CAPRICORN MUNICIPAL DEVELOPMENT GUIDELINES

GEOMETRIC ROAD DESIGN

D1

DESIGN GUIDELINES

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Keeping the Capricorn Municipal Development Guidelines up-to-date

The Capricorn Municipal Development Guidelines are living documents which reflect progress of municipal works in the Capricorn Region. To maintain a high level of currency that reflects the current municipal environment, all guidelines are periodically reviewed with new editions published and the possibility of some editions to be removed. Between the publishing of these editions, amendments may be issued. It is important that readers assure themselves they are using the current guideline, which should include any amendments which may have been published since the guideline was printed. A guideline will be deemed current at the date of development approval for construction works.

GENERAL

D01.01. SCOPE

D01.01.01. This section sets out the Guidelines developed specifically for the design of subdivision roadwork's using principles of street design to ensure safety and improved amenity and to reduce pedestrian/vehicular conflicts.

D01.01.02. A fundamental requirement of the design process is for designers to determine the vehicle speed which is deemed acceptable for a particular subdivision or section of road. The concept of designing to regulatory street speeds is contrary to the current principles of subdivision road design.

D01.01.03. All relevant design principles must be integrated in the development of the road network. A careful balance is required between maximising amenity, safety and convenience considerations and those related to the drivers' perception of driving practice.

D01.01.04. This Guideline shall be read in conjunction with the IPWEAQ publication Street Design Manual.

D01.01.05. Situations outside the scope of this document and Street Design Manual shall refer to requirements of documents listed in the Order of Priority section.

D01.01.06. Local infrastructure is categorised as either 'trunk infrastructure' (i.e. higher-level infrastructure that is shared between multiple developments) or 'non-trunk infrastructure' (i.e. infrastructure that is not shared with other developments and is generally internal to a development site). The classification of infrastructure as trunk or non-trunk guides what infrastructure conditions a Local Government can impose on a development application. Developers are responsible for providing and funding all non-trunk infrastructure, while the funding of trunk infrastructure is shared between a number of developers and the Local Government.

Authority

D01.02. ORDER OF PRIORITY

D01.02.01. The following order of priority for interpretation of documents will apply: (Please note that reference to a Guideline or Standard, is reference to the latest version of the relevant document, unless a version number is specifically stated)

Order of Priority

(a) CMDG Design and Construction Specifications

(b) CMDG Standard Drawings

(c) IPWEAQ Street Design Manual

(d) Design Guidelines for Subdivisional Streetworks, 1995 - 'Queensland Streets'.

(e) AUSTROADS Publications

(f) Department of Transport and Main Roads publications

(g) Queensland Development Code

(h) Australian Standards

D01.03. AIMS

D01.03.01. The provision of a road system is to be designed to achieve the following aims:

- Provide convenient and safe access to all allotments for pedestrians, vehicles and cyclists.
- Provide safe, logical and hierarchical transport linkages with existing street systems.
- Provide appropriate access for buses, emergency and service vehicles.
- Provide a quality product that minimises maintenance costs.
- Provide a convenient way for public utilities.
- Provide an opportunity for street landscaping.
- Provide convenient parking for visitors.
- Have appropriate regard for the climate, geology and topography of the area.

D01.04. REFERENCE AND SOURCE DOCUMENTS

(a) CMDG Guidelines

All Capricorn Municipal Development Guidelines for Design and Construction Specifications and Standard Drawings.

(b) Australian Standards

AS 1158	-	Lighting for roads and public spaces
AS 1428	-	Design for Access and Mobility
AS 2890.1 to 6	-	Parking facilities
AS/NZS 3845	-	Road Safety Barrier Systems

(c) QLD State Authorities

Business Queensland

- Queensland Development Code

Queensland Transport Publications

- Public Transport Infrastructure Manual, (PTIM)

Queensland Treasury Planning Group

- Model Code for Neighbourhood Design August 2020

Department of Infrastructure, Local Government and Planning

- Fact Sheet: Local government infrastructure framework

Queensland Government - Planning Regulations 2017

(d) Other

AUSTROADS
- Guide to Road Design
- Guide to Traffic Management

The Institute of Public Works Engineering Australasia, QLD Division.
- Street Design Manual
- Design Guidelines for Subdivisional Streetworks, 1995 - 'Queensland Streets'.

Department of the Environment and Energy,
- National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shorebirds Jan 2020

D01.05. CONSULTATION

D01.05.01. Designers are encouraged to consult with the Local Government and other relevant authorities prior to or during the preparation of design. Designers should in addition to requirements of this Guideline ascertain specific requirements of these authorities as they relate to the designs in hand.

D01.05.02. Public consultation on designs shall be provided where such action is required by the Local Government's current policy

Public Consultation

D01.05.03. The Designer shall obtain service plans from all relevant public utility authorities and organisations whose services may exist within the area of the proposed development. These services are to be plotted on the relevant drawings including plan and cross-sectional views.

Public Utilities

D01.06. PLANNING CONCEPTS

D01.06.01. In new areas (as distinct from established areas with a pre-existing road pattern) ensure each class of route should reflect its role in the road hierarchy by its visual appearance and related physical design standards. Routes should differ in alignment and design standard according to the volume of traffic they are intended to carry, the desirable traffic speed, and other relevant factors.

Road Hierarchy

D01.06.02. The road network should have clear legibility and should reinforce legibility by providing sufficient differentiation between the road functions.

Legibility

D01.06.03. There will be special constraints and costs associated with the design of roads through or adjacent to land known to be salt affected. Consider early planning to avoid detrimental interference with land known to be salt affected. Adjustments in horizontal and vertical line should be considered to avoid recharge of subsurface water within or adjacent to the road reserve. Consultation with the relevant land and water resource authority shall be mandatory under the above circumstances.

Salinity, Prevention, Early Planning, Mandatory Consultation

D01.06.04. Appropriate native deep-rooted species for plantings in association with road reserve works. Provide plantations of sufficient size and density, multiple row belts and relatively close spacings are recommended, to be effective in their desired role of lowering the groundwater table.

Landscaping, Salinity Prevention

D01.06.05. Integrate all relevant design principles in the development of the road network. Provide a careful balance between maximising amenity, safety and convenience considerations and those related to the drivers' perception of driving practice.

Integrated Design Principles

D01.06.06. Determine the vehicle speed deemed acceptable for the particular section of road as a fundamental requirement of the design process.

Acceptable Vehicle Speed

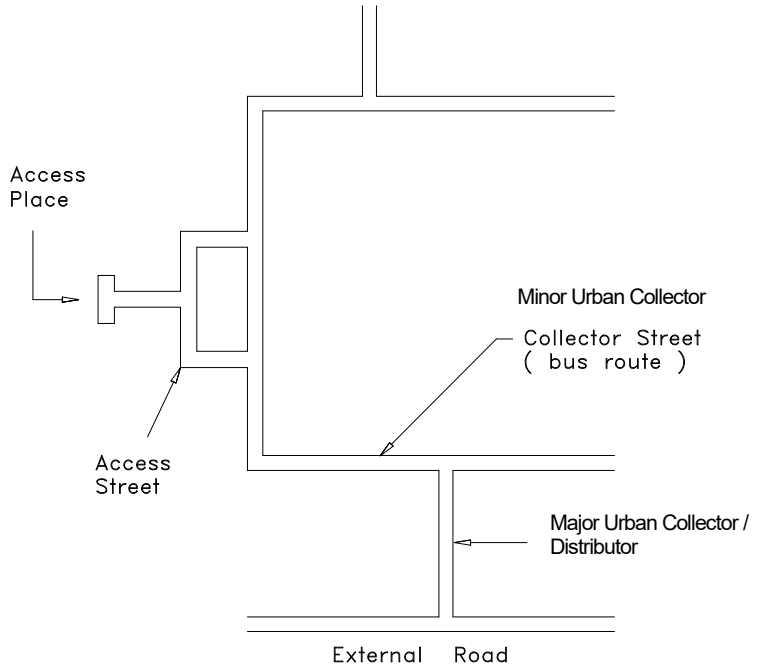
URBAN DESIGN CRITERIA

D01.07. ROAD HIERARCHY

D01.07.01. A hierarchical road network is essential to maximise road safety, residential amenity and legibility. Each class of road in the network serves a distinct set of functions and is designed accordingly. The design should convey to motorists the predominant function of the road. A typical hierarchy is shown on **Figure D01. 07.1 - Typical Road Hierarchy**.

Functionality

Figure D01. 07.1 - Typical Road Hierarchy



D01.07.02. The hierarchy terminology and geometric road design requirements vary between Local Governments. Table D01.08.01 sets out the relevant appendices for each Local Government.

Road Classification

Table D01.08.01 – Geometric Road Design Requirements

Local Government	Design Requirements
Banana Shire Council	See Annexure D01A
Central Highland Regional Council	See Annexure D01B
Gladstone Regional Council	See Annexure D01C
Isaac Regional Council	See Annexure D01D
Livingstone Shire Council	See Annexure D01E
Maranoa Regional Council	See Annexure D01F
Rockhampton Regional Council	See Annexure D01G

D01.07.03. The IPWEAQ Street Design Manual and Austroads Guide to Road Design Part 1 give guidance on the functional classification of urban and rural roads. For the purposes of this document a Distributor is to be considered to have the same function as a Major Collector.

D01.07.04. Each Local Government's road hierarchy shall be defined by the tabled information in Appendices D01A to D01G. Alternative solutions responding to specific site constraints or future planning considerations may be considered at the discretion of Local Government. ***Hierarchy***

D01.07.05. The Local Government will determine the hierarchy classification of all new public roads. The designated road hierarchy will usually be advised at time of development approval. ***New Road Classification***

D01.07.06. Refer to CMDG standard drawings for road type cross section information. ***Typical Cross Sections***

D01.08. ROAD NETWORK

D01.08.01. The design features of each type of road convey to the motorist its primary functions and encourage appropriate driver behaviour.

D01.08.02. Traffic volumes and speeds on any road should be compatible with the functions of that road. ***Compatibility***

D01.08.03. The maximum length of an access place/Local Access should ensure its status as a residential place is retained, where the traffic, in terms of speed and volume will enable the integration of pedestrian, cycle and vehicular movements. This length will also ensure that residential convenience is not unduly impaired as a result of speed restraints. ***Length of Access Place***

D01.08.04. The time required for motorists to travel on all streets within the development should be minimised. ***Travel Time***

D01.08.05. Where access places/Local accesses form part of a pedestrian or cycle network, access links should provide suitable connectivity with adjoining access places or open space systems so as to ensure such pedestrian and cycle network are functionally efficient. ***Pedestrian or Cycle Network***

D01.08.06. The road network should ensure that no road links with another road which is more than two levels higher or lower in the hierarchy. In exceptional circumstances roads may link with others that are more than two levels apart, however, no access place or access street should have access to an access-controlled arterial road. ***Road Links***

D01.08.07. Connections between internal roads shall be T-junctions or controlled by roundabouts. ***Internal Road Connections***

D01.08.08. The road layout should conform to the requirements of the external road network and satisfy the transport provisions of an outline development plan.

Transport Provisions

D01.08.09. The external road network should be designed and located to provide routes which are more convenient for potential through traffic within the network. Major roads should be provided at intervals of no more than 1.5 km and should be complete and of adequate capacity to accommodate through network movements. The internal road system should not provide through routes that are more convenient than the external road network.

External Road Network

D01.09. TRUNCATIONS

D01.09.01. Truncations shall be provided such that the minimum average verge width is provided between the kerb and channel and the property alignment. Additional road truncation may be required to accommodate the geometric requirements of the intersection.

D01.09.02. For a standard T intersection, the minimum truncation of the real property boundary at an intersection angle of 90 degrees shall be by three (3) equal chords to a circle radius equal to the following:

1.	Access Road / Local Street to any road	6.0m radius
2.	Minor Collector or Collector to Minor Collector, Collector, Distributor, Sub-Arterial or Arterial	8.0m radius
3.	Sub-Arterial or Arterial, to Sub-Arterial or Arterial	10.0m radius

D01.09.03. Where the intersection angle is other than 90 degrees boundary radii may need to be adjusted to suit specific intersection treatments to retain minimum verge widths as required by the Local Governments.

D01.10. DESIGN SPEED

D01.10.01. For geometric design of roads design speeds shall be as nominated in Refer to Annexure D01A to D01G unless specified otherwise by Local Government. Developments should be designed with a road layout to achieve the desired speed environment. The use of traffic control devices in lieu of a suitable road layout is not preferred.

Guidelines

D01.10.02. Adoption of a low design speed discourages speeding, attention should be given to ensuring that potentially hazardous features are visible to the driver and adopting traffic engineering measures which will help a driver avoid errors of judgement.

Low Speeds

Hazard Features

D01.10.03. The need for road safety barriers shall be assessed and designed in accordance with AS/NZS 3845.

Road Safety Barriers

D01.11. LONGITUDINAL GRADIENT

D01.11.01. A general minimum gradient as defined in Annexure D01A to D01G for each Local Government should be adopted.

Flat Terrain

D01.11.02. Longitudinal grade through intersections should not exceed 4 per cent, the actual gradient being dependent on the type of terrain. Design of the road alignment and the grades used are interrelated. A steep grade on a side street is undesirable if vehicles have to stand waiting for traffic in the priority road.

Intersections

D01.11.03. Turning circles in cul-de-sacs on steep grades should have grades less than 5 per cent.

Cul-de-sac

D01.11.04. Roads constructed without kerb and channel, completely in embankment may have zero grade. Maximum grades shall be as nominated in Annexure D01A to D01G

D01.12. HORIZONTAL CURVES AND TANGENT LENGTHS

D01.12.01. The horizontal alignment of a road is normally in a series of tangents (straights) and curves. The choice of the horizontal alignment is normally determined from the design speeds for a particular street within the road hierarchy. Designers should ensure that, for a given design speed, the minimum radius of curvature utilised is such that drivers can safely negotiate the curve. Curves which progressively tighten produce an uncomfortable sense of disorientation and alarm. Sudden reverse curves which drivers cannot anticipate also have a potential to cause similar conditions.

Speed/Radius Relation

D01.12.02. Where speed restriction is provided by curves in the street alignment the relationship between the radius of the curve and the desired vehicle speed is given in the IPWEAQ Street Design Manual.

Speed Restriction

D01.12.03. To determine appropriate lengths for tangents between speed restrictions, which may be curves, narrow sections or other obstructions, refer to IPWEAQ Street Design Manual Section 4.2 Vehicle Speeds.

Tangent Length

D01.12.04. Sight distance on horizontal curves is determined by formula, values of which are tabulated in ‘Austroads Guide to Traffic Management – Part 3’.

Sight Distance

D01.13. VERTICAL CURVES

D01.13.01. Vertical curves should be used on all changes of grade where required in accordance with Austroads Guide to Road Design - Part 3:The length of the crest vertical curve for stopping sight distance should conform with 'Austroads Guide to Road Design - Part 3'.

Change of Grade

D01.13.02. For adequate riding comfort, lengths of sag vertical curves should conform with 'Austroads Guide to Road Design - Part 3'.

Riding Comfort

D01.13.03. Junctions of roads should be located at a safe distance from a crest, determined by visibility from the side road. Location of a side road at a crest should only occur if there is no suitable alternative.

Side Road Junctions

D01.13.04. Drainage poses a practical limit to the length of sag curves and a maximum length (in metres) of 15 times the algebraic sum of the intersecting vertical grades should be adopted. This is to avoid water ponding in excessively flat sections of kerb and gutter. A minimum grade of 0.5 per cent should be maintained in the kerb and gutter. This may require some warping of road cross sections at sag points.

Sag Curves

D01.13.05. The three dimensional coordination of the horizontal and vertical alignment of a road should be aimed at improved traffic safety and aesthetics. Economic considerations often require a compromise with aesthetic considerations. The following principles should be applied:

- The design speed of the road in both horizontal and vertical planes should be of the same order.
- Combined horizontal and vertical stopping sight distance and minimum sight distance should be considered three dimensionally.
- Sharp horizontal curves should not be introduced at or near the crest of a vertical curve. A horizontal curve should leave the vertical curve and be longer than the vertical curve.
- A short vertical curve on a long horizontal curve or a short tangent in the gradeline between sag curves may adversely affect the road's symmetry and appearance.

Horizontal and Vertical Alignment Coordination

D01.14. SUPERELEVATION

D01.14.01. The use of superelevation in association with horizontal curves is an essential aspect of geometric design of roads with design speeds in excess of 60 km/h.

D01.14.02. The maximum superelevation for urban roads of higher design speeds should be 6 per cent. Any increase in the longitudinal grade leading to excessive crossfall at intersections should be considered with caution. While it is desirable to superelevate all curves, negative (adverse) crossfall should be limited to 3 per cent.

Negative Crossfall

D01.14.03. In general, curve radii larger than the minimum and superelevation rates less than the maximum should be used where possible. The minimum radius of curves is determined by the design speed; the minimum superelevation (or maximum adverse crossfall) at any point on the circular portion of the curve; and the maximum coefficient of side friction which allows safe lane changing.

Coefficient of Side Friction

D01.15. CARRIAGEWAY WIDTH

D01.15.01. The cross section of the road reserve must cater for all functions that the road is expected to fulfil, including the safe and efficient movement of all users, provision for parked vehicles, provision of a buffer from traffic nuisance for residents, the provision of public utilities and street scaping. The minimum carriageway criteria shall be as defined in Annexure D01A to D01G.

Cross Section Provisions

D01.15.02. The carriageway width must allow vehicles to proceed safely at the operating speed intended for that level of road in the network and with only minor delays in the peak period. This must take into consideration the restrictions caused by parked vehicles where it is intended or likely that this will occur on the carriageway. Vehicles include trucks, emergency vehicles and, on some roads, buses.

Operations Aspects

D01.15.03. The safety of pedestrians and cyclists, where it is intended they use the carriageway, must also be assured by providing sufficient width.

Pedestrians, Cyclists

D01.15.04. The carriageway width should also provide for unobstructed access to individual allotments. Motorists should be able to comfortably enter or reverse from an allotment in a single movement, taking into consideration the possibility of a vehicle being parked on the carriageway opposite the driveway.

Access to Allotments

D01.15.05. The design of the carriageway should discourage motorists from travelling above the intended speed by reflecting the functions of the road in the network. In particular the width and horizontal and vertical alignment should not be conducive to excessive speeds.

Discourage Speed

D01.15.06. Appropriate road reserve width should be provided to enable the safe location, construction and maintenance of required paths and public utility services (above or below ground) and to accommodate the desired level of street scaping.

Road Reserve Width

D01.15.07. The verge when considered in conjunction with the horizontal alignment and permitted fence and property frontage treatments should provide appropriate sight distances, taking into account expected speeds and pedestrian and cyclist movements.

Sight Distance Across Verge

D01.16. CARRIAGEWAY CROSSFALLS

D01.16.01. Desirably, roads should be crowned in the centre. Typical pavement crossfall on straight roads are:

Pavement Crossfall

Pavement Type	*Crossfall*
Bituminous seal coat	3 per cent
Asphaltic concrete pavement	3 per cent
Cement concrete pavement	3 per cent
Paved surfaces	3 per cent
Gravel	5 per cent

D01.16.02. There are many factors affecting levels in urban areas which force departures from these crossfall. Differences in level between road alignments can be taken up by offsetting crown lines or adopting one way cross falls. Sustained crossfall should not exceed 4 per cent, although up to 6 per cent may be used where unavoidable.

Rate of Change - Crossfall

The rate of change of crossfall should not exceed:

- 6 per cent per 30 m for through traffic;
- 8 per cent per 30 m for free flowing turning movements; or
- 12 per cent per 30 m for turning movements for which all vehicles are required to stop.

D01.16.03. The crossfall on a collector or sub-arterial should take precedence over the grade in side streets. Standard practice is to maintain the crossfall on the priority road and adjust the side road levels to suit. The crossfall in side streets should be warped quickly either to a crown or a uniform crossfall depending on the configuration of the side street. A rate of change of grade of two per cent in the kerb line of the side street relative to the centre line grading is a reasonable level.

Priority Road – Crossfall

D01.17. VERGES

D01.17.01. Verges are that part of the street or road reserve between the carriageway and the boundary of adjacent allotment (or other limit to street reserve). It may accommodate public utilities, footpaths, stormwater flows, street lighting poles and planting.

D01.17.02. A suitable design of the verge will depend on utility services, access to allotments, pedestrian usage, tree preservation and stormwater drainage. Refer to CMDG Standard Drawings for verge design requirements (Note: where a cycleway or path is located in the verge the design of such shall be in accordance with the Specification for CYCLEWAY AND PATHWAY DESIGN D9.

Verge

D01.17.03. Minimum verge width shall be as nominated in Refer to Annexure D01A to D01G.

D01.17.04. Verge footpath tree planting is detailed in CMDG Standard Drawings. Refer to CMDG Construction Specification C271 LANDSCAPING for guidance on approved species and planting requirements.

D01.18. INTERSECTIONS

D01.18.01. The design of intersections or junctions should allow all movements to occur safely without undue delay. Projected traffic volumes shall be used in designing of all intersections or junctions.

Traffic Volumes

D01.18.02. All new intersections shall be designed and located in accordance with the IPWEAQ Street Design Manual for local and living streets and "AUSTROADS" for Collector, Distributors and Sub-Arterials.

Intersections

D01.18.03. Intersection design for the junction of subdivision roads with existing sub-arterials and arterials shall be designed in accordance with the publication AUSTROADS Guide to Road Design –

- Part 4: Intersections and Crossing – General
- Part 4A: Unsignalised and signalised intersections
- Part 4B: Roundabouts
- Part 4C: Interchanges

D01.18.04. Intersections with tourist roads and/or state controlled roads shall be designed and constructed in accordance with the requirements of the Queensland Department of Transport and Main Roads (DTMR).

Tourist Roads / State Controlled Roads

Existing Road Pavements

D01.18.05. Where major intersections are required to serve a development complete reconstruction of the existing road pavements will be necessary where the speed environment and irregularity of the existing road pavement may endanger the safety of traffic in the locality.

Intersection Criteria

D01.18.06. Intersections should be generally located in such a way that:

- The streets intersect preferably at right-angles and not less than 70°.
- The landform allows clear sight distance on each of the approach legs of the intersection.
- The minor street intersects the convex side of the major street.
- The vertical grade lines at the intersection do not impose undue driving difficulties.
- The vertical grade lines at the intersection will allow for any direct surface drainage.
- Two minor side streets intersecting a major street in a left-right staggered pattern should have a minimum centre-line spacing of 120m to provide for a possible right-turn auxiliary lane on the major street.
- A right-left manoeuvre between the staggered streets is preferable, avoiding the possibility of queuing in the major street.

D01.18.07. Roundabouts are to be approved by Local Government.

Roundabout Criteria

D01.18.08. Roundabout design should generally comply with the following:

- entry width to provide adequate capacity
- adequate circulation width, compatible with the entry widths and design vehicles e.g. buses, trucks, cars.
- central islands of diameter sufficient only to give drivers guidance on the manoeuvres expected
- deflection of the traffic to the left on entry to promote gyratory movement
- adequate deflection of crossing movements to ensure low traffic speeds
- a simple, clear and conspicuous layout
- design to ensure that the speed of all vehicles approaching the intersection will be less than 50 km/h.

Sight Distance

D01.18.09. Stopping sight distances (SSD) and junction or safe intersection sight distances (SISD) should be based on the intended speeds for each road type in accordance with Austroads Guide to Road Design Part 3 & Part 4A.

D01.18.10. Where pedestrians are intended to cross carriageways, pedestrian facilities should be located where there is clear view between approaching drivers and pedestrians. Crossing Sight Distance (CSD) should be provided between approaching vehicles and pedestrian waiting at cross the road in accordance with Austroads Guide to Road Design Part 4A.

D01.19. TURNING MOVEMENTS

D01.19.01. All vehicle turning movements are accommodated utilising AUSTROADS Design Vehicles and Turning Templates, as follows:

- For intersection turning movements for each road hierarchy the design vehicle is found by reference to Annexure D01A to D01G for individual Local Government requirements.
- For turning movements at the head of cul-de-sac streets sufficient area is provided for the Class 5 Four Axle Truck to make a three-point turn.

Turning Movements

D01.20. TRAFFIC CALMING

D01.20.01. Local Area Traffic Management devices are generally not to be used in greenfield situations. Their use should be confined to brownfield sites where no alternatives exist. The use of Local Area Traffic Management in any situation must be approved by the Local Government.

LGA Approval required

D01.20.02. Calming devices such as thresholds, slow points, speed humps, chicanes and splitter islands should be designed in accordance with the requirements of the publication AUSTROADS Guide to Traffic Management – Part 8: Local Area Traffic Management Devices designs should generally comply with the following:

Local Area Traffic Management

(a) Streetscape

- reduce the linearity of the street by segmentation,
- avoid continuous long straight lines (eg. kerb lines),
- enhance existing landscape character,
- maximise continuity between existing and new landscape areas.

(b) Location of Devices/Changes

- devices other than at intersections should be located to be generally consistent with streetscape requirements,
- existing street lighting, drainage pits, driveways, and services may decide the exact location of devices,
- slowing devices are optimally located at spacings of 100-150m.

(c) Design Vehicles

- emergency vehicles must be able to reach all residences and properties,
- where bus routes are involved, buses should be able to pass without mounting kerbs and with minimised discomfort to passengers,

Design Vehicles

- in newly developing areas where street systems are being developed in line with the Local Area Traffic Management (LATM) principles, building construction traffic must be catered for.

(d) Control of Vehicle Speeds

- maximum vehicle speeds can only be reduced by deviation of the travelled path. Pavement narrowing's have only minor effects on average speeds, and usually little or no effect on maximum speeds,
- speed reduction can be achieved using devices which shift vehicle paths laterally (slow points, roundabouts, corners) or vertically (humps, platform intersections, platform pedestrian/school/bicycle crossings),

Vehicle Speeds

- speed reduction can be helped by creating a visual environment conducive to lower speeds. This can be achieved by 'segmenting' streets into relatively short lengths, using appropriate devices, streetscapes, or street alignment to create short sight lines.

(e) Visibility Requirements (sight distance)

- adequate critical sight distances should be provided such that evasive action may be taken by either party in a potential conflict situation. Sight distances should relate to likely operating speeds,
- sight distance to be considered include those of and for pedestrians and cyclists, as well as for drivers,

Visibility

- night time visibility of street features must be adequate. Speed control devices particularly should be located near existing street lighting if practicable, and all street features/furniture should be delineated for night time operation.

(f) Other Requirements

- dimensions of mountable areas required for the passage of large vehicles to be determined by appropriate turning templates,
- design of all devices must consider future maintenance requirements and also be approved by the appropriate Local Government

Approval

D01.21. PARKING

D01.21.01. The parking requirements for normal levels of activity associated with any land use should be accommodated on-site.

D01.21.02. All on-site parking should be located and of dimensions that allow convenient and safe access and usage.

On-Site

D01.21.03. The number of on-site parking spaces for non-residential land uses conforms to parking standards as determined by the relevant Local Government.

D01.21.04. The layout and access arrangements for parking areas for non-residential land uses should conform to Australian Standard 2890, B99 Vehicle with a minimum parking width of 2.5m or as per Local Government requirements.

Verge Parking

D01.21.05. On single lane access streets, parking spaces should be provided within the verge. Such parking should be well defined and an all-weather surface provided. Such parking shall not restrict the safe passage of vehicular and pedestrian traffic.

D01.21.06. Parking spaces provided on the verge or carriageway should be of adequate dimensions, convenient and safe to access.

Verge Spaces, Indented Parking

D01.21.07. All verge spaces and indented parking areas are constructed of concrete, or asphalt with suitable pavement material and are designed to withstand the loads and manoeuvring stresses of vehicles expected to use those spaces.

Right-angled Parking

D01.21.08. Right-angled parking may be provided where Central Business District (CBD) or adjacent to recreational facilities are situated, or as determined by the relevant Local Government. Typically, this configuration is considered suitable where speeds do not exceed 40 km/h.

Special Parking

D01.21.09. Parking bays may be provided in areas such as the centre of cul-de-sac turning circles, where narrow allotment frontages may reduce both on and off-street parking opportunity.

Safety

D01.21.10. Where required, appropriate provision should be made for vehicles to park safely

D01.22. LIGHTING

D01.22.01. The objective of road lighting is to provide an illuminated environment, which is conducive to the safe and comfortable movement of vehicular and pedestrian traffic at night, and the discouragement of illegal acts. To accomplish this, the lighting should reveal necessary visual information. This consists of the road itself, the course of the road ahead, kerbs, footpaths, property lines, road furniture and surface imperfections, together with the road users including pedestrians, cyclists and vehicles and their movements, and other animate and inanimate obstacles.

Lighting

D01.22.02. All roads in urban areas are required to be effectively lit, generally in accordance with the criteria of the Australian/New Zealand Standard AS/NZS 1158 series. Lighting standards are to be in accordance with Annexure D01A to D01G.

D01.22.03. The sub-categories used in this specification does not apply to lighting intended specifically as security lighting for building exteriors and lighting for video surveillance.

D01.22.04. Lighting design shall have regard to the National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shorebirds. In particular this will affect esplanades and foreshore park areas.

Wildlife

D01.22.05. It is Local Government's preference not to accept Solar Street Lights as an alternative product to grid tied lighting for lighting to be installed on Local Government roads because the current state of development of Solar Street Light technology does not, in the Local Government view, provide a reliable and cost effective solution for the provision of such lighting in most cases. Exceptions On a case-by-case basis the Local Government will consider the use of Solar Street Lights under the following circumstances:

Solar Lighting

1. The provision of lighting is within a community titled subdivision where the Local Government is not responsible for its ongoing operations and maintenance;
2. The provision of lighting is to be on a Local Government controlled road and a funding agreement is secured between the Local Government and the developer or the manufacturer of the lighting equipment for that developer or manufacturer to accept the costs of the future operation and maintenance of that lighting;
3. The provision of lighting for car parks and other Local Government facilities where non-compliance with AS1158 does not, in the Local Government's opinion, present a high risk to the Local Government.

D01.22.06. An approval for an exception to allow the installation of Solar Street Lights under one of the above-mentioned circumstances must be obtained from the Local Government before any works permit or development approval for the installation of Solar Street Lights will be considered by the Local Government.

D01.22.07. As Solar Street Lights are not subject to a Network Extension Agreement (NEA) with Ergon Energy, an indemnity for such lighting shall not be required. The Local Government will, however, provide a non-standard street lighting indemnity where the Local Government approves the installation of Solar Street Lights on Local Government controlled roads, if such an indemnity is required by Ergon Energy.

D01.23. BUS ROUTES

D01.23.01. It is important that the road hierarchy adequately caters for buses. The main criteria in determining the location of bus routes is that no more than 10% of residents should have to walk in excess of 400 metres to catch a bus. Refer to Annexure D01A to D01G for applicable road classes to be designed for bus routes.

Buses

D01.23.02. The design requirements for bus stop location, type and shelter arrangements vary by LGA (refer to LGA Specific CMDG Page). Where no alternate guidance is given, these aspects are to be designed in accordance with the requirements of the Public Transport Infrastructure Manual. Additionally, the Developer must liaise with the local bus company and Translink regarding the extension of bus routes to include the proposed bus stops. The Public Transport Infrastructure Manual can be downloaded from *https://www.Public Transport Infrastructure Manual - Dataset - Publications | Queensland Government*

Bus Stops

D01.24. STREET FURNITURE

D01.24.01. The designer shall ensure that all proposed street furniture (including street signs) complies with Local Government's standards. Refer to CMDG Standard Drawings.

Street Furniture

D01.25. DRAINAGE

D01.25.01. The drainage function of the carriageway and/or road reserve must be satisfied by the road reserve cross-section profile. Refer to CMDG D5 STORMWATER DRAINAGE for specific design requirements.

Drainage

RURAL DESIGN CRITERIA

D01.26. GENERAL

D01.26.01. In addition to the foregoing sections this section specifically applies to all those sites identified as being suited to rural and rural residential road networks. Refer to Annexure D01A to D01G for details associated with the relevant Local Government specific road demands for rural roads.

D01.26.02. For geometric design of rural roads, design speeds shall be as nominated in Annexure D01A to D01G unless specified otherwise by Local Government. Developments should be designed with a road layout to achieve the desired speed environment. The use of traffic control devices in lieu of a suitable road layout is not preferred.

Geometric Design

D01.26.03. Design speed is to be generally used as the basic parameter of design standards and the determination of the minimum design value for other elements in rural subdivisions is to be based on the concept of a "speed environment" as outlined in AUSTROADS Guide to Road Design – Part 3: Geometric Design.

Design Speed

D01.26.04. The minimum carriageway criteria shall be as defined in Annexure D01A to D01G

Carriageway Width

D01.26.05. Where appropriate superelevation, widening and centreline shift and their associated transitions are to comply with AUSTROADS Guide to the Road Design – Part 3.

Superelevation, Transitions, Offset Crowns

D01.26.06. Scour protection of roadside drainage and table drains is required. The level of protection will depend on the nature of the soils, road gradients and volume of stormwater runoff.

D01.26.07. Where the table drain is likely to scour, a stone pitched or suitably lined dish drain is to be constructed along the invert. Protection works may involve concrete lined channels, turfing, rock pitching, grass seeding, individually or any combination of these. Also for grades of less than 0.5%, the inverts of the drain are to be lined to prevent siltation.

Roadside Drainage and Table Drains

D01.26.08. Geotechnical investigations shall be carried out to determine the level and extent of any protection works prior to proceeding to final design stage.

D01.26.09. Roads constructed without kerb and channel, completely in embankment may have zero grade. Maximum grades shall be as nominated in Refer to Annexure D01A to D01G.

Embankment

D01.26.10. All rural residential subdivisions will be required to provide concrete edge, within the road reserve, on both sides of roads as a minimum.

Concrete Edging

D01.26.11. Property access should be limited to one point on to an access, collector, trunk collector or arterial road networks. ***Access***

D01.26.12. All rural subdivisions should be designed to restrict access to major roads.

D01.27. HORIZONTAL AND VERTICAL ALIGNMENT

D01.27.01. Horizontal and vertical curves are to be designed generally to the requirements of AUSTROADS Guide to Road Design – Part 3: Geometric Design. These requirements are essential to satisfy the safety and performance of proper road design. Roads having both horizontal and vertical curvature should be designed to conform to the terrain to achieve desirable aesthetic quality and being in harmony with the landform. ***Horizontal & Vertical Alignments***

D01.28. INTERSECTIONS

D01.28.01. Intersections should generally be designed in accordance with the publication AUSTROADS Guide to Road Design –

- Part 4: Intersections and Crossing – General
- Part 4A: Unsignalised and signalised intersections

D01.28.02. Adequate sight distance should be provided at intersections both horizontally and vertically. Each intersection location shall be examined for conformance with the criteria for Approach Sight Distance (ASD), Minimum Gap Sight Distance (MGSD) and Safe Intersection Sight Distance (SISD). Refer to AUSTROADS Guide to Road Design - Part 4A: Unsignalised and signalised intersections. ***Sight Distance***

D01.29. LIGHTING

D01.29.01. The objective of road lighting in the rural area is to provide an illuminated environment, which is conducive to the safe and comfortable movement of vehicular traffic. To accomplish this, the lighting should reveal necessary visual information. This consists of the road itself, the course of the road ahead, road furniture and surface imperfections, vehicles and their movements, and other animate and inanimate obstacles. ***Lighting***

D01.29.02. Street lighting standards in rural areas shall be determined by individual Local Governments. Refer to Annexure D01A to D01G

D01.29.03. Lighting design shall have regard to the National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shorebirds. In particular this will affect esplanades and foreshore park areas.

D01.29.04. It is the Local Government's preference not to accept Solar Street Lights as an alternative product to grid tied lighting for lighting to be installed on Local Government roads because the current state of development of Solar Street Light technology does not, in the Local Government view, provide a reliable and cost effective solution for the provision of such lighting in most cases.

Solar Lights

Exceptions On a case-by-case basis the Local Government will consider the use of Solar Street Lights under the following circumstances:

1. The provision of lighting is in an isolated location, e.g. a rural intersection, where low voltage power supply is not available

An approval for an exception to allow the installation of Solar Street Lights under one of the above-mentioned circumstances must be obtained from the Local Government before any works permit or development approval for the installation of Solar Street Lights will be considered by the Local Government.

As Solar Street Lights are not subject to a Network Extension Agreement (NEA) with Ergon Energy, an indemnity for such lighting shall not be required. The Local Government will, however, provide a non-standard street lighting indemnity where the Local Government approves the installation of Solar Street Lights on Local Government controlled roads, if such an indemnity is required by Ergon Energy.

D01.30. CLEAR ZONES

D01.30.01. A clear zone is an area adjacent to the traffic lane that should be kept free from features that would be potentially hazardous to errant vehicles. Where it is environmentally appropriate and economically viable, the clear zone should be kept free of non-frangible hazards.

D01.30.02. The clear zone shall be designed to provide a forgiving roadside environment, free of any hazards that may increase the severity of a crash. Ideally this would provide drivers with enough space to regain control of their vehicles and stop safely without colliding with any objects or the vehicle rolling over.

Forgiving Roadside Environment

D01.30.03. Clear zones distances shall comply with Austroads Guide to Road Design – Part 6: Roadside Design, Safety and Barriers Table 4.1 Clear zone distances from edge of through travelled way. The clear zone dimensions are intended as a guide only, and the types of hazards encountered and their treatments shall be assessed for each site, which a greater or lesser width provided depending on the risk factors identified

Clear Zone Design

D01.30.04. Hazards within the clear zone shall be addressed in the following priority order:

(a) Remove the hazard
(b) Redesign the hazard so that it can be safely traversed
(c) Relocate hazard to a location where it is less likely to be struck
(d) Replacement of the hazard so that it breaks away or is impact absorbing
(e) Shield the obstacle with an appropriate barrier and / or a crash cushion

Hazards

(f) Delineate the hazard to make it more conspicuous

D01.30.05. Refer to Austroads Guide to Road Design – Part 6: Roadside Design, Safety and Barriers Chapter 4 Design to Mitigate hazards for guidance with determination of clear zone widths, and identification and appropriate treatment of hazards.

D01.30.06. The aim for all Local Government Controlled roads classified as either Rural Access or Rural Minor Collector is for a minimum of a 3 meter wide clear Zone from edge of traffic lane or drainage formation depending on location. The width of the clear zone for all Local Government Controlled roads classified as Rural Major Collector shall be as the Austroads Guide to Road Design – Part 6: Roadside Design, Safety and Barriers.

D01.30.07. Design of clear zones must take into consideration; ***Specific consideration***

1. Site specific amenity or aesthetic value
2. Protection of rare and endangered species
3. Prevention of land degradation due to soil erosion and salinity
4. Preservation of historical values of roadside features.

Annexure D01A

BSC DESIGN CRITERIA

Urban Areas

BSC – DESIGN CRITERIA – URBAN AREAS								
Criterion		**Arterial Roads**	**Collector streets**			**Access Streets**		
		Arterial	**Industrial Collector**	**Major Urban Collector**	**Minor Urban Collector**	**Industrial Access**	**Urban Access Street**	**Urban Access Place**
General Requirements								
1	Traffic generation (AADT)	Not Specified	Area < 30ha	3001-6000	751-3000	Area < 8ha	251-750	0-250
2	Road Classification	7	10B	8	8B	10	9	9B
3	Maximum Design Speed	80km/h	60km/h	60km/h	50km/h	60km/h	40km/h	30km/h
4	Design vehicle [1 & 2]	Class 11	Class 11	19.0m Semitrailer (Class 9)	19.0m Semitrailer (Class 9)	Class 11	19.0m Semitrailer (Class 9)	Service Vehicles only (Class 5)
5	Pedestrian movement facilities	Pathway (Both sides)	Pathways (one side)	Pathways (Both Sides)	Pathways (one side)	Pathways Desirable (one side)	Pathways Desirable (one side)	Pathways Desirable (one side)
6	Kerb Type	Barrier	Barrier	Layback	Mixed	Barrier	Layback	Layback
7	Minimum Flood Immunity for minor system (kerb and channel flow) AEP (ARI)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)
8	Minimum Flood Immunity for minor system (cross drainage), AEP (ARI)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)
9	Design check for trafficable immunity, AEP (ARI)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)

Annexure D01A

BSC – DESIGN CRITERIA – URBAN AREAS								
Criterion		Arterial Roads	Collector streets			Access Streets		
		Arterial	Industrial Collector	Major Urban Collector	Minor Urban Collector	Industrial Access	Urban Access Street	Urban Access Place
Cross-section requirements								
10	Minimum reserve width [3]	Not Specified	30m	20-22m	18m	25m	18m	18m
11	Nominal carriageway width[4]	Not Specified	18m	14m	12m	13m	10m	8m
12	Minimum Verge width (Each side)	6m	4m	4m	4m	4m	4m	4m
13	Verge grade [5]							
	- Maximum	2.5% @ 6m	2.5% @ 4.5m	2.5% @ 4m	2.5% @4.5m	2.5% @ 3m	2.5% @ 3m	2.5%
	- Minimum	1% @ 6m	1% @ 4.5m	1% @ 4m	1% @4.5m	1% @ 3m	1% @ 3m	1%
14	Off-street path width	2 x 2.0m	1 x 1.2m	2 x 1.2m	1 x 1.2m	1 x 1.2m [6]	1 x 2.0m [6]	1 x 2.0m [6]
Longitudinal requirements								
15	Longitudinal grade							
	- Maximum	8%	8%	10%	10%	8%	16%	16%
	- Desirable maximum	6%	8%	8%	8%	6%	6%	12%
	- Minimum	1%	1%	1%	1%	1%	1%	1%

Endnotes

1 Austroads vehicle classification system

2 Vehicle turning shall be checked with Austroads vehicle Class 9 (19.0m Semi-Trailer)

3 Reserve width to increase in localized areas to accommodate cutting, fill, and intersections i.e. roundabouts etc.

4 Carriageway widths are measured from the invert of kerb and channel on one side of the carriageway to the invert of the kerb and channel on the opposite side of the carriageway.

5 Where feasible, verge shall fall towards the back of kerb and shall match with the top of kerb. Otherwise, match with edge of road.

6 Pathways are desirable but there are situations where a path may not be necessary and individual LGAs may delete the path requirement on a case by case basis with suitable justification

General notes

1. Traffic Volumes and speeds on any road shall be compatible with the residential functions of the road
2. Roads should differ in alignment and design standard according to the volume of traffic they are intended to carry the desirable speed and other factors.
3. In areas each class of route should reflect its role in the road hierarchy by its visual appearance and related physical design standards.
4. Design standard for trunk collector and sub arterial needs to be reviewed with respect to CMDG.

Annexure D01A

BSC DESIGN CRITERIA

Rural Areas

BSC – DESIGN CRITERIA – RURAL AREAS								
		Rural Major Collector	Rural Minor Collector	Rural Major Access	Rural Minor Access	Rural Major Lane	Rural Minor Lane	Rural Track
1	Traffic generation	>250 AADT	100-249 AADT	40-99 AADT	20-39 AADT	10-19 AADT	<10 AADT	-
2	Road Classification	3	4A	4B	5B	6A	6B	6C
3	Desirable Speed Environment	100km/h	100km/h	100km/h	80km/h	60km/h	60km/h	60km/h
4	Design Speed for Individual Elements (Min)	80km/h	80km/h	80km/h	40km/h	40km/h	40km/h	40km/h
5	Line-marking	Yes	Not required	Not required	Not required	Not required	Not required	Not required
6	Minimum Flood Immunity AEP (ARI)	18% (1 in 5 years)	39% (1 in 2 years)	39% (1 in 2 years)	63% (1 in 1 years)	63% (1 in 1 years)	63% (1 in 1 years)	63% (1 in 1 years)
7	Trafficable immunity, AEP (ARI)	2% (1 in 50 years)	5% (1 in 20 years)	5% (1 in 20 years)	18% (1 in 5 years)	18% (1 in 5 years)	18% (1 in 5 years)	18% (1 in 5 years)
Cross-section requirements								
8	Minimum reserve width (Flat terrain ≤ 5%)	25m	25m	25m	25m	25m	25m	25m
9	Minimum reserve width (Undulating / Hilly > 5%) [4]	30m	25m	25m	25m	25m	25m	25m
10	Formation	8m	8m	8m	6m	6m	6m	6m
11	Pavement Width	6.5m	6.5m	6.5m	4m	Note (b)	Note (b)	Note (b)
12	Seal Width	6.5m	4m	Note (a) and (c)	Note (a) and (c)	Not required	Not required	Not required

BSC DESIGN CRITERIA

Rural Areas

BSC – DESIGN CRITERIA – RURAL AREAS								
		Rural Major Collector	Rural Minor Collector	Rural Major Access	Rural Minor Access	Rural Major Lane	Rural Minor Lane	Rural Track
Longitudinal requirements								
13	Longitudinal grade							
	- Desirable Maximum	5%	8%	16%	16%	20%	20%	20%
	- Minimum	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%

Notes;

(a) Sealing shall be required for longitudinal grades in excess of 10% for Rural B zones and in excess of 16% for Rural A zone. Where the rural access (cul de sac) cannot be extended by future development, a 4m seal is generally sufficient (subject to traffic volumes). Where it is possible for the road to be extended to service additional lots, the road shall be constructed to a 6.5m seal standard.

(b) Gravel shall be required for longitudinal grades in excess of 10% for Rural B zones and in excess of 16% for Rural A zone. Gravel shall also be required in locations subject to flooding. i.e. where the risk of erosion is high, e.g. creek crossings. Refer Note (d)

(c) Sealing may be required at sites where existing adjacent roads are sealed. In this instance the seal width will match the adjoining seal with a minimum of 4m.

** In undulating terrain this width shall be increased to enable services to be constructed on accessible flatter land on top and below batters.

** Where the road is a designated on-road bicycle route (signposted and pavement marked) the shoulder provision needs to conform to AUSTROADS – BICYCLES.

** Where a Rural Major Collector is designated as a School Bus Route with Heavy Vehicle Traffic Volume > 10%, sealing of the shoulder is required.

(d) In the Rural Access road classes described above, an assessment of stream flow discharge and velocities by the developer may be required at the discretion of the Local Government to determine the need for further drainage and erosion protection treatments, e.g. Floodways. Refer to CMDG D5 Stormwater Drainage Design

(e) Refer to CMDG Standard Drawings for typical road cross section requirements

Annexure D01B

CHRC DESIGN CRITERIA

Urban Areas

CHRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets			Access Streets		
		Arterial	Sub-Arterial	Industrial	Major collector	Minor collector	Industrial	Residential Access Street	Residential Access Place
General Requirements									
1	Traffic generation (AADT)	>10,000	3,000 – 10,000	Traffic study required	1501-3000	501-1500	-	251-500	0-250
2	Speed environment	60 – 80km/h	60 – 80km/h	60km/h	50 – 70km/h	50 – 60km/h	60km/h	40km//h	40km/h
3	Posted speed	60 – 80km/h	60 – 80km/h	60km/h	50 – 70km/h	50 – 60km/h	50km/h	Urban Default	Urban Default
4	Design vehicle [1 & 2]	Class 11	Class 10	Class 11	19.0m Semitrailer (Class 9)	19.0m Semitrailer (Class 9)	Class 11	19.0m Semitrailer (Class 9)	Service Vehicles only (Class 5)
5	Through road	Yes	Yes	Yes	Yes	Yes	No (Cul-De-Sac or acceptable engineered solution)	Yes	No (Cul-De-Sac or acceptable engineered solution)
6	Direct lot access	No	No	Commercial and Industrial only	Commercial only	Residential and Commercial	Commercial and Industrial only	Residential only	Residential only
7	Bus routes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
8	Cycle facilities	Within Road Reserve, Max Separation from Road Formation	Within Road Reserve, Max Separation from Road Formation	- Separate lanes (desirable) - Shared road space with cars	Within Road Reserve, Max Separation from Road Formation	Within Road Reserve, Max Separation from Road Formation	Shared Road Space with Cars	Neighbourhood Routes, Shared Road Space with Cars	Shared Road Space with Cars
9	Pedestrian movement facilities	Pathway (Both sides)	Pathway (Both sides)	Pathways (Both Sides) [8]	Pathways (Both Sides)	Pathways (Both Sides)	Pathways Single Side within the verge [8]	Pathways Single Side within the verge	Pathways Single Side within the verge [8]
10	Parking provision in road reserve	No	No	Yes	Yes	Yes	Yes	Yes	No
11	Longitudinal line-marking	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Not Required	Not Required	Not Required

Annexure D01B

CHRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets			Access Streets		
		Arterial	Sub-Arterial	Industrial	Major collector	Minor collector	Industrial	Residential Access Street	Residential Access Place
12	Minimum Flood Immunity for minor system (kerb and channel flow) AEP (ARI)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)
13	Minimum Flood Immunity for minor system (cross drainage), AEP (ARI)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)
14	Design check for trafficable immunity, AEP (ARI)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)
15	Wildlife corridors	Yes	Yes	No	No	No	No	No	No
16	Lighting [3]	V3	V3	PR3	PR3	PR2	PR4	PR4	PR4
17	Noise attenuation [4]	1) Buffer 2) Landscaping & Buffer 3) Barrier	1) Buffer 2) Landscaping & Buffer 3) Barrier	Incorporate in Building/Lot Design (Passive)	Incorporate in Building/Lot Design (Passive)	No	No	No	No
18	Intersection interaction								
	- Arterial	Yes	Yes	Yes	Yes	No	No	No	No
	- Sub Arterial	Yes	Yes	Yes	Yes	No	No	No	No
	- Industrial	Yes	Yes	Yes	Yes	No	Yes	No	No
	- Major collector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	- Minor collector	No	No	No	Yes	Yes	Yes	Yes	Yes
	- Industrial	No	No	Yes	Yes	Yes	Yes	No	No
	- Residential Access Street	No	No	No	Yes	Yes	No	Yes	Yes
	- Residential Access Place	No	No	No	No	Yes	No	Yes	Yes

Annexure D01B

CHRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		**Arterial Roads**		**Collector streets**			**Access Streets**		
		Arterial	**Sub-Arterial**	**Industrial**	**Major collector**	**Minor collector**	**Industrial**	**Residential Access Street**	**Residential Access Place**
Cross-section requirements									
19	Carriageway form	Divided	Site Specific	2 Lanes	2 Lanes	2 Lanes	2 Lanes	2 Lanes	Two way
20	Minimum reserve width [5]	60m	30m	30m	25m	20m	25m	18m	18m
21	Nominal carriageway width [6] (Minimum)	12.0m (min, no parking)	11m carriageway width + median	18m	14m	12m	13m	10m	8m
22	Verge width (Minimum)	10m	4.5m	4m	4m	4m	4m	4m	4m
23	Through lane width (Minimum)	3.5m	3.5m	3.5m	3.5m	3.5m	Adjusted to condition	Adjusted to condition	Adjusted to condition
24	Kerb and channel profile	Site Specific	Barrier Kerb and Channel	Mountable Kerb and Channel	Barrier Kerb and Channel	Mountable kerb and channel	Mountable Kerb and Channel	Mountable Kerb and Channel	Mountable Kerb and Channel
25	Median width (minimum)	10m (min)	Site Specific	No median required	Site Specific 3.0m min. (Where Provided)	No median required	No	No	No
26	Verge grade [7]								
	- Maximum	2.5% @ 6m	2.5% @ 6m	2.5% @ 4.5m	2.5% @ 4m	2.5% @4.5m	2.5% @ 3m	2.5% @ 3m	2.5%
	- Minimum	1% @ 6m	1% @ 6m	1% @ 4.5m	1% @ 4m	1% @4.5m	1% @ 3m	1% @ 3m	1%
27	Off-street path width [Pedestrian / cycle] (Minimum)	2 x 2.0m	2 x 2.0m	2 x 2.0m [8]	2 x 2.0m	2 x 2.0m	1 x 2.0m [8]	1 x 2.0m	1 x 2.0m [8]
28	Bicycle lane width	Off Road, Shared Path	Off Road, Shared Path	On Road	Off Road, Shared Path	Off Road, Shared Path	On Road, Not Marked	On Road, Not Marked	On Road, Not Marked
29	On-street parking width (Minimum)	Nil	Nil	2.5m (min) Both sides	2.5m (min) Both sides	2.5m (min) Both sides	Unmarked provisions	Unmarked provisions	No, to be provided separately
30	Bus stops [9]	Indented Bays	Indented Bays	Unmarked	Indented Bays	Marked on road	No	No	No

Annexure D01B

CHRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets			Access Streets		
		Arterial	Sub-Arterial	Industrial	Major collector	Minor collector	Industrial	Residential Access Street	Residential Access Place
Longitudinal requirements									
31	Longitudinal grade								
	- Maximum	8% up to Maximum Length of 300m (Excluding Transitions)	8% up to Maximum Length of 300m (Excluding Transitions)	8% up to Maximum Length of 300m (Excluding Transitions)	10% up to Maximum Length of 300m (Excluding	10%	8%	16%	16%
	- Desirable maximum	5%	6%	8%	8%	8%	6%	6%	12%
	- Minimum	1%	1%	1%	1%	1%	1%	1%	1%
32	Intersection treatments	Grade Separated Signalised Roundabout	Grade Separated Signalised Roundabout	Roundabout Priority "T" (Volume Dependant)	Signalised, Roundabout, Priority T	Signalised, Roundabout, Priority T	Roundabout Priority "T" (Volume Dependant)	Roundabout Priority "T" (Volume Dependant)	Priority "T"
33	Intersection spacing [Centre to centre] (Minimum)	500m	300m	200m	200m	150m	60m	60m	No

[1] Austroads vehicle classification system

[2] Vehicle turning shall be checked with Austroads vehicle Class 9 (19.0m Semi-Trailer)

[3] Lighting categories presented in this table are minimum categories only. Lighting must be designed according to AS 1158.2.

[4] Where applicable for new developments, the applicant is required to submit an acoustic report and mitigation measure(s) in accordance with Council's Planning Scheme for noise associated with the development.

[5] Reserve width to increase in localized areas to accommodate cutting, fill, and intersections i.e. roundabouts etc.

[6] Carriageway widths are measured from the invert of kerb and channel on one side of the carriageway to the invert of the kerb and channel on the opposite side of the carriageway.

[7] Where feasible, verge shall fall towards the back of kerb and shall match with the top of kerb. Otherwise, match with edge of road.

[8] Pathways are desirable but there are situations where a path may not be necessary and individual LGAs may delete the path requirement on a case by case basis with suitable justification

[9] Bus stops to comply with the Public Transport Design Manual (PTIM).

Annexure D01B

CHRC DESIGN CRITERIA

Rural Areas

CHRC – DESIGN CRITERIA – RURAL AREAS					
Criterion		Arterial Road	Collector Street		Access Street
		Rural Arterial [1]	Rural Major Collector	Rural Minor Collector	Rural Access
1	Traffic generation	>3000 AADT	500 – 3000 AADT	100 – 150 AADT	<150AADT
2	Design Speed	110km/h	100km/h	100km/h	100km/h
3	Design vehicle[2,3,4]	Type- 1 (Class 11)	Type- 1 (Class 11)	26m B-Double (Class 10)	26m B-Double (Class 10)
4	Direct lot access	Yes (1 per Property)	Yes (1 per Property)	Yes (1 per Property)	Yes (1 per Property)
5	Parking provision in road reserve	Nil	Nil	Nil	Nil
6	Longitudinal line-marking	Edge of lane and centre	Edge of lane and centre	Not required	Not required
7	Minimum Flood Immunity AEP (ARI)	5% (1 in 20 years)	20% (1 in 5 years)	50% (1 in 2 years)	minimum 50% (1 in 2 years)
8	Trafficable immunity, AEP (ARI)	2% (1 in 50 years)	5% (1 in 20 years)	20% (1 in 5 years)	minimum 50% (1 in 2 years)
Cross-section requirements					
9	Minimum reserve width (Flat terrain ≤ 5%) [5]	40m	25m	20m	20m
10	Minimum reserve width (Undulating / Hilly > 5%) [4]	40m	30m	25m	25m
11	Formation	10m	10m	8m	8m
12	Pavement Width	10m	10m	8m	8m gravel
13	Seal Width	10m	7m	7m	7m
14	Minimum through lane width	3.5m	3.25m	3.25m	3m
15	Verge grade				
	- Maximum	2.5%	2.5%	2.5%	2.5%
	- Minimum	1%	1%	1%	1%

CHRC DESIGN CRITERIA

Rural Areas

CHRC – DESIGN CRITERIA – RURAL AREAS					
Criterion		Arterial Road	Collector Street		Access Street
		Rural Arterial [1]	Rural Major Collector	Rural Minor Collector	Rural Access
Longitudinal requirements					
16	Longitudinal grade				
	- Maximum	5%	8%	8%	8%
	- Minimum	0.5%	0.5%	0.5%	0.5%
17	Intersection treatments	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'
18	Minimum intersection spacing (Centre to centre	>500m	>500m	>400m	>100m

[1] Where Road is to be State Controlled, criteria must follow the State Road Authority requirements

[2] Austroads vehicle classification system

[3] Vehicle turning shall be checked with Austroads vehicle Class 10 (26m B-Double)

[4] Subject to B-Double permit approval

[5] Must meet the minimum road reserve width

Annexure D01C

GRC DESIGN CRITERIA

Urban Areas

GRC – DESIGN CRITERIA – URBAN AREAS											
Criterion		Road				Street					
		Arterial Roads		Distributor Road		Collector streets		Access Streets			
		Arterial	Sub-Arterial	4-Lane Distributor	2-Lane Distributor	Industrial	Residential / Commercial	Industrial Access Street	Residential Access Street	Residential Access Place	Residential Access Lane
General Requirements											
1	Traffic Generation AADT	As per DTMR Requirements	<20,000	<12,000	<6,000	<6,000	<3,000	Traffic study required	<1,000	<150	
2	Speed Environment (km/h)		90	80	70	70	70	60	60	60	
3	Posted Speed (km/h)		80	70	60	60	60	50	50	50	
4	Design Vehicle [1]		26.0m B-Double (Class 10)	26.0m B-Double (Class 10)	26.0m B-Double (Class 10)	26.0m B-Double (Class 10)	19.0m Semitrailer (Class 9)	26.0m B-Double (Class 10)	Service Vehicles only (Class 8) [2]	Service Vehicles only (Class 8) [2]	
5	Through Road		Yes	Yes	Yes	Yes	Yes	No (Cul-De-Sac or acceptable engineered solution)	Yes	No (Cul-De-Sac or acceptable engineered solution)	
6	Direct Lot Access Function Residential Access: Commercial Access: Industrial Access:		No access No access No access	Multi-dwelling only Consolidated Consolidated	1 x property Consolidated Consolidated	No access 1 x property 1 x property	1 x property 1 x property No access	No access 1 x property 1 x property	1 x property No access No access	1 x property No access No access	
7	Hazardous Goods Movement		Primary routes	Nominated routes only	Access only	Nominated routes only	Access only	Nominated routes only	No	No	
8	Public Transport Facilities		Bus Route	Bus Route	Bus Route	Bus Route	Bus Route	No	School Bus Only	No	
9	Bus Stop Prevision		Separate from road	Separate from road	Dedicated Bay	Marked on Road	Marked on Road	No Provision	No Provision	No Provision	
10	Cycle Facilities		As per current industry standards [3]	As per current industry standards [3]	As per current industry standards [3]	As per current industry standards [3]	As per current industry standards [3]	As per current industry standards [3]	As per current industry standards [3]	As per current industry standards [3]	
11	Pedestrian Movement Facilities (Footpath)		Both sides within the verge	Both sides within the verge	Both sides within the verge	Both sides within the verge	Both sides within the verge	One side within the verge	One side within the verge	No Provision	
12	Parking Provision in Road Reserve		Nil	Site Specific	Site Specific	Kerbside	Kerbside	Kerbside	Unmarked	Unmarked	

GRC – DESIGN CRITERIA – URBAN AREAS												
Criterion		Road				Street						
		Arterial Roads		Distributor Road		Collector streets		Access Streets				
		Arterial	Sub-Arterial	4-Lane Distributor	2-Lane Distributor	Industrial	Residential / Commercial	Industrial Access Street	Residential Access Street	Residential Access Place	Residential Access Lane	
13	Longitudinal Line-marking		Edge of Lane & Centre line with RRPM	Edge of Lane & Centre line with RRPM	Edge of Lane & Centre line with RRPM	Edge of Lane & Centre line with RRPM	Edge of Lane & Centre line with RRPM	No Provision	No Provision	No Provision		
14	Minimum Flood Immunity for Minor System (Kerb and channel flow) AEP (ARI)		1% (1 in 100 years)	2% (1 in 50 years)	2% (1 in 50 years)	5% (1 in 20 years)	5% (1 in 20 years)	5% (1 in 20 years)	10% [4] (1 in 10 years)	10% [4] (1 in 10 years)		
15	Minimum Flood Immunity for Minor System (Cross drainage), AEP (ARI)		-	-	-	-	-	-	-	-		
16	Design Check for Trafficable Immunity, AEP (ARI)		1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)		
17	Wildlife Corridors		Yes	Yes	No	No	No	No	No	No		
18	Lighting [5]		V3 (Min)	V4 (Min)	V4 (Min)	PR3 (Min)	PR3 (Min)	PR3 (Min)	PR4 (Min)	PR4 (Min)		
19	Noise Attenuation [6]		Site specific	1) Buffer 2) Landscaping & Buffer	Site specific	Incorporate in Building/Lot Design (Passive)	Incorporate in Building/Lot Design (Passive)	Incorporate in Building/Lot Design (Passive)	No	No		
20	Abutting Land Use		Non-sensitive to vehicle associated noise	Non-sensitive to vehicle associated noise	Retail, Commercial, Light Industrial, Residential	As specified under zoning	As specified under zoning	As specified under zoning	As specified under zoning	As specified under zoning		
21	Land Use Impact Amelioration		Barriers Buffers Setbacks	Barriers Streetscaping Setbacks	Streetscaping Traffic management (site specific)	Streetscaping Intersection Control	Streetscaping Intersection Control	Streetscaping Intersection Control	Streetscaping	Streetscaping		
22	Intersection interaction											
	- Arterial		Yes	Yes	Yes	Yes	No	No	No	No		
	- Sub Arterial		Yes	Yes	Yes	Yes	No	No	No	No		
	- 4-Lane Distributor		Yes	Yes	Yes	Yes	Yes	No	No	No		
	- 2-Lane Distributor		Yes	Yes	Yes	Yes	Yes	No	No	No		
	- Industrial		Yes	Yes	Yes	Yes	Yes	Yes	No	No		
	- Residential / Commercial		No	Yes	Yes	Yes	Yes	No	Yes	Yes		
	- Industrial Access Street		No	No	No	Yes	No	No	No	No		
	- Residential Access Street		No	No	No	No	Yes	No	Yes	Yes		
	- Residential Access Place		No	No	No	No	Yes	No	Yes	No		

Annexure D01C

GRC – DESIGN CRITERIA – URBAN AREAS											
Criterion		Road				Street					
		Arterial Roads		Distributor Road		Collector streets		Access Streets			
		Arterial	Sub-Arterial	4-Lane Distributor	2-Lane Distributor	Industrial	Residential / Commercial	Industrial Access Street	Residential Access Street	Residential Access Place	Residential Access Lane
	-										
Cross-Section Requirements											
23	Carriageway Form	As per DTMR Requirements	Site specific	Divided 2 x 2 lanes	2 marked lanes	2 marked lanes	2 marked lanes	Un-divided 2 lanes	Un-divided 2 lanes	Un-divided 2 lanes	
24	Minimum Reserve Width [7]		40m Depends on Ultimate Function	40m	25m Depends on Ultimate Function	25m	22m	25m	18m	17m	
25	Nominal Carriageway Width [8]		11m (No parking) per carriageway	2 x 11.5m	13m	13m	11m	13m	9m	8m	
26	Minimum Verge Width		7.5m	6m	6m	6m	5.5m	6m	4.5m	4.5m	
27	Minimum Through Lane Width		3.5m	3.5m	3.5m	3.5m	3.0m	3.5m	3.0m	3.0m	
28	Minimum Curve Radius [9]		As per speed environment in accordance with relevant Austroads Guide	As per speed environment in accordance with relevant Austroads Guide	As per speed environment in accordance with relevant Austroads Guide	As per speed environment in accordance with relevant Austroads Guide	As per speed environment in accordance with relevant Austroads Guide	As per speed environment in accordance with relevant Austroads Guide	As per speed environment in accordance with relevant Austroads Guide	As per speed environment in accordance with relevant Austroads Guide	
29	Shoulder Width		2.0m (Min) Both sides each carriageway	3.0m (Min) Left side [10] 1.5m (Min) Right side [10] (Each Carriageway)	Site Specific	N/A	N/A	N/A	N/A	N/A	
30	Kerb and Channel Profile		Barrier Kerb	Barrier Kerb	Barrier Kerb	Barrier Kerb & Channel (150mm high)	Barrier Kerb & Channel (150mm high)	Barrier Kerb & Channel (150mm high)	Mountable Kerb & Channel (100mm high)	Mountable Kerb & Channel (100mm high)	
31	Median Width (Minimum)		5m	5m	Site Specific (2.0m where provided)	Site Specific (2.0m where provided)	Site Specific (2.0m where provided)	Site Specific (2.0m where provided)	No	No	

Annexure D01C

GRC – DESIGN CRITERIA – URBAN AREAS											
Criterion		Road				Street					
		Arterial Roads		Distributor Road		Collector streets		Access Streets			
		Arterial	Sub-Arterial	4-Lane Distributor	2-Lane Distributor	Industrial	Residential / Commercial	Industrial Access Street	Residential Access Street	Residential Access Place	Residential Access Lane
32	Verge Batter Slope and Width [11]	As per DTMR Requirements									
	- Maximum		2.5% @ 6m	2.5% @ 4.5m	2.5% @ 4.5m	2.5% @ 4.5m	2.5% @ 4m	2.5% @ 4.5m	2.5% @ 3m	2.5% @ 3m	
	- Minimum		1% @ 6m	1% @ 4.5m	1% @ 4.5m	1% @ 4.5m	1% @ 4m	1% @ 4.5m	1% @ 3m	1% @ 3m	
33	Off-street Path Width [12] [Pedestrian / Cycle] (Minimum)		2 x 3.0m (Min)	2 x 2.5m (Min)	2 x 2.5m (Min)	2 x 1.5m (Min)	2 x 1.5m (Min)	2 x 1.5m (Min)	1 x 1.5m (Min)	No specific provision	
34	Cycle Lane Width[12]		Dedicated lane (Marked) 2 x 2.5m (Min) (both directions)	Dedicated lane (Marked) 2 x 2.0m (Min) (both directions)	Dedicated lane (Marked) 2 x 2.0m (Min) (both directions)	On road (Not marked)	On road (Not marked)	On road (Not marked)	On road (Not marked)	On road (Not marked)	
35	On-street Parking Width (Minimum)		Nil	3m (Min)	3m (Min) both sides	2.5m (Min) both sides	2.5m (Min) both sides	Unmarked provision	Unmarked provision	Unmarked provision	
36	Bus Stop Width [13]		Site specific	3.0m indented	3.0m indented	Refer to GRC Bus Stop Standards	Refer to GRC Bus Stop Standards	No provision	No provision	No provision	
Longitudinal Requirements											
37	Longitudinal Grade	As per DTMR Requirements									
	- Absolute Maximum		8% up to Maximum Length of 100m (Excluding Transitions)	8% up to Maximum Length of 100m (Excluding Transitions)	8% up to Maximum Length of 100m (Excluding Transitions)	-	10% up to Maximum Length of 75m (Excluding Transitions) on one occasion per road	-	15% up to Maximum Length of 75m (Excluding Transitions)	15% up to Maximum Length of 75m (Excluding Transitions)	
	- Desirable Maximum		6%	6%	6%	8%	8%	8%	10%	10%	
	- Minimum		0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	
38	Median Drainage Surface Treatment		<2% vegetated >=2% concrete	<2% vegetated >=2% concrete	<2% vegetated >=2% concrete	<2% vegetated >=2% concrete	<2% vegetated >=2% concrete	<2% vegetated >=2% concrete	N/A	N/A	

GRC – DESIGN CRITERIA – URBAN AREAS											
Criterion		Road				Street					
		Arterial Roads		Distributor Road		Collector streets		Access Streets			
		Arterial	Sub-Arterial	4-Lane Distributor	2-Lane Distributor	Industrial	Residential / Commercial	Industrial Access Street	Residential Access Street	Residential Access Place	Residential Access Lane
39	Intersection Treatments		Grade Separated Signalised Roundabout (Volume Dependant)	Signalised Roundabout Priority "T" (Volume Dependant)	Signalised Roundabout Priority "T" (Volume Dependant)	Roundabout Priority "T" (Volume Dependant)	Roundabout Priority "T" (Volume Dependant)	Roundabout Priority "T" (Volume Dependant)	Priority "T"	Priority "T"	
40	Intersection Spacing [Centre to Centre] (Minimum)		>1000m	>500m	>500m	>200m	>100m	>200m	>80m	No	

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1 Austroads vehicle classification system.

2 Vehicle turning shall be checked with Austroads vehicle Class 9 (19.0m Semi-Trailer).

3 Refer to Austroads and DTMR publications.

4 Subject to the development category.

5 Lighting must be designed in accordance with AS1158 set, and Main Roads Manual. In addition to this, the Energy Provider has advised that liability for the installation of glare shields on street lighting infrastructure rests with Council. It will be noted that Council will no longer endorse the installation of such shields.

6 Where applicable for new developments, the applicant is required to submit an acoustic report and mitigation measure(s) in accordance with Council's Planning Scheme for Noise associated with the development.

7 Reserve width to increase in localized areas to accommodate cutting, fill, and intersections i.e. roundabouts etc.

8 Carriageway widths are measured from the invert of kerb and channel on one side of the carriageway to the invert of the kerb and channel on the opposite side of the carriageway.

9 It is desirable to super elevate all horizontal curves with negative (adverse) 3% crossfall (i.e. no superelevation). Curve radius for adverse crossfall should be according to guidelines provided in Austroads Part 3.

10 "Left side" and "Right side" are to be taken as in respect to the direction of travel.

11 Where feasible, verge shall fall towards the back of kerb and shall match with the top of kerb. Otherwise, match with edge of road.

12 Widths are to be ultimately controlled by the Footpath / Cycleway Strategy. Carriageway width to be adjusted accordingly.

13 Bus stops to comply with the Public Transport Design Manual (PTIM).

Annexure D01C

GRC DESIGN CRITERIA

Rural Areas

GRC – DESIGN CRITERIA – RURAL AREAS						
Criterion		Road			Road	
		Arterial Roads		Distributor Road	Collector Road	Access Road
		Arterial	Sub-Arterial [1]	2-Lane Distributor [2]	Rural Collector	Local Access Road
General Requirements						
1	Traffic Generation AADT	As per DTMR Requirements	<20,000	<5,000	<1,000	<150
2	Speed Environment (km/h)		110	110	110 (90 Rural Residential)	110 (70 Rural Residential)
3	Posted Speed (km/h)		100	100	100 (80 Rural Residential)	80 (60 Rural Residential)
4	Design Vehicle [3]		26.0m B-Double (Class 10)	26.0m B-Double (Class 10)	26.0m B-Double (Class 10)	26.0m B-Double (Class 10)
5	Through Road		Yes	Yes	Yes	No (Terminates at a gate/grid or fence)
6	Through Lane Running Surface		Sealed	Sealed	Sealed	Formed (AADT<10) Gravel (AADT<150 Sealed (AADT>=150) Sealed (Rural Residential)
7	Shoulder Running Surface		Sealed	Sealed	Sealed (Sealed with Concrete Edge in Rural Residential)	Gravel (Sealed with Concrete Edge in Rural Residential)
8	Direct Lot Access Function Residential Access: Commercial Access: Industrial Access:		 1 per Property Via lower order road[4] Via lower order road[4]	 1 per Property Via lower order road[4] Via lower order road[4]	 1 per Property 1 per Property 1 per Property	 1 per Property 1 per Property 1 per Property
9	Heavy Traffic Movement		Yes	Yes	Subject to Approval	Subject to Approval
10	Hazardous Goods Movement		Primary Routes	Nominated Routes Only	Access Only	Access Only
11	Public Transport Facilities		Line Haul, Priority Treatments	Bus Route	Bus Route	No
12	Bus Stop Provision		Dedicated Bays	Dedicated Bays	On Widened Shoulder, Coinciding with Property Access	No
13	Cycle Facilities [5]		Separate From Road	Separate From Road	On Road	No Specific Provision
14	Pedestrian Movement Facilities (Footpath)		No Specific Provision	No Specific Provision	No Specific Provision	No Specific Provision
15	Parking Provision in Road Reserve		Nil	Nil	Nil	Nil

GRC – DESIGN CRITERIA – RURAL AREAS						
Criterion		**Road**			**Road**	
		Arterial Roads		**Distributor Road**	**Collector Road**	**Access Road**
		Arterial	**Sub-Arterial** [1]	**2-Lane Distributor** [2]	**Rural Collector**	**Local Access Road**
16	Longitudinal Line-marking	As per DTMR Requirements	Edge of Lane & Centre Line with RRPM	Edge of Lane & Centre Line with RRPM	No Provision	No Provision
17	Guidepost Lateral Location		Edge of Carriageway	Edge of Carriageway	Edge of Carriageway	Edge of Carriageway
18	Minimum Flood Immunity for Minor System (Table Drain flow) AEP (ARI)		10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	AADT < 150: 39% (1 in 2 years) AADT ≥ 150 and Rural Residential: 10% (1 in 10 years)
19	Minimum Flood Immunity for Minor System (Cross Drainage), AEP (ARI)		2% (1 in 50 years)	2% (1 in 50 years)	10% (1 in 10 years	AADT < 150: 39% (1 in 2 years) AADT ≥ 150 and Rural Residential: 10% (1 in 10 years)
20	Design Check for Trafficable Immunity, AEP (ARI)				-	-
21	Wildlife Corridors		Yes	No	No	No
22	Lighting [6]		V5 (Min)	V5 (Min)	PR4 (Min)	PR4/PR5 [7]
23	Noise Attenuation [8]		N/A	N/A	N/A	N/A
24	Abutting Land Use		Non-sensitive to Vehicle Associated Noise	Non-sensitive to Vehicle Associated Noise	N/A	N/A
25	Land Use Impact Amelioration		Setbacks [9]	Setbacks [9]	Setbacks [9]	Setbacks [9]
26	Intersection Interaction					
	- Arterial		Yes	Yes	Yes	No
	- Sub Arterial		Yes	Yes	Yes	No
	- 2-Lane Distributor		Yes	Yes	Yes	Yes
	- Rural Collector Road		Yes	Yes	Yes	Yes
	- Local Access Road		No	Yes	Yes	Yes
Cross-Section Requirements						
27	Minimum Reserve Width [10]	As per DTMR Requirements	40m	30m	25m	25m
28	Minimum Formation Width		16m	13m	12m	11m
29	Carriageway Form [11]		Divided 2 Lanes	Un-divided 2 Marked Lanes	Un-divided 2 Lanes	Un-divided 2 Lanes
30	Nominal Carriageway Width		12m	9m	8m	7m
31	Verge Width		1.0m (Min)	1.0m (Min)	1.0m (Min)	1.0m (Min)

Annexure D01C

GRC – DESIGN CRITERIA – RURAL AREAS						
Criterion		Road			Road	
		Arterial Roads		Distributor Road	Collector Road	Access Road
		Arterial	Sub-Arterial [1]	2-Lane Distributor [2]	Rural Collector	Local Access Road
32	Through Lane Width (Minimum)	As per DTMR Requirements	3.5m	3.5m	3.0m	3.0m
33	Shoulder Width		2.5m	1.0m	1.0m (Min)	0.5m (Min)
34	Minimum Curve Radius [12]		1,100m	1,100m	1,100m	1,100m
35	Clear Zone Width		Refer AGRD Part 6	Refer AGRD Part 6	Refer AGRD Part 6	Refer AGRD Part 6
36	Median Width (Minimum)		1 x Clear Zone Width (Where Required)	N/A	N/A	N/A
37	Table Drain Invert Depth [13]		0.3m (Min)	0.3m (Min)	0.3m (Min)	0.3m (Min)
38	Off-street Path Width [Pedestrian / Cycle] Minimum) [14]		No Specific Provision	No Specific Provision	No Specific Provision	No Specific Provision
39	Bicycle Lane Width [14]		Nil (Use Sealed Shoulder)	No Specific Provision	No Specific Provision	No Specific Provision
40	On-street Parking Width (Minimum)		No Specific Provision	No Specific Provision	No Specific Provision	No Specific Provision
41	Bus Stop (Width, Indented)		3m Shoulder Extensions (Where required)	3m Shoulder Extensions (Where required)	3m Shoulder Extensions (Where required)	No Provision
Longitudinal Requirements						
42	Longitudinal Grade					
	- Maximum	As per DTMR Requirements	-	-	-	-
	- Desirable maximum		5%	7%	8%	10% Unsealed 15% Sealed
	- Minimum		1%	1%	1%	1%
43	Intersection Treatments		Priority "T"	Priority "T" Or Roundabout (3 or 4 legs) (Volume Dependant)	Priority "T" Or Roundabout (3 or 4 legs) (Volume Dependant)	Priority "T"
44	Intersection Spacing [Centre to Centre] (Minimum)		>500m	>500m	>500m	>100m

[1] Where Road is to be State Controlled, Criteria must follow the State Road Authority Requirements
[2] Traffic Distributor is to be used as Industrial Road
[3] Austroads vehicle classification system
[4] Access is to be to an existing lower order road, or to a newly created lower order road located at an adjoining property boundary
[5] Required where identified in Pedestrian & Cycle Strategy. Designed in accordance with to Austroads and DTMR publications
[6] Lighting categories presented in this table are minimum categories only. Lighting must be designed according to AS 1158.2.
[7] Rural roads are to be designed to a minimum of category PR4/PR5 lighting and no route lighting. Intersection flag lighting may be used, however, Council's approval is required in this instance. Following lighting infrastructure shall be considered for a rural road through a rural residential area;

- Minimum Category PR4 (except rural sub-arterial and distributor road where minimum requirement is V5) shall be provided. PR5 is absolute minimum and can be used if there are existing reticulation poles;
- Lighting shall be provided for,

  i. Intersections
  ii. Culvert identified as being a hazard in accordance with Part 6: Austroads Guide to Road Design;
  iii. Floodways and causeway;
  iv. Cul-de-sacs;
  v. End of road;
  vi. Change in pavement width;
  vii. Change in travel direction;
  viii. Local Area Traffic Management Devices

- Where lighting (Category PR4 and PR5) is provided, minimum illumination width shall be the width of the road reserve or 12.5m either side of the road centre line whichever is the smaller width.
- In addition to this, the Energy Provider has advised that liability for the installation of glare shields on street lighting infrastructure rests with Council. It will be noted that Council will no longer endorse the installation of such shields. Council does not permit installation of glare shield on the street lighting infrastructure

[8] Where applicable for new developments, the applicant is required to submit an acoustic report and mitigation measure(s) in accordance with Council's Planning Scheme for noise associated with the development.
[9] Distance as specified in the Planning Scheme
[10] Minimum Reserve width is Carriageway + Verge Width x 2 + Drainage x 2 + Lateral Clearance x 2, width to increase in localised areas to accommodate cutting, fill, and intersections etc.
[11] Carriageway form is typically located centrally within the road reserve
[12] 3% superelevation is utilised for these minimum radii
[13] Invert depth is depth below edge of carriageway.
[14] Widths are to be ultimately controlled by the Footpath / Cycleway Strategy. Carriageway width to be adjusted accordingly.

Annexure D01D

IRC DESIGN CRITERIA

Urban Areas

IRC – DESIGN CRITERIA – URBAN AREAS										
Criterion		Arterial Roads		Collector streets				Access Streets		
		Arterial	Sub-Arterial	Trunk	Industrial	Major collector	Minor collector	Industrial	Residential Access street	Residential Access place
General Requirements										
1	Traffic generation (AADT)	Volumes Not Restricted	Site specific	> 3000	Serviced area up to 30ha	1501-3000	501-1500	Serviced area <8ha	251-500	0-250
2	Design Speed	60 - 80km/h	60 - 80km/h	80km/h	60km/h	60km/h	50km/h	60km/h	40km/h	30km/h
3	Posted speed	60 - 80km/h	60 - 80km/h	70km/h	60km/h	60km/h	Urban Default	50km/h	Urban Default	Urban Default
4	Design vehicle [1&2]	TMR Permitted Vehicles	Class 10	26.0m B-Double (Class 10)	26.0m B-Double (Class 10)	19.0m Semitrailer (Class 9)	19.0m Semitrailer (Class 9)	19.0m Semitrailer (Class 9)	19.0m Semitrailer (Class 9)	Service Vehicles only (Class 5)
5	Through road	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No (Cul-De-Sac or acceptable engineered solution)
6	Direct lot access	No	No	Commercial and industrial only	Commercial and industrial only	Commercial only	Residential and commercial	Commercial and industrial only	Residential only	Residential only
7	Bus routes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
8	Cycle facilities	Within Road Reserve, Max Separation from Road Formation	Lanes on Road (in shoulder)	Lanes on Road (in shoulder)	District / Neighbourhood Routes, Preference 1. Separate Lanes (desirable) 2. Shared Road space	Neighbourhood Routes, Shared Road Space with Cars	Neighbourhood Routes, Shared Road Space with Cars	Neighbourhood Routes, Shared Road Space with Cars	Neighbourhood Routes, Shared Road Space with Cars	Neighbourhood Routes, Shared Road Space with Cars
9	Pedestrian movement facilities	Within Road Reserve, Max Separation from Road Formation	Pathways Both Sides within the verge	Pathways Both Sides within the verge	Pathways Both Sides within the verge	Pathways Both Sides within the verge	Pathways Both Sides within the verge	Pathways Both Sides within the verge	Pathways Both Sides within the verge	Pathways Both Sides within the verge
10	Parking provision in road reserve	No	No	No	Yes	Yes	Yes	Yes	Yes	No
11	Longitudinal line-marking	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Not Required	Not Required	Not Required

IRC – DESIGN CRITERIA – URBAN AREAS										
Criterion		**Arterial Roads**		**Collector streets**				**Access Streets**		
		Arterial	**Sub-Arterial**	**Trunk**	**Industrial**	**Major collector**	**Minor collector**	**Industrial**	**Residential Access street**	**Residential Access place**
12	Minimum Flood Immunity for minor system (kerb and channel flow) AEP (ARI)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	39% (1 in 2 years)	39% (1 in 2 years)	39% (1 in 2 years)
13	Minimum Flood Immunity for minor system (cross drainage), AEP (ARI)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)
14	Design check for trafficable immunity, AEP (ARI)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)
15	Wildlife corridors	Yes	Yes	No	No	No	No	No	No	No
16	Lighting [3]	V3 (Min)	V3 (Min)		PR3 (Min)	PR3 (Min)	PR3(Min)	PR3 (Min)	PR5 (Min)	PR5 (Min)
17	Noise attenuation [4]	1) Buffer 2) Landscaping & Buffer 3) Barrier	1) Buffer 2) Landscaping & Buffer 3) Barrier	Yes	Incorporate in Building/Lot Design (Passive)	Incorporate in Building/Lot Design (Passive)	No	No	No	No
18	Intersection interaction									
	- Arterial	Yes	Yes	Yes	No	No	No	No	No	No
	- Sub Arterial	Yes	Yes	Yes	Yes	No	No	No	No	No
	- Trunk	No	Yes	Yes	Yes	No	No	No	No	No
	- Industrial Collector	No	Yes	Yes	Yes	No	No	Yes	No	No
	- Major collector	No	No	No	Yes	Yes	Yes	Yes	Yes	No
	- Minor collector	No	No	No	No	Yes	Yes	Yes	Yes	Yes
	- Industrial access	No	No	No	Yes	Yes	No	Yes	No	No
	- Residential Access Street	No	No	No	No	Yes	Yes	No	Yes	Yes
	- Residential Access Place	No	No	No	No	No	No	No	Yes	Yes

Annexure D01D

IRC – DESIGN CRITERIA – URBAN AREAS										
Criterion		Arterial Roads		Collector streets				Access Streets		
		Arterial	Sub-Arterial	Trunk	Industrial	Major collector	Minor collector	Industrial	Residential Access street	Residential Access place
Cross-section requirements										
19	Carriageway form	Divided	Site Specific	Divided	2 Lanes	2 Lanes	One-way / Two-way	Two Way	Two way	Two way
20	Minimum reserve width [5]	60m	-	30m	30m	20m	20m	25m	18m	18m
21	Nominal carriageway width [6] (Minimum)	12.0m (min, no parking)	-	18m (2 x 6.5m carriageway + 5.0 centre median (varies))	18m	12m	10m	13m	10m	8m
22	Verge width (Minimum)	10m	-	4.5m	4m	4m	4m	4m	4m	4m
23	Through lane width (Minimum)	3.5m	3.5m	3.5m	3.5m	3.0m	3.0m	Adjusted to condition	Adjusted to condition	Adjusted to condition
24	Kerb and channel profile	Site Specific	Barrier Kerb	Barrier Kerb	Barrier Kerb and Channel (150mm high)	Barrier Kerb and Channel (150mm high)	Barrier Kerb and Channel (150mm high)	Mountable Kerb and Channel	Mountable Kerb and Channel	Mountable Kerb and Channel
25	Median width (minimum)	10m	5m	5m	Site Specific 3.0m min. (Where Provided)	Site Specific 3.0m min. (Where Provided)	No	No	No	No
26	Verge grade [7]									
	- Maximum	2.5% @ 6m	2.5% @ 6m	2.5% @ 4.5m	2.5% @ 4.5m	2.5% @ 4m	2.5% @4.5m	2.5% @ 3m	2.5% @ 3m	2.5% max
	- Minimum	1% @ 6m	1% @ 6m	1% @ 4.5m	1% @ 4.5m	1% @ 4m	1% @4.5m	1% @ 3m	1% @ 3m	1%
27	Off street path width (Pedestrian / cycle)	2 x 2.0m	2 x 2.0m	2 x 2.0m	1 x 2.0m	2 x 2.0m	1 x 1.5m	1 x 2.0m	1 x 1.5m [8]	1x 1.5m [8]
28	Bicycle lane width	On Road, Marked 2.0m (min both direction, included in shoulder width)	On Road, Marked 2.0m (min both direction, included in shoulder width)	On Road, Not Marked	On Road, Not Marked	On Road, Not Marked	On Road, Not Marked	On Road, Not Marked	On Road, Not Marked	On Road, Not Marked
29	On street parking width	Nil	Site Specific	Unmarked provisions	2.5m (min) Both sides	2.5m (min) Both sides	2.5m (min) Both sides	Unmarked provisions	Unmarked provisions	Unmarked provisions
30	Bus stops [9]	Indented Bays	Indented Bays	Indented Bays	Marked on Road	Marked on Road	Marked on Road	No	No	No

Annexure D01D

IRC – DESIGN CRITERIA – URBAN AREAS										
Criterion		Arterial Roads		Collector streets				Access Streets		
		Arterial	Sub-Arterial	Trunk	Industrial	Major collector	Minor collector	Industrial	Residential Access street	Residential Access place
Longitudinal requirements										
31	Longitudinal grade									
	- Maximum	6% 8% up to Maximum Length of 300m (Excluding Transitions)	6% 8% up to Maximum Length of 300m (Excluding Transitions)	6%	8%	10% up to Maximum Length of 300m (Excluding Transitions)	10%	10%	16% [10]	16% [10]
	- Desirable maximum	5%	5%	5%	6%	8%	8%	6%	12%	12%
	- Minimum	1%	1%	1%	1%	1%	1%	1%	1%	1%
32	Intersection treatments	Grade Separated	Grade Separated Signalised Roundabout (Volume Dependant)	Roundabout Signalised	Roundabout Signalised Priority "T" (Volume Dependant)	Roundabout Signalised Priority "T" (Volume Dependant)	Roundabout Priority "T" (Volume Dependant)	Priority "T"	Priority "T" Roundabout	Priority "T"
33	Intersection spacing [Centre to centre] (Minimum)	2km Highway >2km Motorway	1000m	200m	200m	150m	100m	120m	60m	No

1 Austroads vehicle classification system

2 Vehicle turning shall be checked with Austroads vehicle Class 9 (19.0m Semi-Trailer)

3 Lighting categories presented in this table are minimum categories only. Lighting must be designed according to AS 1158.2.

4 Where applicable for new developments, the applicant is required to submit an acoustic report and mitigation measure(s) in accordance with Council's Planning Scheme for noise associated with the development.

5 Reserve width to increase in localized areas to accommodate cutting, fill, and intersections i.e. roundabouts etc.

6 Carriageway widths are measured from the invert of kerb and channel on one side of the carriageway to the invert of the kerb and channel on the opposite side of the carriageway.

7 Where feasible, verge shall fall towards the back of kerb and shall match with the top of kerb. Otherwise, match with edge of road.

8 Pathways are desirable but there are situations where a path may not be necessary and individual LGAs may delete the path requirement on a case by case basis with suitable justification

9 Bus stops to comply with the Public Transport Design Manual (PTIM).

10 The absolute maximum grade shall be 20% for a maximum length of 60m. The maximum length of grades less than 20% but not less than 16% shall be 60m plus 25m for each 1% the grade is less than 20%. The maximum length of any grade greater than 16% shall be 160m.

IRC DESIGN CRITERIA

Rural Areas

IRC – DESIGN CRITERIA – RURAL AREAS					
	Criterion	Arterial Road	Collector Street		
		Rural Arterial [1]	Rural Major Collector	Rural Minor Collector	Rural Access
General Requirements					
1	Traffic generation	>3000 AADT	501 – 3000 AADT	151 – 500 AADT	<150 AADT
2	Design Speed	110km/h	110km/h	110km/h	110km/h
3	Design vehicle[2,3,4]	26m B-Double (Class 10)	26m B-Double (Class 10)	26m B-Double (Class 10)	26m B-Double (Class 10)
4	Direct lot access	Yes (1 per Property)	Yes (1 per Property)	Yes (1 per Property)	Yes (1 per Property)
5	Parking provision in road reserve	Nil	Nil	Nil	Nil
6	Longitudinal line-marking	Edge of lane and centre	Edge of lane and centre	Not required	Not required
7	Minimum Flood Immunity AEP (ARI)	5% (1 in 20 years)	5% (1 in 20 years)	18% (1 in 5 years)	minimum 39% (1 in 2 years)
8	Trafficable immunity, AEP (ARI)	2% (1 in 50 years)	2% (1 in 50 years)	5% (1 in 20 years)	5% (1 in 20 years)
Cross-section requirements					
9	Minimum reserve width (Flat terrain ≤ 5%) [5]	40m	25m	20m	20m
10	Minimum reserve width (Undulating / Hilly > 5%) [4]	40m	30m	25m	25m
11	Formation	10m	10m	8m	8m
12	Pavement Width	10m	10m	8m	8m
13	Seal Width[7]	10m	10m	8m	No Seal Required [6]
14	Minimum through lane width	3.5m	4.0m	3.5m	3.5m
15	Verge grade				
	- Maximum	2.5%	2.5%	2.5%	2.5%
	- Minimum	1%	1%	1%	1%

IRC DESIGN CRITERIA

Rural Areas

IRC – DESIGN CRITERIA – RURAL AREAS					
Criterion		Arterial Road	Collector Street		
		Rural Arterial [1]	Rural Major Collector	Rural Minor Collector	Rural Access
Longitudinal Requirements					
16	Longitudinal grade				
	- Maximum	5%	8%	8%	10% max (Unsealed) 15% max (Sealed)
	- Minimum	0.5%	0.5%	0.5%	0.5%
17	Intersection treatments	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'
18	Minimum intersection spacing (Centre to centre)	>500m	>500m	>500m	>100m

[1] Where Road is to be State Controlled, criteria must follow the State Road Authority requirements
[2] Austroads vehicle classification system
[3] Vehicle turning shall be checked with Austroads vehicle Class 10 (26m B-Double)
[4] Subject to B-Double permit approval.
[5] Must meet the minimum road reserve width
[6] Sealing shall be required for longitudinal grades in excess of 10% and in instances where existing adjacent roads are sealed (seal width to match existing seal width)
[7] Where the road is a designated on-road bicycle route (signposted and pavement marked) the shoulder provision needs to conform to the AUSTROADS Traffic Engineering Practice Part 14: Bicycles

Annexure D01E

LSC DESIGN CRITERIA

Urban Areas

LSC – DESIGN CRITERIA – URBAN AREAS									
Criterion		**Arterial Roads**		**Collector streets**			**Access Streets**		
		Arterial	**Sub-Arterial**	**Industrial**	**Major Urban Collector**	**Minor Urban Collector**	**Industrial**	**Residential Access Street**	**Residential Access Place**
General Requirements									
1	Traffic generation (AADT)	Volumes Not Restricted	6001-10,000		3001-6000	751-3000	-	251-750	0-250
2	Speed environment	80kph min 100kph max	80kph min 100kph max	60km/h max	60kph max	60kph max	50kph max	50kph max	50kph max
3	Design vehicle [1 & 2]	TMR Permitted Vehicles	26.0m B-Double (Class 10)	26.0m B-Double (Class 10)	19.0m Semitrailer (Class 9)	19.0m Semitrailer (Class 9)	Single Unit Trucks/Bus	Council Refuse Collection Vehicle	Council Refuse Collection Vehicle
4	Check Vehicle	Subject to local government approval							
5	Direct lot access	No	No	Commercial and industrial only	Commercial only	Residential and commercial	Commercial and industrial only	Residential only	Residential only
6	Bus routes	Yes	Yes	Yes	Yes	Yes	No	No	No
7	Cycle facilities (On roads)	Within Road Reserve, Max Separation from Road Formation	Lanes on Road (in shoulder) and	District / Neighbourhood Routes, 1) On road (Desirable) 2) Shared Road space	Neighbourhood Routes, 1) On road lanes; and 2) Off road shared paths	Neighbourhood Routes, 1) On road lanes; and 2) Off road shared paths	Neighbourhood Routes, Shared Road Space with Vehicles	Neighbourhood Routes, Shared Road Space with Vehicles	Neighbourhood Routes, Shared Road Space with Vehicles
8	Off-street path width [Pedestrian / cycle] [3] (Minimum)	2 x 2.0m	2 x 2.0m	1x1.5m	2x1.8m	1x1.8m	1x1.5m [4]	1x1.5m [4]	1x1.5m [4]
9	Parking provision in road reserve	Regulated by Local Law							
10	Pavement Markings	In accordance with the MUTCD							
11	Minimum Flood Immunity for minor system (kerb and channel flow) AEP	10%	10%	10%	10%	10%	10%	10%	10%

Annexure D01E

LSC – DESIGN CRITERIA – URBAN AREAS									
Criterion		**Arterial Roads**		**Collector streets**			**Access Streets**		
		Arterial	**Sub-Arterial**	**Industrial**	**Major Urban Collector**	**Minor Urban Collector**	**Industrial**	**Residential Access Street**	**Residential Access Place**
12	Minimum Flood Immunity for minor system (cross drainage), AEP	2%	2%	2%	2%	2%	2%	2%	2%
13	Design check for trafficable immunity, AEP	1%	1%	1%	1%	1%	1%	1%	1%
14	Wildlife corridors	Yes	Yes	No	No	No	No	No	No
15	Lighting [5]	In accordance with the Local Government Policy https://www.livingstone.qld.gov.au/downloads/file/560/road-lighting-procedure							
16	Noise attenuation [6]	Refer Endnote							
17	Intersection interaction								
	- Arterial	Yes	Yes	No	No	No	No	No	No
	- Sub Arterial	Yes	Yes	Yes	Yes	No	No	No	No
	- Industrial Collector	No	Yes	Yes	Yes	Yes	Yes	No	No
	- Major Urban Collector (1)	No	Yes	Yes	Yes	Yes	No	No	No
	- Major Urban Collector (2)	No	No	No	Yes	Yes	Yes	Yes	No
	- Minor Urban Collector	No	No	No	Yes	Yes	Yes	Yes	No
	- Industrial Access Street	No	No	Yes	No	Yes	Yes	No	No
	- Residential Access Street	No	No	No	No	Yes	No	Yes	Yes
	- Residential Access Place	No	No	No	No	No	No	Yes	Yes
Cross-section requirements									
18	Carriageway form								
19	Minimum reserve width [7]	60m	30m	30m	20m	18m	25m	16m	16m

Annexure D01E

LSC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets			Access Streets		
		Arterial	Sub-Arterial	Industrial	Major Urban Collector	Minor Urban Collector	Industrial	Residential Access Street	Residential Access Place
20	Nominal carriageway width [8] (Minimum)	12m (no parking)	5.5 carriageway + 5.0 centre median	18m	10m	10m	13m	7.5m	5.5m
21	Verge width (Minimum)	10m	4.5 – 5.5m	4m	4.5m	4m	4m	4m	4m
22	Through lane width (Minimum)	3.5m	3.5m	3.5m	3.5m	3.5m	Adjusted to condition	Adjusted to condition	Adjusted to condition
23	Kerb and channel profile	Type 1 Barrier	Type 1 Barrier	Type 1 Barrier	Type 1 Barrier	Type 2 Mountable	Type 1 Barrier	Type 2 Mountable	Type 2 Mountable
24	Median width (minimum)	10m (min)	5m (min)	Site Specific 3.0m min. (Where Provided)	Site Specific 3.0m min. (Where Provided)	No	No	No	No
25	Verge grade [9]								
	- Maximum	16%	16%	16%	16%	16%	16%	16%	16%
	- Minimum	1%	1%	1%	1%	1%	1%	1%	1%
26	Cycle lane Width [On Road]	2.0m	2.0m	No	1.5m	No	No	No	No
Longitudinal requirements									
27	Longitudinal grade								
	- Maximum	8% up to Maximum Length of 300m (Excluding Transitions)	8% up to Maximum Length of 300m (Excluding Transitions)	8% up to Maximum Length of 300m (Excluding Transitions)	10% up to Maximum Length of 300m (Excluding Transitions)	10%	10%	16%	16%
	- Desirable maximum	5%	6%	6%	8%	8%	6%	12%	12%
	- Minimum	1%	1%	1%	1%	1%	1%	1%	1%

Annexure D01E

LSC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets			Access Streets		
		Arterial	Sub-Arterial	Industrial	Major Urban Collector	Minor Urban Collector	Industrial	Residential Access Street	Residential Access Place
28	Intersection treatments	Grade Separated Signalised Roundabout (Volume Dependant)	(Volume Dependant) Roundabout Priority / Signalised "T" (Volume Dependant)	(Volume Dependant)	(Volume Dependant)	Priority "T"	Priority "T"	Priority "T"	Priority Controlled
29	Intersection spacing [Centre to centre] (Minimum)	2km Highway >2km Motorway	1000m	200m	150m	150m	120m	60m on same sides 40m on opposite sides	60m on same sides 40m on opposite sides

1 Austroads vehicle classification system

2 Vehicle turning shall be checked with Austroads vehicle Class 9 (19.0m Semi-Trailer)

3 2.5m if road network is part of Principal Cycle Network Plan (PCNP).

4 Pathways are desirable but there are situations where a path may not be necessary and individual LGAs may delete the path requirement on a case by case basis with suitable justification

5 Lighting categories presented in this table are minimum categories only. Lighting must be designed according to AS 1158.2.

6 Where applicable for new developments, the applicant is required to submit an acoustic report and mitigation measure(s) in accordance with Council's Planning Scheme for noise associated with the development.

7 Reserve width to increase in localized areas to accommodate cutting, fill, and intersections i.e. roundabouts etc.

8 Carriageway widths are measured from the invert of kerb and channel on one side of the carriageway to the invert of the kerb and channel on the opposite side of the carriageway.

9 Where feasible, verge shall fall towards the back of kerb and shall match with the top of kerb. Otherwise, match with edge of road.

Annexure D01E

LSC DESIGN CRITERIA

Rural Areas

LSC – DESIGN CRITERIA – RURAL AREAS					
	Criterion	Arterial Road	Collector Street		
		Rural Arterial [1]	Rural Major Collector	Rural Minor Collector	Rural Access
General Requirements					
1	Traffic generation	>8000 AADT	1000 – 7999 AADT	151 – 999 AADT	<150 AADT
2	Design Speed	110km/h	110km/h	110km/h	110km/h
3	Design vehicle[2,3,4]	26m B-Double (Class 10)	26m B-Double (Class 10)	26m B-Double (Class 10)	26m B-Double (Class 10)
4	Direct lot access	Yes (1 per Property)	Yes (1 per Property)	Yes (1 per Property)	Yes (1 per Property)
5	Parking provision in road reserve	Nil	Nil	Nil	Nil
6	Longitudinal line-marking	Edge of lane and centre	Edge of lane and centre	Not required	Not required
7	Minimum Flood Immunity AEP (ARI)	5% (1 in 20 years)	5% (1 in 20 years)	18% (1 in 5 years)	minimum 39% (1 in 2 years)
8	Trafficable immunity, AEP (ARI)	2% (1 in 50 years)	2% (1 in 50 years)	5% (1 in 20 years)	5% (1 in 20 years)
Cross-section requirements					
9	Minimum reserve width (Flat terrain ≤ 5%) [5]	40m	25m	25m	25m
10	Minimum reserve width (Undulating / Hilly > 5%) [4]	40m	30m	25m	25m
11	Formation	10m	10m	8m	6.5m
12	Pavement Width	10m	8m	8m	6.5m
13	Seal Width	10m	8m	8m	No Seal Required [6]
14	Minimum through lane width	3.5m	3m	3m	3m
15	Verge grade				
	- Maximum	2.5%	2.5%	2.5%	2.5%
	- Minimum	1%	1%	1%	1%

LSC DESIGN CRITERIA

Rural Areas

Longitudinal requirements					
16	Longitudinal grade				
	- Maximum	5%	8%	8%	10% max (Unsealed) 15% max (Sealed)
	- Minimum	0.5%	0.5%	0.5%	0.5%
17	Intersection treatments	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'
18	Minimum intersection spacing (Centre to centre)	>500m	>500m	>500m	>100m

[1] Where Road is to be State Controlled, criteria must follow the State Road Authority requirements
[2] Austroads vehicle classification system
[3] Vehicle turning shall be checked with Austroads vehicle Class 10 (26m B-Double)
[4] Subject to B-Double permit approval
[5] Must meet the minimum road reserve width
[6] Sealing shall be required for longitudinal grades in excess of 10%

Annexure D01F

MRC DESIGN CRITERIA

Urban Areas

		MRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets				Commercial	Access Streets		
		Arterial	Sub-Arterial	Trunk Collector	Industrial Collector	Major Collector	Minor Collector	Commercial	Industrial Access	Residential Access Street	Residential Access Place
	General Requirements										
1	Traffic generation (AADT)	Site Specific	Site Specific	3001-6000	Serviced area up to 30ha	1501-3000	601-1500	-	Serviced area <8ha	251-600	0-250
2	Design Speed	60 - 80km/h	60 - 80km/h	60km/h	60km/h	60km/h	50km/h	40km/h	50km/h	50km/h	50km/h
3	Design vehicle [1 & 2]	Double Road Train (Class 11)	Double Road Train (Class 11)	Double Road Train (Class 11)	Double Road Train (Class 11)	19.0m Semitrailer (Class 9)	19.0m Semitrailer (Class 9)	19.0m Semitrailer (Class 9)	Double Road Train (Class 11)	19.0m Semitrailer (Class 9)	Service Vehicles (Class 5)
4	Through road	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No (Cul-De-Sac or acceptable engineered solution)
5	Direct lot access	No	No	Commercial and industrial only	Commercial and industrial only	Residential and commercial	Residential and commercial	Commercial only	Commercial and industrial only	Residential only	Residential only
6	Bus routes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
7	On-road cycle facilities	No	No	No	Yes Exclusive /separated cycleway	Yes Exclusive /separated cycleway	Yes Site Specific	Yes Site Specific	Yes Site specific	Yes Neighbourhood Routes, Shared with Cars	Yes Neighbourhood Routes, Shared with Cars
8	Pedestrian movement facilities	Both Sides within the verge	Both Sides within the verge	Both Sides within the verge	Both Sides within the verge	Both Sides within the verge	Both Sides within the verge	Both Sides within the verge	One Side within the verge[(12)]	One Side within the verge[(12)]	One Side within the verge[(12)]
9	Parking provision in road reserve	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	Longitudinal line-marking	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Edge of Lane & Centre with RRPM	Not Required	Not Required	Not Required

Annexure D01F

		MRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets				Commercial	Access Streets		
		Arterial	Sub-Arterial	Trunk Collector	Industrial Collector	Major Collector	Minor Collector	Commercial	Industrial Access	Residential Access Street	Residential Access Place
11	Minimum Flood Immunity for minor system (kerb and channel flow) AEP	10%	10%	10%	10%	10%	10%	10%	39%	39%	39%
12	Minimum Flood Immunity for minor system (cross drainage), AEP	2%	2%	2%	2%	2%	2%	2%	10%	10%	10%
13	Design check for trafficable immunity, AEP	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
14	Wildlife corridors	Yes	Yes	No	No	No	No	No	No	No	No
15	Lighting [3]	Site Specific	Site Specific	PR2 (Min)	PR3 (Min)	PR3 (Min)	PR3 (Min)	PR2 (Min)	PR3 (Min)	PR4 (Min)	PR4 (Min)
16	Noise attenuation [4]	1) Buffer 2) Landscaping & Buffer 3) Barrier	1) Buffer 2) Landscaping & Buffer 3) Barrier	1) Buffer 2) Landscaping & Buffer 3) Barrier	Incorporate in Building/Lot Design (Passive)	Incorporate in Building/Lot Design (Passive)	Incorporate in Building/Lot Design (Passive)	No	No	No	No
17	Intersection interaction										
	- Arterial	Yes	Yes	Yes	No	No	No	No	No	No	No
	- Sub Arterial	Yes	Yes	Yes	Yes	No	No	No	No	No	No
	- Trunk Collector	No	Yes	Yes	Yes	Yes	No	Yes	No	No	No
	- Industrial Collector	No	Yes	Yes	Yes	No	No	No	Yes	No	No
	- Major collector	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	- Minor collector	No	No	No	No	Yes	Yes	No	No	Yes	Yes
	- Commercial	No	No	Yes	No	Yes	No	Yes	No	No	No
	- Industrial access	No	No	No	Yes	Yes	No	No	Yes	No	No
	- Residential Access Street	No	No	No	No	Yes	Yes	No	No	Yes	Yes
	- Residential Access Place	No	No	No	No	No	Yes	No	No	Yes	Yes

Annexure D01F

		MRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets				Commercial	Access Streets		
		Arterial	Sub-Arterial	Trunk Collector	Industrial Collector	Major Collector	Minor Collector	Commercial	Industrial Access	Residential Access Street	Residential Access Place
		Cross-section Requirements									
18	Carriageway form	Divided / Site Specific	Divided / Site Specific	2 Lanes	2 Lanes	2 Lanes	2 Lanes	2 Lanes	2 Lanes	2 Lanes	2 Lanes
19	Minimum reserve width [5]	60m	40m	26m	30m	26m	20m	30m	26m	20m	20m
20	Nominal carriageway width [6] (Minimum)	Site Specific	Site Specific	18m	18m	18m	12m	22m	12m	10m	10m
21	Verge width (Minimum)	Site Specific	Site Specific	4m	4m	4m	4m	4m	4m	4m	4m
22	Through lane width (Minimum)	3.5m	3.5m	3.5m	3.5m	3.5m	3.5m	5.0m	3.5m	3.5m	3.5m
23	Kerb and channel profile	Site Specific	Site Specific	Barrier Kerb and Channel	Barrier Kerb and Channel	Mountable Kerb and Channel	Mountable Kerb and Channel	Barrier Kerb and Channel	Mountable Kerb and Channel	Mountable Kerb and Channel	Mountable Kerb and Channel
24	Median width (minimum)	Site Specific	Site Specific	Site Specific 3.0m min. (Where Provided)	Site Specific 3.0m min. (Where Provided)	Site Specific 3.0m min. (Where Provided)	No	No	No	No	No
25	Verge grade [7]										
	- Maximum	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
	- Minimum	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
26	Off street path width (Pedestrian / cycle)	2 x 2.5m	2 x 2.5m	2 x 2.5m	2 x 2.5m	2 x 2.5m	2 x 2.5m	2 x 2.5m	1 x 2.5m	1 x 2.5m [88]	1 x 2.5m [8]
27	On-road cycle lane width	N/A	N/A	N/A	2.0m	2.0m	2.0m	2.0m	N/A	N/A	N/A
28	On street parking width	Nil	Nil	Unmarked provisions	2.6m (min) Both sides	2.6m (min) Both sides	2.6m (min) Both sides	Site Specific	Unmarked provisions	Unmarked provisions	Unmarked provisions
29	Bus stops [9]	Indented Bays	Indented Bays	Indented Bays	Marked on Road	Marked on Road	Marked on Road	Indented Bays	Marked on Road	No	No

Annexure D01F

		MRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets				Commercial	Access Streets		
		Arterial	Sub-Arterial	Trunk Collector	Industrial Collector	Major Collector	Minor Collector	Commercial	Industrial Access	Residential Access Street	Residential Access Place
		Longitudinal Requirements									
30	Longitudinal grade										
	- Maximum	6%	6%	10%	8%	10%	12%	8%	10%	12% [10]	12% [10]
	- Desirable maximum	5%	5%	8%	6%	8%	10%	6%	8%	10%	10%
	- Minimum	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
31	Intersection treatments[11]	Grade Separated	Grade Separated, Signalised or Roundabout	Signalised or Roundabout	Signalised or Priority "T"	Roundabout, Signalised or Priority "T"	Roundabout or Priority "T"	Roundabout, Signalised or Priority "T"	Priority "T"	Roundabout or Priority "T"	Priority "T"
32	Intersection spacing [Centre to centre] (Minimum)	2000m	1000m	200m	200m	150m	100m	100m	120m	60m	No

1 Austroads vehicle classification system.

2 Vehicle turning shall be checked with Austroads vehicle Class 9 (19.0m Semi-Trailer).

3 Lighting categories presented in this table are minimum categories only. Lighting must be designed according to AS 1158.2.

4 Where applicable for new developments, the applicant is required to submit an acoustic report and mitigation measure(s) in accordance with Council's Planning Scheme for noise associated with the development.

5 Reserve width to increase in localized areas to accommodate cutting, fill, and intersections i.e. roundabouts etc.

6 Carriageway widths are measured from the invert of kerb and channel on one side of the carriageway to the invert of the kerb and channel on the opposite side of the carriageway.

7 Where feasible, verge shall fall towards the back of kerb and shall match with the top of kerb. Otherwise, match with edge of road.

8 Pathways are desirable but there are situations where a path may not be necessary and individual LGAs may delete the path requirement on a case by case basis with suitable justification.

9 Bus stops to comply with the Public Transport Design Manual (PTIM).

10 The absolute maximum grade shall be 20% for a maximum length of 60m. The maximum length of grades less than 20% but not less than 16% shall be 60m plus 25m for each 1% the grade is less than 20%. The maximum length of any grade greater than 16% shall be 160m.

11 Treatment selection volume and traffic composition dependent.

12 Provision for paths on both sides (in the future) still needs to be allowed for in the cross section.

Annexure D01F

MRC DESIGN CRITERIA

Rural Areas

MRC – DESIGN CRITERIA – RURAL AREAS									
		Arterial Major [1]	Arterial Minor	Rural Collector Major A	Rural Collector Major B	Rural Collector Minor A	Rural Access Primary A	Rural Access Primary B	Rural Access Secondary
General Requirements									
1	Traffic generation (AADT)	>3000	1000 – 3000	250 – 999	150 - 249	100 – 149	40 -99	10 – 39	< 10
2	Design Speed (individual elements)	80km/h	80km/h	80km/h	80km/h	80km/h	60km/h	60km/h	40km/h
3	Desirable Speed Environment	100km/h	100km/h	100km/h	100km/h	100km/h	80km/h	80km/h	80km/h
4	Design vehicle[2,3]	Double Roadtrain (Class 11)	Double Roadtrain (Class 11)	Double Roadtrain (Class 11)	Double Roadtrain (Class 11)	Double Roadtrain (Class 11)	Double Roadtrain (Class 11)	Double Roadtrain (Class 11)	Double Roadtrain (Class 11)
5	Direct lot access	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Parking provision in road reserve	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
7	Longitudinal line-marking	Edge of lane and centre	Edge of lane and centre	Edge of lane and centre	Not required	Not required	Not required	Not required	Not required
8	Minimum Flood Immunity AEP	10%	10%	18%	18%	39%	39%	39%	63%
9	Trafficable Immunity, AEP	2%	2%	5%	5%	10%	10%	18%	18%
Cross-section Requirements									
10	Minimum reserve width (Flat terrain ≤ 5%)	40m	25m	20m	20m	20m	20m	20m	20m
11	Minimum reserve width (Undulating / Hilly > 5%)	50m	30m	25m	25m	25m	25m	25m	25m
12	Formation	10m	10m	9m	9m	9m	8m	8m	6m
13	Pavement Width	9m	9m	8m	8m	8m	7m	4m	No Pavement Required
14	Seal Width	9m	9m	8m	7(8)m [4]	7m	No Seal Required [5]	No Seal Required [5]	No Seal Required [5]
15	Minimum lane width	3.5m	3.5m	3.5m	3m	3m	3m	-	-

MRC DESIGN CRITERIA

Rural Areas

MRC – DESIGN CRITERIA – RURAL AREAS									
		Arterial Major [1]	Arterial Minor	Rural Collector Major A	Rural Collector Major B	Rural Collector Minor A	Rural Access Primary A	Rural Access Primary B	Rural Access Secondary
	Longitudinal Requirements								
16	Longitudinal grade Maximum	5%	5%	8%	8%	8%	8% max (Unsealed) 12% max (Sealed)	8% max (Unsealed) 12% max (Sealed)	8% max (Unsealed) 12% max (Sealed)
	Longitudinal grade Minimum	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
17	Intersection treatments	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'
18	Minimum intersection spacing (Centre to centre)	500m	500m	500m	500m	100m	100m	100m	100m

[1] Where Road is to be State Controlled, criteria must follow the State Road Authority requirements

[2] Austroads vehicle classification system

[3] Vehicle turning shall be checked with Austroads vehicle Class 11 (Double Roadtrain)

[4] Where pavement material used is of a lower standard, seal width is to be extended to shoulders

[5] Sealing shall be required for longitudinal grades in excess of 8%. Sealing may be required at sites where existing adjacent roads are sealed. In this instance the seal width shall match the adjoining seal with a minimum of 7.0 m

Annexure D01G

RRC DESIGN CRITERIA

Urban Areas

RRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets			Access Streets		
		Arterial	Sub-Arterial	Industrial	Major collector	Collector	Industrial	Access Street	Local Access
General Requirements									
1	Traffic generation	Traffic study required	6,001 – 10,000 AADT	Traffic study required	3,001 – 6,000 AADT	751 – 3,000 AADT	Traffic study required	251 – 750 AADT	0 – 250 AADT
2	Design Speed[1]	60 – 80km/h	60 – 80km/h	60km/h	50 – 60km/h	50km/h	50km/h	40km/h	30km/h
3	Speed Limit	60 – 80km/h	60 – 80km/h	60km/h	50 – 60km/h	50km/h	50km/h	50km/h	50km/h
4	Design vehicle[2,3]	26m B-Double (Class 10)	26m B-Double (Class 10)	26m B-Double (Class 10)	19m Semitrailer (Class 9)	14m single unit bus (Class 4)	26m B-Double (Class 10)	14m single unit bus (Class 4)	Domestic refuse collection vehicle (Class 5)
5	Through road	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No (Cul-De-Sac or acceptable engineered solution)
6	Direct lot access	No	No	Commercial and industrial only	Commercial only	Residential and commercial	Commercial and industrial only	Residential only	Residential only
7	Bus routes	Yes	Yes	Yes	Yes	Yes	No	School bus only	No
8	Cycle facilities	Separate lanes	Separate lanes	- Separate lanes (desirable) - Shared road space with cars	- Separate lanes (desirable) - Shared road space with cars	Shared road space with cars	Shared road space with cars	Shared road space with cars	Shared road space with cars
9	Pedestrian movement facilities	Pathway (Both sides)	Pathway (Both sides)	Pathway (One side)	Pathway (Both sides)	Pathway (one side)	Pathway one side only	Pathway (one side)	Pathway (one side)
10	Parking provision in road reserve	No	No	Yes	Yes	Yes	Yes	Yes	Yes
11	Longitudinal line-marking	Edge of lane and centre with RRPM	Edge of lane and centre with RRPM	Edge of lane and centre with RRPM	Edge of lane and centre with RRPM	Not required	Not required	Not required	Not required
12	Minimum Flood Immunity for minor system (kerb and channel flow) AEP (ARI)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	39% (1 in 2 years)	minimum 39% (1 in 2 years) Refer to D5	Minimum 39% (1 in 2 years) Refer to D5
13	Minimum Flood Immunity for minor system (cross drainage), AEP (ARI)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	2% (1 in 50 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)	10% (1 in 10 years)
14	Design check for trafficable immunity, AEP (ARI)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)	1% (1 in 100 years)
15	Wildlife corridors	Yes	Yes	No	No	No	No	No	No
16	Lighting[4]	V5 (min)	V5 (min)	PR3 (min)	PR3 (min)	PR3 (min)	PR3 (min)	PR5 (min)	PR5 (min)
17	Noise attenuation[5]	Yes	Yes	Yes	Yes	No	No	No	No

Annexure D01G

RRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets			Access Streets		
		Arterial	Sub-Arterial	Industrial	Major collector	Collector	Industrial	Access Street	Local Access
18	Intersection interaction								
	- Arterial	Yes	Yes	No	No	No	No	No	No
	- Sub-Arterial	Yes	Yes	Yes	Yes	No	No	No	No
	- Industrial collector	No	Yes	Yes	Yes	No	Yes	No	No
	- Major collector	No	Yes	Yes	Yes	Yes	Yes	Yes	No
	- Minor collector	No	No	No	Yes	Yes	No	Yes	Yes
	- Industrial access	No	No	Yes	Yes	No	Yes	No	No
	- Access street	No	No	No	Yes	Yes	No	Yes	Yes
	- Access place	No	No	No	No	Yes	No	Yes	No
Cross-section requirements									
19	Carriageway form	Divided	Divided	2 marked lanes	2 marked lanes	Un-divided	Un-divided	Un-divided	Un-divided
20	Minimum reserve width[6,7]	(Specific data for these categories shall be provided by the consulting engineer for individual application.)	30m	30m	22m	19m	25m	16m	16m
21	Nominal carriageway width[8]		5.5m carriageway + 5m median	18m	12m	10m	13m	7.5m	7.5m [9]
22	Minimum verge width		4.5m	5m	5m	4.5m	4m	4m	4m
23	Minimum through lane width		3.5m	3.5m	3.5m	Single moving lane	Single moving lane	Single moving lane	Single moving lane
24	Kerb and channel profile		Barrier kerb and channel	Barrier kerb and channel	Barrier kerb and channel	Mountable kerb and channel	Barrier kerb and channel	Mountable kerb and channel	Mountable kerb and channel
25	Median width		5m	5m - chevron	Site specific (3m where provided)	No median required	No median required	No median required	No median required
26	Verge grade[10]								
	- Maximum		2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
	- Minimum		1%	1%	1%	1%	1%	1%	1%
27	Off street path width (Pedestrian/ cycle)[7]		2 x 2.5m (Min)	1 x 1.5m (Min)	2 x 1.5m (Min)	1 x 1.5m (Min)	1 x 1.5m (Min) [11]	1 x 1.5m (Min)	1 x 1.5m (Min) [11]
28	Bicycle lane width		60km/hr – 1.5m; 70km/hr – 1.8m; 80km/hr – 2.0m Both directions (Included in shoulder width)	- On road (Not marked) - 1.5m where provided	- On road (Marked) - 1.5m where provided	On road (Not marked)	On road (Not marked)	On road (Not marked)	On road (Not marked)
29	On street parking width		Site specific	2.5m (min) both sides[12]	2.5m (min) both sides[13]	Unmarked provision	Unmarked provision	Unmarked provision	Unmarked provision
30	Bus stops[14]	Indented bays	Indented bays	Marked on road	Marked on road	Marked on road	Nil	Nil	Nil

RRC – DESIGN CRITERIA – URBAN AREAS									
Criterion		Arterial Roads		Collector streets			Access Streets		
		Arterial	Sub-Arterial	Industrial	Major collector	Collector	Industrial	Access Street	Local Access
Longitudinal requirements									
31	Longitudinal grade								
	- Maximum[15]	8%	8%	8%	10%	10%	10%	16%	16%
	- Desirable maximum	5%	6%	6%	8%	8%	6%	12%	12%
	- Desirable minimum	1%	1%	1%	1%	1%	1%	1%	1%
	- Minimum[16]	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
32	Intersection treatments	- Grade separated - Signalised - Roundabout	- Grade separated - Signalised - Roundabout	- Signalised - Roundabout - Priority 'T'	- Signalised - Roundabout - Priority 'T'	- Signalised - Roundabout - Priority 'T'	- Priority 'T' - Signalised	- Priority 'T' - Roundabout	- Priority 'T'
33	Minimum intersection spacing (Centre to centre)	500m	300m	100m	100m	100m	60m	60m	Nil

[1] Achieved via horizontal geometry and various traffic management devices to constrain vehicle operating speed.

[2] Austroads vehicle classification system

[3] Vehicle turning shall be checked with Austroads vehicle Class 9 (19.0m Semi-Trailer)

[4] Lighting categories presented in this table are minimum categories only. Lighting must be designed according to AS 1158.2.

[5] Where applicable for new developments, the applicant is required to submit an acoustic report and mitigation measure(s) in accordance with Council's Planning Scheme for noise associated with the development.

[6] Must meet the minimum road reserve width.

[7] Reserve width to increase in localized areas to accommodate cutting, fill, and intersections i.e. roundabouts etc.

[8] Carriageway widths are measured from the invert of kerb and channel on one side of the carriageway to the invert of the kerb and channel on the opposite side of the carriageway.

[9] Pavement width reductions to 5.5m may be acceptable in certain circumstances

[10] Where feasible, verge shall fall towards the back of kerb and shall match with the top of kerb. Otherwise, match with edge of road.

[11] Pathways are desirable but there are situations where a path may not be necessary and individual LGAs may delete the path requirement on a case by case basis with suitable justification

[12] Includes 0.5m offset

[13] Includes 0.5m offset

[14] Bus stops to comply with the Public Transport Design Manual (PTIM).

[15] The absolute maximum grade shall be 20% for a maximum length of 60m. The maximum length of grades less than 20% but not less than 16% shall be 60m plus 25m for each 1% the grade is less than 20%. For a grade of 16%, the maximum length shall be 160m.

[16] Lesser grades maybe accepted subject to Council approval.

Annexure D01G

RRC DESIGN CRITERIA

Rural Areas

RRC – DESIGN CRITERIA – RURAL AREAS					
Criterion		Arterial Road	Collector Street		
		Rural Arterial [1]	Rural Major Collector	Rural Minor Collector	Rural Access
General Requirements					
1	Traffic generation	>8000 AADT	1000 – 7999 AADT	151 – 999 AADT	<150 AADT
2	Design Speed	110km/h	110km/h	110km/h	110km/h
3	Design vehicle[2,3,4]	26m B-Double (Class 10)	26m B-Double (Class 10)	26m B-Double (Class 10)	26m B-Double (Class 10)
4	Direct lot access	Yes (1 per Property)	Yes (1 per Property)	Yes (1 per Property)	Yes (1 per Property)
5	Parking provision in road reserve	Nil	Nil	Nil	Nil
6	Longitudinal line-marking	Edge of lane and centre	Edge of lane and centre	Not required	Not required
7	Minimum Flood Immunity AEP (ARI)	5% (1 in 20 years)	5% (1 in 20 years)	18% (1 in 5 years)	minimum 39% (1 in 2 years)
8	Trafficable immunity, AEP (ARI)	2% (1 in 50 years)	2% (1 in 50 years)	5% (1 in 20 years)	5% (1 in 20 years)
Cross-section requirements					
9	Minimum reserve width (Flat terrain ≤ 5%) [5]	40m	25m	25m	25m
10	Minimum reserve width (Undulating / Hilly > 5%) [4]	40m	30m	25m	25m
11	Formation	10m	10m	8m	6.5m
12	Pavement Width	10m	8m	8m	6.5m
13	Seal Width	10m	8m	8m	No Seal Required [6]
14	Minimum through lane width	3.5m	3m	3m	3m
15	Verge grade				
	- Maximum	2.5%	2.5%	2.5%	2.5%
	- Minimum	1%	1%	1%	1%

RRC DESIGN CRITERIA

Longitudinal requirements					
16	Longitudinal grade				
	- Maximum	5%	8%	8%	10% max (Unsealed) 15% max (Sealed)
	- Minimum	0.5%	0.5%	0.5%	0.5%
17	Intersection treatments	Priority 'T'	Priority 'T'	Priority 'T'	Priority 'T'
18	Minimum intersection spacing (Centre to centre)	>500m	>500m	>500m	>100m

[1] Where Road is to be State Controlled, criteria must follow the State Road Authority requirements

[2] Austroads vehicle classification system

[3] Vehicle turning shall be checked with Austroads vehicle Class 10 (26m B-Double)

[4] Subject to B-Double permit approval

[5] Must meet the minimum road reserve width

[6] Sealing shall be required for longitudinal grades in excess of 10%