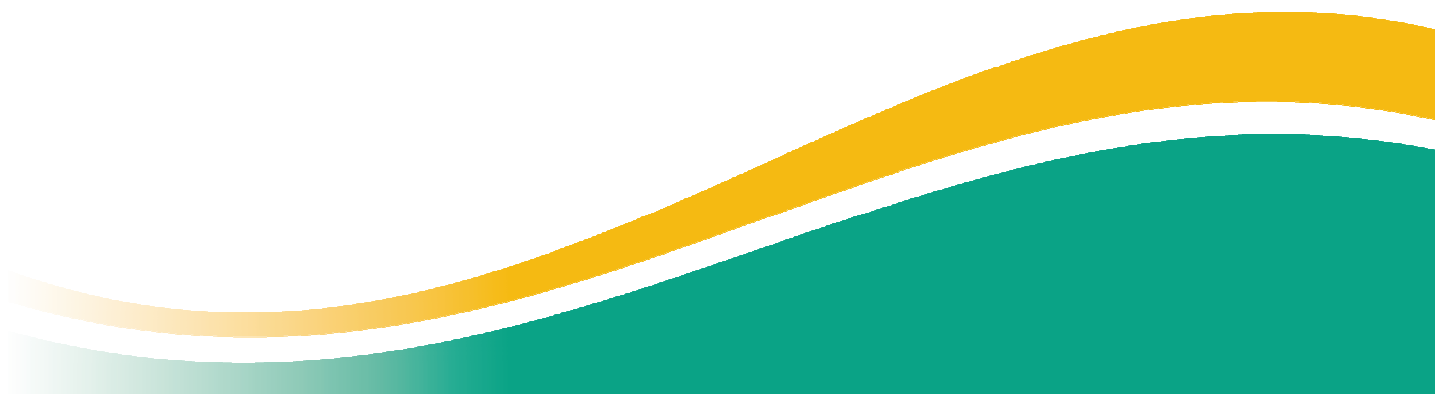




Rockdale Technical Specification **Traffic, Parking and Access**

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I Preliminary

1.1 Introduction

Part 4.6 of Rockdale City Development Control Plan (“the DCP”) contains general principles for parking, access and movement, including required parking rates for new development. This technical specification is developed to provide further detailed information in relation to traffic impact studies, design of parking facilities and pavement, as well as some other design considerations.

This Technical Specification must be read in conjunction with Rockdale City Development Control Plan (DCP) and any environmental planning instruments that apply to the land.

1.2 Objectives

To provide further details and assist the DCP in relation to:

- Ensuring that the processes for assessment of traffic impacts, and the preparation of traffic studies, are well defined;
- Ensuring that adequate parking facilities are provided to satisfy the demands generated;
- Ensuring that the design of parking facilities meets acceptable standards;
- Ensuring that the requirements of pedestrians, signage, drainage, landscaping and lighting are satisfied; and
- Providing guidance on the preparation of documents that support the parking facility design.

1.3 Application of the Technical Specification

This Technical Specification shall be applied to the design and construction of parking facilities associated with development within the area of Rockdale City Council.

This Technical Specification shall be considered as the policy and specifications of Rockdale City Council in relation the exempt development provisions for vehicle and driveway crossings in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

1.4 Referenced Documents

The following documents are referred to in this Technical Specification:

1.4.1 Council documents

Rockdale City Development Control Plan
Rockdale Council, AUS-SPEC
Rockdale Council, Technical Specifications for Landscaping
Rockdale Council, Technical Specifications for Stormwater Management

I.4.2 Standards

Note: Where a reference is made in this Technical Specification to a publication of an Australian Standard the reference shall be to the most recent edition. An exception exists in the case of parking for people with a disability.

AS

2890	Parking Facilities
2890.2	Part 2: Off-street commercial vehicle facilities
2890.3	Part 3: Bicycle parking facilities
2890.5	Part 5: On-street parking
3727	Guide to residential pavements

AS/NZS

2890.1	Part 1: Off-street car parking
2890.6	Part 5: Off-street parking for people with a disability
Note: At the time of preparation of this Technical Specification the reference standard adopted by the Building Code of Australia for the design of parking for people with a disability is AS2890.1:1993.	
3728	Guide to residential pavements

I.4.3 Austroads

AGPT02/08	Guide to Pavement Technology – Part 2: Pavement Structural Design
AP-G1 I.3/04	Guide to Traffic Engineering Practice - Part 3: Traffic Studies
AP-G34/06	Austroads Design Vehicles and Turning Path Templates
AP-T36/06	Pavement Design for Light Traffic: A Supplement to Austroads Pavement Design Guide

I.4.4 Other references

CCA T48-2009 Guide to Industrial Floors and Pavements, Cement Concrete Association
Building Code of Australia
New South Wales Roads and Traffic Authority, Guide to Traffic Generating Development (2002)
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
State Environmental Planning Policy (Infrastructure) 2007
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004

2 Traffic Impact Assessment

The consideration of traffic, parking and access impacts of a development are an integral part of the assessment of development. A traffic impact study (also known as a traffic impact assessment) provides an outline and an appraisal of the traffic, parking and access issues for a development. The information within it enables Council to assess the impacts.

All traffic impact studies (assessments) shall be undertaken in accordance with the New South Wales Roads and Traffic Authority's Guide to Traffic Generating Development.

Due to the technical approach that is required in the preparation of a traffic impact study, the study should be undertaken by a suitably qualified professional. Typically, this requires the traffic impact study to be prepared by an experienced and qualified Traffic Engineer or Transport Planner.

2.1 When is traffic impact study required?

It is not necessary for all Development Applications to undertake a detailed traffic impact study. However, a traffic impact study should be carried out for development in the following circumstances:

- When a development is Traffic Generating Development and therefore subject to Clause 104 of State Environmental Planning Policy (Infrastructure) 2007; or
- When the type, size or location of the proposal results in potential impact on the local transport systems; or
- Where the proposal is adjacent to a state road, and/or an important public transport facility; or
- Where the development is for a child care centre.

2.2 What information is included in a traffic impact study?

The RTA Guide to Traffic Generating Development (2002) states:

Information collected in (traffic) studies should reflect the size and type and location of the development as well as its relationship to surrounding developments and the adjacent transport network.

Therefore, a varied approach should be taken to identifying the extent of a traffic impact study for development of different types, and scales.

Generally, traffic impact studies should cover the topics as specified in the RTA Guide to *Traffic Generating Development*. These topics are summarised as follows:

- Introduction - background to the proposal, scale, mix.
- Existing context - including accessibility by all modes.
- Proposed development- the trip generation across all modes (including cars, commercial vehicles, etc), expected modal split and parking requirements.
- Transport impacts - how the traffic and trips generated by the new development will affect the existing conditions.

- Parking – requirements for off-street, impacts to on-street.
- Mitigation of impacts - what measures the proposal has incorporated to ensure minimal negative impact on the existing transport system in light of additional generated trips, and that promote alternatives to the car.

2.3 Parking studies

Parking studies may be used to assess the car parking demand for a proposed development where parking rates are not specified by Council's DCP or the RTA Guide to Traffic Generating Development, or there is valid justification for a variation to the parking rates.

The approach to completing a parking study should follow the same principles of a traffic impact study. Parking studies should be undertaken by a suitably qualified professional, such as a Traffic Engineer.

The objective of the parking study is to estimate parking demand by making a comparison to one or more existing development. It is important that the existing development chosen for the study is similar in terms of the issues that are likely to affect parking demand. These issues may include:

- the size of the existing and proposed developments;
- the location of the existing and proposed developments;
- the proximity to Classified Roads of the existing and proposed developments;
- the proximity to public transport of the existing and proposed developments;
- the modal split of the existing development and the expected modal split of the proposal;
- the off street parking provision of the existing development and proposed development;
- the on-street parking availability and the extent and configuration of on-street parking regulation around the existing development and proposed development;
- any adjacent developments (including approved developments that have not yet commenced) that may affect parking; and
- any potential local variations due to social or demographic issues.

Where available, comparisons should be drawn to more than one existing development. This provides greater assurance of the results.

Parking studies are required to be based on sound statistical analysis principles. Whilst it is acknowledged that it is not reasonable to conduct surveys over extended periods, analysis of available surveys must be carried out to account for any daily, weekly and seasonal variations.

Parking studies should be undertaken in accordance with the *Austroads Guide to Traffic Engineering Practice – Part 3: Traffic Studies*.

2.4 Other surveys

In the preparation of traffic impact studies a number of other surveys may be required in order to assess the existing traffic conditions and analyse the traffic issues for the proposed development. Such surveys may include:

- Traffic volume;
- Traffic generating (for uses not covered by the RTA Guide to Traffic Generating Development);

- Commercial vehicle generation;
- Pedestrian and bicycle volumes; and
- Origin and destination.

In all cases where data collection and surveys are required, which then form the background to the analysis of traffic impacts, the data collection and surveys should be undertaken in accordance with the Austroads *Guide to Traffic Engineering Practice – Part 3: Traffic Studies*.

3 Determination of Parking Demand

The parking required by a development is a principal issue in the assessment of traffic, parking and access issues. This section outlines the method of determining the demand for parking of various types of vehicles.

3.1 Off-street car parking

The number of off-street car parking spaces to be provided for a development shall be in accordance with the DCP.

3.2 Parking for people with a disability

The number of off-street car parking spaces to be provided for people with a disability in non-residential uses shall be in accordance with the Building Code of Australia. Where the Building Code of Australia does not specify a rate the number of parking spaces for people with a disability shall be 1 space per 50 spaces or part thereof.

In residential developments, the number of parking spaces for people with a disability is to be determined by the requirements for adaptable housing, which are specified in the DCP.

Where nominated in a State Environmental Planning Policy, the number of the parking spaces for people with a disability shall also comply with that policy, for example *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004*.

3.3 Parking for commercial vehicles

The number of off-street parking spaces for commercial vehicles (also referred to as loading bays or service bays) to be provided for residential developments, office/retail/business developments, and hotel/motel developments shall be in accordance with the Table 3.1, Table 3.2 and Table 3.3 respectively.

For developments other than those specified in Table 3.1, Table 3.2, and Table 3.3, particularly industrial developments, the parking requirements for service vehicles shall be determined by surveys of similar developments. When making recommendations for the number of service bays to be provided, the recommendations should have regard to the future uses of the site, so that future change of use may not be restricted by lack of appropriate service bays.

Number of Units	Service Bays Required ⁽³⁾			
	VAN	SRV	MRV	LRV
0-9	1 ⁽¹⁾	-	-	-
10-49	-	1 ⁽²⁾	-	-
50-99	-	1	1	-
100-149	-	2	1	-
150-249	1	2	1	1
250-500	1	2	2	1
500 and over	2	2	2	1

Table 3.1 Service Bays Required for Residential Flat Buildings and the Residential Component of Mixed Use Development (incl Shop Top Housing)

(1) The van space may be shared with visitor parking or service bay for retail/commercial/business in a shop top housing development.

(2) The SRV space may be shared with a service bay for retail/commercial/business in a shop top housing development

(3) To be read in conjunction with Section 4.3.3.

Gross Floor Area (m ²)	Service Bays Required				
	VAN	SRV	MRV	LRV	AV
0-199	1				
199-999		1			
1,000-2,999	1		1		
3000-4,499	1	1	1		
4,500-5,999	2	1	1		
6,000-8,999	3	2	2	1	1
9,000-14,999	5	3	3	1	1
15,000-26,999	6	3	3	2	2
27,000-39,999	8	3	4	3	2
40,000 and over	Subject to study				

Table 3.2 Service Bays Required for Office/Retail/Business Development

Number of Rooms	Service Bays Required			
	VAN	SRV	MRV	LRV
0-199	1	-	1	-
200-399	1	-	1	1
400-599	1	1	1	1
600 and over	1	2	1	1

Table 3.3 Service Bays Required for Hotel/Motel Development

Where a development requires the provision of off-street waste removal services, the development shall provide off-street parking spaces for the waste vehicles. The requirements for a development to provide off-street waste collection are to be obtained from the DCP.

3.4 Bicycle parking

The number and type of bicycle parking spaces to be provided for a development shall be in accordance with the DCP.

3.5 On-street parking

In some circumstances a development may be required to provide on-street parking facilities. These instances will be either determined by Council, or agreed to by Council upon submission of a proposal by a developer, on a case by case basis.

Child care centre developments may be entitled to claim use on on-street parking in lieu of off-street parking, as outlined in the DCP, and subject to the conditions that are specified in the DCP.

All matters relating to on-street parking are subject to discretion of Council, and may be subject to concurrence from the Rockdale Traffic Committee. The dedication of on-street parking for child care centres is at the discretion of Council, and is subject to concurrence from the Rockdale Traffic Development Advisory Committee.

4 Design of Parking Facilities

Parking facilities, including all areas for parking vehicles as well as manoeuvring areas and access to parking areas, must be designed to be efficient, safe and convenient. Taking account of the characteristics a variety of vehicles described by the Australian Standards (AS2890), the following section describes the method of design of parking facilities.

4.1 Design of off-street car parking

The design of off-street car parking facilities shall be in accordance with the Australian Standard 2890.1, except where varied by this Technical Specification. The variations contained in this Technical Specification are designed to ensure that the objectives of Section 4.6 of the DCP in relation to traffic, access and parking are achieved.

4.1.1 Classification

Off-street car parking shall be classified in accordance with Australian Standard 2890.1, except that user class 1A shall not be used.

4.1.2 Parking modules

Off street car parking modules shall be designed in accordance with Australian Standard 2890.1.

In public car parks, small car spaces shall not exceed 5% of the total public car parking allocation. Small car spaces are not permitted in private car parks for employees, domestic property car parks or residential property car parks.

Where nominated in a State Environmental Planning Policy, the design of the parking spaces shall also comply with that policy, for example *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

4.1.3 Circulation roadways and ramps

Circulation roadways and ramps in car parking facilities shall be designed in accordance with Australian Standard 2890.1, except as follows:

- a. Access driveway and circulation roadway widths less than 5.5m must satisfy the Australian Standard 2890.1 in relation traffic volumes, and in the case of a ramp a Traffic Management System will be required to be implemented in the development to establish a control for priority access on the ramp. Priority should be provided to the vehicle entering the ramp from the nearest frontage roadway, and the system will require automated vehicle detection and signals.
- b. The maximum gradient of straight and curved ramps, in all types of car parks, shall be 1 in 5 (20%). Where a ramp also provides pedestrian access, the maximum gradient of the ramp shall be 1 in 8 (12.5%).

The design of circulation roadways in Multi Dwelling Housing development should avoid straight sections of roadway by providing curved roadways and siting buildings with a staggered effect to create interest. In larger Multi Dwelling Housing developments, the design of circulation roadways should consider the principles of road design as they relate to subdivision of land, and an appropriate road hierarchy should be established within the development.

4.1.4 Domestic driveways

Domestic driveways shall be designed in accordance with Australian Standard 2890.1, except as follows:

- a. The width of a domestic driveway shall be 3.0m minimum, unless the driveway is a curved driveway. Domestic driveway widths less than 3.0m may be permitted provided that the minimum pavement width is not less than 2.4m and clearance is provided to obstructions, as for a circulation roadway or ramp section in Australian Standard 2890.1.
- b. The gradients of a domestic driveway between the frontage roadway and the property boundary, and over a footpath, shall be as determined by Council upon submission of an application for Boundary Levels.
- c. The maximum gradient of a domestic driveway shall be 1 in 5 (20%). Where a driveway also provides for pedestrian access the maximum gradient of the driveway shall be 1 in 8 (12.5%).

4.1.5 Access driveway width, location, and layout

An access driveway is the roadway/driveway extending from the edge of the frontage roadway (typically defined by kerb and gutter) to the property boundary. An access driveway may also be referred to as a footpath crossing or vehicular entrance. A layback or gutter crossing is used in conjunction with an access driveway to allow vehicles to cross the gutter whilst maintaining the drainage function of the frontage roadway.

Access driveways shall be designed in accordance with Australian Standard 2890.1, except as follows:

- a. Access driveway width shall be in accordance with the following:
 - (i) Single unit dwellings (including secondary dwelling developments)

For a property with a single road frontage, vehicle access may be provided by:

- A single access driveway of maximum width 4.5m at the boundary, or
- Two access driveways of maximum width 3m each at the boundary and separated by a minimum of 6m along the kerb (Figure 4.1).
- In all cases the minimum access driveway width is 2.7m.

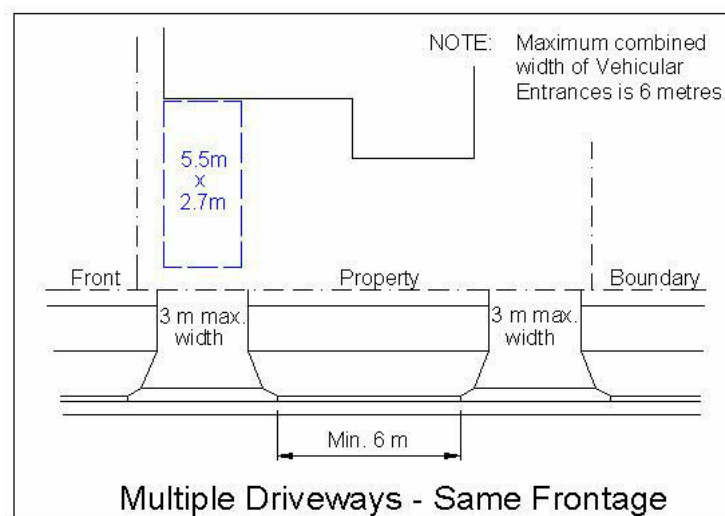


Figure 4.1

For a property with dual road frontage at the corner of two roads, vehicle access may be provided as for a property with a single road frontage and the additional option as follows:

- Two individual access driveways of maximum width 3m each at the boundary and separated by a minimum of 6m along the kerb, with preferably one driveway on each frontage (Figure 4.2).

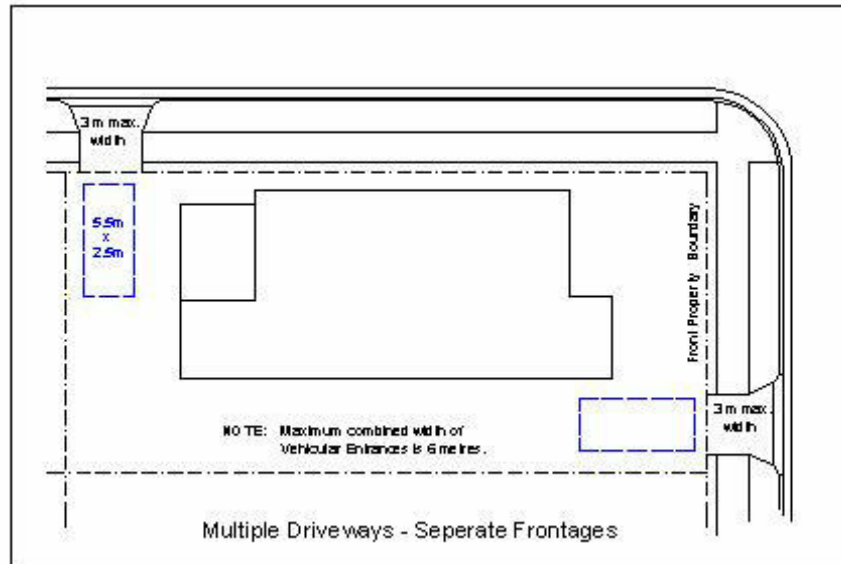


Figure 4.2

For a property with dual road frontage, where one frontage is a road and one frontage is a narrow street, vehicle access may be provided as for a property with a single road frontage and the additional options as follows:

- Two individual access driveways of maximum width 3m each at the boundary, where one access driveways is from the road and one access driveway is from the narrow street, or
- A single access driveway of maximum width 6m at the boundary where the access is from the narrow street only.

(ii) Dual Occupancies

For a property with a single road frontage, vehicle access may be provided by:

- A combined single access driveway of maximum width 5.0m at the boundary, or
- Two individual access driveways of maximum width 3m each at the boundary and separated by a minimum of 6m along the kerb.
- In all cases the minimum access driveway width is 2.7m.

For a property with dual road frontage at the corner of two roads, vehicle access may be provided as for a property with a single road frontage and the additional option as follows:

- Two individual access driveways of maximum width 3m each at the boundary and separated by a minimum of 6m along the kerb, with preferably one driveway on each frontage.

For a property with dual road frontage, where one frontage is a road and one frontage is a narrow street, vehicle access may be provided as for a property with a single road frontage and the additional option as follows:

- Two individual access driveways per dwelling of maximum width 3m each at the boundary, where one access driveway is from the road and one access driveway is from the narrow street, or
- A single access driveway per dwelling of maximum width 6m at the boundary where the access is from the narrow street only.

(iii) Multi Dwelling Housing Development

For a property with a single road frontage, vehicle access may be provided by:

- A single access driveway of maximum width 3.5m at the boundary, or
- Two individual access driveways of maximum width 3m each at the boundary and separated by a minimum of 6m along the kerb.
- In all cases the minimum access driveway width is 3.0m.
- Larger access driveway widths, in accordance with the Australian Standard 2890.1, may be permitted for developments that have driveway movements in excess of 30 vehicle trips per hour in the peak hour, or a connecting roadway in excess of 30m, or restrictions to sight distance.

For a property with dual road frontage at the corner of two roads, vehicle access may be provided as for a property with a single road frontage and the additional option as follows:

- Two individual access driveways of maximum width 3m each at the boundary and separated by a minimum of 6m along the kerb, being a maximum of one driveway per road frontage.

For a property with dual road frontage, where one frontage is a road and one frontage is a narrow street, access may be provided as for a property with a single frontage, but access is to be restricted to either the road frontage or the narrow street frontage only.

(iv) Residential Flat Buildings

For property with a frontage less than 30m, access may be provided by a single access driveway of minimum width of 2.7m and maximum width of 4.5m at the boundary.

For property with a frontage greater than 30m, access may be provided by two single access driveways of maximum combined widths of 6m at the boundary and separated by a minimum 6m of kerb.

Requests for greater access driveway widths for larger developments shall be considered on their merit.

(v) Mixed Use Developments (including residential)

The access driveway design for a mixed development shall be in accordance with Australian Standard 2890.1, and in the case of an access driveway that provides access for commercial vehicles, the design shall also be in accordance with the requirements of Section 4.4.

(vi) Commercial Development

The access driveway design for commercial development shall be in accordance with Australian Standard 2890.1, and in the case of an access driveway that provides access for commercial vehicles, the design shall also be in accordance with the requirements of Section 4.4.

(vii) Industrial Development

The access driveway design for industrial development shall be in accordance with Australian Standard 2890.1, and in the case of an access driveway that provides access for commercial vehicles, the design shall also be in accordance with the requirements of Section 4.4.

(viii) Child Care Centres

For a property with a single road frontage, or a property with dual road frontage at the corner of two roads, access may be provided by:

- A single access driveway of maximum width 6.0m at the boundary, or
- Two individual access driveways of maximum width 3m each at the boundary and separated by a minimum of 6m along the kerb if on the same frontage, or one driveway per road frontage.

For a property with dual road frontage, where one frontage is a road and one frontage is a narrow street, access shall be provided so that access is gained from the road only, and vehicular exit may be to the road or narrow street.

- b. In addition to the access driveway location requirements of the DCP (i.e. restrictions on access to Classified Roads), access driveway location shall be in accordance with the Australian Standard 2890.1. Driveway access is not permitted within any area designated as a *prohibited location*, as identified in Australian Standard 2890.1. When an application for development is lodged and the continuation of use of an access driveway that is located within a *prohibited location* is proposed, the request for re-use is subject to a determination by Council, and dependant upon the following:
- (i) Whether access would be physically impossible if use of the driveway in the *prohibited location* was denied, or the driveway is a domestic driveway that is excluded from a prohibition by the Australian Standard;
 - (ii) The sight distances available for vehicles and pedestrians;
 - (iii) The volume of traffic using the driveway;
 - (iv) The off-site conditions of the road environment.

Where Council considers that the request for re-use of the driveway in a prohibited location is not acceptable, the development must be designed in accordance with Australian Standard 2890.1.

- c. Sight lines for pedestrians at domestic driveways shall be in accordance with the following:
- (i) For a domestic property driveway a 0.9m x 0.9m triangle shall be provided with no obstruction greater than 1.0m above boundary level.
 - (ii) For a residential property driveway a 0.9m x 0.9m triangle shall be provided with no obstruction above boundary level.

- (iii) For a public car park driveway, or private car park driveway to property other than domestic or residential property, a 2.0m x 2.5m triangle shall be provided with no obstruction above boundary level.
- d. The layout of the access driveway should attempt to minimise the hard stand area whilst permitting a functional design. The vehicular entrance layout shall be perpendicular to the line of the kerb and gutter. The layback component needs to function as part of the gutter for adequate drainage whilst permitting vehicles to pass across it.

The access driveway layout may include 500mm splays on either side of the crossing, between the path and the layback. The layback shall be 450mm wide with 450mm wings. The typical access driveway layout is shown in Figure 4.3.

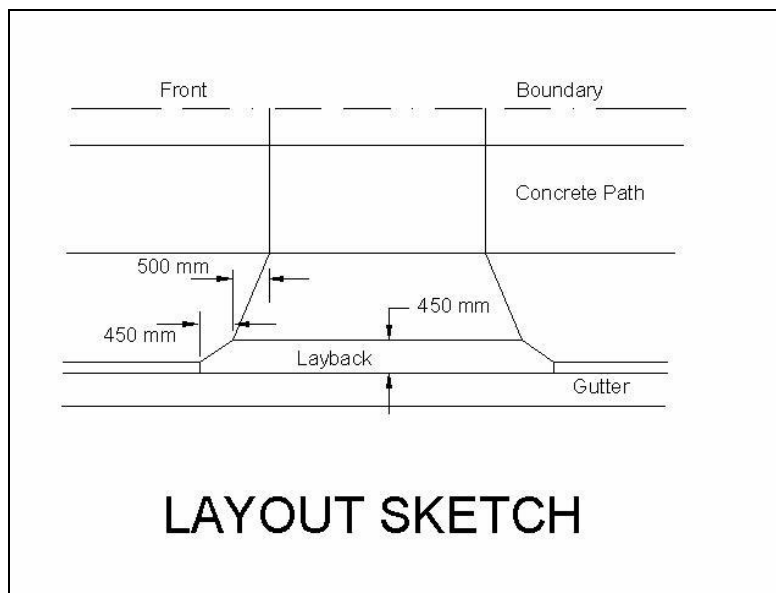


Figure 4.3 – Layout of an access driveway

- e. The footpath or footway area between the front property boundary and the kerb contains assets owned by Council and other parties. At times, an access driveway may be proposed adjacent to an asset or in a conflicting location with an asset, thus requiring relocation or modification of such an asset. However, Council may not allow relocation or modification of its assets, for example modification of extended kerb inlet lintels. Other assets may be owned by other authorities or public utilities. Access driveways shall be located with clearances to objects as follows:
- (i) Trees:
- An access driveway shall not be located closer than 1.2m to a tree trunk or within the canopy drip line, whichever is greater. For trees that are listed as Heritage Items the location of the driveway shall be determined by a Heritage Impact Statement.
 - Applications that require the removal of an existing mature tree will need to be referred to Council. Council's Tree Preservation Officer will determine whether the tree can be removed or must be preserved.
 - The layout of an access driveway adjacent to an existing tree may only be modified by removing the splay. No further modification will be permitted.
 - If approval is obtained for removal of the tree, the cost shall be borne by the applicant. Payment will be required prior to commencement of work.

- (ii) Drainage structures:
 - Where a proposed access driveway impacts a drainage structure, the matter will be referred to Council for determination. All determinations are at Council's discretion, and must consider the local drainage requirements.
 - If approval is obtained for relocation or alteration to the drainage structure, the cost shall be borne by the applicant. Payment will be required prior to commencement of work by Council.
 - Certain types of drainage structures can not be modified, or can only be modified with significant difficulty or cost, and in such cases modification will not be permitted, for example extended kerb inlet lintels.
- (iii) Traffic Facilities
 - Where a proposed access driveway impacts a traffic stem and sign, the matter will be referred to Council for determination. All determinations are at Council's discretion and must consider the local traffic management requirements.
 - If approval is obtained for relocation of the stem and sign, the cost shall be borne by the applicant. Payment will be required prior to commencement of work by Council.
 - Where a proposed access driveway conflicts with a traffic facility, other than a traffic stem or sign, the access driveway proposal will be required to be amended, since modification of the traffic facility is generally not permitted.
- (iv) Redundant Access Driveways
 - Where an application for an access driveway involves relocation of an existing access driveway, the existing access driveway shall be made redundant and converted to normal footpath area i.e. Removal of the layback and replacement with kerb and gutter, including removal of all concrete, and replacement of turf.
- (v) External Authority and Utility Installations
 - Utility pits, manholes, overhead cabling poles, etc, are assets that are owned and managed by external authorities.
 - Where an application for an access driveway conflicts with a utility pit, manhole or overhead cabling pole, the asset must be relocated to a position outside of the access driveway. The minimum clear distance is shall be 0.5m.
 - In the case of pits and manholes only, Council may accept an official exemption from the relevant authority, or their authorised representative, stating that they do not object to their asset being located within the access driveway. This exemption does not apply to overhead cabling poles, such as electricity and telecommunication poles.

4.1.6 Gradients of access driveways

Maximum gradients on and near access driveways, other than domestic driveways, shall be in accordance with Australian Standard 2890.1, except as follows:

- a. The gradients of an access driveway between the frontage roadway and the property boundary, and over a footpath, shall be as determined by Council upon submission of an application for Boundary Levels.

4.1.7 Queuing areas

The design of queuing areas shall be in accordance with Australian Standard 2890.1.

4.1.8 Access to mechanical parking installations

Access to mechanical parking installations shall be in accordance with Australian Standard 2890.1.

4.1.9 Use of mechanical parking installations

Mechanical parking installations include car stackers, car lifts, car turntables and any other device that relies on a mechanical system to move, lift, lower or rotate a car.

Mechanical parking installations may be used in parking facilities servicing the following types of parking:

- a. Parking for domestic property.
- b. Parking for residential property, except parking for visitors.

Mechanical parking installations may not be used in public car parks, or for publicly available car spaces within car parks that are primarily for private use. Council also discourages the use of mechanical systems in private car parks for employees, since the use of mechanical systems in these instances can lead to unfavourable queuing issues.

Council requires all mechanical parking installations to be covered by a positive covenant to ensure the ongoing maintenance and long term viability of the installation.

4.1.10 Design of enclosed garages

An enclosed garage may be either a structure erected within another parking structure or a stand alone structure, such as a garage on a domestic property.

For right angle access to a garage the required width of apron for manoeuvring purposes shall be in accordance with the Australian Standard AS2890.1 and shall be increased by 0.6m to ensure adequate manoeuvring.

Where an enclosed garage has a frontage to a narrow street or laneway the apron width shall take account of the lawful ability of a vehicle to park on-street opposite the garage, and therefore obstruct the vehicle swept path.

4.1.11 Stack parking

Stack parking may be used in the following types of developments:

- a. Residential development, if the car spaces are owned or allocated to the same owner or occupant and there is a maximum of two (2) car parking spaces in line.
- b. Automotive development (e.g. vehicle body repair workshop, and vehicle repair station), if the parking available for visitors or customers of the development are the unobstructed parking spaces and there is a maximum of two (2) car parking spaces in line.
- c. Office premises and sex services premises, if the parking available for visitors or customers of the premises are the unobstructed parking spaces and there is a maximum of two (2) car parking spaces in line.

4.2 Parking for people with a disability

The design of parking spaces for people with a disability shall be in accordance with the provisions of the *Building Code of Australia* *.

Where nominated in a State Environmental Planning Policy, the design of the parking spaces for people with a disability shall also comply with that policy, for example *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004*.

* - At the time of preparation of this Technical Specification the reference standard adopted by the *Building Code of Australia* for the design of parking for people with a disability is AS2890.1:1993. However, the requirements of AS/NZS 2890.6 are expected to be adopted by the Building Code of Australia in the future. AS/NZS 2890.6 was published by Standards Australia on 22 October 2009.

4.2.1 Stack parking

Stack parking may be not used for parking for people with a disability.

4.3 Design of off-street parking for commercial vehicles

The design of off-street parking facilities for commercial vehicles, including loading bays and associated manoeuvring areas, shall be in accordance with the Australian Standard 2890.2, except where varied by this Technical Specification. The variations contained in this Technical Specification are designed to ensure that the objectives of Section 4.6 of the DCP in relation to traffic, access and parking are achieved.

4.3.1 Design vehicles

The design of off-street parking facilities shall be based on the types of vehicles defined by Table 4.1 and the design vehicle dimensions, including clearance height, listed in Table 4.2.

Design Vehicle	Description
VAN	A 99.8 th percentile vehicle equivalent to the Council's large car.
SRV	Small Rigid Vehicle. The SRV represents light trucks, and large vans exceeding the 99.8 th percentile vehicle dimensions (such as Mercedes Sprinter, Ford Transit, etc), to a maximum load capacity of 4.0 tonnes, and typically having a single rear axle and either single or dual tyres.
MRV	Medium Rigid Vehicle. The MRV represents the common service truck having a load capacity of 8 tonnes, and typically having a single rear axle and dual tyres.
LRV	Large Rigid Vehicle. The LRV represents the maximum dimensions of a single unit truck (specialist vehicles excepted), and typically has a load capacity of 12 tonnes. The class also includes 4-axle twin-steer vehicles with a typical load capacity of 16 tonnes.
RCV	Industrial Refuse Collection Vehicle.
AV	19m Articulated Vehicle. The AV is the largest vehicle for which under normal circumstances, a service facility would need to be designed.

Table 4.1 Definitions for design commercial vehicles

Vehicle Class	Overall Length	Design Width	Clearance Height
VAN	5.4	2.1	2.3
SRV	6.4	2.3	3.5
MRV	8.8	2.5	4.5
LRV	12.5	2.5	4.5
RCV	10.5	2.5	4.5m*
AV	19.0	2.5	4.5

Table 4.2 Design vehicle dimensions and clearance height
*6.4m height required for waste collection area to enable tipping of bins

4.3.2 Dimensions of loading bays

The minimum dimensions for loading bays shall be in accordance with Table 4.3.

Vehicle Class	Bay Width (m)	Bay Length (m)
VAN	3.00	5.40
SRV	3.50	7.00
MRV	3.50	9.00
LRV	3.50	11.00
RCV	3.50	10.50
AV	3.50	17.00

Table 4.3 Design dimensions for loading bays

Ambulance bays shall meet the minimum requirements specified by the Ambulance Service of NSW. Requirements for Ambulance bays may be obtained from the published website of the Ambulance Service of NSW.

4.3.3 Design considerations

In addition to providing a sufficient number of servicing bays for the above needs, it is important that servicing areas are well located. If goods/refuse have to be trolleyed significant distances, or man-handled within service areas, this can affect the turnover time and hence the average number of bays in use at any one time.

Design guidelines have been developed by Council to assist developers with appropriately guiding the design of their sites with respect to servicing and loading. Council's *Technical Specification for Waste Management* and the 'Better Practice Guide for Waste Management in Multi-Unit Dwellings'(DECC, February 2008) provide information for how waste servicing can be incorporated into varying types of development sites.

Other design considerations are as follows:

- a. If access is to be provided from a major road or retail street then ALL service vehicles must:
 - (i) Enter and leave the site in a forward direction;
 - (ii) Traverse the site on circulation roads/aisles to access service areas; and
 - (iii) Manoeuvre on-site to allow parking and loading/unloading in a designated service area, without affecting the operations of the parking area.
- b. If the access is to be provided from a minor street then MRV/LRV/AV service vehicles as a minimum must:
 - (i) Be able to stand wholly contained within the site without occupying any designated queue areas, or blocking access to more than 50% of car parking spaces;
 - (ii) Any on-street manoeuvring can be limited to reversing on or off the site in one movement only; and
 - (iii) For low traffic generating developments (less than 20 vehicles per hour) the swept path of the design vehicle may cover the overall width of a two-way undivided driveway.
- c. If access is to be provided from a minor street then VAN/SRV service vehicles must:

- (i) Enter and leave the site in a forward direction;
 - (ii) Traverse the site on circulation roads/aisles to access service areas; and
 - (iii) Manoeuvre on-site to allow parking and loading/unloading in a designated service area, without affecting the operations of the parking area.
- d. For low traffic generating sites (less than 20 vehicles per hour) with access provided from a minor street, VAN/SRV service vehicles as a minimum must:
 - (i) Be able to stand wholly contained within the site without occupying any designated queue areas, or blocking access to more than 50% of car parking spaces;
 - (ii) Any on-street manoeuvring can be limited to reversing on or off the site in one movement only; and
 - (iii) The swept path of the design vehicle may cover the overall width of a two-way undivided driveway.
- e. Where site access is to be provided for vehicles that occasionally service the site as part of its normal operation, then the following access provisions is required for a RCV/LRV (Waste Collection/Furniture Removal Van) service vehicle:
 - (i) The vehicle can stand wholly contained within the site, with minimal impacts on car park operations;
 - (ii) Reverse manoeuvres are limited to one only, either to or from the site; and
 - (iii) The swept path of the vehicle does not have a greater overall width than the access driveway.

For the design of Ambulance bays, the design considerations are as follows:

- a. The following factors must be given prime consideration in the design of an ambulance entry.
 - (i) Ambulance driveways should be exclusive to ambulance vehicles;
 - (ii) Entrance driveways should indicate entrance restrictions and Ambulance parking restrictions with a clear directory sign, which may read, “AMBULANCE ENTRY” or “AMBULANCE ONLY”. In some locations the sign may need to be illuminated; and
 - (iii) Surfaces to driveways should be smooth but non slip and be without uncovered drainage gutters or speed humps.
- b. Turning circles and clearances to kerbs, existing buildings or other obstructions are for the current largest size of ambulance vehicle which requires a minimum turning circle of 15 metres.
- c. The canopy over the entrance is to be large enough to provide ample cover for two paramedics to unload the patient from the rear of the vehicle.
- d. The surface beneath the canopy should be level and non-slip and ideally at the same level as the entrance to the building. Canopies must be clear of the vehicle turning circles and the stretcher handling area.
- e. The height of the canopy from finished paved area to the underside should be 3.5 metres (3.2 metres to the underside of any beam). These dimensions are required to accommodate roof mounted radio aerials.

Further information may be obtained from the published website of the Ambulance Service of NSW.

4.3.4 Gradients

The maximum allowable gradients and rates of grade change on circulation roadways used by commercial vehicles shall be in accordance with Australian Standard AS2890.2.

For access driveways used by commercial vehicles, the gradients between the frontage roadway and the property line, and over a footpath, shall be as determined by Council upon submission of an application for Boundary Levels.

Where access driveways and circulation roadways are used by cars and commercial vehicles the maximum gradient and rates of gradient change provisions of Australian Standard AS2890.2 shall prevail.

4.3.5 Mechanical systems

The use of turntables to enable the entry and exit of service vehicles in a forward direction is not a recommended approach by Council. The use of turntables should be seen as an absolute 'last resort' to resolving access issues within constrained sites.

4.3.6 Stack parking

Stack parking may not be used for commercial vehicle parking.

4.4 Design of bicycle parking facilities

The design of bicycle parking facilities shall be in accordance with Australian Standard AS2890.3.

In consideration of the security and surveillance arrangements of typical bicycle parking locations, the classification of bicycle parking facilities for various localities in a range of development types shall be in accordance with Table 4.4.

Development Type and Location	Classification
Residential Flat Building	
<i>Basement</i>	1 or 2
<i>Ground Level</i>	1 or 2
Business and other non-residential	
<i>Basement</i>	1
<i>Ground level (internal)</i>	1 or 2
<i>Ground level (external)</i>	3

Table 4.4 Bicycle parking facilities for various localities and development types

Facilities for class 3 shall be racks and stands that meet the requirements of the Australian Standard.

4.5 Design of on-street parking facilities

The design of on-street parking facilities shall be in accordance with Australian Standard AS2890.5. However, the design of on-street parking facilities must also consider the requirements of Council's AUS-SPEC, which outlines the criteria for geometric road design, pavement design, subsurface drainage design, stormwater drainage design, and cycleway and pathway design.

Where applicable, on-street parking will also be required to comply with published Technical Directions of the NSW Roads and Traffic Authority. Where a development is required to provide on-street parking, the design approval of the on-street parking will require the concurrence of the Rockdale Traffic Committee.

5 Pavement Design

Pavements for parking facilities, including areas for parking vehicles as well as manoeuvring areas and access to parking areas, must provide a stable surface of adequate design life that will meet the intended traffic volumes and traffic loads. Pavements must also be able to withstand the effects of stormwater runoff. The following section describes the methods of designing pavements.

Where a development is a mixed use development containing residential, the pavement shall be designed using the requirements for non-residential pavements, unless the development provides separate parking and access facilities for cars and commercial vehicles.

The types of pavement available can be classified as follows:

- Rigid – concrete slab base, with or without reinforcement.
- Flexible – granular material base (bound/unbound), with a surface asphaltic concrete.
- Pavers – concrete slab or granular material base, with a surface of pavers (concrete or clay).

Flexible pavements may only be used in commercial or industrial developments, for parking facilities excluding the access driveway(s). In such cases the surfacing material shall be asphaltic concrete only. Sprayed bituminous surfacing, and other surfacing materials, shall not be used.

The use of exposed aggregate finishes is not permitted in any situation.

5.1 Residential pavements

In residential developments the pavement is expected to carry light traffic only, predominately cars. Traffic volumes increase as density of the development increases.

Low numbers of commercial vehicles are expected in low density residential, but the frequency and size of commercial vehicles is expected to increase with the increase in density.

5.1.1 Access driveways

The pavements for access driveways in residential developments shall, as a minimum, be in accordance with Table 5.1.

5.1.2 Other areas

The pavements for other areas, such as circulation roadways and ramps, parking modules and manoeuvring areas, shall be the same as the minimum standard for a residential access driveway. Alternatively, the pavement may be designed in accordance with Australian Standard AS3727.

	Single Dwelling	Dual Occupancy	Multi Dwelling Housing	Residential Flat Building
Concrete				
Type	Normal Duty	Normal Duty	Heavy Duty	Heavy Duty
Concrete strength	25 MPa	25 MPa	25 MPa	25 MPa
Thickness	125 mm	125mm	150 mm	150 mm
Reinforcement	F72	F72	F82	F82
Finish	Plain or faux brick only	Plain or faux brick only	Plain or faux brick only	Plain or faux brick only
Segmental Pavers				
Type	Normal Duty	Normal Duty	Heavy Duty	Heavy Duty
Paver thickness	80 mm	80 mm	80 mm	80 mm
Paver sub-base	100 mm compacted FCR; or 100 mm, 20 MPa concrete	100 mm compacted FCR; or 100 mm, 20 MPa concrete	100 mm compacted FCR; or 100 mm, 20 MPa concrete	100 mm compacted FCR; or 100 mm, 20 MPa concrete

Table 5.1 Pavement specifications for a residential access driveway

5.2 Other pavements

In non-residential developments the pavement is expected to carry a range of traffic volumes, arising from both cars and commercial vehicles. Volumes may be significant as well as the size and frequency of commercial vehicles.

5.2.1 Access driveways

The pavements for access driveways in non-residential developments shall, as a minimum, be in accordance with Table 5.2.

	Commercial	Industrial
Concrete		
Type	Heavy Duty	Heavy Duty
Concrete strength	25 MPa	25 MPa
Thickness	150 mm	150 mm
Reinforcement	F82	F82
Finish	Plain or faux brick only	Plain or faux brick only
Segmental Pavers		
Type	Heavy Duty	Heavy Duty
Paver thickness	80 mm	80 mm
Paver sub-base	100 mm compacted FCR; or 100 mm, 20 MPa concrete	100 mm compacted FCR; or 100 mm, 20 MPa concrete

Table 5.2 Pavement specifications for a non-residential access driveway

5.2.2 Other areas

The pavements for other areas, such as circulation roadways and ramps, parking modules and manoeuvring areas, shall be the same as the minimum standard for a non-residential access driveway. Alternatively, the pavement may be designed in accordance with a suitable published standard or design guide, such as the *Austroads Guide to Pavement Technology – Part 2: Pavement Structural Design*, *Pavement Design for Light Traffic: A Supplement to Austroads Pavement Design Guide* or the Cement Concrete Association's *Guide to Industrial Floors and Pavements*.

6 Other Design Considerations

Parking facilities require well coordinated signage, lighting, security and travel paths to direct pedestrians between the parking facility and the associated building, as well as the provision of adequate landscaping and drainage facilities.

6.1 Pedestrians

To ensure the safety of pedestrians using parking facilities, there should be separation between pedestrian paths and vehicles, including bicycles. In particular, parking facilities providing for commercial vehicles shall provide a physical barrier to prevent unauthorised access into the commercial vehicle area.

Pedestrian crossings on circulation roadways and parking aisles should be minimised, but where necessary shall be at right angles to the traffic flow. The parking facility design must ensure that pedestrians are not required to use vehicular ramps. Driveways for a domestic property are exempted from this requirement, but the maximum gradient of a driveway providing pedestrian access is 1 in 8 (12.5%).

The parking facility design must consider the requirements of pedestrians in accordance with the requirements of Australian Standard AS2890.1.

6.2 Signage

Signs shall be provided in the parking facility to direct pedestrians and ensure their safety against all hazards, as well as directing, informing and controlling traffic. All directional, informative and regulatory signs shall be in accordance with Australian Standard 2890.1, Australian Standard 2890.3, and in the case of on-street parking facilities Australian Standard 2890.5.

6.3 Drainage

The drainage of pavements in parking facilities is an important issue to consider. Poor drainage can cause pavement deterioration and failure. It can also detract from the pedestrian use of the facility.

Minimum gradients are required to ensure that parking facilities drain adequately, and these gradients are specified in Table 6.1.

	Rigid Pavements	Flexible Pavements	Pavers
Covered	1%	2%	2%
Uncovered	0.5%	1%	1%

Table 6.1 Minimum gradients for drainage

All parking facilities are also required to provide drainage to collect and discharge runoff to prevent ponding and flooding, due to construction of impervious surfaces. The design of surface stormwater drainage systems shall be carried out in accordance with the Council's *Technical Specification for Stormwater Management*.

6.4 Lighting

Parking facilities, and all associated pedestrian and circulation areas, shall be designed with lighting in accordance with the lighting standards specified by the Australian Standard 2890.1.

6.5 Landscaping

Parking facilities shall be landscaped in accordance with the Council's *Technical Specification for Landscaping*.

The design of landscaping within parking facilities and adjacent to access driveways must ensure that required sight distances and clearance envelopes are achieved. Sight distance assessments and clearance envelopes must be based on the mature state of trees and shrubs.

Landscape design shall also ensure that required clearances around parking spaces are maintained.

7 Design Documentation for Parking Facilities

This section sets out the minimum documentation standards for the design of parking facilities. In most cases the design plans for a parking facility may be prepared by an architect. However the advice of a suitably qualified professional, such as a Traffic Engineer, may be required in relation to particular documents.

7.1 Plans

Plans are the principle document in the design of a parking facility, and indicate most of the features of the parking facility.

Plans for the design of parking areas shall include:

- Geometric layout of the parking facility, identifying all access driveways, circulation roadways, control points, parking aisles, parking spaces, queuing areas, ramps, roads and other features that comprise a parking facility.
- Dimensions of all features where they derive from numerical standards set by this Technical Specification or Australian Standards AS2890.
- Details of the classification of parking for cars.

7.2 Swept path analysis

Swept path analysis is required in most instances to assess the adequacy of the parking facility design. The analysis may be undertaken using swept path templates, or swept path diagrams from a recognised computer program.

The objective of the analysis is to ascertain whether design vehicles achieve the minimum clearances when manoeuvring in a parking facility.

Swept path analysis should be undertaken by a suitably qualified professional, such as a Traffic Engineer.

7.2.1 Swept path templates

For the assessment of off-street parking facilities the templates from Australian Standard AS2890.1 and Australian Standard AS2890.2 shall be used to assess the adequacy of the design of the facility.

In assessing the adequacy of the design the clearances from Australian Standard AS2890.1 and Australian Standard AS2890.2 shall be applied.

For the movement of vehicles to and from a frontage roadway, in connection with a parking facility the templates from Austroads *Design Vehicles and Turning Path Templates* shall be used.

7.2.2 Swept path diagrams

Swept path diagrams may be used in the place of swept path templates to assess the adequacy of design of parking facilities. Where a swept path diagram is used, the diagram must be produced by a recognised computer program, and must be plotted onto a design plan of the facility.

Swept path diagrams for off-street car parking facilities shall be based on:

- a. The base vehicle dimensions for the B99 and B85 cars as defined by Australian Standard AS2890.1.
- b. A minimum turn radius of 6.3m for the B99 car and a minimum turn radius of 5.8m for the B85.
- c. Swept path clearances in accordance with Australian Standard AS2890.1.

Swept path diagrams for off-street parking facilities used by commercial vehicles shall be based on:

- a. The design vehicle dimensions specified in Section 4.3.1 of this Technical Specification.
- b. The wheel base, design turning radius and swept circle dimensions from Australian Standard AS2890.2.
- c. Manoeuvring clearances in accordance with Australian Standard AS2890.2.

For the movement of vehicles to and from a frontage roadway, in connection with a parking facility the swept path diagrams shall be prepared using the base data from Austroads *Design Vehicles and Turning Path Templates*.

7.3 Sections

The preparation of sections allows for gradients in the parking facility to be assessed. Gradients are critical to the suitability of access, where maximum gradients can prevent vehicle access, and also where minimum gradients can affect the drainage.

7.3.1 Longitudinal sections

Longitudinal sections are required for all circulation roadways, ramps and access driveways where there are changes in gradient requiring consideration of relevant provisions of the Australian Standard AS2890, e.g. in the case of parking facilities for cars, this requires longitudinal sections for changes in gradient exceeding 12.5%.

All longitudinal sections are to be drawn to a scale that enables graphical checking of ground clearances using the templates from the Australian Standard AS2890, e.g. in the case of parking facilities for cars, this requires longitudinal sections at a scale of 1 to 25.

In the case of ground clearance checking for commercial vehicles, the longsection will be required to plot the commercial vehicle clearance using the ground clearance data from Australian Standard AS2890.2.

Sections relating to access driveways must extend in the frontage roadway to enable checking of ground clearance at the movement across the layback or gutter crossing. It must also be acknowledged that any longitudinal section prepared in relation to an access driveway for a development will not be final until such time as Boundary Levels are issued by Council for the property.

7.3.2 Cross sections

Cross sections shall be provided where a design proposes superelevation of a circulation roadway or ramp, particularly in the cases of curved roadways or ramps. Cross sections shall also be provided where a design proposes cross fall in a roadway, or where there is an integration of

roadway and drainage facilities, such as drainage swales or drainage channels. Cross sections should be prepared at an appropriate scale, e.g. 1 to 20.

7.4 Details

Details may be included on the plans as required for the design of such elements as follows:

- Kerbs;
- Pedestrian ramps;
- Pavements;
- Signs;
- Linemarking; and
- Traffic management facilities.

7.5 Specifications

A detailed specification for the construction of parking facilities, including the installation of all signs and linemarking, should be developed to ensure that the completed facilities achieve the intended design.

Construction specifications are available from Council for various work elements related to the construction of parking facilities, based on AUS-SPEC.

The potential for variations, in particular to the design dimensions, must be minimised, so that facilities are able to adequately cater for the design vehicle. Variations that reduce the available clearances for the design vehicle can lead to decreased efficiency, and ultimately affect the function and amenity of the parking facility.

7.6 Shared parking registers

In mixed use premises the peak parking demand for the various uses may not always correspond, and in such cases a reduction in the number of parking spaces in the facility can provide for a more efficient parking facility. The DCP identifies the conditions that apply to shared parking concessions. The method of determining whether a shared parking concession applies is to prepare a Shared Parking Register.

An example of the Shared Parking Register is included in Appendix A.

8 Definitions

Access Driveway has the same meaning as AS2890.1.

Domestic Driveway has the same meaning as AS2890.1

Domestic Property has the same meaning as AS2890.1, and generally a Dwelling House, a Dwelling House with a Secondary Dwelling, and a Dual Occupancy are each considered to be a Domestic Property.

Narrow Street means a street where the distance measured from boundary to boundary is 12.2 m or less.

Residential Property has the same meaning as AS2890.1, and generally a Residential Property is property other than a Dwelling House, a Dwelling House with a Secondary Dwelling, and a Dual Occupancy.

Stack Parking means two or more parking spaces that are provided in line, one vehicle behind another, and occupancy of the parking space nearest the parking aisle or driveway obstructs access to the other space or spaces.

