

DISTRICT COUNCIL OF STREAKY BAY

Standards and Requirements for the Design, Construction and Development of Infrastructure Assets in the District Council of Streaky Bay

POLICY	14.01
Classification	Infrastructure
Date Approved	18 March 2009
Review Frequency	Annually
Last Reviewed	March 2009
Next Review Date	March 2010
Version Number	Issue 1
Responsible Officer	Works Manager
Council File Reference	14.019.002.002 / F16/1142

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Release Date	Version	By
20 November 2008	Draft	M.Faulkner
18 March 2008	Revision 1	M.Faulkner

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- Table 1: Standard Road Design Elements for New Development
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List of References and Acknowledgements

This document has been compiled with direct reference to the District Council of Mount Barker 'Standards and Requirements for the Design, Construction, and Development of Infrastructure Assets in the District Council of Mount Barker, August 2007'.

The following reference documents were used to assist in the preparation of this document.

- The Development Act 1993
- The District Council of Streaky Bay Development Plan
- Code of Technical Requirements for the Legal Use of Traffic Control Devices, Transport SA (1999) – the “Code”
- Minister for Transport and Urban Planning Notice to Council - Traffic Control Devices and Road Events under the Road Traffic Act 1961 (12 March 2001) – the “Minister’s Notice”
- Commonwealth Disability Standards for Accessible Public Transport
- AS 1428, Part 1: Design for Access and Mobility, General Requirements for Access-New Building Work, Standards Australia (2001)
- AS 1428, Part 2: Design for Access and Mobility, Enhanced and Additional Requirements-Building and Facilities, Standards Australia (1992)
- AS 1428, Part 4: Design for Access and Mobility, Tactile Indicators, Standards Australia (2002)
- AS 1158, Part 3.1: Road Lighting, Pedestrian Area (Category P) Lighting-Performance and Installation Design Requirements, Standards Australia (1999)
- Guide to Traffic Engineering and Practice, Part 13, Pedestrians, AUSTRROADS (1995)
- Guide to Traffic Engineering and Practice, Part 14, Bicycles, AUSTRROADS (1999)
- Design Vehicles and Turning Path Templates, AUSTRROADS (1995)
- AMCORD – Australian Model Code of Residential Development, Commonwealth development of Housing and Regional Development (1995)
- GRDSA – Good Residential Design SA, Planning SA (1999)
- PUACC - Services in Streets Public Advisory Committee (1997)
- Stormwater Pollution Prevention – Code of Practice for the Building and Construction Industry – March 1999 – EPA.
- Stormwater Pollution Prevention – Code of Practice for Local, State and Federal Government – November 1997 – EPA.
- Stormwater Pollution Prevention – Code of Practice for the Community – September 1997 –EPA.
- Septic Tank Effluent Drainage Scheme Design Criteria (DHS &LGA)

- Technical Specifications for the Construction of a Septic Tank Effluent Disposal System. (DHS)

CWMS general information available on the Local Government Association Web Site (www.lga.sa.gov.au)

In addition to reference to the above Standards Documents it is also acknowledged with thanks that reference to and extracts from the following documents have also been used in the preparation of these Standards and Requirements;

- The District Council of Mount Barker ‘Standards and Requirements for the Design and Construction of Infrastructure Assets’
- The City of Playford “Land Division Requirements”.
- The City of Salisbury “Draft Land Division Guidelines” (unpublished).
- Mosman Municipal Council “Policy for on Site Water Detention”.
- Mosman Municipal Council “Guidelines for Stormwater Drainage Systems”.
- Far North Queensland Regional Organisation of Councils (FNQROC) Development
- Brisbane City Council – Urban Management Division Dwg. UMS 335

SECTION I

INTRODUCTION

1 INTRODUCTION

- Land division is “development” and therefore requires approval under the Development Act 1993. Development applications will be assessed against the provisions of the Streaky Bay District Council Development Plan.
- The Development Act specifies several mandatory land division requirements, including
 - 12.5% of the land shall be vested in the Council as open space. There are provisions for this to be contributed as land or monetary payment or a combination of the two up to this limit.
 - Roads must be designed, constructed and sealed to recognised Australian Standards and be built in accordance with the District Council of Streaky Bay policies and standard drawings
 - Footpaths, water tables (kerbs and gutters), culverts and drains must be designed and constructed to recognised Australian Standards and be built in accordance with Council policies and standard drawings.
 - All electricity must be supplied underground unless it is specified by Council that the area does not require underground mains.
 - The requirements of public agencies, including Council, shall be met for the supply of water, telecommunications and CWMS.

This document provides further information pertaining to Councils expectations regarding these mandatory requirements.

- This Standards and Requirements document has been prepared by Council as a reference document to assist Developers, Planners and Engineers involved in the planning and design of land development in the District Council of Streaky Bay area where there is a requirement to construct infrastructure assets.
- The document will assist Developers to undertake preliminary planning and design work and to have an understanding of what Councils minimum requirements are to facilitate discussion with Council prior to lodgement of a Development Application.
- These Standards and Requirements have been prepared with the aim of encouraging “best practice” in the development of new land areas in the District of Streaky Bay. It is acknowledged that “best practice”

changes over time and reviews will be made to these standards and requirements on a needs basis in order to reflect such changes.

- This document should be used by Developers as an infrastructure planning and design aid, however, each development site and Development Application will vary from site to site. Accordingly, designers are encouraged to consult with the Council Works and Development Staff and any other relevant authorities prior to or during the preparation of designs.
- Designers, in addition to the requirements of this document, should ascertain the specific requirements of all authorities as they relate to the designs in hand and the proposed development site.
- This document does not remove or replace the requirement of the Developer to submit a Development Application to the Council in accordance with the provisions of the Development Act 1993 and the District Council of Streaky Bay Development Plan.
- Development approval will be incumbent on all of the requirements of the Development Act 1993, the District Council of Streaky Bay Development Plan and site specific planning conditions being met, including existing Land Management Agreements. This document does not address planning issues and the applicant should contact Councils Development Assessment Manager regarding these issues.
- This Standards and Requirements Document is not intended to inhibit innovation. Council encourages and will consider innovative design where it can be demonstrated that the alternative approach is equal to or superior to the standards set out in this document.

SECTION 2

DEVELOPER RESPONSIBILITIES

2 DEVELOPER RESPONSIBILITIES

The Developer shall engage a professional engineer to design and supervise all engineering works associated with the development. The drawings and specifications for such works shall be approved by Council, in writing prior to any construction work commencing.

2.1 Service Authorities

The Developer shall be responsible for all liaisons with the relevant Service Authorities in relation to the provision of the services to each individual parcel of land as required by a development. These services shall include, but not be limited to:

- electrical reticulation
- telecommunication;
- street lighting;
- conduits and pits for telecommunication services;
- CWMS services.
- water reticulation and services, where available;

For the provision of wastewater facilities liaison should be undertaken with the Council in accordance with Section 6 of this document.

All services are to be installed underground and are to be installed prior to the construction of road pavements.

Wherever it is not possible to carry out boring and it is necessary to excavate trenches through existing Council roads, the Developer shall reinstate such surfaces in accordance with the requirements of the current version of the Transport SA Standard Specification for "Excavation and Reinstatement of Road Pavements".

2.2 Documentation to be provided to Council

Prior to Granting Development Plan Consent to a subdivision approval, Council will need to: -

- be satisfied that the subdivision will;
 - a) adequately cater for future vehicular traffic,
 - b) include appropriate provision for pedestrians and cyclists,
 - c) make due allowance for major stormwater flow paths and stormwater harvesting areas,
 - d) provide usable reserve areas that will be of benefit to the community.

- have a full appreciation of any possible impacts of the subdivision upon the environment, neighbouring lands, adjoining developments, and existing infrastructure, such as roads, stormwater, and CWMS.

To assist Council in its deliberations on these broader scale and long term issues, the Developer may be requested to provide: -

- A Structured Plan – drawn to an appropriate scale – showing:
 - Road carriageway widths;
 - Stormwater management proposals;
 - Any physical traffic control devices;
 - Connections to existing streets and neighbouring land;
 - Pedestrian and shared paths and crossings;
- A statement and if necessary a plan, listing estimated traffic flow figures for the subdivision shall be provided. This statement or traffic impact plan shall be prepared by a professional engineer with relevant experience.
- Report on the geotechnical investigations undertaken for the site. The investigation shall include, as a minimum: -
 - Test pitting over the site to minimum depths of 2.5m to establish and record the presence of any possible rock or groundwater.
 - Soaked CBR testing of all types of soils that will be encountered at the designed street sub-grade level. The testing shall be carried out in accordance with AS 1289.5.1.1-2003 on soils compacted to 95% dry density ratio (Standard).
The above information shall form the basis of the design of roads, drainage and earthworks associated with the subdivision
- A Concept Stormwater Management Plan for the whole development showing the locations and sizes of any stormwater harvesting devices, delineation and areas of all sub-catchments, minor stormwater flow paths (Q_{10}), and flow path for the major event (Q_{100}).
- A Concept Open Space Plan for the whole development setting out the location type and size of the area for all proposed public open space, and a landscaping concept plan demonstrating how the open space will serve a community purpose and fit into the existing neighbourhood.
- An Existing Trees Survey Plan setting out the location of all existing trees on the development site. The plan should identify and those trees to be removed and retained and be accompanied by an Arborist report, detailing the significance of the trees. Council may require a commitment from the developer to enter into a Land Management Agreement to protect significant trees.

- A Concept Plan indicating the proposed method to deal with the collection, treatment and disposal of sewerage, and sewerage waste (including wastewater) from the site.

2.3 Pre Construction

Prior to the commencement of any work onsite the following details are to be submitted to the Council for approval:

- Final detailed road construction drawings indicating:
 - Road layout and geometry (including traffic management measures and intersections with existing roads),
 - Road pavement design based on subgrade testing
 - Details of any driveways where longitudinal gradient to proposed lots is greater than 1 in 6
 - Lighting Plan with luminaire, light poles and standard of design details
 - The measures to be implemented during the construction process to control sediment and erosion Footpath and shared path details,
- A detailed Landscaping and Open Space Plan incorporating street trees (position, type) and reserve landscaping treatments including tree planting
- A detailed Stormwater Management Plan
- A copy of the final water reticulation drawing, if necessary.
- An Easement Plan.
- A copy of the approved sewerage “Community Wastewater Management Scheme” (CWMS) design drawings.
- A copy of the final electrical reticulation drawings, showing the locations of all transformers, HV switching cubicles and street lighting.
- Technical Specifications and Tender Details.
- The Developer shall also submit a Composite Services Plan (hard copy, colour presented at a scale 1: 1,000 or larger, and an electronic copy in AutoCAD format .dwg), clearly showing all cadastral boundaries, easements, permanent survey marks and lot numbers; the locations of all water and CWMS mains and service points; all stormwater drains, pits, and rear of allotment service points; the common service trench routes and lot service pillars/points; street lights; and electrical transformers and switching cubicles.

2.4 Post Construction

Upon completion of construction, and before the issue of a Certificate of Practical Completion by Council, the Developer shall supply the following information to the complete satisfaction of Council,

- An electronic copy of the “As-Constructed” drawings for all civil works including roads, drainage, traffic control devices, street trees, street furniture and for all reserves including paths, lighting, underground services, irrigation system, park furniture, plantings, retaining walls and any other infrastructure provided by the Developer in AutoCAD (.dwg) format. This is to include any variations to the For Construction plans, including survey results.
- A hard copy of the “As Constructed” drawings for all civil works, including roads, drainage, traffic control devices, street trees, street furniture and for all reserves including paths, lighting, underground services, irrigation system, park furniture, plantings, retaining walls and any other infrastructure provided by the Developer. This is to include any variations to the For Construction plans, including survey results.
- A schedule or register of all the infrastructure that will become the property of Council in tabular Excel format to the satisfaction of Council
- Copies of compaction test results, as follows:
 - Roads - Four tests per thousand square metres in each layer (the Council may specify the location from time to time).
 - Trenches in Roads - One test per each layer for each material every 30 metres of trenching. One test per trench for each service trench to each property.
- Certification from the consulting professional engineer that the development has been constructed in accordance with the approved plans and specifications
- Certification from the Department of Human Services that the CWMS has met their approval.
- Ensure that all easements to be provided to Council and all other Service Authorities comply with Council requirements and are in place.
- Bank Guarantees or bonding arrangements necessary as specified in Councils Bonding Policy

2.5 Liabilities and Insurances

The Developer shall be responsible for all damage to existing facilities, services and structures sustained as a result of the development of the subdivision, whether those damaged items are in public or private ownership.

All damage shall be promptly reinstated to an equivalent standard acceptable to the owner.

Council will require the Developer to take out all necessary insurance policies to indemnify and protect it against any claims that may arise in undertaking the development.

Council may require the Developer to enter into a Land Management Agreement between the Council and the Developer to ensure that existing trees on the property that are identified as to be retained are appropriately protected and maintained in good condition.

SECTION 3

ROAD NETWORK ASSETS

3 ROAD NETWORK ASSETS

The geometry of a road is to be designed so as to meet the following aims.

- Provision of safe and convenient access to all allotments for pedestrians, vehicles and cyclists.
- Provision of appropriate access for emergency and service vehicles.
- Provision of convenient access route for public utilities.
- Provision of an opportunity for streetscape development.
- Provision of convenient parking for visitors.

To assist developers and designers to meet these aims Council has adopted the road classification system for new development detailed in Table 1: Standard Road Design Elements. This table sets out the general minimum standard design elements for the various road classifications.

It should be noted however that some of the design elements may be varied as a result of relevant site conditions.

3.1 Developer Responsibilities

3.1.1 Prior to Development Approval

Prior to Granting Development Plan Consent to a subdivision approval, Council will need to: -

- be satisfied that the subdivision will;
 - adequately cater for future vehicular traffic,
 - include appropriate provision for buses, pedestrians and cyclists,

To assist Council in its deliberations on these broader scale and long term issues, the Developer shall provide: -

- A Structured Plan – drawn to an appropriate scale – showing:
 - Road carriageway widths;
 - Stormwater management proposals;
 - Any physical traffic control devices;
 - Connections to existing streets;
 - Pedestrian and cycle paths and crossings;
- A statement and if necessary a plan, listing estimated traffic flow figures for the subdivision shall be provided. This statement or traffic impact plan shall be prepared by a professional engineer with relevant experience.

3.1.2 Prior to Construction

- Final construction drawings indicating:
 - Road layout and geometry (including traffic management measures and intersections to existing roads),
 - Details of any special driveways – where longitudinal gradient is greater than 1 in 6 to proposed lots Footpath and shared path details,
- The extent of any site filling and cutting, including details of how these will be treated or transitions at the boundaries of the site,
- Technical Specifications and Tender Details.
- A road pavement design

3.1.3 Post Construction

Upon completion of construction, and before the issue of a Certificate of Practical Completion by Council, the Developer shall supply the following information to the complete satisfaction of Council;

- An electronic copy of the “As-Constructed” drawings for all civil works including roads, drainage, traffic control devices, street trees, street furniture and and for all reserves including paths, lighting, underground services, irrigation system, park furniture, plantings, retaining walls and any other infrastructure provided by the Developer in AutoCAD (.dwg) format. This is to include any variations to the For Construction plans, including survey results.
- A hard copy of the “As Constructed” drawings for all civil works, including roads, drainage, traffic control devices, street trees, street furniture and for all reserves including paths, lighting, underground services, irrigation system, park furniture, plantings, retaining walls and any other infrastructure provided by the Developer. This is to include any variations to the For Construction plans, including survey results.
- A schedule or register of all the infrastructure that will become the property of Council in tabular Excel format to the satisfaction of Council
- Copies of compaction test results, as follows:
 - Roads - Four tests per thousand square metres in each layer (the Council may specify the location from time to time).
 - Trenches in Roads - One test per each layer for each material every 30 metres of trenching. One test per trench for each service trench to each property.
- Certification from a consulting professional engineer that the development has been constructed in accordance with the approved plans and specifications

- A twelve (12) month defects liability period will commence from the date of practical completion, during which the developer will need to provide a bank guarantee in accordance with Councils Bonding Policy

3.2 Road Hierarchy and Geometry

Council has adopted the street classification system detailed in Table 1: Standard Road Design Elements for all new development. This table sets out the general minimum standard design elements for the various road classifications.

3.2.1 Street Definitions

- **Local Road**

A Local Road is one in which the residential environment is dominant, traffic is subservient, speed and volume are low, (<40 km/h and <1000 vehicles respectively), with a footpath required on at least one side of the road and pedestrian and cycle movements are facilitated. Vehicle speeds are typically controlled by street length and /or alignment.

The Local Road will generally be accessible by only one entry and exit point (such as a cul-de-sac or dead end street).

The number of dwelling units served must be small and should generally not exceed 30, and the maximum effective length of an access road should ensure that its status as a residential place is retained. This length should also ensure that residential convenience is not unduly compromised as a result of speed constraints.

Local Roads would be expected in all residential or country living developments.

A Local Road shall be designed for serviceability.

Drawing 1 depicts a typical cross section of a Local Road

- **Local Collector Road**

A Local Collector Road allows a connection between local streets and the main traffic routes (Wells St, Cape Bauer Dr, Bay Road, Highways) . Its function is to facilitate the convenient and safe movement of residential traffic to and from the identified main roads.

A Local Collector Road normally has special characteristics – short length for speed control, and use as a “gateway” to a residential area. It will also have wide verges to accommodate pedestrian or shared paths on both sides of the road.

Drawing 2 sets out the minimum cross section requirements for a Collector Road.

Local Collector Roads would be necessary to service all residential or country living developments.

Rural Sealed Road

Rural Sealed Roads would typically be required adjoining Rural 8 developments, where traffic volumes in excess of 50 vehicles per day would be expected. The design of the road should incorporate two 3.6m travelling lanes, with 1m wide sealed shoulder on both sides. A resultant seal width of 9.2m and formation 11m.

Drawing 3 sets out the minimum cross section requirements for a Rural Sealed Road.

Rural Unsealed Roads

Whilst the development of any land would typically demand a sealed road frontage there may be circumstances where an unsealed rural road would be appropriate.

Drawing 4 sets out the minimum cross section requirements for a Rural Unsealed Road.

3.2.2 Street Pattern

In a new subdivision, the various street types defined above shall be arranged in a logical pattern relative to their respective hierarchy in recognition of the inter-relationship between the various residential types in such a manner as to eliminate undesirable through traffic and restrict vehicle speeds.

3.2.3 Access within Community Title Land

Council has not separately classified those Access Lanes or Access Roads designed to provide access to land developed under the provisions of the Community Title Act 1996. However, Developers should be aware that where infrastructure assets are developed which require vehicular and pedestrian access to Community Land, including garbage trucks, furniture removal trucks, fire control vehicles; Councils engineering design standards and requirements that apply to infrastructure required for land developed under Torrens Title will be applied.

Where the Developer proposes to use cross sections that differ from those in Drawings 1 to 4, full details shall be presented. Council will consider the merit of each variation having regard to traffic, services, and planning elements.

3.2.4 Carriageways and Road Reserve Widths

All carriageways shall be able to accommodate service and emergency vehicles at all times, accounting for the likely demand on roads including car parking, buses, commercial vehicles and traffic volumes. Minimum carriageway widths for all road classifications shall be as nominated in Table 1: Standard Residential Road Design Elements.

All road reserves shall be able to accommodate the above objectives for the street carriageway, plus the requirements for footpaths, landscaping, drainage, underground services, street lighting columns, and safe vehicle entry and egress from every individual property.

The street network, including all intersections and T-junctions, must be able to accommodate the AUSTROADS 12.5 metre Single Unit Vehicle without the need for the mounting of kerbs by leading or trailing wheels, except where

- A Cul-De-Sac greater than 50 metres in length shall be designed to accommodate a U-turn by the ACCO-F series garbage truck.
- A Cul-De-Sac less than 50 metres in length shall be designed to accommodate a three-point turn by the B99 passenger vehicle only (refer AS2890.1).

3.2.5 Local Widening

The carriageway width of local roads and local collector roads shall be widened by 0.8 metres on all horizontal curves where the centre-line radius is less than 50 metres, and the total angle of deflection exceeds 20°. The widening shall extend for the full length of the curve plus 8 metres into the straight at either end of the curve, and it shall be applied equally either side of the street centre-line. A transition taper of length 8 metres shall be provided at each end of the widened section to transition to the normal street width.

This allows for the swept path of larger vehicles negotiating such curves, and/or to enable the provision of a rumble bar median if deemed necessary by the Council.

3.2.6 Junctions

All T junction pavements must intersect at 90 degrees and the straight leg of the T must be at least 8 metres long.

3.3 Road Construction Standards

All works shall conform to the requirements of a specification prepared for the works under consideration, by a reputable professional engineer. Where relevant, any products used shall be installed in accordance with the manufacturer's instructions.

The minimum standard for road construction within the District Council of Streaky Bay is demonstrated in Drawings 1 to 4 Typical Cross Sections.

3.3.1 Pavement Design

Road pavements are to be designed and constructed in accordance with:

- AUSTRROADS - A Guide to the Structural Design of Road Pavements AP-17/92; or if appropriate
- AUSTRROADS - A Guide to the Design of New Pavements for Light Traffic, APRG-Rpt-21.

Design shall cater for the likely construction traffic associated with development of future civil works stages and all houses in the subdivision, refuse collection, and emergency services vehicles.

Pavement design will be based on the CBR testing of actual sub-grade soils, but must also take into account soil reactivity.

All roads and parking bays shall be surfaced with a minimum two coat bitumen seal. Major intersections, as nominated by Council and all roundabouts shall be sealed with a minimum of 40mm of AC14 Asphaltic Concrete.

3.3.2 Road Materials

Roads shall be constructed using material conforming to the requirements of Transport SA, Pavement Material (PM) specifications for quarry and recycled materials. Base shall comply with PM 1 / 20QG. Sub-base shall comply with PM 2 / 20QG, PM 2 / 40QG, or PM 2 / 20CR. A pavement design is to be approved by Council prior to construction.

3.3.3 Kerb and Watertable

Concrete kerb and watertable shall be provided on both sides of all roads, as specified in Table 1 except as otherwise approved by Council.

All concrete kerb and watertable provided will be of a rollover mountable type except on roads with no property frontage and along the edges of reserves where upright barrier kerb and watertable should be used. Kerbs shall be provided in accordance with Drawing 5: Typical Standard Kerb and Channel Details.

A galvanised steel kerb adaptor shall be provided per each allotment to facilitate the disposal of stormwater from the property. Each adaptor shall be cast into the kerb on the downstream side of the allotment situated approximately 1 metre from the alignment of the adjoining property boundary.

Kerb Ramps shall be provided at every corner radius where footpaths are proposed. The location is to be approved by the Council. Kerb ramps shall comply with the various AS1428 standards.

Warning Tactile Ground Surface Indicators (TGSi) shall be provided within kerb ramps. The ramps shall have a maximum grade of 1:8, as allowed in AS1428.4. Kerb ramps shall be provided in accordance with Drawing 7: Typical Standard Kerb Ramp Details.

3.3.4 Concrete

All concrete works shall comply with the requirements of AS 3600 in all particulars. Ready mixed concrete shall comply with AS 1379.

Reinforcing bar and mesh and hard drawn steel wire shall comply with AS1302, AS 1304 and AS 1303 respectively.

Concrete shall have a maximum aggregate size of 20mm. The following grades of concrete shall be used for works in new subdivisions for the following applications

- Kerb and gutter, spoon drains, etc. - N25
- Drainage pits and structures - N32
- Concrete paths, paving (not road pavements) - N25
- Other non structural concrete - N20

All concrete work shall be designed and constructed so that long term shrinkage cracking occurs at controlled joints and locations. Appropriate provision shall be made for thermal expansion.

Cover to reinforcing steel, surface finishes, and curing of concrete shall all comply with the respective requirements of AS 3600.

3.3.5 Block Paving

Concrete paving units shall comply with MA 20 "Specification for Concrete Segmental Paving Units" published by the Concrete Association of Australia. They shall be 80mm thick (trafficable areas) or 60mm thick (footpaths), Strength Grade N45 have a minimum abrasion resistance of 1.2 at 28 days, interlocking in design, and of the colour and shape as nominated by Council.

Where Council approval is given for the construction of Concrete Segmental Paving Units within road pavements they shall be 80mm thick, embedded in a 20mm thick layer of Paving Bedding Sand which shall form part of a road pavement with a minimum thickness of 300mm, subject to appropriate design considerations and unless otherwise specified.

Where Council approval is given to construct Concrete Segmental Paving Units on footpaths they shall be 60mm thick on footpaths in residential areas

(80mm thick in driveways), and 80mm thick in both the path and in driveways in non residential areas. Pavers will be laid on a minimum thickness of 75mm of compacted quarry rubble free of clay and deleterious materials, and embedded into a 20mm layer of Paving Bedding Sand.

The material used for filling between pavers shall be an approved proprietary sand based product, which may be broomed and vibrated into place but which ultimately provides an effective, flexible, bound sealant that will resist unintended extraction by vacuum street cleaning equipment.

The finished levels of the block paving shall be to an even and plane surface to within +3 mm, -0 mm from the design levels shown on the drawings. Particular care shall be taken to ensure that the levels of adjoining units correspond and that the units along the edges are between 5 and 10mm above the lip of the adjacent concrete gutter to provide proper drainage of the pavement.

3.3.6 Hold Points for Council Inspection

Works shall be held, and the Council notified for the purpose of inspection, at the following stages during the course of road and drainage construction:

- After preparation of the sub-grade, for proof rolling, prior to application of sub-base.
- After preparation of the sub-base, for proof rolling, prior to application of base.
- After the construction of drains and drain structures, prior to the backfilling of trenches.
- After final base preparation, prior to sealing and notification of the proposed sealing date.

3.4 Path Construction Standards

The existing footpath network shall not be unduly compromised by new development, but rather new development should seek to complete or enhance the network by developing efficient walking links, particularly to adjacent key destinations such as the school, shops, and sporting precincts..

In General, the requirements and qualities prescribed in AS 1428.2 for “Circulation Spaces” (section 6) and, where applicable, “Continuous Accessible Path of Travel” (section 7) is expected along all paths.

Footpaths are to be provided along the road network in accordance with Table 1: Standard Residential Road Design Elements.

Footpaths shall be constructed in a manner consistent with adjoining footpath links and consideration shown for the existing streetscape. However, unless

otherwise approved by Council all footpaths shall be constructed in concrete with a minimum width of 1.5 metres and a thickness of 100mm in accordance with Drawing 6: Typical Standard Footpath and Verge Details.

Where Council approval is given to construct Concrete Segmental Paving Units on footpaths they shall be 60mm thick on footpaths in residential areas (80mm thick in driveways), and 80mm thick in both the path and in driveways in non residential areas. Pavers will be laid on a minimum thickness of 75mm of compacted quarry rubble free of clay and deleterious materials, and embedded into a 20mm layer of Paving Bedding Sand.

The width of footpaths as determined above shall not be obstructed by street furniture, lighting poles, bus shelters, street trees etc.

3.4.1 Shared Paths

Bicycle paths and shared paths shall be made in accordance with AUSTRROADS Part 14 (1999). Shared paths shall:

- be 2.5 metres wide unless a narrower path can be justified under the criteria outlined in AUSTRROADS Part 14;
- have a minimum radius of 30 metres along mid-length sections, unless demonstrably impractical; and,

The exclusive use of paths for cyclists within the footpath reserve is discouraged.

Public lighting may be required along shared paths which form a linear link.

3.4.2 Verges

Street verges are defined herein as those areas of the road reserve between the kerb and gutter (or edge of bitumen in the event that there is no kerb) and the property boundary. All verges shall slope down from the property boundary to the top of kerb level. The maximum slope shall be 5%, and the minimum slope shall be 2%. For properties which fall away from the road reserve, the verge shall have a minimum fall from the property boundary to the adjacent kerb of 2%.

Any resulting differences between the finished surface and natural surface at the property alignment shall be handled by battering up or down to the natural surface level, as required, and within the proposed allotments or reserves (external to the road reserve). Such batters shall have sufficiently flat slopes so that:

- they can be reasonably maintained, and;
- they will have long term stability having regard to the topographical form and geotechnical properties of the site.

All verges shall be excavated to a depth of 75mm below the surface of the footpath and the top of kerb and backfilled with Council approved topsoil to

provide a growing medium with a raked finish and containing no material with a particle size greater than 20mm. All disturbed areas within the road reserve shall be turfed or seeded to the satisfaction of Council.

Drawing 6 defines a Typical Standard Footpath and Verge Details.

The street verge shall be kept clear of all obstructions.

3.4.3 Stormwater

Where footpaths are proposed to be constructed a 100mm diameter "Sewer Grade" UPVC stormwater sleeve shall be provided under the footpath adjacent to each respective kerb adaptor to facilitate the disposal of stormwater from the property, generally in accordance with Drawing 6 Typical Standard Footpath and Verge Details.

The installation of the pipe should ensure a minimum fall of 1 in 100 towards the kerb.

3.4.4 Driveways

The design or layout of all driveways shall be in accordance with AS 2890.1.

Where within the subdivision the final surface level at the edge of the road reserve will be substantially different to the natural surface level, Council may require the Developer to demonstrate how vehicular access with longitudinal gradient no greater than 1 in 6 will be provided to lot affected by the planned earthworks. This will need to be demonstrated on a long section identifying individual transitions in accordance with AS2890.1 2004.

Driveways providing access and egress to allotments on the low side of the road shall be designed to ensure that there is a sufficient vehicle standing area within the property to provide adequate visibility for motorists when exiting the property.

All single battleaxe allotments shall be provided with a sealed driveway, a minimum width on 3m, extending the full length of the access leg of the allotment designed to Council satisfaction. The driveway is to be constructed from the existing kerb and channel (or edge of bitumen) to the property boundary. Conduits for internal allotment services are to be provided adjacent to, and for the whole full length, of the driveway

The provision for new vehicle crossovers and inverts, and the reinstatement of existing crossovers not required by the development shall be carried out by the Developer to the satisfaction of Council.

The thickness of concrete footpaths adjacent to all development sites with a planned commercial or industrial land use will be 150mm thick with F82 steel reinforcing mesh centrally placed.

The construction and finish of driveways between the kerb and the property boundary shall be consistent with the existing footpath and sympathetic to the existing streetscape. The design and finish of driveways are to be approved by Council prior to construction, and be generally in accordance with Standard Drawing 8.

3.5 Traffic Management

The subdivisional layout shall be the primary means of limiting vehicle speeds in residential streets. Where necessary to supplement the limits on vehicle speeds inherent in the subdivision layout, use shall be made of appropriate traffic control devices. These devices must comply wholly with the “Code of Technical Requirements for the Legal Use of Traffic Control Devices in South Australia”.

The subdivision layout shall be the primary means of limiting vehicle speeds in residential areas. In order to restrict speeds, the desirable maximum length of road between slow points should be 120m, with an absolute maximum length of 150m.

Subdivision layout and the street design should be designed to limit the maximum speeds to those defined in Table 1: Standard Residential Road Design Elements

3.5.1 Roundabouts

Roundabouts shall be designed and constructed to comply with the requirements of AUSTRROADS publication “Guide to Traffic Engineering and Practice, Part 6, Roundabouts”. Roundabouts on residential streets shall also be designed to comply with the standard design envelop provisions of the Code of Technical Requirements for the Legal Use of Traffic Control Devices.

Vehicular access to individual lots shall not be to or from the circulating roadway of a roundabout. Landscaping of the central roundabout island shall not be of such nature and height as to compromise the sight distance requirements for vehicles set out in the above standards.

3.5.2 Cul-De-Sac Turning areas

Cul-De-Sac and turning areas shall be used in terminating or dead end streets and shall be designed to comply with the requirements of AUSTRROADS publication “Guide to Traffic Engineering and Practice” and provide adequate manoeuvring for heavy vehicles.

3.5.3 Other Traffic Management Devices

Other traffic management devices such as Entry Thresholds, Slow Points, Speed Humps, Chicanes, and Splinter Islands should be designed in accordance with the requirements of the AUSROADS Publication “Guide to Traffic Engineering Practice - Part 10 Local Area Traffic Management” and are to be approved by Council.

Devices other than at intersections should be located so as to be generally consistent with streetscape requirements, street lighting, drainage pits and driveway locations.

3.5.4 Road Signs

All traffic signs shall be installed in accordance with the requirements AS 1742 Manual of Uniform Traffic Control Devices. The plans depicting road signage arrangements (for placement on both new and existing roads) shall be approved by Council before installation.

3.5.5 Pavement Marking

All pavement marking, rumble bar medians, etc. shall comply with the requirements of AS 1742 Manual of Uniform Traffic Control Devices, the Code of Technical Requirements for the Legal Use of Traffic Control Devices, and Transport SA Standard Specifications.

Kerbing for median strips and the central and splitter islands of roundabouts etc shall also be painted as set out in those publications.

3.5.6 Street Names

All streets are to be named via resolution of Council and Developers should consult with Council about road names during the concept design consultation stage. Street name signs shall be provided at the threshold of each new road and opposite T junctions.

Street name signs shall be installed in accordance with the following provisions,

- The sign will be mounted on a 3000mm long, 90mm diameter galvanised steel post, the bottom 600mm of which will be inserted into a galvanised steel sleeve suitably anchored into the ground.
- The sign shall be made of extruded aluminium, 830mm long, and 150mm high with the end cut in a taper as determined by standard manufacture.
- Where two lines of text is required e.g. “No Through Road’ following the street name the sign will be 830mm long, 200mm high with the end cut in a taper as determined by standard manufacture.

- The sign shall include the Council emblem.
- The sign shall be mounted to the post using aluminium brackets with anti vandal bolts.
- Street name lettering shall be black 100mm high centrally located on the sign over a white reflective background. (note; where two lines of text are required i.e. “No Through Road” the second line of text will be 50mm high

Approved street names should be shown on the final deposited plan prior to Section 51 Clearance being issued

3.5.7 Public and Street Lighting

Public lighting is to be provided in all streets and roads to the boundary of the development. Public lighting shall also be required in reserves over 1hectare in size or where access to structures within the park is a feature, or paths within the park form a linear link.

The level and standard of lighting shall be determined according to SAA codes and AS/NZS 1158 Series, and in consultation with Council.

The Developer shall be responsible for liaison with ETSA Utilities in respect to both Public Lighting and for the provision of an underground electricity service to all new lots in the development.

Trenches in road reserves shall be backfilled in accordance with ETSA Utilities Standard Specifications, so as to avoid future settlement of new road and footpath surfaces. The pavement and surface of trenches in existing road pavements shall be treated in accordance with the current version of the Transport SA Standard Specification for “Excavation and Reinstatement of Road Pavement”.

Street Light Columns will be of a type approved by Council during the design consultation stage. Column types may vary depending on the hierarchy classification for the road, however all luminaires will be either metal halide or compact florescent.

Street Light Columns are to be located in the verge/nature strip area of the footpath a minimum distance of 600mm behind the face of the kerb and positioned to avoid close proximity to driveway entries or future street tree canopies.

SECTION 4

STORMWATER DRAINAGE

4 STORMWATER DRAINAGE

Stormwater management forms an integral part of any development. The objectives of stormwater management within the Streaky Bay District Council are is to

- Collect stormwater from a catchment and harvest for reuse within the development reserves
- To convey retention overflow to its receiving waters with minimal nuisance, danger, or damage
- Prevent flooding of public and private property both within the catchment and downstream
- To provide safety for traffic and pedestrians by controlling frequent stormwater flows

The stormwater management scheme for all developments is to incorporate both a minor and major system. The major system shall provide a safe well defined overland flow path for rare runoff events (Q_{100}) while the minor system shall be capable of controlling flows from frequent runoff events (Q_{10}). Minor system flows are to be conveyed underground unless approved otherwise by Council.

New building development or redevelopment generally increases the stormwater runoff from the site due to the increase in impervious areas such as roofs and pavement. Direct discharge of this increased runoff into the existing stormwater drainage system may increase the risk of flooding downstream properties and may have adverse effects on the natural watercourses and downstream drainage infrastructure. External drainage head works may need to be undertaken to improve the downstream system to cater for these increased flows.

Council therefore requires Developers to incorporate appropriate stormwater management techniques and strategies to:

- detain and utilize the increased stormwater runoff on the site; and,
- maintain the volume and rate of flow of the runoff to those levels existing prior to development.

4.1 Developer Responsibilities

4.1.1 Prior to Development Approval

Prior to Council issuing development approval the Developer will provide Council with a Concept Stormwater Management Plan for the whole development showing the locations and sizes of any stormwater retention/ systems, delineation and areas of all sub-catchments, minor stormwater flow paths ($minQ_{10}$), and flow path for the major event (Q_{100}).

For assessment and approval of the stormwater drainage aspects of proposed developments, site plans submitted as part of a Development Application should show the following:

- Existing site levels or contours with adjacent road, kerb and drainage invert levels.
- Design levels and grading of pavement and driveway areas.
- Layout of the proposed piped drainage system and details of the connection to Council's drainage system.
- The location, positioning and type of proposed stormwater harvesting and pollution prevention devices.

Engineering design plans and stormwater calculations for on-site stormwater harvesting should be documented by a professional consulting engineer.

4.1.2 Prior to construction:

The Developer will provide Council with a Detailed Stormwater Management Plan and construction design drawings for approval including full details of the approved stormwater drainage system for the site, any works external to the site, the location and allocation of any drainage easements, and details of any temporary works, drains or banks proposed as part of the project.

The Detailed Stormwater Management Plan will address the following issues;

- An assessment of the impact of the proposed development on both the internal and external stormwater drainage network;
- What stormwater measures are proposed to protect the site from a major storm event (ARI = 100 years) as well as minor storm events (ARI = 10 years).
- The strategies to be used to harvest, store, and reuse stormwater from the development site.
- The proposals and strategies to be used to control the entry of litter and pollution from the site into the stormwater network or harvesting devices
- The measures to be used to control erosion and sedimentation during construction.
- All works proposed within lands under the control of other Authorities must have the approval from the relevant authority prior to commencing work. Evidence of such shall be provided with the design submission.

4.1.3 Post construction

As soon as practical after construction of the stormwater drainage system and the implementation of the stormwater management plan, and before the issue of a certificate of practical completion by Council, the Developer shall supply;

- an electronic copy of the "As Constructed" drawings in AutoCAD format (.dwg or .dxf). "As Constructed" drawings are to contain

adequate details to the satisfaction of Council and in accordance with Councils standard template. This is to include any variations to the For Construction plans, including survey results.

- a schedule of the infrastructure that will become the property of Council in tabular Excel format to the satisfaction of Council;
- copies of compaction tests for all trenches in roads (one test per layer for each backfill material for each 30 metres of trenching);
- certification by a professional civil engineer that the works were carried out in accordance with the approved plans and specifications.

4.2 Retention

Retention storage (or harvesting) of stormwater on the site is an effective way of capturing and utilising runoff for reuse purposes within the development. It is also an effective method of limiting peak flow rates and holding the large volumes of runoff generated by new developments. In this way downstream flow rates can be kept within the capacities of the existing system and little or no upgrading of the downstream drainage infrastructure will be necessary.

The location, size and type of development will influence the on-site strategies and techniques that may be employed, and Developers are encouraged to consult Council in the planning stage for advice on these aspects of stormwater management.

Council require on site retention of stormwater. However, if the applicant can demonstrate that the existing catchment has an adequate drainage system and stormwater harvesting is possible or exists elsewhere, then retention may not be required or could be minimised. In order to establish this requirement the applicant will need to provide a study prepared by a suitably qualified professional civil engineer which;

- Analyses the whole catchment and demonstrates that the capacity of the existing stormwater drainage system and harvesting infrastructure is adequate for post-development runoff and allows for increase development of other sites within the catchment;
- Demonstrates that there is no increase in the incidence of flooding downstream; and,
- That there will be no impact on the water quality downstream, or any increase in erosion.

Detention basins, or dams, are discouraged due to high evaporation rates within the Streaky Bay District.

4.2.1 Storage Systems

Underground storage of stormwater runoff in the form of underground tanks or a run of large diameter pipe is encouraged and may be used to hold the volume of runoff and to reduce peak discharge flow rates. Off-line storage in

underground tanks requires a site with sufficient grade to allow the low flow outlet from the underground tank to freely drain to the downstream system.

4.3 External Drainage Headworks

Where on-site retention of stormwater is not provided and runoff from the developed site is connected into Council's drainage system, the downstream infrastructure (pipes, tanks) may need to be upgraded to cater for the increase in peak flows and the greater volume of runoff. The type of development, its location within the particular sub-catchment and the present state of the downstream drainage facilities will determine the extent of external drainage headworks required.

In lieu of providing on-site retention measures, the Developer may choose to contribute to part of the external drainage headworks in proportion to the increased runoff from the developed site.

If the Developer decides to pursue the option to contribute to the cost of providing the necessary head works external to the development in lieu of on-site stormwater retention the Developer, in consultation with the Council, will be responsible for the cost of carrying out of the engineering design work necessary to determine the extent of work and estimated costs to determine the amount of contribution applicable.

4.4 Drainage Design

The drainage system should be designed in accordance with the requirements of the Institution of Engineers, Australia publication, "Australian Rainfall and Runoff, a guide to flood estimation Volume 1 Revised Edition 1987" and drainage should be in accordance with the National Plumbing and Drainage Code, part 3 Stormwater Drainage Australian Standard 3500.3 1990.

The drainage system should be designed to cater for the major storm event (Q_{100}) as well as minor storm events (Q_{10}).

The flow path for major storm flows (1 in 100 year ARI) must be contained within reserves and utilise natural overland flow paths or the road reserve and not enter into private property unless within a designated easement. Minor flows shall be conveyed underground unless approved otherwise by Council.

4.4.1 Connection and Integration to Councils Drainage Network

The overflow piped system for minor flows should be connected to Council's drainage system via a junction box on the existing main trunk drain or discharged to the main open channel via an appropriate headwall.

4.5 Drainage Easements

Where drainage easements are required to facilitate future access to the drainage network the Developer will take the measures necessary to ensure that the drainage reserve or easement be vested in Council ownership.

Easements shall be provided over all drains in any allotments not being a road reserve. Unless otherwise required by Council such easements shall be Three (3) metres wide when the easement contains only a single drain and at least Four (4) metres wide when the easement contains more than one drain.

4.6 Residential Development Drainage Requirements

Where properties drain naturally to the street, a galvanised steel kerb adaptor shall be provided per allotment. Such adaptors shall be cast into the kerb on the downstream side of the allotment, the location of which shall be within approximately one metre from the alignment of adjoining property boundaries.

Where footpaths are to be provided, a 100mm diameter UPVC sewer class sleeve shall be provided under the path adjacent to each respective kerb adaptor to facilitate the connection of stormwater pipes from the property to the kerb at a minimum grade of 1 in 100 flowing towards the kerb. This is to be provided in accordance with Drawing 6 Typical Standard Footpath and Verge Details.

Where allotments grade away from the street frontage rear of allotment drainage shall be provided. If not established, an easement may be required. A stormwater connection point shall be provided for each allotment.

Where the allotment grades to the rear and there is no rear of allotment drainage provided, a drainage easement will need to be obtained for the outfall pipe drain through the rear property for connection to the street watertable.

Such drains shall be designed to accommodate stormwater from the entirety of the respective allotments in the occurrence of an ARI = 1 in 10 year storm event

The minimum diameter of the pipe shall be 100mm and each allotment shall be provided with a 300mm x 300mm grated inlet pit/junction box, located at the lowest corner of each respective allotment.

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

Stormwater harvesting or retention may be required and should be developed in accordance with Section 4.2.

4.7 Drainage Requirements for Industrial and Commercial Development

Stormwater discharge from industrial/commercial properties (including car parking areas) must pass through an appropriate sized Stormwater By-Pass Interceptor Pit (Stormceptor) located within the property to remove grit and contaminants prior to entering the stormwater system via a minimum 300dia RC pipe connection to the piped drainage system.

The outfall pipe should be connected to Councils drain, subject to Council approval, by breaking into an existing junction box or side entry pit or by constructing a new junction box on the existing drain.

In some cases the outfall may discharge to an open channel or natural watercourse via a headwall with appropriate scour protection.

4.8 Stormwater Pollution Control Devices

Where Stormwater pollution control device(s) are required by Council to prevent the ingress of silts or other deleterious waste matter into the Councils existing stormwater drainage network they shall be constructed generally in accordance with the requirements of "Stormwater Pollution Prevention-Code of Practice for Local, State and Federal Governments" EPA, November 1997.

4.9 Stormwater Pipes

Stormwater drainage pipes and box culverts shall generally be of reinforced concrete construction and in accordance with the following.

- Minimum pipe size of 300mm
- Minimum box culvert size of 450mm x 300mm
- Minimum clear cover over pipes or culverts shall be 600mm in general or in accordance with the manufacturers specification otherwise approved by Council.
- The minimum vertical and horizontal clearances between a stormwater pipe and any other pipe or service conduit shall be 150mm.
- In areas of high water table, sandy soils or highly reactive soils, rubber ring joints shall be used.
- Minimum allowable pipe grades of 0.3% are required to ensure that water velocities in all pipe runs will be sufficient for self cleansing
- The pipe size of rear of allotment drains should be determined on merit.

Pipe outlets into natural watercourses and open channels shall incorporate works designed to provide protection from flows within the receiving waters, from overland flows into the receiving waters, and from local scouring and

undermining of the outlet structure, and include measures to dissipate the outflow velocity.

4.10 Side Entry Pits and Manholes

Side entry pits and man holes shall generally be of reinforced concrete construction. Where pre cast side entry pits and manholes are proposed they shall be installed in accordance with the manufacturer's directions and specifications.

See Drawings 10 Double Side Entry Pit Layout

Where side entry pits and manholes are installed the following shall be taken into account;

- All pits are to be recessed sufficiently to maintain a continuous lip line in accordance with the drawings.
- All pits are to be free draining.
- Pits at intersections are generally to be located at the tangent point taking into account the position of pedestrian paths and kerb ramps.
- Reductions in pipe sizes shall not be permitted.
- Pipe openings are to be located within a single wall (i.e. pipes shall not be allowed to enter through the pit corner).
- The desirable maximum side entry pit depth shall be 1.5m to facilitate maintenance.
- Side entry pits should be located at the mid-point of allotment frontages to minimise conflict with serve conduits and future driveways.
- Manhole lids on all roads will be constructed in heavy duty concrete to accommodate heavy traffic loads.

SECTION 5

LANDSCAPE AND OPEN SPACE

5 LANDSCAPING AND OPEN SPACE

A general aim for landscape design is to incorporate the existing natural character of the site. This includes consideration of specific natural elements on the site and the wider natural environment within which the site is situated.

The landscape design should also provide accessible and equitable provision of open space to the community. The configuration of reserves and streetscape should aim to be cohesive and legible within the larger urban design of precincts principles and designed to visually enhance the streetscape.

5.1 Developer Responsibilities

5.1.1 Prior to Development Approval

The Developer will be required to ensure that the following requirements are carried out to meet the Councils standards in respect to the open space and landscape objectives of the development plan.

- Preparation of concept landscape plans and associated documentation is to be undertaken by a qualified Landscape Architect.
- The landscape architect will consult with the Council in the formulation of a design brief for the site.
- An existing tree survey of the site shall establish those trees to be removed and those trees to be retained for inclusion in a landscape plan.
- A landscape concept plan shall be prepared and given approval by Council.

5.1.2 Prior to Construction

Following Council approval of the landscape concept plan design but prior to construction, the Developer shall provide

- A final landscape design plan, a technical specification and a schedule of works shall be prepared and lodged with the Council in hard copy and electronically.
- Approval of Council for any variations to the approved plans and specifications during the development stage must be sought by the landscape architect.
- If necessary, the establishment of a Land Management Agreement protecting significant trees

Typically, Landscape Design Plans will identify:

- Existing elements to be removed / retained

- Construction details including site grading and drainage
- Surface treatments and layout
- Planting design - A plant schedule listing the botanical name, the container size and the quantity/density of planting and have reference to Councils Tree Management Policy 2008.
- Irrigation design

Typically, the Technical Specification will comprise:

- Site preparation and demolition
- Earthworks and cultivation
- Irrigation
- Concrete works, and paving
- Planting schedule and turf specification
- Park and Street Furniture, Fencing, Lighting
- Maintenance requirements and Schedules
- Landscape Work Schedules.

5.1.3 Post Construction

- “As constructed” drawings shall be submitted to Council both in hard copy format and electronically (in AutoCAD format) at the issuing of the Certificate of Practical Completion.
- Signed and registered LMA protecting significant vegetation if required
 - A schedule or register of all the infrastructure that will become the property of Council in tabular Excel format to the satisfaction of Council
- A 12 month defects liability bond will be required for all works in accordance with Council Bonding policy.

5.2 Legislative Responsibilities

The Development Act requires that 12.5% of the land shall be vested in the Council as public open space for developments exceeding twenty allotments. There are provisions in the Act for this to be contributed either as land or monetary payment or a combination of the two up to the value of this limit.

Where a Developer is proposing to make a monetary payment in lieu of land, discussions should be held with the Council at the concept plan stage.

5.3 Landscape Design Principles

Developers will need to consider a range of general design principles when planning streetscapes and open space designs. Consideration should be given but not limited to;

- The configuration of open space to complement existing vegetation to attract and support the fauna native to the local area and to provide a buffer between development and viable ecosystems.
- Integration of streetscapes, parks, reserves and habitat corridors, to provide linear connections within and external to the development.
- Maximisation of opportunities for the retention and/or re-introduction of plant material that is indigenous to the site.
- Establishment of plant material of appropriate structure and species composition in accordance with Councils Tree Management Policy 2008.
- Future maintenance of landscape works and ensuring that works are to the appropriate standard, of durable materials and low maintenance design.
- Conservation of irrigation water by using designs appropriate to the climate and utilising water-wise plant selection.
- Maximising opportunities for water re-use where opportunities are available.
- Ensuring that the design and development of the site does not increase the rate of surface run-off and that opportunities to improve the quality of surface water before leaving the site are examined.
- Incorporation of on-site retention of stormwater for re-use into the design
- The orientation of the subdivision design should consider incorporation of frontages to open space to promote natural surveillance and community ownership.
- Streetscape design elements should be applied consistently to create continuity in character and appearance.
- Linkage of the pedestrian and cycle network with reserves and parks where appropriate.
- Design of street lighting and public open space lighting to provide adequate illumination

5.4 Existing Trees

All existing trees on, and within 5 metres, of the development site boundary (or where requested by Council) shall be the subject of a detailed and accurate survey. An “Existing Tree Survey Plan” must accompany the land division plan and be submitted at the time of lodgement.

The “Existing Tree Survey” plan may be either:

- a separate plan, or;
- included within the Land Division Plan.

The potential impact of the land division upon existing trees must be clearly shown on a plan and must contain the following information;

- identification of the species including the botanical name of the tree;
- the location of the tree accurately indicated, and;

- the height and canopy of the tree and girth of the trunk.

The “Existing Tree Survey” plan must also indicate whether it is proposed that the tree is to be removed or retained. There should be no net loss of indigenous vegetation (where indigenous vegetation is to be removed it must be replaced with local species and identified in the landscaping plan).

Where there are existing trees to be retained on the site the following tree protection measures are to be undertaken by the developer prior to the commencement of any demolition, development, construction or building works,

- The tree is to be physically protected by providing a fence defining the Tree Protection Zone using 1.8 metre high star picketing/chain wire. The fencing shall be located along the Tree Protection Zone and shall remain in place until all works are completed.
- All construction drawings including the landscape design plan, earthworks, drainage and service drawings shall show the trees to be retained and their protection zones.
- There is to be no storage of materials or machinery or site office/sheds, nor is cement to be mixed or chemicals spilt/disposed of in the area, soil levels altered or excavations undertaken, or stockpiling of soil or rubble within the tree protection zone.
- Any works required within the tree protection zone shall be under the direction of a suitably qualified Arborist, and to the satisfaction of Council.
- The applicant shall contact Council to arrange a site inspection to confirm the accuracy of Tree Protection Zones required for those trees to be retained.
- The name and number of the contractor completing the works, and/or a contact number for enquiries regarding the works.

In order to retain any established landscape character, all trees located within the existing road reserves shall be protected and retained, unless approved otherwise by Council.

5.5 Street Trees

Street trees are to be provided in front of all properties at the centre of the allotment at a rate of one (1) per allotment, or at a rate necessary to provide a maximum spacing of twenty (20) metres. Street trees are to be planted within the Council verge in accordance with Drawing 1 Typical Cross Section of a Local Street.

The species, size, age, method of planting and the location of the street trees will be approved by Council in writing prior to planting. Reference shall be made to Councils Tree Management Policy 2008.

Dependent upon the species of street tree, a minimum height for each tree may be specified by Council at the time of planting. Each tree will be double staked with 50mm hardwood stakes installed parallel to the road and loose tied and be planted in a mulched 1 metre diameter bowl to facilitate watering and water retention.

The trees shall be maintained in good health by the applicant for a period of 12 months from the date of the issue of a certificate of practical completion. Any dead, diseased and damaged trees shall be replaced during this period.

A site inspection will be carried out in the presence of a representative of the Developer and the Council not less than two months before the expiry of the maintenance period to determine what planting, if any, needs to be replaced.

The design of the layout of street tree planting should be thematic and consistent with the objective of providing avenues of planting.

5.6 Reserve Design

In addition to the general landscape design principles outlined in Section 5.4, the following design requirements are specific to those reserves that are planned within the Streaky Bay District Council Area;

5.6.1 Trees in Reserves

Where it is proposed to plant trees in reserves or on any other common land, community land or buffer zones the proposed planting will be included in the landscape concept plan to be submitted to the Council in accordance with the design principles outlined above.

Tree planting in reserves will need to take into account:

- Existing trees on the site.
- Soil stabilisation needs
- Accessible shade
- Ease of future maintenance
- Proximity of fences and pathways (trees should not be planted closer to fences that abuts private property than their mature height).
- Lighting considerations where appropriate
- Bushfire risk minimisation
- General aesthetic quality

Tree planting in reserves shall include a mix of native and selected exotic species to reflect existing plantings in nearby and surrounding areas, and shall be designed via consultation with Council and in accordance with its Tree Management Policy 2008.

5.6.2 Grassing

Unless otherwise indicated by Council, all reserves are to be grassed. Specific requirements include

- A minimum depth of 100mm of suitable topsoil shall be provided over all reserves to provide a satisfactory growing medium.
- All reserves shall be grassed with drought tolerant, low water use and frost hardy grasses to the satisfaction of Council.
- The land should be suitably designed and established for its intended future use and to minimise future maintenance requirements.

5.6.3 Fencing

Reserves shall be fenced in accordance with the following

- Fencing of reserves where they abut any allotment not being a road or an existing reserve shall be off 1800mm capped colourbond fencing with galvanised posts and rails “facing into the adjacent allotment”. Alternative high standard fencing may be approved by Council
- Fencing of reserves on road boundaries will be the subject of a separate decision of Council but should amongst other things provide for a high degree of visibility into the reserve from the street. Roadside fencing should incorporate a vehicle access gate for maintenance vehicles.
- Where a reserve incorporates a children’s playground the road side boundary fence or, within a separate fence specifically enclosing the playground area in large reserves the fence will incorporate a child proof safety gate

5.6.4 Irrigation

An Irrigation Management Plan for the reserves is required by Council prior to installation. The plan needs to encompass best water management practices (for mains and reclaimed water) and include requirements as set out in the South Australian Reclaimed Water Guidelines. It should incorporate the following features;

- best practice water management features and water sensitive design.
- valves, fittings and backflow prevention devices suitable for automatic operation and capable of utilising reclaimed water (class A)
- irrigation of grassed areas and planted garden beds to be via sprinklers or dripper lines to Council satisfaction

The following requirements need to be addressed

- A service connection and water meter are required to all open spaces and reserves and must be a minimum of 40mm with an appropriate backflow device fitted (to comply with AS 3500.1-1990 section 7).

- One connection is to be provided for each 2000 square metres of the park
- The installation of an irrigation system to all landscaped traffic islands and roundabouts is mandatory

Irrigation systems are to be installed to Council satisfaction.

5.6.5 Furniture

Park furniture including seats, tables, litter bins, bike racks, drinking fountains etc will be of a type and manufacture approved by Council during the concept plan design consultation stage and unless otherwise stipulated by Council will be consistently used in all reserve areas.

5.6.6 Paths

Paths within reserves should be designed for their intended purpose in accordance with Section 3.4. Paths will be of concrete construction in accordance with Drawing 6 Typical Standard Footpath and Verge Details or other materials to the satisfaction of Council;

Paths shall be designed so as to create pedestrian and/or bicycle links to existing paths in the vicinity of the development.

5.6.7 Lighting

Public lighting may be required in reserves over 1hectare in size or where paths or access to other structures are features of the park or the park forms a linear link.

Light poles shall be of a type and style approved by Council at the concept plan design consultation stage and shall be connected to the street electricity grid using either metal halide or compact florescent luminaires.

SECTION 6

COMMUNITY WASTEWATER
MANAGEMENT SCHEMES
(CWMS)

6 COMMUNITY WASTEWATER MANAGEMENT SCHEMES (CWMS)

In the township of Streaky Bay the Council operates a CWMS which collects primary treated effluent from septic tanks on individual properties and delivers it to a treatment plant. Where no CWMS exists, treated effluent is disposed of on site by way of soakage trenches or sprinklers

On site disposal of effluent is not always satisfactory in the Streaky Bay District Council for the following reasons;

- The existing soil conditions in much of the area is not suitable for the onsite disposal of effluent;
- Large allotments are required;

To overcome these concerns Developers seeking to undertake land development projects in the Council area will be required in most instances to either;

- Connect into Councils existing CWMS; or
- Construct a CWMS for the particular development; or
- Consider alternative sewerage management techniques in consultation with Council.

Unless otherwise specified by Council all new residential or country living allotments shall be connected to Councils existing CWMS.

6.1 Fees and Charges

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

- All internal pipe network and pumping station costs
- The connecting main costs from the development to a point (determined by Council) into the existing CWMS.

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

6.2 Design Requirements

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

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

- Septic Tank Effluent Drainage Scheme Design Criteria (DHS & LGA);
- Technical Specification for the Construction of Septic Tank Effluent Disposal Schemes (DHS);

Council is to be given at least 24 hours notice of intention to perform work on its CWMS and an application to perform work on Council infrastructure is to be completed and approved before any work can commence.

As constructed plans are required for all additions and alterations to Councils CWMS.

SECTION 7

ENVIRONMENTAL PROTECTION

7 ENVIRONMENTAL PROTECTION

The Developer and contractors shall take all measures necessary to ensure minimum disturbance to the existing environment as a result of the development

7.1 Site Control

The Developer, and contractors shall observe all rules and regulations in force on the site and shall comply with all notices and instructions issued by Council in relation to such rules and regulations.

No new tracks shall be formed, existing tracks altered, camps erected, trees or shrubs removed, fences cut, water, sewerage or power lines cut or any other such things done without the prior approval of the Council.

Under no circumstances shall fires be lit without the prior approval in writing of the Country Fire Service.

7.2 Environmental Control

The Developer shall be responsible for ensuring that the provisions of this section and any other environmental protection provisions in the contract are complied with and that the requirements of any statute, by-law, standard and the like related to environmental protection are observed.

The Developer shall, prior to the commencement of work on the site, submit to the Council their proposals for traffic movement, temporary structures, cleaning up, erosion control and the like. After the proposals have been approved by Council, the Developer shall be responsible for ensuring that the approved proposals are observed. Any changes to the approved proposals shall be subject to the prior agreement of Council.

The Developer shall carry out the work with reference to the Environment Protection Agency (EPA) Codes of Practice.

The Developer shall ensure that pollutants such as dust, sediment, litter and wash down water do not leave the site during construction of the works.

The Developer shall prepare a Soil Erosion and Drainage Management Plan (SEDMP) showing how this is to be achieved. The plan shall include a site layout together with a written procedure and implementation plan, and be submitted to Council prior to work commencing. These shall include all aspects of site management including:

- Site access from public or private roads;
- Access around the site;

- Areas of earthworks, stockpiles, loading areas;
- Site drainage including all relevant information including sediment collection devices, drainage lines and discharge points; and

The Developer shall ensure that the following principles are included in the SEDMP and achieved on the site throughout the construction period:

- Limit site access to nominated and controlled locations and ensure that sediment is not transported off the site on vehicles or by vehicle wash down activities;
- Locate all stockpiles away from concentrated water flow paths;
- Ensure that the least amount of land is exposed to the risk of erosion for the shortest period of time;
- Effectively control surface runoff entering and leaving the site;
- Ensure that erosion control and sediment collection structures are located to maximise their effectiveness and are in place prior to the commencement of site clearing works;
- Locate sediment traps and basins in locations that will not create flood risks to adjoining properties;
- Where control of creek or river flows is necessary, ensure that both low and high flows are managed to minimise erosion. For example if access across a creek is required construction of a ford may be preferable to construction of a culvert and roadway;
- Rehabilitate all disturbed areas as soon as possible including the reinstatement of riparian areas and the installation of ground cover planting progressively as earthworks are completed;
- Effectively maintain the erosion control and sediment collection devices; and
- Decommission sediment traps and basins only after completion of final works and as approved by the Council.

7.3 Preservation of Flora

The Developer shall refrain from destroying, removing or clearing trees and shrubs to an extent greater than is necessary for the execution of the work under the contract.

Areas to be cleared shall be inspected by the Developer, and approval of Council obtained before any trees or shrubs are removed, cleared or destroyed.

Where there are existing trees to be retained on the site the tree protection measures indicated in Section 5 of this document are to be undertaken by the Developer prior to the commencement of any demolition, development, construction or building works.

7.4 Working Hours

Construction activities on the development site shall be carried out only between the following hours;

- Monday to Saturday - 7am to 5pm,
- Sunday - no work shall be undertaken other than necessary watering for dust control.

7.5 Site Access

Where more than one street abuts the development site Council will nominate the location and street from which access to the site is obtained. Developers are required to obtain Councils consent for the location of working access points to the site.

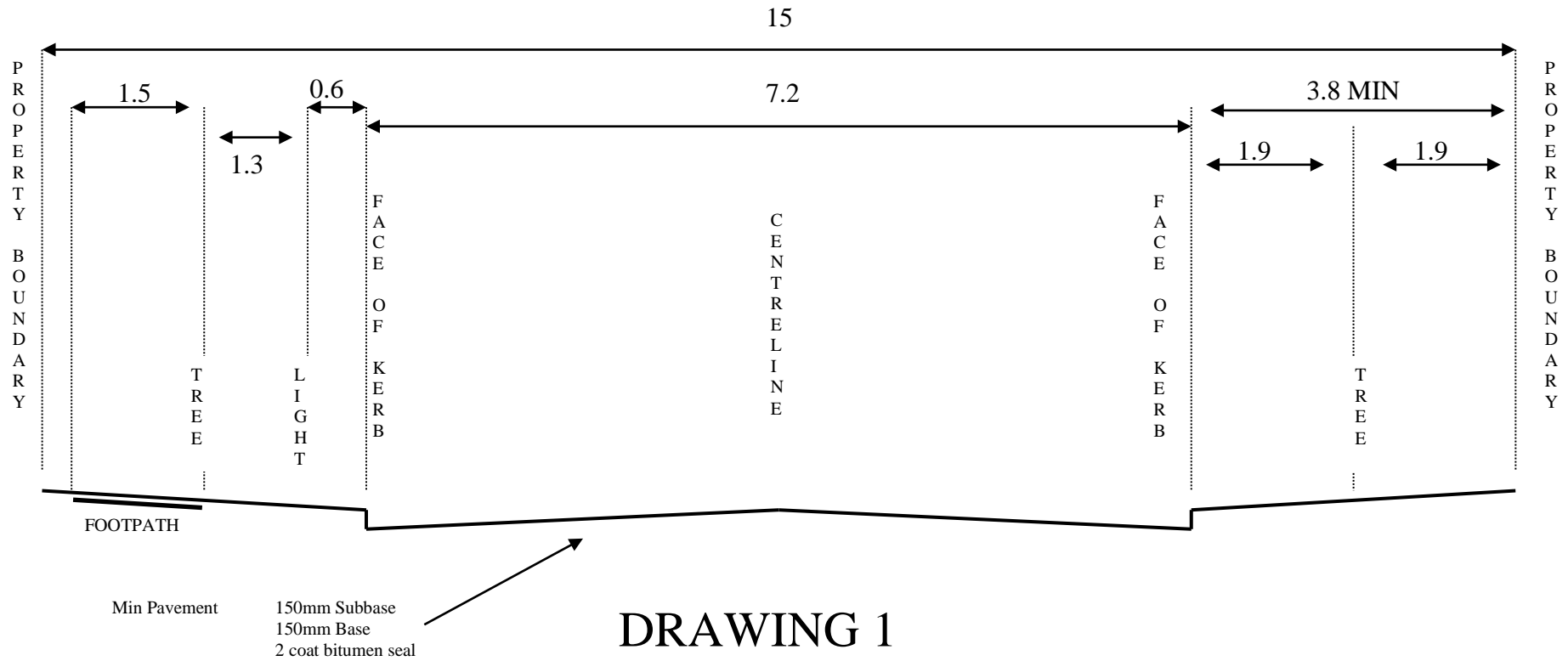
TABLES AND DRAWINGS

Table 1: Standard Residential Road Design Elements

Street Type	Local Road	Local Collector Road	Rural Sealed Road	Rural Unsealed Road
Reserve Width	15 m	20 m	30m	30m
Verge width	3.9	5	12m	9.5m
Traffic Catchment (max)	<15lots	>30 lots	>5 lots	>2 lots
Traffic volume	150vpd	300vpd	50vpd	20vpd
Design speed	15km/h (max)	30km/h (max)	40 km/h (max)	50 km/h (max)
Carriageway Width	7.2m	10m	9.2m 1m shoulder both sides	11.0m formation 10m gravel
Lanes – moving	1	2	1	
Parking	1	1	1	
Kerb and Gutter	Yes	Yes	No	No
Constructed footpaths (with a one side path – preference is to be located on low side)	One side – Width 1 .5m	One or both sides - width 1.5m	Nil	Nil
Cycle provision	N/A	On carriageway	Nil	Nil
Adjoining Land Division	Residential and Country Living	Residential and Country Living	Rural Eights	Rural
Grade Desirable	10%	10%	10%	10%
Absolute maximum	16%	16%	16%	16%
Sight distance (general)	As per Austroads, AS2890, AS1428	As per Austroads, AS2890, AS1428	As per Austroads, AS2890, AS1428 Aust Model Code & Services in Streets Code	As per Austroads, AS2890, AS1428 Aust Model Code & Services in Streets Code
Reference Standards and Codes	Aust Model Code & Services in Streets Code	Aust Model Code & Services in Streets Code	Aust Model Code & Services in Streets Code	Aust Model Code & Services in Streets Code

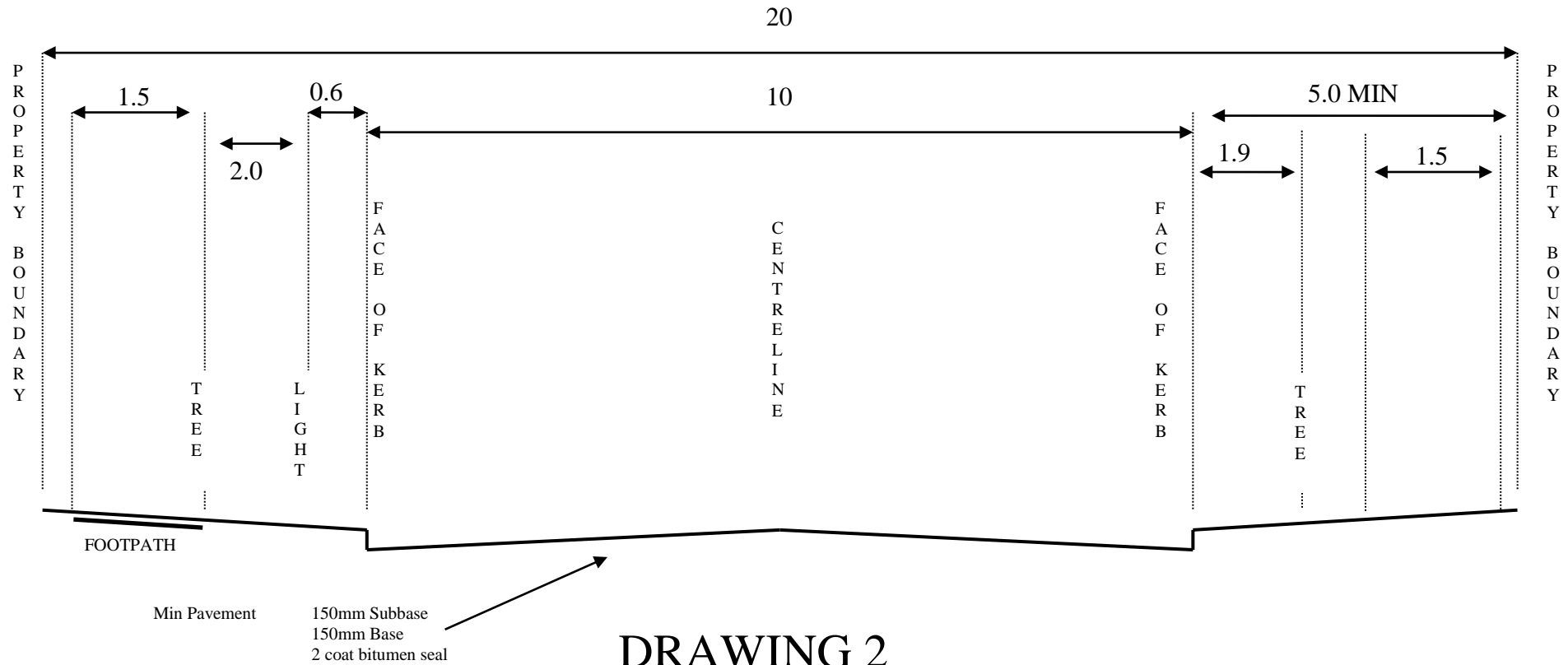
DISTRICT COUNCIL OF STREAKY BAY

TYPICAL CROSS-SECTION – LOCAL ROAD



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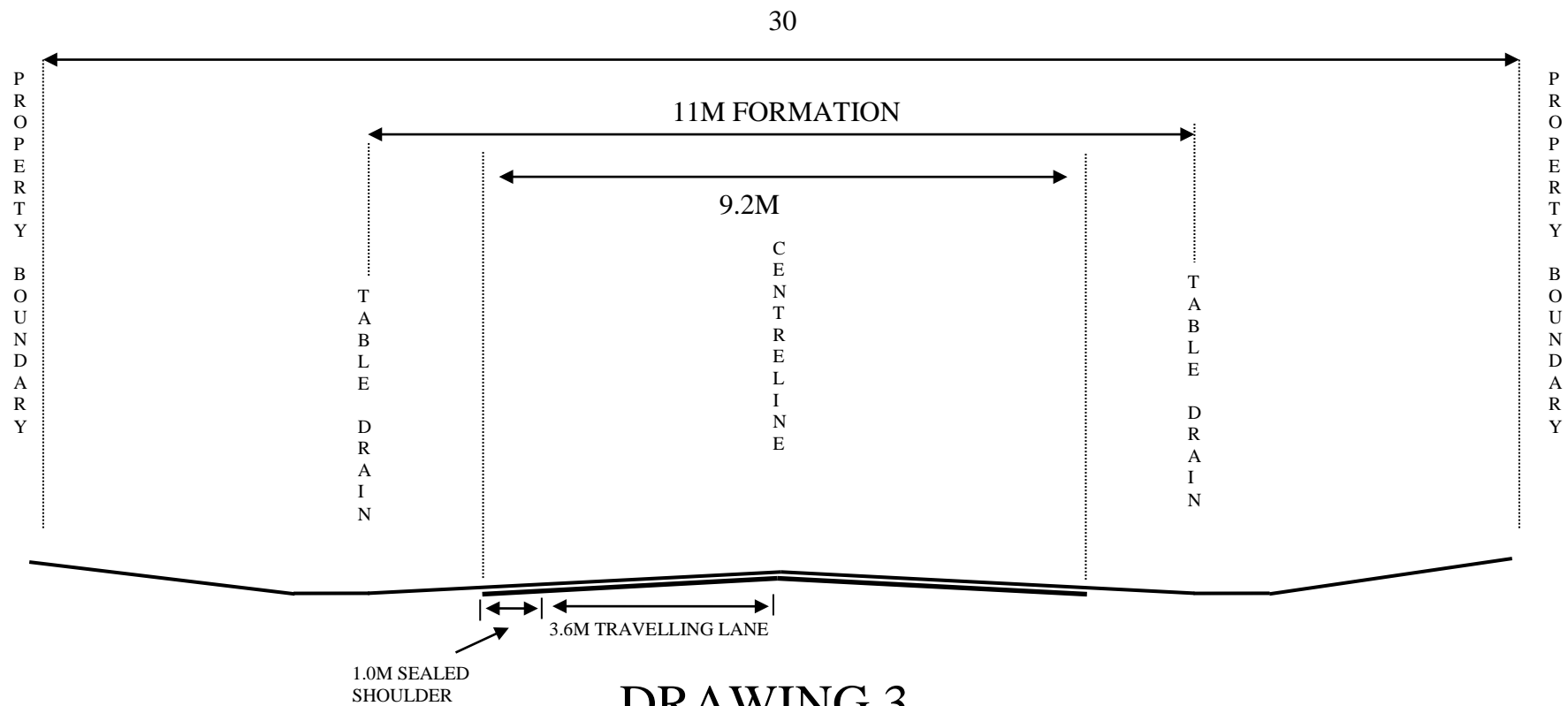
TYPICAL CROSS-SECTION – LOCAL COLLECTOR ROAD



DRAWING 2

DISTRICT COUNCIL OF STREAKY BAY

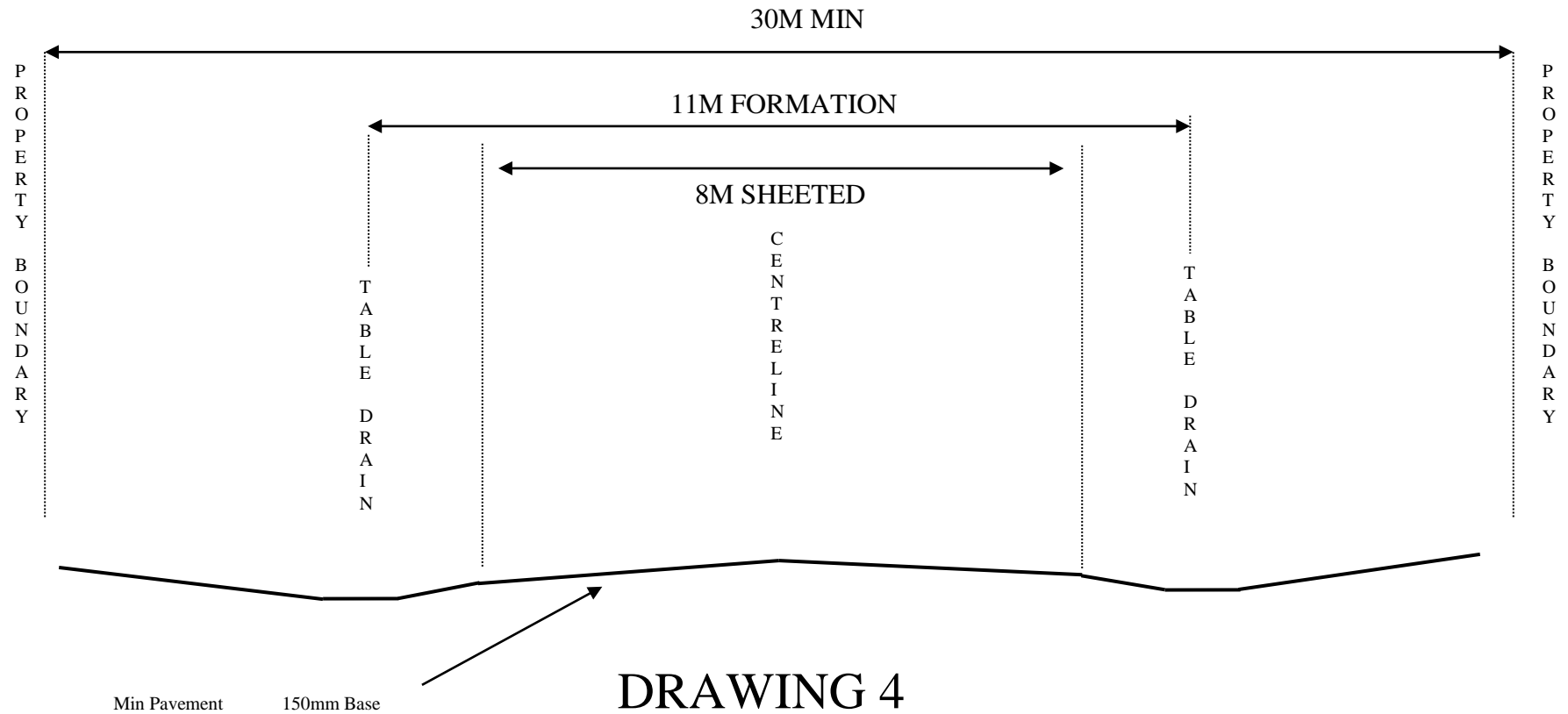
TYPICAL CROSS-SECTION – RURAL SEALED ROAD



DRAWING 3

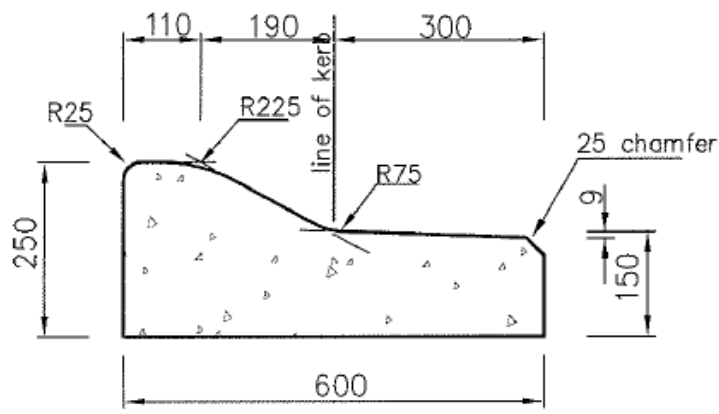
DISTRICT COUNCIL OF STREAKY BAY

TYPICAL CROSS-SECTION – RURAL UNSEALED ROAD

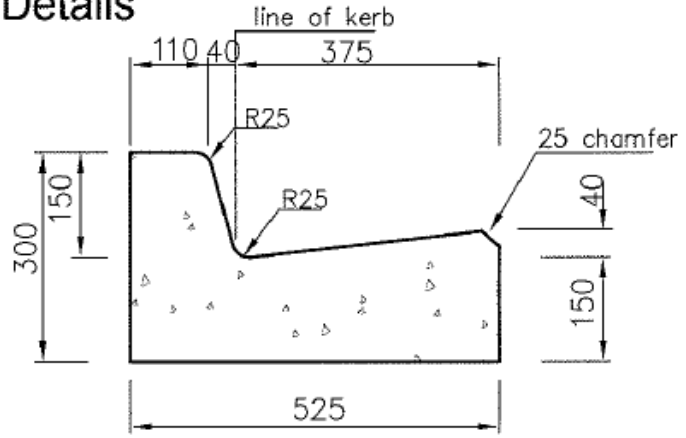


DISTRICT COUNCIL OF STREAKY BAY

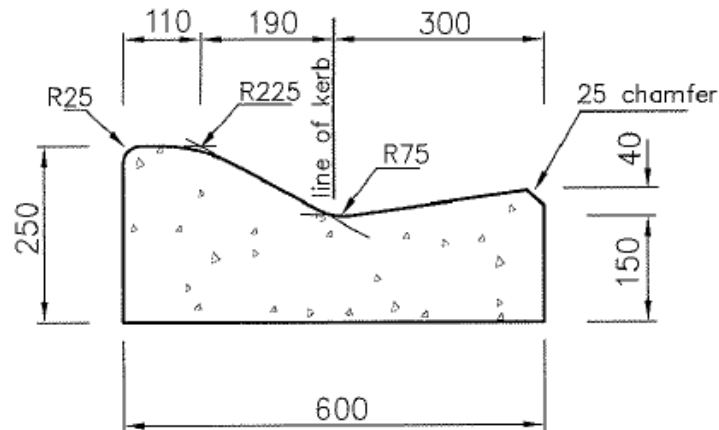
Standard Kerb & Channel Details



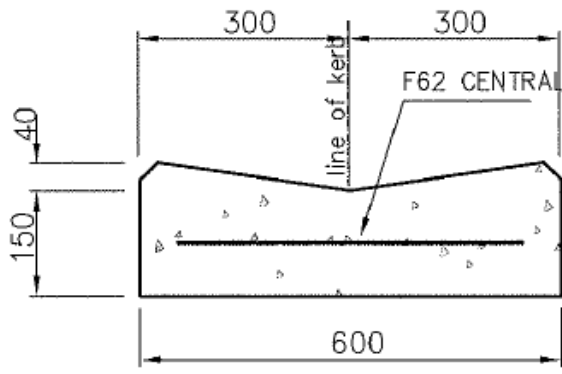
MOUNTABLE KERB AND TRAY



BARRIER KERB AND CHANNEL



MOUNTABLE KERB AND CHANNEL

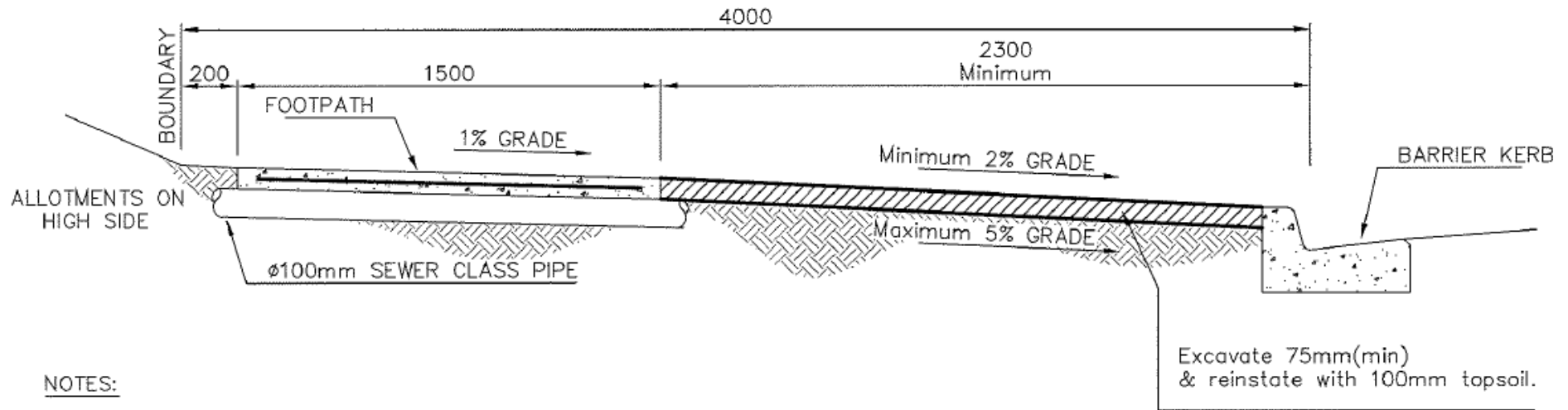


VALLEY/SPOON DRAIN

DRAWING 5

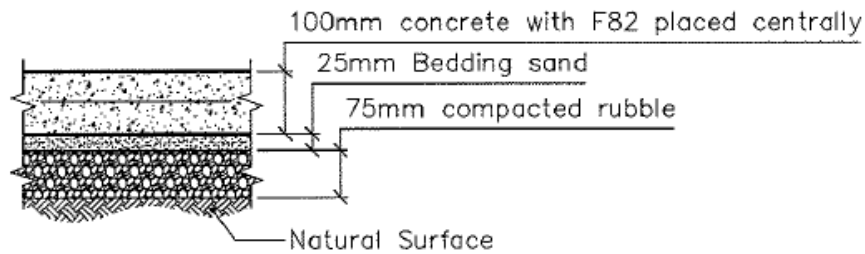
DISTRICT COUNCIL OF STREAKY BAY

Typical Standard Footpath and Verge Details



NOTES:

- CONTROL JOINTS TO BE PLACED EVERY 1.500m AND EXPANSION JOINTS PLACED EVERY 6.000m.
- 100mm SEWER CLASS SLEEVE TO BE LOCATED UNDER FOOTPATH AS SHOWN AND IN LINE WITH KERB OUTLETS (WHERE FOOTPATHS ARE LOCATED ON THE HIGH SIDE OF ROAD)

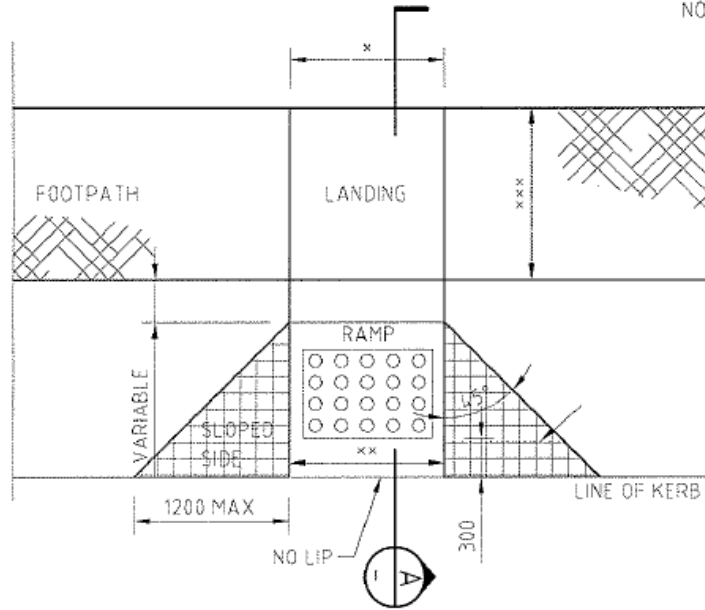


Typical Section
(Not to Scale)

DRAWING 6 DISTRICT COUNCIL OF STREAKY BAY

Typical Standard Pedestrian cross-over Details


NOT TO SCALE

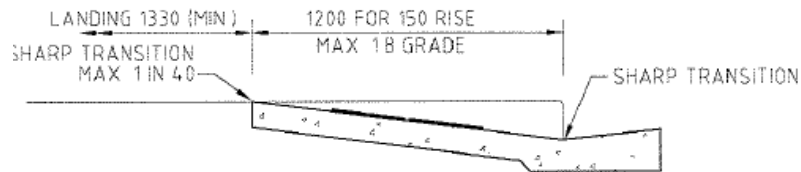


PLAN VIEW

SCALE 1:50

RAMP DETAILS

- SLOPE 1 IN 8 MAX, 1 IN 12 PREFERRED
- LENGTH 1200 NOMINAL, 1520 MAX AT 1 IN 8
- CROSSFALL OF LANDING MAX 1 IN 40 IN DIRECTION OF TRAVEL
- COLOUR RED TACTILE ON GREY CONCRETE
- SURFACE SLIP RESISTANT WET OR DRY
- * WIDTH 1000 MIN, 1200 PREFERRED IF BICYCLE OR SHARED PATH, FULL WIDTH OF PATH
- ** CONSTRUCTION JOINT MUST BE PARALLEL TO ORIENTATION OF TACTILE SURFACE INDICATOR
- *** VARY LANDING WIDTH TO SUIT FOOTPATH
-  TACTILE SURFACE INDICATOR TYPE 'B' IN ACCORDANCE WITH AS1428.4 - 1992



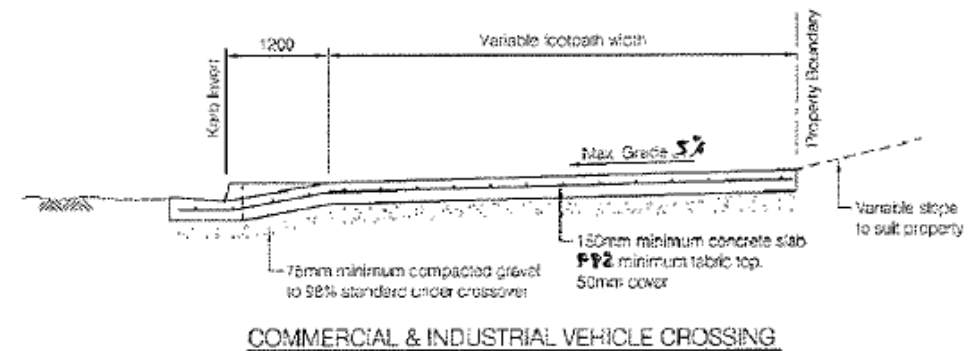
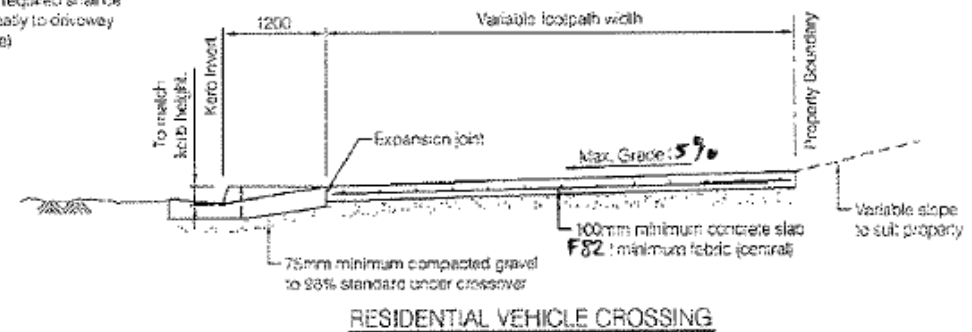
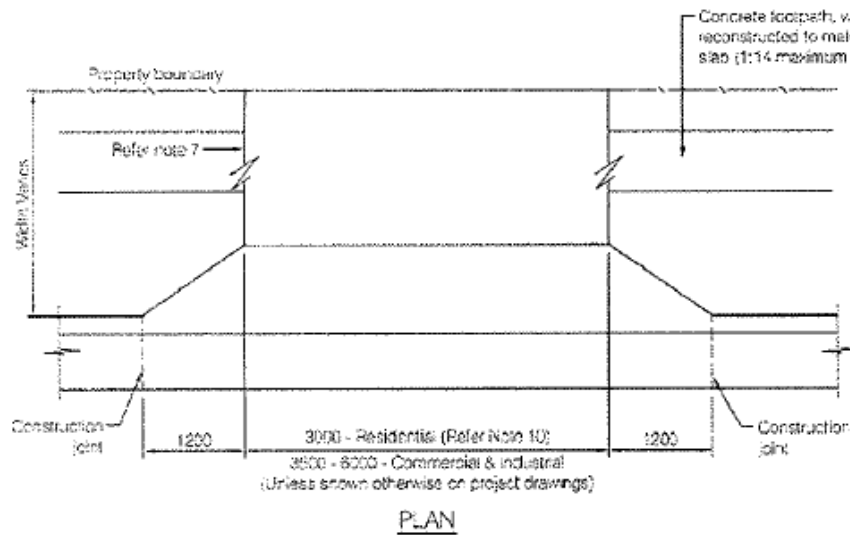
SECTION

SCALE 1:25



KERB RAMP

DISTRICT COUNCIL OF STREAKY BAY



NOTES

1. All joints to existing kerbs shall be sawcut prior to breaking out concrete for removal.
2. Concrete is to be N25 min. in accordance with AS1379 and AS3600.
3. All concrete to be broom finished.
4. Where a concrete footpath abuts a crossing an expansion joint shall be installed.
5. Expansion joints to be 10mm thick, closed cell cross linked polyethylene foam (85-150kg/m).
6. Depths of concrete and reinforcing steel shown are minimum requirements for good foundations and average traffic loadings. Where this does not apply, depths of concrete and reinforcing steel shall be increased to suit specific conditions.
7. Where an existing footpath is present it is to be sawcut and an expansion joint provided.
8. Subgrade to be compacted to 98% standard.
9. All dimensions are in millimetres.
10. Residential refers to single dwelling duplex. All other crossings as per commercial/industrial details.

FNQROC Development Manual