

DESIGN STANDARDS
for
URBAN INFRASTRUCTURE
5 DRIVE WAYS



5 DRIVEWAYS

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5.1 Introduction

5.1.1 Purpose

This design standard sets out the requirements for all classes of driveways to be constructed on ACT Government land. It does not include standards for vehicular movement areas within the boundaries of a block.

In designing driveways, the primary consideration must be the safety of the driveway user as well as the safety of other users including pedestrians, cyclists and traffic on the road from which access is being gained. The designer should also aim to minimise the impact on the streetscape consistent with that safety.

The Standards specified in this document have been found over many years of application to meet the above criteria in almost all cases in the ACT. It is acknowledged however, that in some circumstances, other solutions may perform equally well or better. In such cases, the proposed designs may be acceptable to the ACT Government provided that the designers are able to demonstrate that the performance criteria are met.

5.1.2 Definitions

Block (or Allotment or Lot) means a parcel of land, whether or not the subject of a *lease*.

Commercial Driveway is a driveway to a business site.

Domestic driveway has the same meaning as in AS2890.1; namely a driveway serving from 1 to 3 dwelling units.

Driveway is defined as a path intended for the purpose of allowing vehicular movement from the through carriageway of a road or street to a block.

Heavy Duty Driveway is a commercial driveway or a residential driveway other than a domestic driveway.

Property Line means the street frontage of an allotment and defines the boundary between public and private property.

Residential driveway means a driveway serving a property whose prime purpose is residential. It may be either domestic or heavy-duty depending on the type of residential development.

Road means any public thoroughfare whose primary purpose is the conveyance of vehicular traffic.

Services (or Utilities) means Service Authority systems which provide customers with electricity, natural gas telecommunications, water and sewerage.

Street means any street, lane, square, court, alley etc, whose primary purpose is providing access to residential buildings.

Verge means that part of the street reserve between the carriageway and the boundary of adjacent lots (or other limit to street reserve). It may accommodate public utilities, footpaths, stormwater flows, street lighting poles and planting.

5.2 Related codes of practice and guidelines

5.2.1 Policies and Guidelines

ACT Code for Residential Development (ACTCODE) – Department of Urban Services.

Procedure for Conversion of Standard Stormwater sump cover to Trafficable cover – ACT Roads and Stormwater.

5.2.2 Industry standards

Guide to traffic engineering practice part 11 - Parking - AUSTRROADS.

AS 2890.1-1993 Parking facilities - Off-street car parking - Standards Australia.

AS 2890.2-1989 Off-street parking - Commercial vehicle facilities - Standards Australia.

AS 3727-1993 Guide to residential pavements - Standards Association of Australia.

A Guide to the Design of New Pavements for Light Traffic – A Supplement to Austroads Pavement Design – APRG Report 21.

5.3 General Principles

5.3.1 Function

The primary function of any driveway is to transfer vehicles from the public road system to a site but driveways have to serve other purposes which designers must bear in mind when drawing up plans.

Many driveways will also act as the point of entry to the site for pedestrians and cyclists who may find difficulty in climbing grades that are simple for motor vehicles. This is of particular concern in the case of residential driveways that may be used by lessees to transfer garbage and recycling bins from the property to the collection point.

5.3.2 Design Issues

Driveways should be designed for the most common vehicle which will be using them and then checked against all other vehicles which may use them to ensure that those vehicles can do so without causing damage to the driveway or to other assets. It is permissible however to adopt a lower level of service for the less frequent use.

For example a driveway to a large multi unit site should be designed to allow two normal passenger cars to pass on the paving. However the truck carrying out the weekly on site collection of garbage or recyclables could be allowed to use the whole width of driveway blocking access to other users for the short time it is on the site. Driveways to car parks for office complexes are similar whereas the driveway to a transport depot would need to be wide enough to allow two trucks to pass.

Driveways should be designed to allow vehicles to enter the site by turning at low speed from the traffic lane nearest the site without intruding into other traffic lanes. The driveway should be of sufficient width to allow two vehicles to pass so that queuing on the public road is not necessary.

5.4 Materials and Pavement Design

Although a variety of materials may be used to construct vehicular driveways, the government and utility authorities (water, sewerage, electricity, communications, gas, etc) will not match non-standard finishes when repairing damage. Only the basic concrete and asphalt finishes can be maintained due to the inability of the government and utility authorities to hold a stockpile of every different paver and tile on the market, the need for licensing to install most proprietary finishes, and the higher cost of special finishes. If a leaseholder chooses to use a product other than concrete or asphaltic concrete, the cost to

reinstate that finish (if reinstatement is possible) must be borne by the lessee. Note also that any minor repairs may be carried out using asphaltic concrete regardless of the original construction material.

In line with current Australian Standards, the minimum strength of concrete to be used for any class of driveway is to be Grade 32 (32 Mpa).

Designers and contractors should bear in mind the fact that services trenches in verges may not have received as much compaction as they need to carry the weight of vehicles and should specify and carry out extra compaction over those trenches as required.

5.4.1 Residential

Residential Driveway Pavements should be designed using *AS 3727-1993 Guide to Residential Pavements*, which covers concrete, asphalt, bitumen sprayed seal and block (segmental) pavers.

Driveways serving from one to three residences can be designed as “light” pavements whereas driveways for multiple unit sites which serve four or more units are considered “medium.”

Note that the quality criterion for pavers is minimum breaking load. For all driveways designed to use segmental pavers, the Medium Traffic criteria should be used for paver selection. This specifies a minimum breaking load of 5kN.

Concrete pavements for domestic driveways should be a minimum of 100mm thick Grade 32 concrete on a 75mm layer of compacted sub-base. For other residential driveways, the minimum Grade 32 concrete thickness that will be accepted is 150 mm reinforced with F82 mesh at 50mm top cover.

5.4.2 Commercial

Commercial driveways should be designed using the *Guide to the Design of New Pavements for Light Traffic* for the appropriate traffic conditions on the site.

The minimum acceptable concrete pavement for a driveway to a commercial site is 150mm thick Grade 32 concrete reinforced with F82 mesh at 50mm top cover on a 75mm layer of compacted sub-base.

5.5 Dimensions and Grades

5.5.1 Deviation from Right Angle to Kerb

The centreline of the driveway is to form a right angle (90 degrees) with the kerb. In certain circumstances a slight deviation of up to 1 in 10 from the right angle may be acceptable. Generally, larger deviations will not be considered for the following reasons:

- Larger angles in the direction of traffic flow can allow excessive speed and endanger pedestrians.
- If vehicles have to turn more sharply than 90 degrees, the chance of missing the driveway and tracking across landscaped areas is increased.
- It can become difficult for drivers entering a traffic stream to see oncoming traffic if angles are too acute.

For driveways intended for two-way traffic, the centreline is the line drawn between the midpoint of the property line edge of the driveway to the midpoint of the kerbline edge of the

driveway. For one-way driveways, which are only splayed on one edge, the centreline is considered to be parallel to the unsplayed edge.

5.5.2 Splay

Driveways should generally be wider at the kerblines than at the property line to allow for the circular path of a turning vehicle. In the interests of minimising the effect on the streetscape of suburban areas, this requirement does not apply to domestic driveways which may be permitted to have parallel sides. If the driveway is splayed, the minimum taper length across the verge should be 4 metres or the width of the verge whichever is smaller.

Note that driveways intended for one way use only should only be splayed on one side. This not only tends to make the one way system self-enforcing but also minimises the amount of paving needed. The appropriate sides for the splays are on the left turn in side and the left turn out side.

5.5.3 Dimensions for Domestic Driveways

The following table sets out the dimensions for driveways serving from one to three dwelling units.

Driveway Application	Minimum width at property boundary	Maximum width at property boundary	Minimum width at kerb line	Maximum width at kerb line
Single Dwelling Unit	2.9 metres	5.5 metres	5.0 metres	5.5 metres
Two or three dwelling units with provision to turn around inside the property so that exit is in a forward direction.	3.5 metres	5.5 metres	5.0 metres	5.5 metres
Two or three dwelling units with no provision to turn around inside the property so that exit is usually in a reverse direction.	5.5 metres	5.5 metres	5.5 metres	5.5 metres

5.5.4 Dimensions for Heavy Duty Driveways

As stated in Section 5.3.2, heavy duty driveways should be designed on a case by case basis however the dimensions shown on drawing number DS5-02 can be adopted in most cases. Designers should be able to justify their selection of a particular size and shape of driveway even if they use the dimensions shown on the standard drawings.

5.5.5 Gradients of Driveways

In determining the longitudinal grade of the driveway, designers may use either the ACT Standard Car as depicted in Figure 5.1 below or the D99 car template from the current version of AS 2890.1 to ensure no scraping on new driveways.

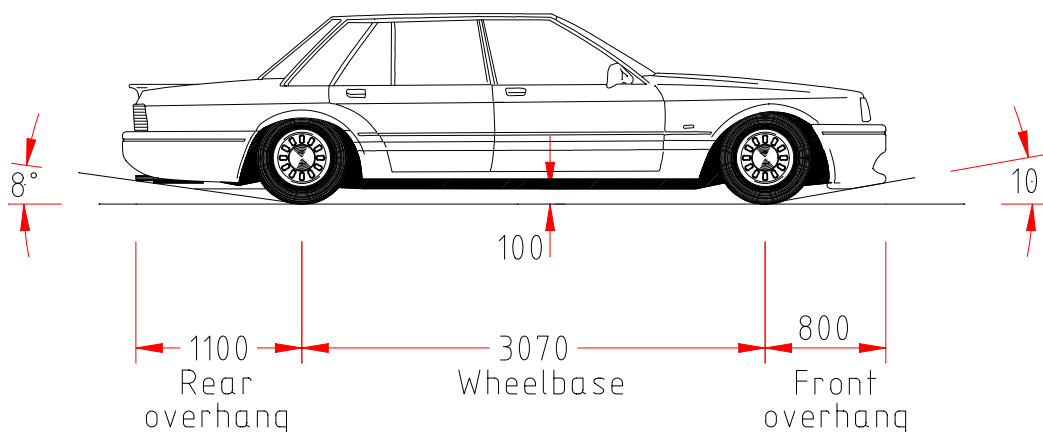


Figure 5.1 – ACT Standard car for New Driveway Design

For reconstruction in existing areas or for areas where verge crossfalls are near the maximum and slopes in the block are steeper, the vehicle template depicted in Figure 5.2 may be used only with the approval of Roads ACT.

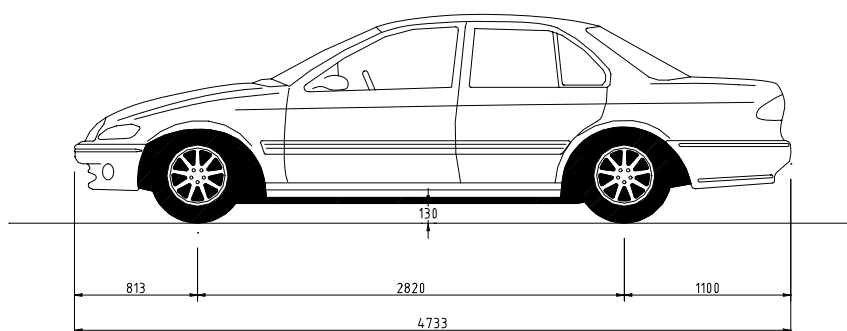


Figure 5.2 – ACT Standard car for Driveway Reconstruction

(subject to Roads ACT approval)

Driveway designers should be mindful of the fact that even if there is no paved footpath in a street, the verge will be used for pedestrian movement along the street. Driveways must provide for this movement by incorporating a section at least 1.2 metres wide for the full width of the driveway which slopes towards the road at no more than 2%. Appropriate easements will be needed to ensure that vehicles do not scrape when traversing this area. In all cases where paved footpaths do not exist, designers should seek advice from either the land

developer in new estates or from the ACT Government in established areas for the location of possible future footpaths.

Please note that in most cases it will be necessary to ease the grade when connecting to existing footpaths (whether or not the footpath requires reconstruction for structural reasons) in order to avoid scraping the underside of the vehicle.

5.6 Restriction on Location

It should be noted that all services will not necessarily be in place at the time a driveway is being designed. It is therefore essential for designers, builders and lessees to check with the relevant authorities to obtain the necessary information about future services, landscaping and paths. Failure to obtain this information may result in additional costs to the lessee if there is a need to relocate services. Any necessary relocation or alteration to services approved by the relevant authority will be carried out at the lessee's expense.

5.6.1 Existing Kerb Crossings

Kerb crossings are constructed across formed (upright) kerbs and are usually laid before land is available for leasing. Normally, they are located on the low side of a block near one of the side boundaries. The lessee is responsible for ensuring that the layout of internal vehicular movement areas will permit the construction of a driveway, which aligns with the existing kerb crossing.

The ACT Government may consider requests to relocate existing kerb crossings or for additional kerb crossings to be constructed provided Lease and Development Conditions do not prohibit this. However the lessee must meet all the costs of these changes including the cost of closing any unused existing crossings as well as the cost modifying or relocating any engineering services or landscape features which would be affected by these changes.

5.6.2 Distance from Street Intersections

For corner blocks at unsignalised intersections the edge of driveway closest to the intersection should be constructed at least 6 metres from the kerb tangent point. Designers should consult Section 3.2.3 of AS 2890.1 for guidance near signalised intersections.

5.6.3 Trees

Driveways must be located at least 3 metres from the outside of the trunk of any existing street trees. This is necessary to prevent damage to the roots of existing trees and to minimise the chance of future damage to the driveway by tree roots.

If there is an existing driveway within 3 metres of a street tree then the minimum clearance to a new driveway on the opposite side of the tree shall be 5 metres to the outside of the trunk.

In some established areas with mature trees, an even larger distance may be necessary depending on the species.

In some newer areas where trees have only recently been planted (generally less than twelve months old), driveways may be permitted closer to trees to a minimum of 1.2 metres from the outside of the trunk. However it will be necessary to provide root barriers along the edge of the driveway over the distance where the clearance to the tree is less than 3 metres. Designers can refer to *Design Standard 23 – Plant Species for Use in Urban Landscaping* for more guidance on the use of root barriers.

5.6.4 Other Above Ground Obstructions

Clearance is required from above ground obstructions in order to minimise the chance of damage to both the vehicle using the driveway and to the obstruction itself. Clearance is also necessary to allow passengers to leave a stationary vehicle without injuring themselves or damaging either the vehicle or the obstruction. It is essential therefore that designers identify the location of all obstructions in the verge area including: streetlight or power poles, pad-mount substations, mini-pillars, traffic or street signs, bus stops or shelters, bollards or fences, above ground fire hydrants, fire hydrant markers, or other road furniture.

A minimum clearance of 1.2 metres is required from all obstructions except for ACTEW substations where a minimum clearance of 1.5 metres is required. This distance is measured from the nearest outer edge of the obstruction to the edge of driveway by the shortest possible route.

5.6.5 Stormwater Sumps

A minimum clearance of 1.2 metres is required from the edge of the driveway to the concrete surround of a stormwater sump. This is to ensure that vehicles are not damaged by the sharp drop into the gutter at the edge of the sump and also to ensure that the sump lids are not subject to damage by inadvertent trafficking by vehicles.

On a road bounded by a layback kerb where the 1.2 metre clearance cannot be achieved, it may be possible to convert the roadside stormwater sump cover to allow light motor vehicles to cross the sump to gain access to a single residential dwelling.

The sump will require relocation rather than conversion if any of the following conditions apply.

- The road is bounded by other than layback kerb.
- The driveway serves more than a single residence.
- The driveway serves a commercial or industrial site.
- The conversion reduces inlet capacity and is likely to increase local flooding.
- The conversion has an adverse effect on the public at large, neighbouring leases, traffic or government assets.

In some cases, it may not be possible to either convert or relocate the sump due to adverse effects on the function of the stormwater system. In this case the driveway must be relocated.

Designers should note that any conversion or relocation of sumps must be carried out at the lessee's expense and that in most cases it is preferable to relocate the driveway.

5.6.6 Other Underground Services

Driveways are to be located so that they are clear of underground services owned by ACTEW Corporation, in accordance with ACTEW Water Supply & Sewerage Standards. This includes water and sewer connections (from the main to the property line), valves, hydrants, or sewer manholes.

Where driveways cross ACTEW water and sewer mains, they should be designed so as not to decrease cover over the main thereby imposing additional traffic loading, or built in such a manner as to structurally 'span' the pipe trench. If this is not complied with, ACTEW Corporation may incur additional costs in accessing these services for repairs and maintenance. Details of any change in cover or structural spanning of the trench are to be approved by ACTEW.

It may be necessary in some cases to re-locate services at the lessee's cost. Designers, builders and lessees should consult with ACTEW Corporation beforehand.

If the driveway, or its continuation inside the block, is proposed to be constructed near or in an ACTEW easement, then designers, builders and lessees should submit an *Application to Infringe an ACTEW Easement* for approval by ACTEW Corporation.

The following general principles are followed with respect to driveways near or on ACTEW water or sewerage pipes or their registered easements:

- ACTEW access structures (manholes etc) must not be buried, hidden or made difficult to find.
- ACTEW construction and maintenance crews must have sufficient room to be able to dig up, repair, replace or install new pipes in the future, using contemporary and safe work practices.
- Transit along an easement is not to be blocked.
- Special conditions may be required by ACTEW to be added to the land title in the form of an *Easement in Gross*.

5.7 Summary

Performance Criteria	Acceptable Standard
<p>SAFETY</p> <ul style="list-style-type: none"> • Vehicles or pedestrians will not slip in wet or frosty conditions • Clear view of traffic on road when exiting driveway 	<ul style="list-style-type: none"> • Maximum gradient 17% • Slip resistant surface • Maximum 1 in 10 skew • Minimum 6m from intersection tangent point
<p>TRAFFICABILITY & FUNCTIONALITY</p> <ul style="list-style-type: none"> • Vehicle wheel path fully within driveway (vehicle body may overhang driveway foot print) • Sufficient clearance to obstructions to accommodate driver error • Able to fully open doors and alight from vehicle • Vehicles don't scrape when passing over • Water will not flow from the road into the lease • Doesn't pond water • Driveway will not be damaged by or cause damage to roots from established trees 	<ul style="list-style-type: none"> • Minimum driveway foot print as per standard drawing • Minimum 1.2m clearance to obstructions (1.5m to electrical transformer) • Minimum 1.2m clearance to obstructions • Long section of driveway compatible with ACT 95% Standard Car Template • Ease as per standard drawings • Driveway must rise above the kerb at 2% slope for a distance of 1.5 metres when the road crossfall slopes towards the block. • Minimum slope in any direction of 1%. • CUPP to be consulted where trees have a trunk diameter above 200mm (established trees)
<p>STRUCTURAL COMPETENCE</p> <ul style="list-style-type: none"> • Driveway will support rigid truck without failing • -Driveway will not subside as a result of being located over poorly compacted base 	<ul style="list-style-type: none"> • Constructed in accordance with standard drawings and/ or AS3727 • No evidence of cracking, subsidence or steps after a minimum service life of 2 years • survived fully loaded rigid truck test loading
<p>OTHER ISSUES</p> <ul style="list-style-type: none"> • Taking out the garbage bin and other pedestrian access • Proper provision for footpath • Maintenance of Streetscape • Low maintenance expenditure requirement 	<ul style="list-style-type: none"> • Maximum gradient 17% • Slip resistant surface • 2% gradient at path location • Maximum 5.5m driveway width (domestic) • Width as per standard drawings (heavy duty) • concrete or AC construction (sprayed seal driveways have high maintenance costs) • Maximum 5.5m driveway width (domestic) • Width as per standard drawings (heavy duty)

5.8 Driveway Design Checklist

The following check list and information will help you locate and design your driveway construction or modification.

Location

1. Do Lease and Development Conditions place restrictions on Driveway location?
 YES No
2. If YES, does the proposed Driveway comply?
 YES No
3. Is this a corner block?
 YES No
4. If YES, is the proposed Driveway at least 6 metres clear of Tangent Point?
 YES No

Trees

5. Are there mature trees in the verge?
 YES No
6. If YES, is the edge proposed Driveway at least 3 m clear of the outside of the trunk?
 YES No
7. If No, has Canberra Urban Parks and Places advised that a smaller distance is permissible?
 YES No
8. Are there immature trees in the verge?
 YES No
9. If YES, is the edge of the proposed Driveway at least 3 m clear of the outside of the trunk?
 YES No
10. If No to question 9, is the edge of the proposed Driveway at least 1.2 m clear of the outside of the trunk and have root barriers been specified next to the driveway?
 YES No

Sumps

11. Are there any stormwater sumps in the vicinity?
 YES No
12. If YES, is the edge of the proposed Driveway at least 1.2 m clear of the concrete surround?
 YES No
13. If No for Question 12, has Roads ACT approved conversion of the sump?
 YES No

Obstructions

14. Are there any streetlight poles, power poles, mini-pillars, traffic or street signs, bus stops or shelters, bollards or fences, fire hydrants or markers, or other road furniture in the verge in front of this block or an adjacent block?
 YES No
15. If YES, is the edge of the proposed Driveway at least 1.2 m clear of the obstruction?
 YES No
16. Are there any s pad-mount substations in the verge in front of this block or an adjacent block?
 YES No
17. If YES, is the edge of the proposed Driveway at least 1.5 m clear of the substation?
 YES No

Dimensions and Grades

18. Is the driveway at a right angle to the kerb line?
 YES No
19. If NO is the deviation from right angle less than 1:10?
 YES No
20. Are there any existing footpaths or is it intended (by ACT Government, Estate Developer or site developer) to construct footpaths adjacent to the block?
 YES No
21. If yes, are proposed driveway levels compatible with the path?
 YES No
22. Are dimensions and Grades in accordance with Standard Drawings?
 YES No
23. If no has the design been checked with the templates in AS 2890 for turning and longitudinal travel?
 YES No

Heritage

24. Is the site or the precinct, which contains it a nominated heritage site?
 YES No
25. If YES, has the Heritage Unit approved the location and materials?
 YES No

5.9 Standard drawings

TITLE	No.
Domestic Driveways	DS5-01
Heavy Duty Driveways	DS5-02
Driveway Levels for 1 and 2 Metre Vertical Curves	DS5-03
Road Verges – Verge Gradient	DS4-03