossings

Footway crossings slabs, or parts of footway crossings slabs, that become redundant are to be removed and the footway area restored. Disused gutter crossings are to be removed and the kerb reinstated.

Any existing unused gutter crossings and footway crossing slab will also need to be removed, irrespective of the fact that it may have not become redundant as a consequence of the current application.

Removing a disused gutter crossing is generally completed by Council. The applicant may organise for their contractors to do this work only if the total amount of internal concrete driveways and parking areas being constructed exceeds 150 m^2.

Details for kerb and gutter construction are given in Appendices.

S4.0 Designing Internal Access Roads and Parking Spaces.

S4.1 General

Where the development must provide on-site parking facilities, the design of all parking spaces, circulation roads and manoeuvring areas on the property must conform to the minimum requirements outlined below and the design criteria in AS 2890.1-2004 Parking Facilities, Part1 Offstreet Parking and AS 2890.2 –1989, Part 2, Commercial Vehicle Facilities Part 3 Bicycle parking Facilities. In so far as any inconsistency exists between criteria outlined below and the Australian Standards, the criteria in this document shall apply.

S4.2 Design of Parking Spaces

Parking Spaces for Commercial Vehicle facilities

Parking spaces for commercial vehicles shall comply with AS2890.2-2002.

Parking Spaces in Non Residential Development for Cars and Small Vehicles

The depth of a parking space shall not be less than 5.5 m except in the following cases.

a. where a vehicle may overhang the end of a space; or

b. where a space is provided for a small car.

Details of the above exceptions can be found in section 2.4.1 Angle parking spaces of AS2890.1-2004.

The width of a parking space is dependent on the width of the manoeuvring lane and will be in accordance with the following minimum standards for 90 degree angle parking. Parking spaces at other angles may be designed in accordance with AS2890.1-2004 section 2.4 – Design of Parking Modules.

CLEAR WIDTH OF SPACE	CLEAR WIDTH OF MANOEUVRING LANE
2.5 m	7.0 m
2.6 m	6.7 m
2.7 m	6.4 m
2.8 m	6.1 m
more than 2.8 m	6.0 m

Table 4

These widths do not apply for disabled parking spaces, where more stringent criteria are to be applied. Disabled car spaces are to comply with AS2890.6.

The absolute clear width of a parking space shall be 2.4 m and the abs minimum width of a manoeuvring lane shall be 5.8 metres for 90 degree parkin

Where the parking is provided as an undercover space, Council may per reduction of the clear width of parking spaces in accordance with the diagram if columns are setback from the front of the space.

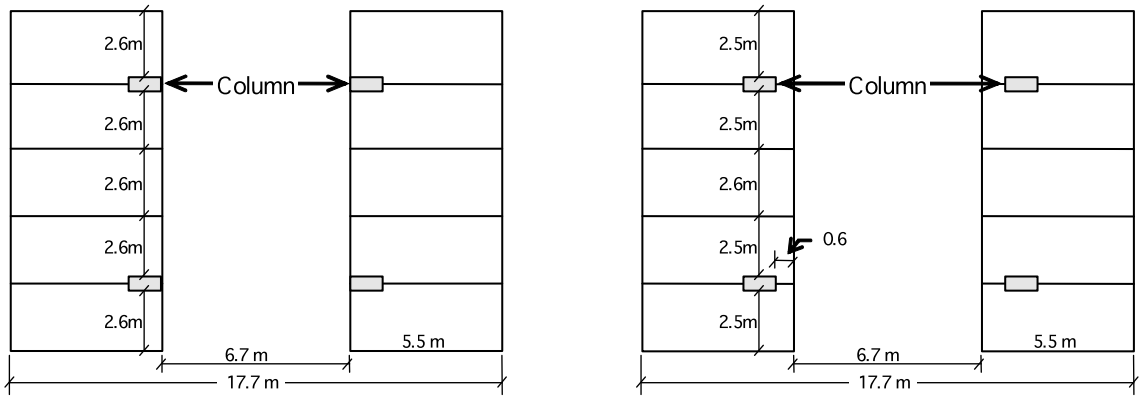


Figure 3

Blind Aisles

Provision shall be made for the sweep of the front of the vehicle where a parking space is perpendicular to the access driveway and has a wall or kerb greater than 150 mm high immediately adjacent the space.

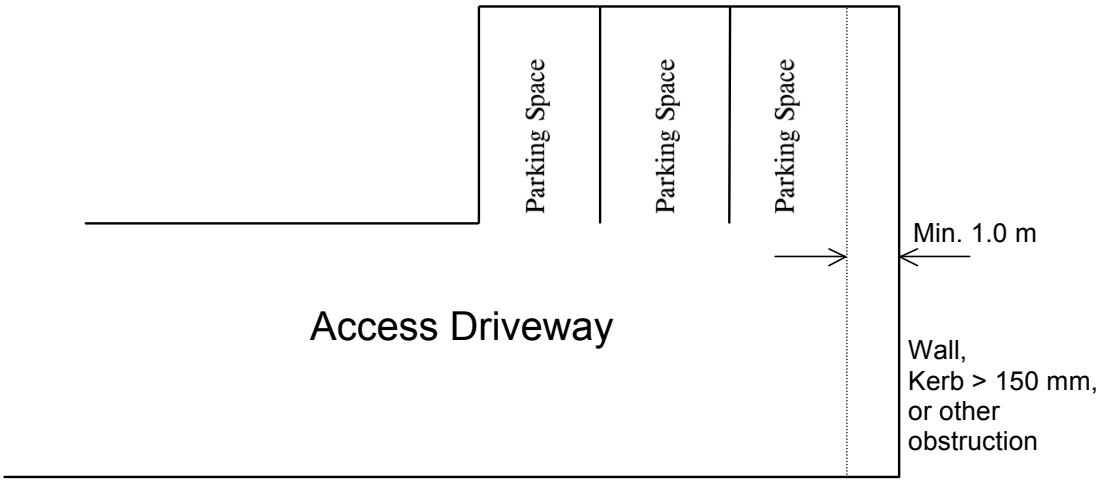


Figure 4

Domestic and Residential Development

- The depth of a parking space shall not be less than 5.5 m.
- The minimum clear width of an enclosed single vehicle garage or undercover parking space shall be 3.0 metres and 2.5 metres for uncovered parking spaces.
- Garage doorway shall have a minimum width of 2.5 metres. A wider doorway be required if there is not sufficient maneuvering space in front of the garage enable a straight entry. Garage widths and turning paths are to comply with t below.
- The absolute minimum width of a maneuvering lane shall be 6.5 metres for 90 degree parking although the lane width will need to increase where the parking space width is less than 2.6 metres in accordance with Figure 5.

OFFSET FROM EDGE OF DRIVEWAY	SINGLE OPENING "X"		DOUBLE OPENING	
	FORWARD ENTRY	REVERSE ENTRY	FORWARD ENTRY	REVERSE ENTRY
4.5	4.4	3.6	7.5	6.1
5.0	4.4	3.0	7.5	5.5
5.5	4.4	2.7	7.5	5.2
6.0	4.2	2.4	7.4	5.0
6.5	4.1	2.4	7.2	4.8
7.0	3.8	2.4	7.0	4.8
7.5	3.5	2.4	6.6	4.8
8.0	3.0	2.4	6.1	4.8
8.5	2.5	2.4	5.3	4.5
9.0	2.4	2.4	5.3	4.8
Straight Approach	2.4	2.4	4.8	4.8

Table 5 **Garage Opening Widths to Comply with AS2890.1 Section 5.4**

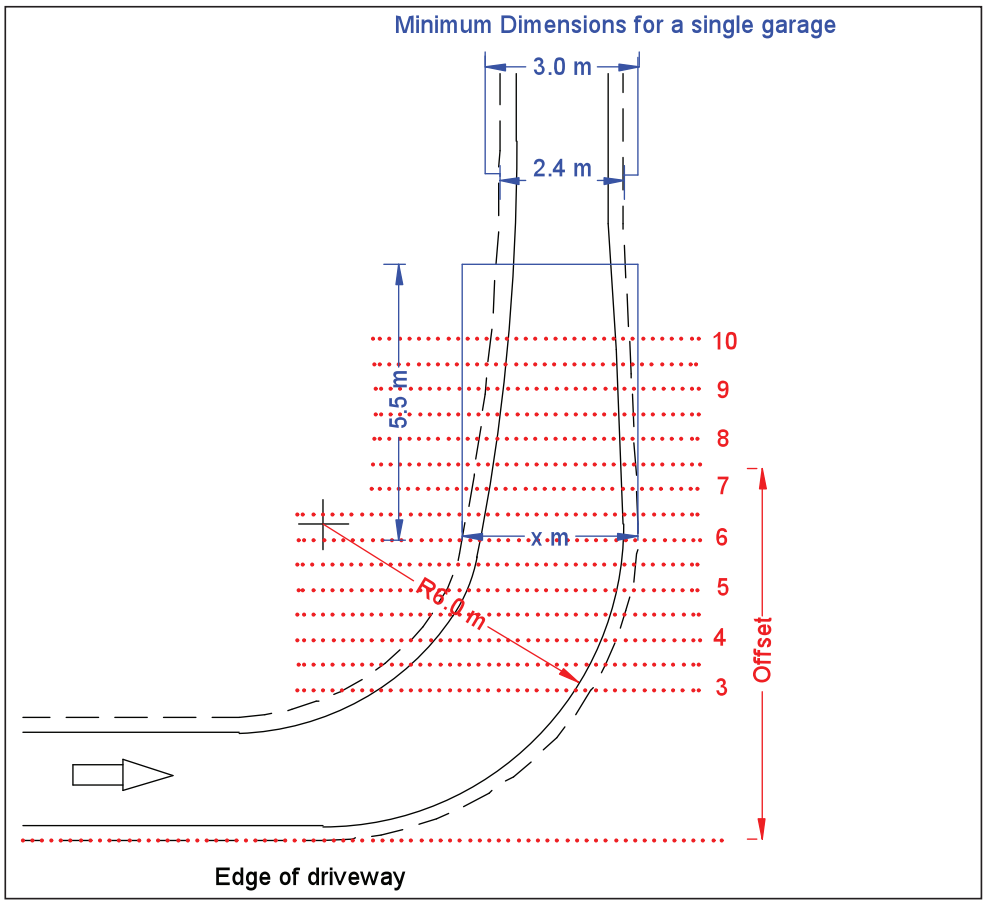


Figure 5

Note: This table of garage opening widths is meant for a general guide only as individual circumstances will vary. The table can also be used to check the opening for recessed garages and carports

Internal Access Road Widths

Provision must be available within the property to enable vehicles (85th percentile vehicle) to enter and leave the designated parking space in a single 3 point turn manouvre.

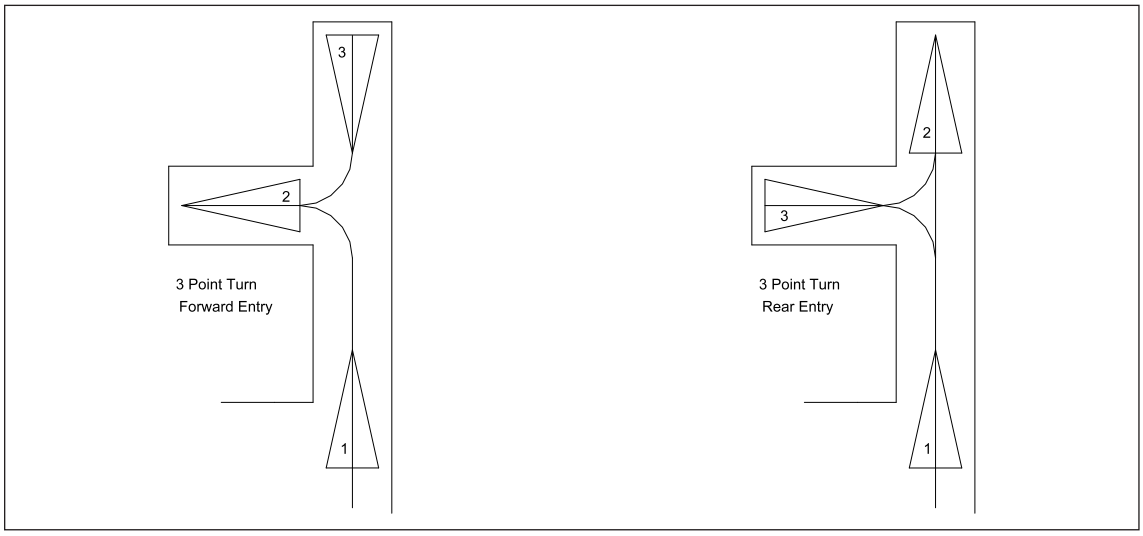


Figure 6 Three Point turns

A 99th percentile vehicle shall be used as disabled vehicle. Vehicles must be able to enter and leave in a forward direction. This provision may be waived where the garage is located at the front of a dwelling and there is insufficient space within the front setback to provide a turning area. Turning templates are supplied in the appendix. A clearance of 300 mm should be added to both sides of the turning path.

In non-residential properties, the minimum carriageway width for one-way roadways or ramps is 2.9 metres and 5.5 metres for two-way roadways or ramps. Where there is to be a kerb or barrier higher than 150 mm and closer than 300 mm from one edge of the roadway, the roadway shall be widened to provide a minimum of 300 mm clearance to the obstruction. If there is to be a high kerb or barrier on both sides, the width increase shall be sufficient to provide 300 mm on both sides.

Residential properties containing more than ten (10) parking spaces shall have lane widths of the same size as non-residential developments.

Residential properties containing 10 vehicle parking spaces or less, shall provide a minimum carriageway width of 3.0 metres however there must be provision for vehicle passing at least every 30 m by way of a passing bay with a minimum carriageway width of 5.5 metres and minimum length of 5.5 metres and suitable transitions.

Concrete wheel strips may be used along straight sections of drive. Wheel strips are inappropriate for use in areas where vehicles are turning. Wheel strips sh 600 mm wide with a 1200 mm separation.

Where the access road circulates, the dimensions shall comply with section AS2890.1 :2004, Design of Circulating Roadways and Ramps.

Gradients for Cars and Small Rigid Trucks

At entry and exit points including along the access driveway are to be designed to minimise entry hazards from the road, account for pedestrian safety and prevent scraping of vehicles.

Parking Spaces

The maximum grade for parking bays shall be:

- measured parallel with the angle of parking - 1 in 20 -5% (1 in 40 = 2.5% for disabled vehicles); and
- measured at 90° to the angle of parking - 1 in 20 (5%).

Access Roads

The minimum grade shall be 1 in 100 (1.0%).

The maximum grade shall be:

a. Straight ramps:
   i. 20 m long or more - 1 in 6 (16.7%) if pedestrian access is not obtained at the driveway; and
   ii. less than 20 m long - 1 in 4 (25%) where pedestrian access is not obtained at the driveway.

b. Curved ramps - as for straight ramps, except the grade shall be measured along the inside edge of the carriageway; and

c. Changes of Grade- 1 in 8 (12.5%). Where this change is exceeded, transition sections will be required. These are to be a minimum length of 2.0 metres. On complex transitions the ground clearance templates in the appendix may be used to check access.

The maximum cross-fall on an internal roadway shall be 5%.

Pedestrians

Where the driveway is the sole pedestrian access to a building, the following maximum grades shall apply:

a. 20 m long or more - 1 in 8 (12.5%); and

b. less than 20 m long - 1 in 6 (16.7%).

The above standard does not apply to buildings with high public usage and and disabled housing developments. These developments must provide pedestr access in accordance with the requirements of AS 1428.1 – 1998.

Driveway profiles for maximum rise and fall are shown in the appendix. Council is to be consulted and a vehicular crossing application made to obtain driveway levels.

Headroom

For car and light van access into dwellings the height between the floor and an overhead obstruction shall be a minimum of 2200 mm. Headroom at a driveway change is grade at the garage entry shall be measured as shown in figure 5.3 of AS2890. 1:2004.

Applicants should ensure that provision for pipes, ducts and sprinkler systems within the car park does not compromise minimum clearances.

S4.2 Construction Standards

Construction Standard for Crossover Slabs

Suitable Materials

Vehicle footway crossing slabs are to be constructed of:

- plain concrete with a 28 day compressive strength of 25 mpa;
- coloured or patterned concrete with a 28 day compressive strength of 25 mpa; or
- concrete pavers.

The applicant is to be aware that any future restoration of the footway crossing carried out by Council or another service authority will be in plain concrete. The extent of restoration will be limited to the area damaged. Generally it will not extend to replacing the entire footway crossing slab.

Thickness

Concrete slabs shall be constructed in accordance with the following thicknesses:

Up to two dwellings	125 mm thick, unreinforced
more than two dwellings, Commercial, Light Industrial	150 mm thick + 1 layer of F62 fabric
Major Commercial / Heavy Industrial	175 mm thick + 1 layer F72 fabric

Reinforcing shall have approximately 40 mm top cover and should be supported during construction by bar chairs at 1-metre centres. The reinforcement should not be continuous through a control joint.

A 50 mm thick granular su-base shall be provided under all footway crossings.

Mastic joints 5 mm thick are to be provided at the property boundary and at the rear of the gutter crossing (layback). Dummy joints shall be provided at either side of the footway where applicable.

Pavers shall be a minimum 75 mm thick laid on a 100 mm unreinforced concrete base with a 30 mm layer of sand between the pavers and the concrete. A hard wood or concrete edge restraint is to be provided.

Pervious pavers will not be permitted on driveways unless they are laid strictly in accordance with specifications approved by Council. This generally requires a selected subgrade material up to 500 mm deep to permit satisfactory subsurface drainage.

Finish

Concrete crossovers should usually have a broom finish unless it has a gradient steeper than 1 (vertical) to 5 (horizontal) when it should be finished with a wooden float. The finish is to be a uniform, non-slip surface. All edges are to be rounded with a 75 mm edging tool.

Any damaged, defaced or otherwise unsatisfactory section shall be removed and replaced.

All footway crossings should have slip resistance appropriate for the pavement slopes as required by AS3661 .1. The relative level of adjacent pavers should not be greater than 5 mm, and gaps between pavers or in patterned concrete slabs, no greater than 3 mm. The finish is not to constitute a hazard to pedestrians.

Levels

The levels of the footway crossing must be in accordance with property alignment levels issued by Council. No internal driveways adjacent the proposed footway crossing should be constructed prior to issuing of alignment levels. If the proposed driveway levels on any approved building plans do not conform to the levels prepared by Council, the property alignment levels prepared by Council shall apply.

Altering Public Footway Levels

Where the property alignment levels issued by Council differ from the existing footway levels, the surrounding footway area must be regraded to satisfactorily marry into the new footway crossing. The minimum extent of footway which must be regraded is determined using the design constraints outlined below:

1. the maximum change of grade along the footway is to be 1 in 10 with a minimum segment length of 4.0 metres;
2. the maximum longitudinal grade of the footway is to be 1 in 6;
3. if it is impractical to achieve the above maximum grade, consideration will be given to permit installation of stairs within the footway;
4. if it was necessary to increase the footpath grade, and the longitudinal grade of the footpath exceeds 1 in 8, then concrete footpaving will need to be constructed over the regraded section of footway;
5. if access to adjoining private properties is affected by the footway regrading, all work necessary shall be done within those properties to ensure satisfactory pedestrian and vehicular access is restored. If work is to be undertaken within an adjoining property it will be necessary to obtain written consent from the adjoining property owner/s that they will permit the applicant (or applicant's agents) to enter their property in order to undertake all work necessary to ensure vehicles and pedestrians have satisfactory access to the property following regrading of footpath. The letter of consent must be submitted to the Principal Certifying Authority (PCA) prior to issuing of the Construction Certificate for the building works;
6. all mains, services, poles, footpath paving etc that require alteration shall be altered at the applicant's expense to the satisfaction of Council and the relevant authority;
7. where the alteration of a house service is required, it is to be carried out by a suitably experienced tradesperson. Twenty-four (24) hours notice shall be given to the affected property owner before their service is affected;
8. in the case of public utility mains, if a main must be raised, lowered, or relocated, the applicant shall liaise with the relevant Authority to organise the alteration and undertake all work to the satisfaction of that Authority; and
9. the applicant shall arrange with the relevant authority for the alteration of all surface fittings of all services that are affected by the new finished surface levels.

If the ground level of the property adjacent the footpath is above or below the finished level of the footway then adequate measures must be taken to support the land by constructing either earth batters or retaining structures. These are to be fully contained within the property and are not to encroach onto the public footway.

Where retaining of an adjoining property is necessary as a consequence of regrading the footway, written permission from the affected property owner(s) to enter their property and undertake such work must be submitted to the Principle Certifying Authority (PCA) prior to issuing of the Construction Certificate for the building works.

Construction Standard for Footways

Material for filling shall be clean fill consisting of not less than 70 per cent granular material and must be free from vegetation, stumps, roots, rubbish, and other deleterious material. Where excavation in rock is necessary, the rock shall be removed to a depth of 100 mm below finished surface level.

A 75 mm layer of topsoil is to be placed over the footway. The topsoil is to contain less than 40% clay. Clods in the topsoil shall not be greater than 50 mm Φ. The minimum finished grade should be 1%. There should be no localised depressions that may pond, or concentrate rainwater.

Couch, kikuyu and Buffalo turf to match pre-existing grass types, is to be laid over all areas of exposed soil.

Construction Standard for Gutter Crossings

Generally, gutter crossings may only be constructed or extended by Council. The applicant may organise for their contractors to do this work only if the total amount of internal concrete driveways and parking areas being constructed exceeds 150 m^2.

Gutter crossings (laybacks) shall be constructed in plain concrete in accordance with the design shown on plan M 421 in the appendix. Finish shall be wood float or broom with a 75 mm edging. Detailed construction standards are outlined in Part 8.4 Public Civil Works of this DCP.

Bridge crossings will no longer be permitted; except in cases where the Council considers that it is not practical to construct a standard layback.

Construction of Internal Access Roads

General

Internal pavements for residential developments consisting of single dwellings or multiple dwellings shall be in accordance AS 3727-1993 Guide to Residential Pavement. Extracts from this standard are provided below. Pavements that will carry heavy vehicles or significant traffic volumes shall be designed in accordance with the AustRoads "Pavement Design" manual (AustRoads 1992) or the Clay Brick & Paver Institute publication "Specifying and Laying Clay Pavers".

Concrete Pavements

Typical slab thickness, concrete grade, joint spacing and reinforcement should be in accordance with the table below.

Traffic	Min Slab Thickness	Min Concrete Grade	Alternative 1 Max. Control Joint Spacing	Alternative 1 Min Reo Fabric	Alternative 2 Max. Control joint Spacing	Alternative 2 Min Reo Fabric	Alternative 3 Max. Control joint Spacing	Alternative 3 Min Reo Fabric
Light Traffic - Use by no more than two Dwellings	100	N20	2	-	3	F52	6	F62
	150	N25	2	-	4	F72	6	F82
Medium Residential Traffic Light/Industrial Commercial								
Heavy Industrial/Commercial	See AustRoad Manual							

Table 6 Concrete Pavements

Note: Slab thickness is measured from the underside of the slab to the bottom of any top surface patterning.

Reinforcing shall have approximately 40 mm top cover and should be supported during construction by bar chairs at 1 metre centres. The reinforcement should not be continuous through a control joint. Where the slab surrounds another structure such as a drainage pit, trimming reinforcement should be used. Trimming reinforcement should be not less than one Y12 bar of minimum length 600 mm.

Control joints shall have spacings no greater than shown in the table above. They shall be constructed by formwork between concrete pours, or creating a place of weakness to a depth of one third to one quarter of the pavement thickness. Mastic isolation joints should be provided where a pavement adjoins a building or other rigid structure such as a drainage pit.

Segmental Pavements

Typical thickness of base-courses and required breaking load for paver units shall be as follows:

Traffic	Compacted Base-course Thickness	Min. Breaking load of paving units
Light Traffic - Use by no more than two Dwellings	75	3
Medium Residential Traffic	150	5
Other	See "Specifying and	Laying Clay Pavers"

Table 7 Segmental Pavements

The sand bedding course shall be of roughly uniform thickness and not exceed 30 mm after compaction.

Pavers should have a nominal 3 mm joints between the units. Joints should be filled with an appropriate sand.

The entire perimeter of segmental pavements should be provided with lateral edge restraints.

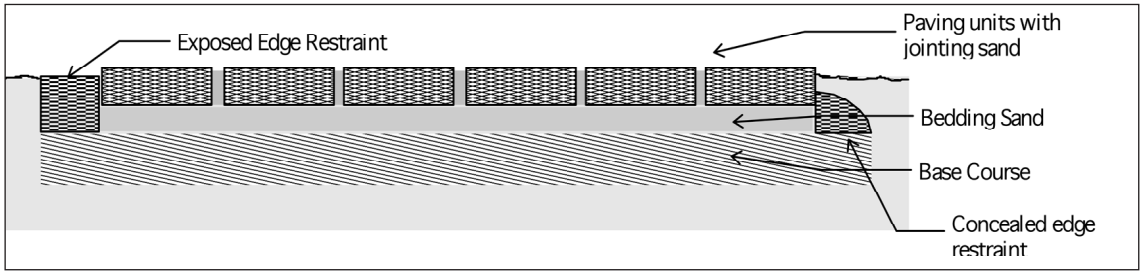


Figure 7 Segmental Pavements

Gravel Pavement

Gravel driveways are inappropriate for use in the Ryde area due to the low permeability of the underlying soils. Gravel may be used as a finish treatment over a concrete driveway provided the driveway grade does not exceed 5% and edge restraints are provided to ensure the gravel is not washed from the drive.

External Appearance

The external appearance of any car parking structure or area shall be of an acceptable standard and finish when viewed from the street. Setbacks from the front facade and landscaping should be used to soften the impact of such areas. Unpaved car parking will not be permitted.

Landscaping

A landscaped strip of between 1.5 metres and 3.0 metres along the frontage to a street or other public property will be required. A greater landscaped strip may be required to screen multi level carparks.

In order to reduce the amount of hardstanding areas within an open carpark and provide shade to vehicles. A landscaping strip having a minimum area of 6 m^2 (minimum 1.5 metre width and 3 metres long) is to be established fro every ten (10) car parking spaces.

Such landscaping strips are to be established and maintained with appropriate planting of shrubs and shade trees.

A detailed landscaping plan shall be submitted as part of the Development Appkication for Council's consideration and approval. The landscape plan shall:

a. Be prepared by a suitably qualified person and be of a minimum scale of 1:100;

b. Ensure that trees and shrubs willhave an informal and softening effect on buildings and the overall environment. Trees should be planted in sufficient numbers to achieve this aim;

c. Ensure that any on-site stormwater detentionsystem is complimentary to and corresponds with the proposed landscape treatment;

d. Screen and shade private open spaces;

e. Provide privacy to occupants of neighbouring properties;

f. Screen poor views;

g. Be easily maintained;

h. Where possible, use Australian native plants, particularly material indigenous to the area; and

i. Provide for street trees consistent with, and complimentary to existing trees at 6 metre centres within the footpath area at the front of the property.

S4.4 Standards Enforcement

Checking Design

Plans submitted to the principle certifying authority should show;

- the location of all driveways and carparking spaces;
- existing gutter levels at either side of the footway crossing;
- the level of all proposed carparking spaces; and
- construction details of the crossover.

The certifier will check:

- the location to ensure compliance with the development standards; and
- levels of the garage against the property alignment levels to ensure access can be achieved without exceeding maximum permissible grades or grade changes.

Inspections

A compliance certificate must be obtained following placement of formwork and re-inforcement, if applicable, but prior to pouring of concrete. The certifier will check:

- thickness and layout of formwork;
- suitability of subgrade treatment;
- crossover location and width; and
- crossover levels.

A compliance certificate must be obtained upon completion of the driiveway. The certifier will check:

- quality of the finish;
- all disused driveways have been removed. If footway regrading was undertaken the certifier will check;
- the levels of the footway; and
- suitability of the transitions to the existing footway levels.

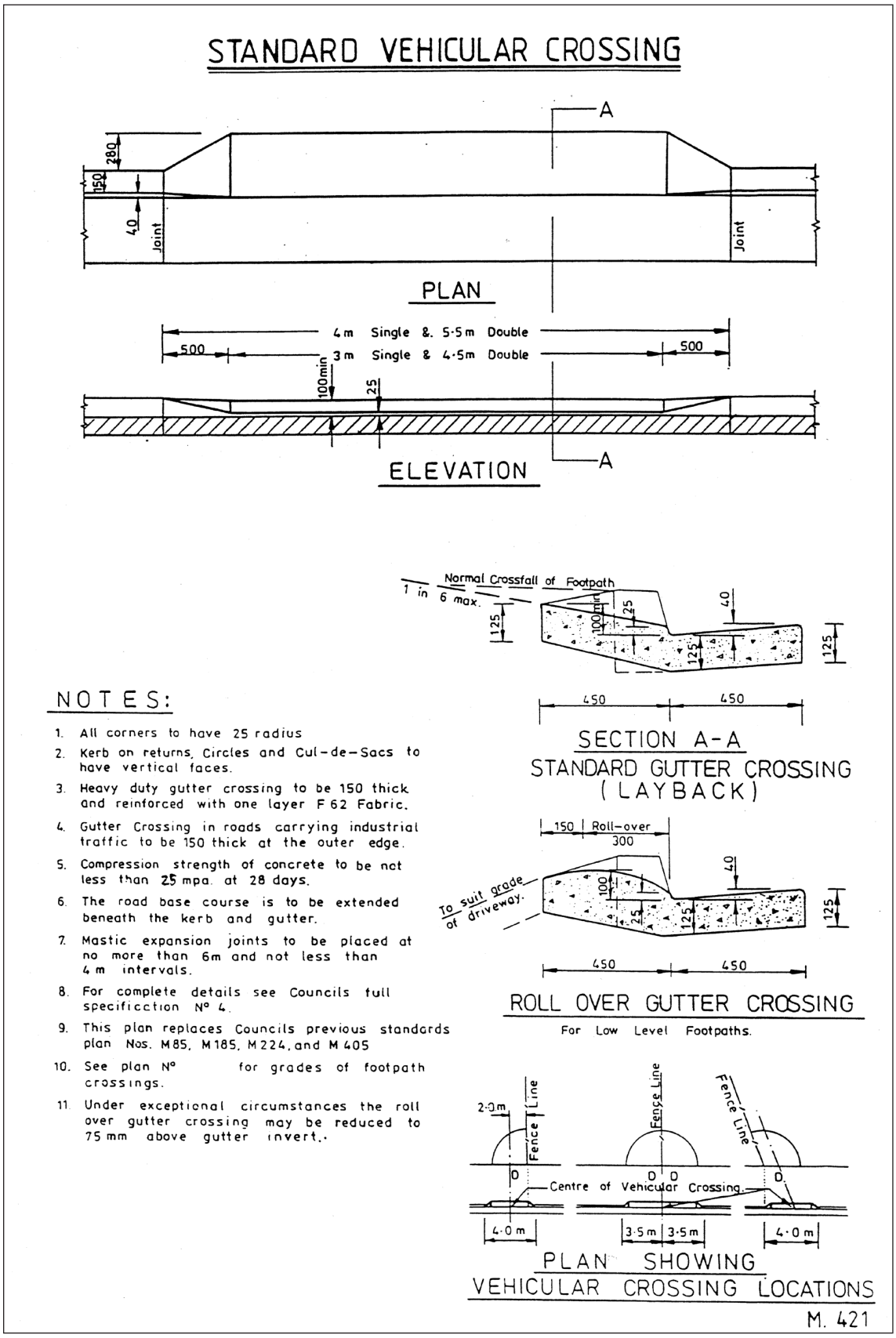
Where new turf has been laid, a further compliance certificate will be necessary two (2) months after the turf has been laid on the public footpath. The certifier will check:

- the finished level of the footway adjacent the kerb is not below the top of kerb;
- there is no step down from any footpaving or driveway crossings to the finished level of the footway;
- there are no localised depressions where water may pond or flows may be concentrated; and
- there are no areas of dead turf.

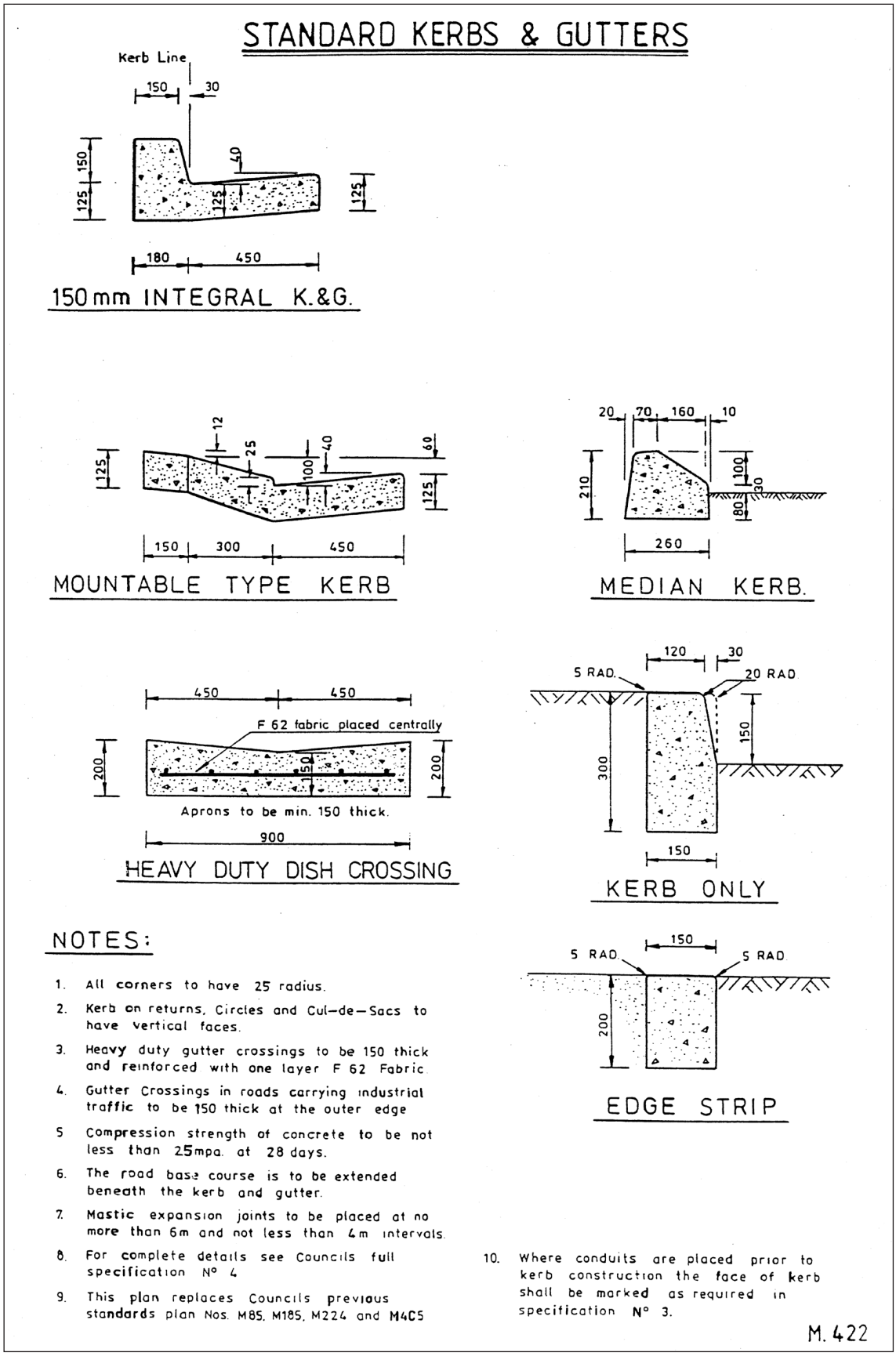
The building security deposit will not be refunded until this compliance certificate is obtained.

If the development standard is not met, the unsatisfactory components of the driveway will need to be removed and reconstructed. Unsatisfactory sections of regarded footway will need to be repaired. If turf is dead, it will need to be replaced and maintained by the applicant for a further two month period after which, a further compliance certificate is required.

APPENDICES

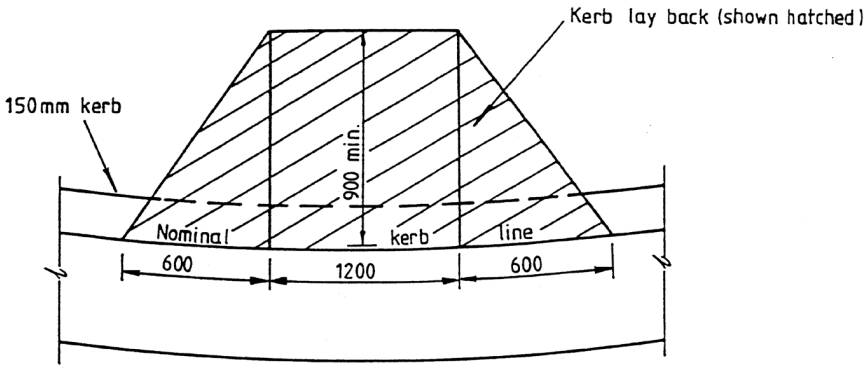


Plan M.421 Standard Vehicle Crossing

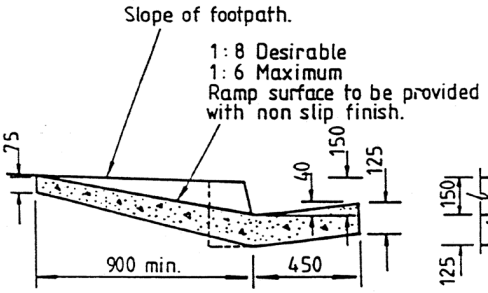


Plan M.422 Standard Kerb and Gutters

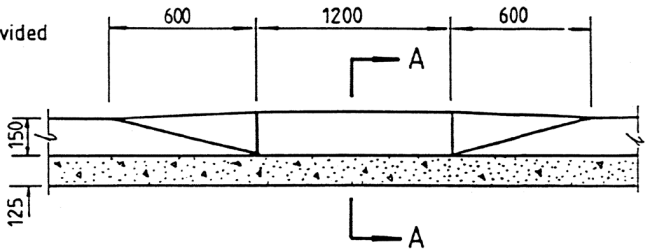
STANDARD KERB RAMP



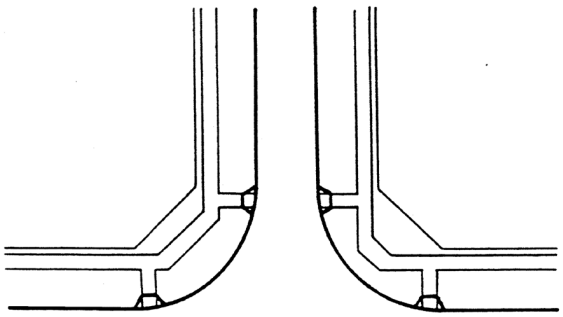
PLAN



CROSS SECTION A-A



ELEVATION



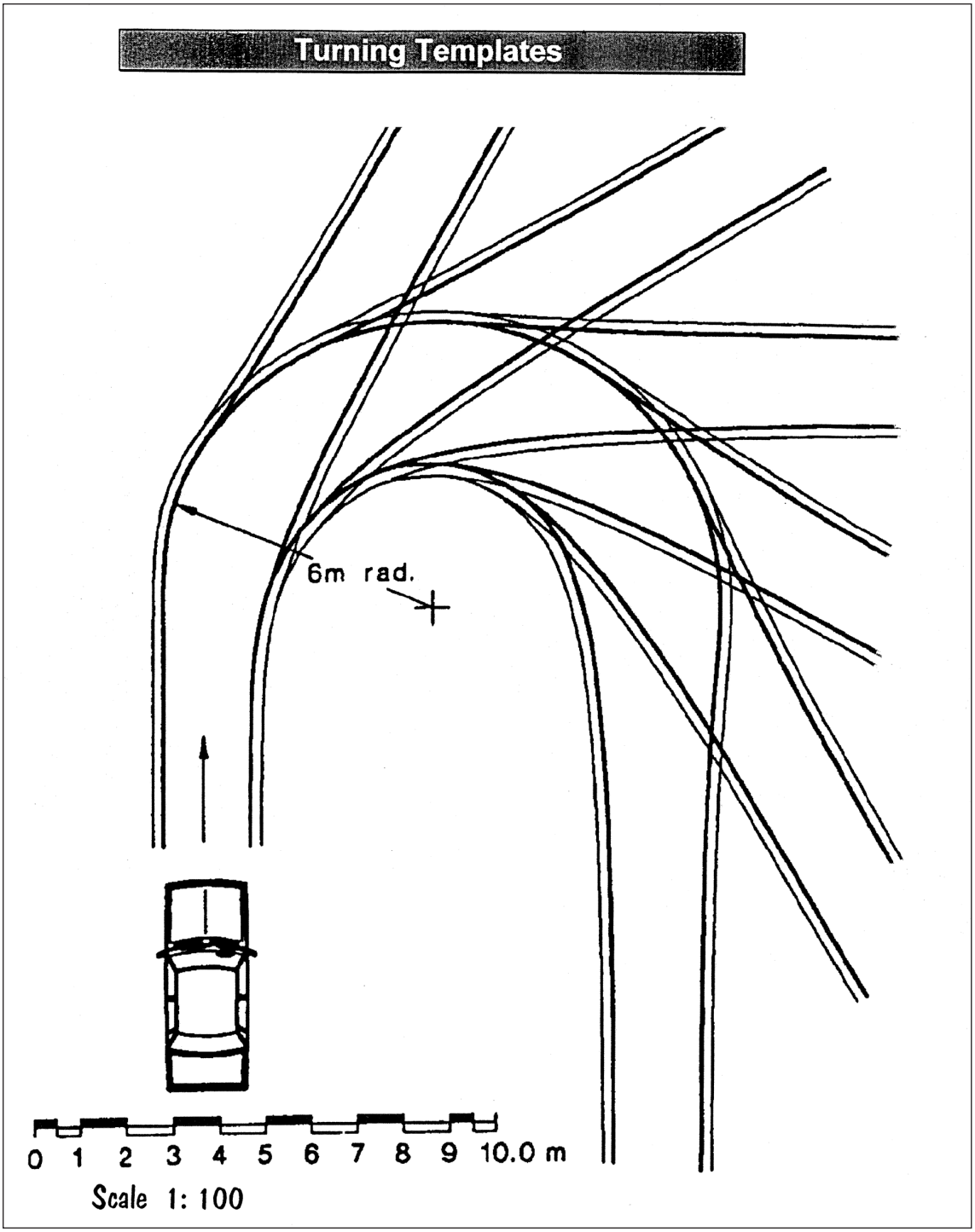
PLAN SHOWING KERB RAMP CROSSING
(DIAGRAMMATIC ONLY)

NOTES:

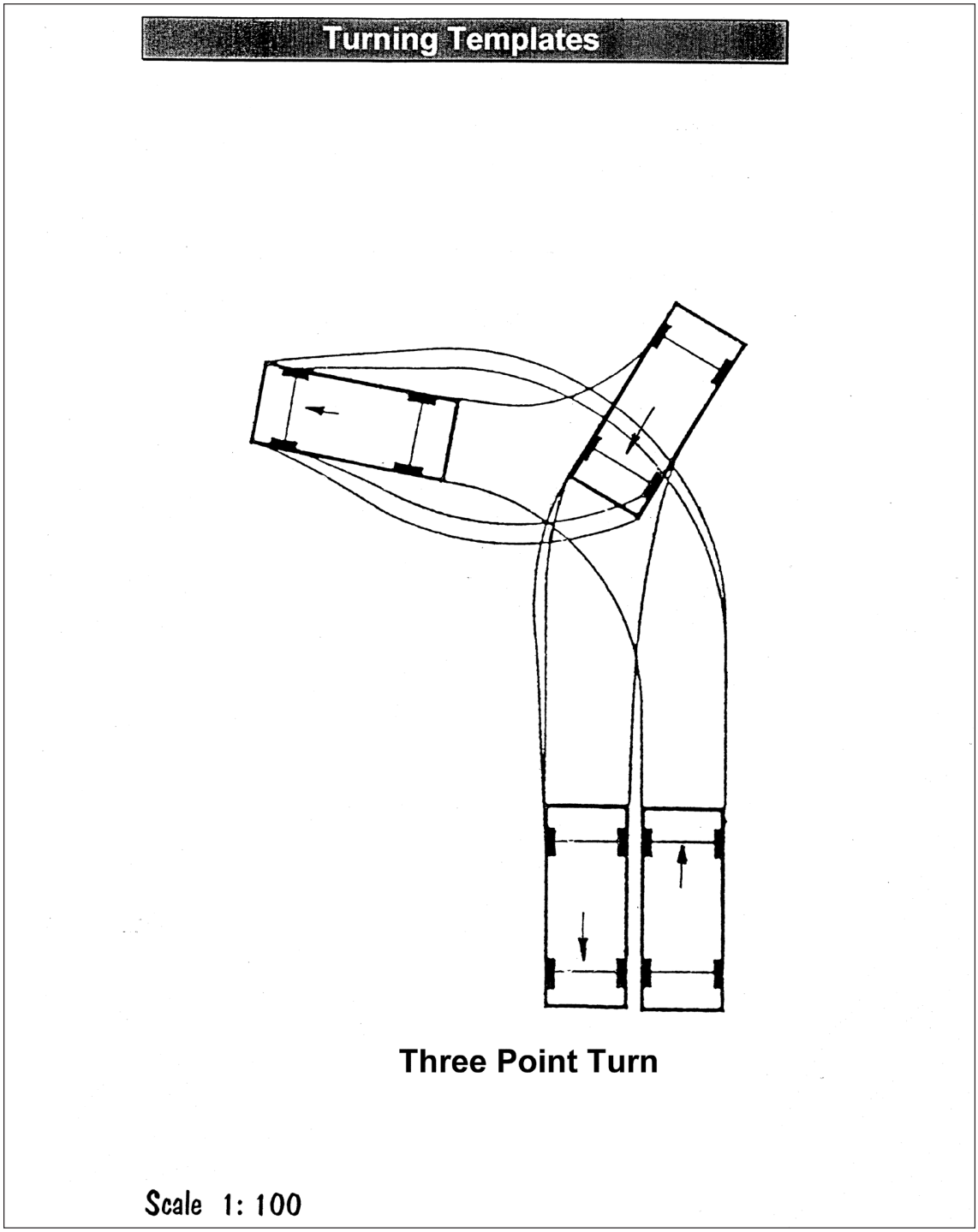
1. Kerb ramps shall be constructed at all road intersections and in front of pathways. Where the specified construction of the road kerb height varies from the 150 mm dimension shown on this drawing the depth of the kerb ramp into the footpath shall be adjusted from the 900mm minimum to a minimum depth of six (6) times the specified kerb height.
2. Kerb ramps to be laid on a well compacted fine crushed rock base minimum thickness 50mm.
3. Concrete to be of 25 MPa compressive strength (F'c) at 28 days.

PLAN Nº
M 388 c

Plan M.388c Standard Kerb Ramp



Vehicle Turning Templates according to AS290.1:2004 and AS2890.2-2002



Vehicle Turning Templates according to AS290.1:2004 and AS2890.2-2002

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