

Version No:	1.0
Responsible Officer/s:	Works Manager
Issued:	6 August 2018
Next Review:	August 2018

1. Purpose

The purpose of this Policy is to set out requirements for construction of infrastructure assets within the Council area.

2. Scope

This Policy applies to all infrastructure assets within the Council area constructed by either Council or developers.

3. Definitions

Carriageway – the constructed road surface that carries traffic. Usually constructed with rubble or crushed rock and may include a bitumen, hotmix or concrete topcoat.

Developer – Any party or individual, undertaking development works related to a development approval.

Swale Drain – An open shallow drain along a roadside, with gently sloped sides and grassed surface capable of being mown with a rider-mower and allowing the soakage and flow of stormwater, usually to a defined stormwater basin or other disposal/management area.

4. General Design and Construction Requirements

Council has adopted an asset hierarchy to enable a structured and uniform approach to the design, construction and maintenance of assets for both “rural” and “township” areas. It should be noted that infrastructure constructed in certain development zones may have specific requirements, however these are specified where applicable.

4.1. General

All roads shall be designed incorporating survey data for levels and appropriate design standards for the type of traffic expected to use the roads on a regular basis. Road designs including all traffic control devices must comply with current Australian Standards, the Code of Technical Requirements for the Legal Use of Traffic Control Devices, and Department for Planning, Transport and Infrastructure’s (DPTI) Pavement Marking and General Sign Installation manuals.

New roads are required to be designed and constructed to join with pavements of existing roads, with any disturbed surfaces being reinstated. Applicants are required to complete the application form “*Authorisation to Alter a Public Road pursuant to Section 221 of the Local Government Act 1999*” to have these changes approved prior to commencement of work.

4.2. Road Reserves

Road reserve widths are required to be generally 20.0 metres. A narrower road reserve, to a minimum of 15.0 metres, will be considered where there is adequate provision for stormwater drainage, access to allotments and roadside batters that are no steeper than 1:6 so as to be readily maintained with a rider mower or similar.

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4.3. Hierarchy/Zone Specific Requirements

(a) *Rural (includes Rural Living Zone)*

Roads will generally be required to be of 9.0 metre wide construction with a 7.0 metre sealed carriageway. Minor roads may be of 8.0 metre construction with a 6.0 metre sealed carriageway. Swale drains along roadsides should be levelled and grassed and able to be safely mown.

(b) *Township (includes Coastal Settlement Zone, Settlement Zone, Residential Zone and Township Zone)*

Generally required to be constructed with a 9.6 metre sealed carriageway, with concrete kerb and channel. Minor roads may be an 8.0 metre carriageway. Footpaths should be levelled and grassed to provide safe pedestrian access.

4.4. Cul-de-sacs and Intersections

All cul-de-sac ends shall be designed to enable a large single unit vehicle, eg a Council garbage truck to undertake a U-turn or three-point turn. Parking shall be restricted within the cul-de-sac where it may affect the turning manoeuvre.

4.5. Property Entrances

All property entrances shall be constructed and sealed to the property boundary. This work should be undertaken in conjunction with the roadworks. Appropriate drainage is to be incorporated in the design of the entrance. This requirement is not retrospective in respect to roads constructed by Council.

4.6. Stages Developments

All infrastructure and services for each stage of a development shall be constructed to the designated boundary of a stage.

4.7. Services

Services are required to be installed by the developer, and this requirement will be included in the Conditions of Approval when the land division is approved. The developer should allow for the installation of services in conjunction with undertaking roadworks. Services may include:

- Sewer or Community Wastewater Management Scheme (CWMS)
- Telecommunications
- Power to be placed underground
- Street Lighting
- Gas
- Water

It is the developer's responsibility to liaise with the providers of these services to co-ordinate their installation.

4.8. Earthworks

The excavation and filling of land must be undertaken in accordance with AS 3798 – 1996 "Guidelines for Earthworks for Commercial and Residential Development".

4.9. Signage

At completion of the development, the developer is also required to install all appropriate signage to Australian Standards, on new and existing roads. This will include T-junction signs, hazard boards, curve signs, road name signs, and any other signs as required.

5. Road Construction

5.1. Pavement Design

Road pavements are to be designed and constructed in accordance with the current version of the "AUSTROADS - Guide to Pavement Technology".

Design shall cater for the likely construction traffic associated with development of future civil works stages and all houses in the sub division, as well as commercial and emergency services vehicles.

Pavement design will be based on the CBR testing of actual sub-grade soils, but must also take into account soil reactivity and any long term issues related to the development itself (such as loss of sub-grade strength due to changed water table levels).

5.2. Materials for Roadworks

(a) General:

1. All material shall be clean, sound, hard and durable. Foreign material shall not be present in sufficient quantity to produce adverse affect upon the usage or performance of the material.
2. All material shall be produced from natural rock or sand deposits and shall be pre-approved by the Works Manager prior to its use.
3. The contractor shall be required to submit a reference sample of the proposed material and to undertake the following laboratory testing of the material:
 - Sieve analysis (gradings)
 - Atterberg limits

(b) Fill Material:

1. Excavated material may be used as fill material provided it is considered acceptable by Council's Works Manager, but shall generally consist of the following properties:
 - particle size to not exceed 75mm
 - be free of organic or other foreign matter
 - under proof rolling, not show any signs of deformation, rutting, softness or yielding or be unstable
 - be stable under various moisture contents with minimal swell or shrinkage.
2. Proof rolling shall be used to determine the acceptability of a material placed as fill and shall be undertaken by using either a fully laden water cart or other heavy machine exceeding 10 tonne in mass.
3. Fill material shall be placed in layers of between 150 - 200mm loose thickness.

Proof rolling shall constitute a hold point in roadwork construction

and the contractor shall not proceed to the next stage until approval has been granted by Council's Works Manager.

(c) Sub-grade:

The sub-grade shall be prepared to produce a tight dense surface and shall be compacted to not less than 95% of standard maximum dry density for all roadways up to and including residential class. For road classes considered above residential the sub-grade shall be compacted to a level as determined by Council's Works Manager and based on the materials sub-grade CBR value and its resilient modulus. The method for determining the sub-grade materials CBR value shall be in accordance with the Austroads pavement design manual "A Guide to the Structural Design of Road Pavements."

The testing and verification of the sub-grade shall constitute a hold point in the road construction and the contractor shall not proceed to the next stage until approval has been granted by Council's Works Manager.

(d) Sub-base:

1. For roads up to and including residential class, the sub-base layer shall consist of either 40mm crushed limestone rubble as approved by Council's Works Manager, and in accordance with the material properties as indicated below, or PM2/40QG as specified in Appendix 1 - Pavement Material Specification. The minimum sub-base thickness shall be 150mm, and with no individual layer placed exceeding a compacted thickness of 150mm.
2. A minimum compaction of 96% MDD is required and tested at a frequency of 1 test per 500m² per sub-base layer.
3. Material to be used is generally described as non-plastic cementitious coralline limestone rubble. It shall be graded and all material shall pass a 75mm screen, with the maximum dimensions being not more than 100mm. It shall be free of deleterious material. Surfaces containing oversize material may be rejected.
4. Contractors are required to provide a NATA laboratory analysis of the material being used. The analysis is to include:
 - particle size distribution to AS1289 C.6.1 (sampled in accordance with AS1141.3);
 - consistency limits and moisture content to AS1289.

NOTE: If the above tests are superseded by revised Australian Standards, such new standards to be used and listed.
5. During the course of the works, any substantial variation in the material may be rejected. The Works Manager will have sole discretion on definition of substantial variation.

The testing and verification of the sub-base shall constitute a hold point in the road construction and the contractor shall not proceed to the next stage until approval has been granted by Council's Works Manager.

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(e) Base:

- For roads up to and including residential class, the base layer shall consist of a 100mm thick compacted layer of PM1/20QG.
- A minimum compaction of 96% MDD is required for all sample points, tested at a frequency of 1 test per 250m² per layer.

The testing and verification of the base shall constitute a hold point in the road construction and the contractor shall not proceed to the next stage until approval has been granted by Council's Works Manager.

(f) Construction Tolerances

Tolerances for the construction of various pavement courses shall comply with the following:

Course	Design Level Tolerance	Layer Thickness Tolerance
Sub-grade	+ 30mm - 30mm	+ 30mm - 30mm
Sub-base	+ 20mm - 20mm	+ 20mm - 20mm
Base	+ 10mm - 10mm	+ 15mm - 15mm
Overall	+ 20mm - 10mm	+ 20mm - 10mm

(g) Final Trim

Following placement and compaction of base course material, the whole of the surface of the base course shall be final graded and trimmed to the specified tolerances so as to leave a hard, dense, tightly packed surface, free of defects. Road surfacing shall not be commenced until the profile, surface compaction, quality and finish of the base course have been inspected and approved by Council's Works Manager.

The testing and verification of the final trim shall constitute a hold point in the road construction and the contractor shall not proceed to the next stage until approval has been granted by Council's Works Manager.

5.3. Surface

Unless otherwise approved by Council, all roads will have the following surface applied:

Hierarchy	Road Segments	Intersections, Junctions and Cul-de-sacs
Rural	14mm/7mm two-coat spray seal	40mm Asphalt
Township	10mm/7mm two-coat spray seal	40mm Asphalt

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6. Kerb and Channel

6.1. Hierarchy/Zone Specific Requirements

(a) *Rural (includes Rural Living Zone)*

Rollover profile kerb (or similar treatment) is required at intersections and curves to discourage vehicles from travelling off the sealed surface.

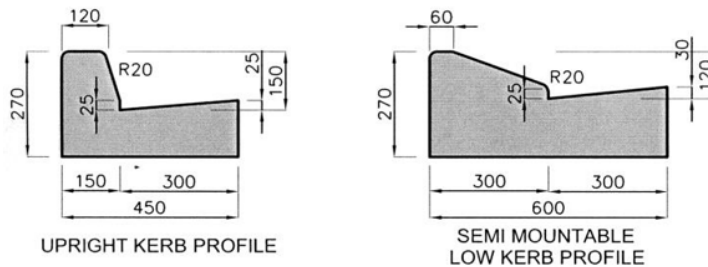
(b) *Township (includes Coastal Settlement Zone, Settlement Zone, Residential Zone and Township Zone)*

Rollover or upright profile kerb and channel is required to both sides of all streets to provide a structural pavement edge, a drainage mechanism and to delineate vehicle movements.

(c) Other kerb profiles may be used subject to prior approval of the Works Manager and the provision of kerb inserts at the location shown on the engineering drawings.

6.2. Kerb Profile

(a) Kerb and channel is to be constructed using concrete of twenty eight (28) day strength of 20MPa ($F'c=20MPa$). All concrete surfaces within the development to be finished to a steel float finish.



(b) Kerb transition between types shall be made over 3 metres.

A visual inspection of the kerb base prior to placement of kerbing shall constitute a hold point in the road construction and the contractor shall not proceed to the next stage until approval has been granted by Council's Works Manager.

7. Stormwater Management

7.1. Hierarchy/Zone Specific Requirements

(a) *Rural (includes Rural Living Zone)*

Stormwater management should provide for surface water from the road to drain to a grassed swale drain along the roadside. Swale drains should gravitate to a stormwater retention basin. Swale areas should be levelled and grassed, to enable maintenance mowing in a safe manner by the adjoining landowner.

(b) *Township (includes Coastal Settlement Zone, Settlement Zone, Residential Zone and Township Zone)*

Drainage should gravitate to a stormwater retention basin and/or other suitable stormwater management infrastructure.

7.2. Stormwater Design

Calculations should be carried out to determine the expected volumes of water to enter the drainage basin in a normal rainfall event, and the basin sized accordingly. For rainfall events in excess of normal expectations, provision should be made for discharge of overflow to the aquifer (subject to approval from Department of Environment and Natural Resources).

The major drainage system comprising road reserves, flood ways, etc, should be designed and constructed to convey storm event run-offs up to and including at least the 100 year average recurrence interval (ARI) and also permit a free and uninterrupted path of major stormwater run-off so as not to cause inundation of houses and properties. The developer shall provide a reserve or drainage reserve for at least the 1:100 ARI flow path, which is not an easement through private property.

The minor drainage system including kerbs and water tables, swales, sumps, and underground pipes etc, shall be designed and constructed to convey the 1:5 ARI flow for residential and 1:10 ARI flow for Industrial/Commercial, excluding rear of allotment drainage.

Rear/Front of allotment stormwater drainage is to be provided for those allotments that do not drain naturally to their road frontage watertable. If this is required, each allotment shall be provided with a 300mm by 300mm grated inlet pit, located at the lowest corner of each respective allotment. Pipe size shall cater for a 1:20 ARI storm and be a minimum of 300mm diameter sewer class PVC or other approved by Council.

Rear of allotment stormwater drainage shall also be provided where allotments back onto reserves.

All stormwater drains and other stormwater drainage works serving more than one allotment and not wholly located within roads or reserves vesting in Council pursuant to Section 233 I e (2) of the Real Property Act shall be contained within an easement for drainage purposes and provided on the relevant final plan. Such easements shall be a minimum width of 3.0 metres and delineated to the reasonable satisfaction of the Council.

The drainage system is to include trash racks or gross pollutant traps or other approved system, located at least at the downstream outlet of the development.

The stormwater detention system shall be designed where it is necessary to restrict or control outflow from the development.

Retention basins are to be designed such that they are suitable for the dual use of stormwater detention and recreational purposes. The detention system shall be capable of at least limiting 1:100 ARI flows to that expected from a 1:10 ARI storm.

The design of the retention basin on proposed reserve allotments shall:

- (a) be undertaken by an appropriately qualified engineer.
- (b) provide a bore with associated gross pollutant trap for drainage of the basin, at a location to be agreed with the Works Manager.
- (c) incorporate a tree planting plan for trees of locally indigenous species. Trees provided shall be in advanced stages of growth.
- (d) be approved by Council's Works Manager prior to commencement of construction.
- (e) be constructed to the satisfaction of Council's Works Manager.

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A visual inspection of the pipe laying prior to backfilling of trenches shall constitute a hold point in the road construction and the contractor shall not proceed to the next stage until approval has been granted by Council's Works Manager.

8. Community Wastewater Management System (CWMS)

In some of the townships in the Council area, Council operates a CWMS which collects primary treated effluent from septic tanks on individual properties and delivers it to a treatment plant.

Developers seeking to undertake land development projects within these areas will be required in most instances to either connect into Councils existing CWMS or construct a CWMS for the particular development.

8.1. Fees and Charges

The developer is required to meet certain costs in relation to the provision of sewerage infrastructure, namely;

- (a) A connection set by Council annually per allotment for connection into Councils existing CWMS;
- (b) All internal pipe network and pumping station costs and the connecting main costs from the development to a point (determined by Council) into the existing CWMS.

In the event that the capacity of Councils existing CWMS is not sufficient to accommodate the new development and significant Waste Water Treatment Plant upgrading is required, then Council may require the Developer to meet these costs in lieu of the "per allotment" fee.

8.2. Design Requirements

Developers are required to provide a development structure plan in accordance with Section 2.5 of this document setting out details on the methodology to be used to collect and dispose of sewerage from the site.

Developers are directed to the following publications which are available on the Local Government Association Web Site (www.lga.sa.gov.au) for the design of the sewerage network within their development:

- (a) Community Wastewater Management System Design Criteria (DHS & LGA);
- (b) Technical Specification for the Construction of Community Wastewater Management Systems (DHS).

9. Responsibilities

Director of Environmental Services
Works Manager

10. References

Development Act 1993
Development Regulations 2008
Local Government Act 1934 and Local Government Act 1999



Design, Construction & Development of Infrastructure Assets Policy

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11. Review

This policy will be formally reviewed by Council at a minimum every four (4) years, within 12 months of a general election, or on significant change to legislation or other matters which could affect this policy.

Action	Date	Minute Reference
Adopted by Council	6 August 2018	18115.2.1