

**TABLE 1.1**  
**CLASSIFICATION OF OFF-STREET CAR PARKING FACILITIES**

User class	Required door opening	Required aisle width	Examples of uses (Note 1)
1	Front door, first stop	Minimum for single manoeuvre entry and exit	Employee and commuter parking (generally, all-day parking)
1A	Front door, first stop	Three-point turn entry and exit into 90° parking spaces only, otherwise as for User Class 1	Residential, domestic and employee parking
2	Full opening, all doors	Minimum for single manoeuvre entry and exit	Long-term city and town centre parking, sports facilities, entertainment centres, hotels, motels, airport visitors (generally medium-term parking)
3	Full opening, all doors	Minimum for single manoeuvre entry and exit	Short-term city and town centre parking, parking stations, hospital and medical centres
3A	Full opening, all doors	Additional allowance above minimum single manoeuvre width to facilitate entry and exit	Short term, high turnover parking at shopping centres
4	Size requirements are specified in AS/NZS 2890.6 (Note 2)		Parking for people with disabilities

NOTES:

- 1 Except for the requirements specified in Clause 1.4 relating to User Classes 1A and 4, the examples of uses are intended to be flexible and allow for progressive improvement both in the ease of manoeuvring into and out of parking spaces, and in leaving and re-entering the vehicle as one progresses up the user class scale from 1 to 3A. The modelling of vehicle manoeuvring into Class 1A spaces shows however, that many drivers may have difficulty driving into and out of such spaces, especially those with vehicles larger than the B85 vehicle. Furthermore, they may have difficulty entering and leaving the vehicle in the narrower spaces. Safety issues associated with delays and congestion caused by manoeuvres into and out of Class 1A spaces in large parking areas should also be taken into account. See also Appendix B, Paragraph B4.8.
- 2 In preparation, see footnote to Clause 1.2.

## SECTION 3 ACCESS FACILITIES TO OFF-STREET PARKING AREAS AND QUEUING AREAS

### 3.1 GENERAL

#### 3.1.1 Access design principles

All accesses to off-street car parks from frontage roads shall be formed in such a way as to be clearly recognized by road users as *either* an access driveway *or* as an intersection.

For access driveways, kerbs and footpaths shall be continuous through the junction with the frontage road. The appearance and character of the driveway shall be such that it will be clear to vehicle drivers that pedestrians and frontage road traffic have priority of movement.

If intended as an intersection, the entry and exit shall be designed as if for a public roadway, with all necessary traffic control devices and intersection geometric design requirements.

Category 5 facilities in Table 3.1 shall be provided as intersections. Category 3 and 4 facilities may also be considered for provision as intersections.

NOTE: Guidance on capacity provision at entry and exits at large car parks is given in Appendix D.

Where the frontage road is two-way and has more than two lanes, any provision for right turns, either into or out of an access driveway, shall be subject to special design.

#### 3.1.2 Categories of access facilities

To determine the access facility type and for access driveways, widths and restrictions on their location along frontage roads, this Section categorizes accesses according to—

- (a) the class of parking facility as shown in Table 1.1;
- (b) the frontage road type, either arterial (including sub-arterial) or local (including collector); and
- (c) the number of parking spaces served by the access facility.

These categories are set out in Table 3.1.

### 3.2 ACCESS DRIVEWAYS—WIDTH AND LOCATION

#### 3.2.1 Access driveway widths

Except as specified in Clause 3.2.2, where traffic flow data on an access driveway is either known or can be determined by separate means more accurately than by use of the categories in Table 3.1, such data may be used to determine driveway widths by accepted design procedures. In the absence of such data the widths given in Table 3.2 shall be used.

Access driveways may require widening where they meet the frontage roadway to allow turning movements from the kerbside lane without adversely affecting traffic flows in the frontage roadway.

Where separate entry and exit roadways are provided, they shall be at least 1 m apart.

**TABLE 3.1**  
**SELECTION OF ACCESS FACILITY CATEGORY**

Class of parking facility (see Table 1.1)	Frontage road type	Access facility category				
		Number of parking spaces (Note 1)				
		<25	25 to 100	101 to 300	301 to 600	>600
1.1A	Arterial	1	2	3	4	5
	Local	1	1	2	3	4
2	Arterial	2	2	3	4	5
	Local	1	2	3	4	4
3.3A	Arterial	2	3	4	4	5
	Local	1	2	3	4	4

NOTES:

- 1 When a car park has multiple access points, each access should be designed for the number of parking spaces effectively served by that access.
- 2 This Table does not imply that certain types of development are necessarily suitable for location on any particular frontage road type. In particular, access to arterial roads should be limited as far as practicable, and in some circumstances it may be preferable to allow left-turn-only movements into and out of the access driveway.

**TABLE 3.2**  
**ACCESS DRIVEWAY WIDTHS**

metres			
Category	Entry width	Exit width	Separation of driveways
1	3.0 to 5.5	(Combined) (see Note)	N/A
2	6.0 to 9.0	(Combined) (see Note)	N/A
3	6.0	4.0 to 6.0	1 to 3
4	6.0 to 8.0	6.0 to 8.0	1 to 3
5	To be provided as an intersection, not an access driveway, see Clause 3.1.1.		

NOTE: Driveways are normally combined, but if separate, both entry and exit widths should be 3.0 m min.

### 3.2.2 Width requirements at low volume (Category 1) access driveways and connecting roadways

Where the circulation roadway leading from a Category 1 access driveway is 30 m or longer, or sight distance from one end to the other is restricted, and the frontage road is an arterial or sub-arterial road, both the access driveway and the circulation roadway for at least the first 6 m from the property boundary shall be a minimum of 5.5 m wide. In other cases subject to consideration of traffic volumes on a case-by-case basis, lesser widths, down to a minimum of 3.0 m at a domestic property, may be provided. As a guide, 30 or more movements in a peak hour (in and out combined) would usually require provision for two vehicles to pass on the driveway, i.e. a minimum width of 5.5 m. On long driveways, passing opportunities should be provided at least every 30 m.

Reversing movements to public roads shall be prohibited wherever possible.

### 3.2.3 Access driveway location

To keep conflicts between frontage road traffic and car park traffic to an acceptable minimum, the following requirements and recommendations apply:

- (a) *Driveway Categories 1 and 2* At unsignalized intersections of sub-arterial, collector or local streets with each other or with an arterial road, access driveways in Categories 1 and 2 (see Table 3.1) shall not be located in the sections of kerb shown by heavy lines in Figure 3.1. This requirement shall not apply to accesses to domestic driveways in the kerb section opposite the entering road at any intersection including signalized intersections. Furthermore, it shall not apply to any access driveway serving a property which would otherwise be denied access due to the physical impossibility of meeting the requirement.

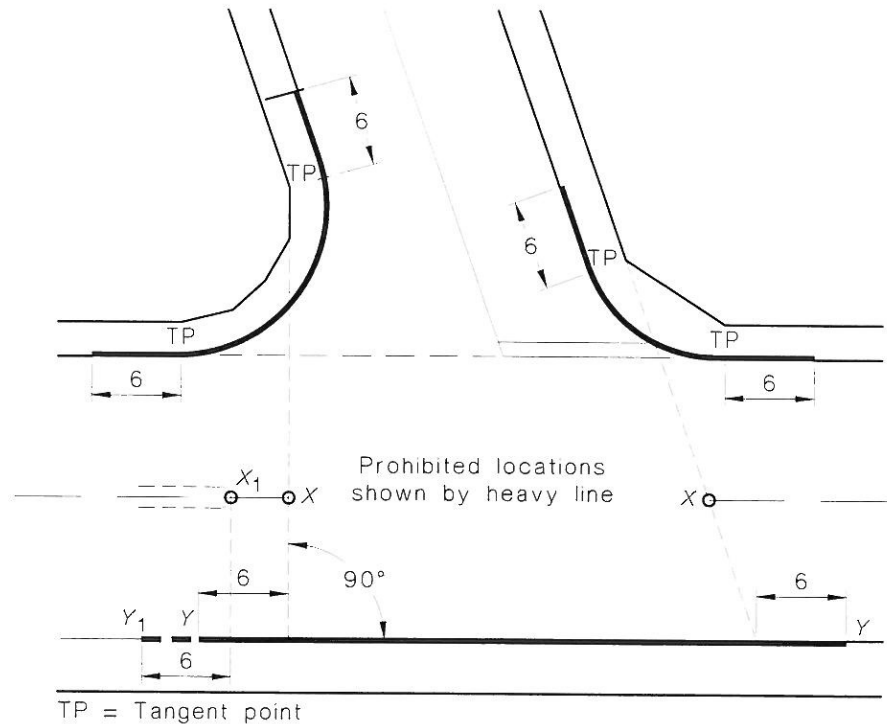
At signalized intersections, the minimum distance from the intersection, measured from the property boundary along both legs, shall be increased as necessary to locate access driveways beyond the influence of normal queue lengths at the intersections. If this is not practicable, it may be necessary to provide—

- (i) an arrangement which confines traffic to turning left when either entering or leaving the car park;
  - (ii) a signalized driveway with signals coordinated with the intersection signals; or
  - (iii) other traffic management means of providing for safe and efficient operation of the driveway.
- (b) *Driveway Categories 3 and 4* Driveways in categories 3 and 4 (see Table 3.1) shall not be located—
- (i) on arterial roads unless entrances and exits are designed and constructed as intersection treatments catering adequately for all projected traffic flows;
  - (ii) closer to intersections than permitted for Category 1 and 2 driveways (see Item (a));
  - (iii) opposite other developments generating a large amount of traffic, unless all projected traffic flows are provided for in a properly designed and constructed intersection treatment, including the installation of signals if necessary;
  - (iv) where there is a heavy and constant pedestrian movement along the footpath, unless this can be adequately catered for by some form of positive control, e.g. traffic signals;
  - (v) where right turning traffic entering the facility would obstruct through traffic; or
  - (vi) where traffic using the driveways will interfere or block the operations of bus stops, taxi ranks, loading zones or pedestrian crossings.

NOTE: In these instances, it may be appropriate to move the bus stop or other facility, if this would result in the best overall design.

Entry for left turning vehicles into driveways in Categories 3 and 4 should be gained by the first vehicular driveway reached, and by using the kerbside lane.

NOTE: Guidance on capacity provision at entry and exits at large car parks is given at Appendix D.



## NOTES:

- 1 Accesses to domestic driveways are excluded from the prohibition in respect of the kerb section marked Y-Y (see Clause 3.2.3(a)).
- 2 The points marked  $X_1$  and  $X$  are respectively at the median end on a divided road and at the intersection of the main road centre-line and the extensions of the side road property lines shown as dotted lines, on an undivided road. On a divided road, dimension Y-Y extends to Point  $Y_1$ .

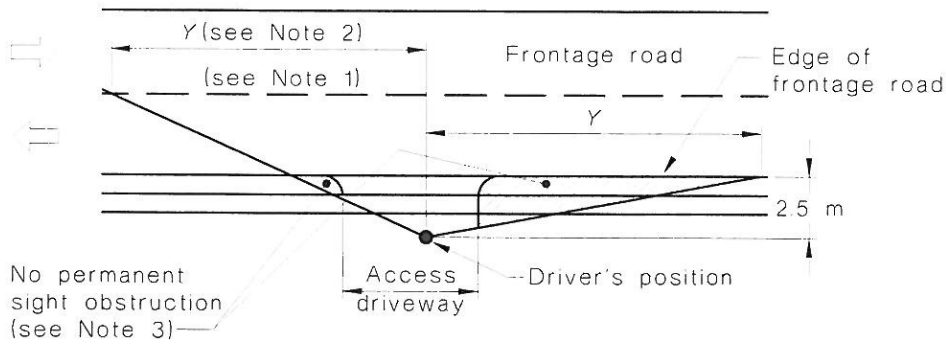
DIMENSIONS IN METRES

FIGURE 3.1 PROHIBITED LOCATIONS OF ACCESS DRIVEWAYS

**3.2.4 Sight distance at access driveway exits**

Access driveways need to be located and constructed so that there is adequate entering sight distance to traffic on the frontage road and sight distance to pedestrians on the frontage road footpath for traffic entering the frontage road, as follows:

- (a) *Entering sight distance* Unsignalized access driveways shall be located so that the intersection sight distance along the frontage road available to drivers leaving the car park or domestic driveway is at least that shown in Figure 3.2.
- (b) *Sight distance to pedestrians* Clear sight lines as shown in Figure 3.3 shall be provided at the property line to ensure adequate visibility between vehicles leaving the car park and pedestrians on the frontage road footpath.



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2 <sup>nd</sup> and 3 <sup>rd</sup> columns
100	139	160	
110	153	190	

NOTES:

- Centre-line or centre of road (undivided road), or right hand edge of right hand through lane (divided road).
- A check to the left is not required at a divided road where the median is wide enough to shelter a vehicle leaving the driveway.
- Parking on this side of the frontage road may need to be restricted on either side of the driveway so that the sight distance required by the above table to an approaching vehicle is not obstructed.
- This is the posted or general speed limit unless the 85th percentile speed is more than 5 km/h above the limit in which case the tabulated speed nearest the 85<sup>th</sup> percentile shall be adopted.
- The values in the table apply only to left turn and right turn manoeuvres into two-way roads up to four lanes wide and one-way streets regardless of width, either for a 5 s gap, desirable at lower frontage road speeds, or minimum stopping sight distance based on 2 s reaction time.  
Crossing manoeuvres (e.g. from an access opposite the stem of a T-junction) over four lanes or more, and turning manoeuvres into a six lane two-way road would require longer gaps unless there was a median wide enough to store a vehicle and allow a two stage manoeuvre.
- These distances are based on stopping sight distances with reaction time of 1.5 s for traffic approaching along the frontage road and are applicable to a frontage road speed of up to 80 km/h only. Wherever practicable sight distance provided at domestic property accesses should meet the values given in the second or third columns of the Table.
- When checking sight distance the driver's eye height and the height of the object (approaching vehicle) are to be taken as 1.15 m above the road surface.

FIGURE 3.2 SIGHT DISTANCE REQUIREMENTS AT ACCESS DRIVEWAYS

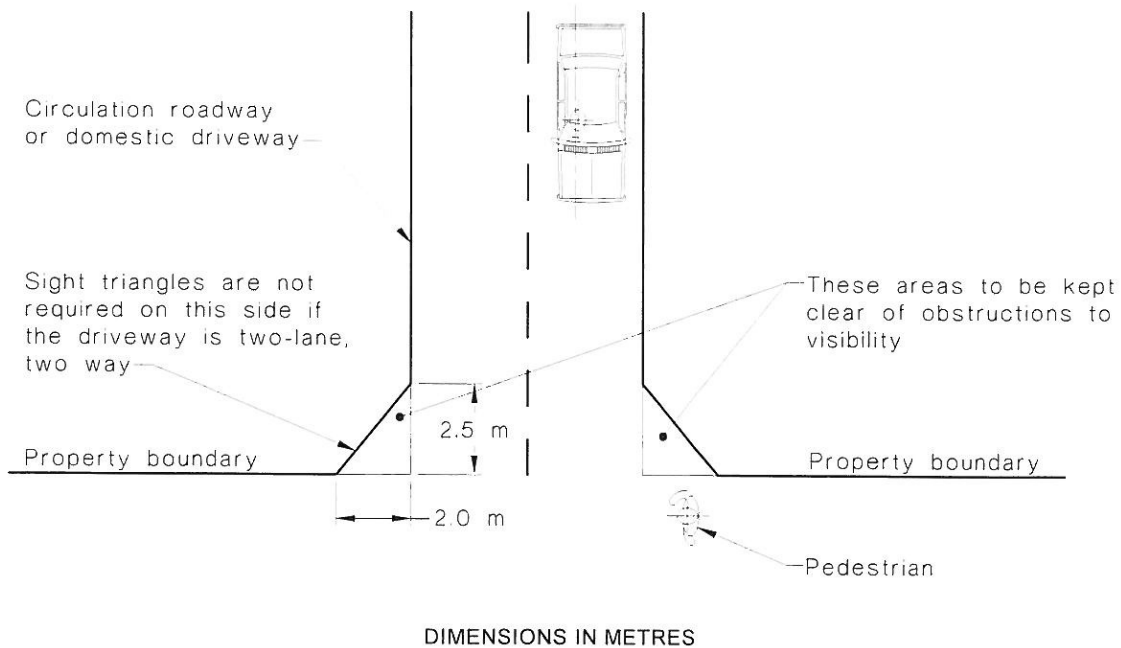


FIGURE 3.3 MINIMUM SIGHT LINES FOR PEDESTRIAN SAFETY

### 3.3 GRADIENTS OF ACCESS DRIVEWAYS

At entry and exit points, the access driveway should be graded to minimize problems associated with crossing the footpath and entering the traffic in the frontage road.

Maximum gradients on and near access driveways, other than at domestic properties (see Clause 2.6), shall be as follows:

- (a) *Property line/building alignment/pedestrian path*—max. 1 in 20 (5%) between edge of frontage road and the property line, building alignment or pedestrian path (except as provided in Item (d)), and for at least the first 6 m into the car park (except as provided below).

The grade of the first 6 m into the car park may be increased to 1 in 8 (12.5%) under the following conditions:

- (i) The grade is a downgrade for traffic leaving the property and entering the frontage road.
- (ii) The user class is Class 1, 1A or 2 only.
- (iii) The maximum car park size is—
  - (1) for entry into an arterial road—25 car spaces, or
  - (2) for entry onto a local road—100 car spaces.

The maximum grade across the property line shall remain at 1 in 20 (5%).

- (b) *Vehicular control points*—max. 1 in 20 (5%) for at least 6 m prior to the control point.
- (c) *Queuing area*—max. 1 in 10 (10%) for not less than 0.8 of the queue length determined in Table 3.3.
- (d) *Across footpaths*—where the driveway crosses a footpath, the driveway grade shall be 1 in 40 (2.5%) or less across the footpath over a lateral distance of at least 1.0 m.

NOTE: The advice of the relevant regulatory authority should be sought to obtain grade requirements for footpaths.

- (e) For ramps and circulation roadways at locations other than in Items (a) to (d), see Clause 2.5.3.
- (f) For domestic driveways, see Clause 2.6.

### 3.4 QUEUING AREAS

At an entry point, the queuing area to be provided between the vehicular control point and the property boundary shall be sufficient to allow a free influx of traffic which will not adversely affect traffic or pedestrian flows in the frontage road. No parking space manoeuvres shall be allowed to take place within the queuing area.

The size of the queuing area may be determined from consideration of the following:

- (a) Traffic volume in surrounding streets.
- (b) The number of parking spaces in the car park.
- (c) Anticipated peak entry/exit flow.
- (d) Rate of entry/exit at control points.
- (e) Hourly parking accumulation and turnover.
- (f) Freedom of movement beyond the control point.

In the absence of more specific guidance, the size of the queuing area shall be calculated from Table 3.3, for a car park with boom gates and ticket issuing devices at entry points, and based on the proposed size of the parking station and anticipated peak hourly inflow of traffic.

**TABLE 3.3**  
**MINIMUM QUEUING LENGTH AT A CAR PARK WITH**  
**CONTROL POINTS AT ENTRANCES**

Capacity of car park (Note 1)	Peak hourly in-flow of traffic	
	Up to 75% of capacity (Note 2)	More than 75% of capacity (Note 3)
Not more than 100 cars	The greater of a minimum of 2 cars or 3% of capacity	The greater of a minimum of 2 cars or 4% of capacity
More than 100 cars	1st 100 cars: 3% of capacity 2nd 100 cars: 2% of capacity Additional cars: 1% of capacity A minimum queuing length of 3 cars/lane	1st 100 cars: 4% of capacity 2nd 100 cars: 2% of capacity Additional cars: 1.5% of capacity A minimum queuing length of 3 cars/lane

NOTES:

- 1 Equal to the total number of parking spaces served by the entrance (proportioned where several entrances service a common parking area).
- 2 Generally casual (short-staying) and mixed patronage.
- 3 Tidal traffic typical of car parking for a special event.

The number of cars calculated from Table 3.3 shall be rounded up to the next whole number and a length of 6.0 m per vehicle allowed for in each lane.

In addition, the following shall be observed:

- (i) The queuing area in car parks using attendant parking shall be at least twice as large as that given in Table 3.3.
- (ii) An adjoining breakdown lane/strip 2.0 m wide shall be provided on one side of a single queuing lane.



- (iii) Multiple queuing lanes shall be a minimum 2.7 m wide each.
- (iv) Queuing areas in a multiple entry car park shall be based on the expected volume of traffic served by each entry point.

### **3.5 ACCESS TO MECHANICAL PARKING INSTALLATIONS**

Access to mechanical parking installations such as car stackers, shall be by means of access driveways and circulation roadways designed in accordance with this Standard, and providing sufficient vehicle storage to ensure that queues of vehicles awaiting service by the installation do not extend beyond the property boundary of the parking facility under normally foreseeable conditions.

When determining the amount of vehicle storage required, queue lengths shall be calculated by applying conventional queuing theory to estimated mean arrival rates during normal peak periods, and mean service rates under continuous demand, determined as closely as possible from observing the operation of similar facilities. The storage area shall be designed to accommodate the 98th percentile queue under such conditions. The queue lengths given in Table 3.3, shall not be used in this case.