Guidelines for the Subdivision and Development of Land

incorporating:

Part A – Land Subdivision and Development Process

Part B – Guidelines for the Design and Construction of Road and Drainage Infrastructure
Guidelines for the Subdivision & Development of Land

SCHEDULE OF ADOPTION

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Part A – Land Subdivision and Development Process
Part A – Land Subdivision & Development Process

1.0 Council Authority

Warrnambool City Council is the authority responsible for consent to develop, and approval of developments and subdivisions within the Warrnambool municipality through the Warrnambool Planning Scheme.

In some circumstances Council is required to obtain the consent of referral authorities such as Powercor, VicRoads, Wannon Water, Glenelg Hopkins Catchment Management authority etc, and Council must also comply with particular legislative requirements.

Compliance with the provisions of the Warrnambool Planning Scheme does not necessarily imply that Council is required to consent to, or approve, an application.
2.0 Council Objectives

The following objectives are set out in the Warrnambool Planning Scheme:

- To provide a clear and consistent framework within which decisions about the use and development of land can be made.
- To express state, regional, local and community expectations for areas and land uses.
- To provide for the implementation of State, regional and local policies affecting land use and development.

The above points are supported by the following vision for 2020:

General

- Council infrastructure asset management plans will be properly resourced.
- Council’s infrastructure assets will be well managed and maintained.
- Infrastructure asset management will be sustainable; that is, expenditure on asset renewal will meet renewal needs.
- Infrastructure assets will be maintained at specified service standard levels.
- Council infrastructure assets will be constructed to relevant standards of urban design.
- Infrastructure will be suitable for community needs.
- Community safety will be an integral factor in the development and management of infrastructure assets.

City Planning

- The City’s urban development will be sustainable in environment, social and economic terms.
- Urban development will recognise and protect the City’s remarkable natural and built heritage.
- Productive rural areas will be protected.
- Urban growth areas will be developed on the concept of neighbourhoods with a strong focus on community access, safety and community participation in planning for growth.
- The City Centre will be an active and vibrant area which fulfils prosperous retail and business activity, is a cultural and entertainment hub and is safe and accessible for pedestrians.
- The City Centre will be the main retail and commercial area, but with secondary areas performing separate and complementary roles.
- Development along the rivers and coast will be subject to protection and will incorporate the triple bottom line in design processes.
- The Warrnambool foreshore will be recognised as an area of special importance in the City.
- Council will be a leader in the design/architecture of new facilities for which Council is responsible and will also encourage and promote good design which incorporates safety, flexibility and environmental principles.
- Council will encourage and facilitate the development of diverse, affordable housing stock to suit the range of household needs.
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Environment

- Warrnambool will have a unique City landscape which will be preserved to a high standard.
- Council will encourage and support community involvement in the conservation of the local environment.
- Council will provide leadership for the community to enhance and protect our natural environment.
- Our community will embrace the concept of waste minimisation.
- Council will be an environmentally-friendly purchaser.
- Environment management plans will be established for public places.
- Indigenous vegetation will be progressively re-introduced, where appropriate.
- Floodplain areas will be managed accordingly to high environmental values and appropriate safety standards.
- Parks, gardens and streetscapes will enhance the image of a safe, clean and green City.
- Public Art will be integral to our public spaces.

3.0 Restriction to Council’s Activities

Restrictions to Council's powers to approve the subdivision of land are set out in the Warrnambool Planning Scheme and are detailed the State Planning Policy Framework, Local Policy Framework, individual zones and overlays which are applicable in the Warrnambool municipality. Advice as to which of these restrictions apply to a property should be initially obtained from Council's City Strategy and Development Branch.

4.0 Subdivision and Development Process

4.1 Subdivision Approval Process

The subdivision of land is controlled through the planning system. Either a planning permit is required for subdivision or the planning scheme provisions must specifically allow for subdivision.

The Subdivisions Act 1988 sets out the procedures to be followed by Council in certifying plans of subdivision and issuing statements of compliance.

An application for subdivision under the Planning and Environment Act 1987 can run in parallel with the certification process under the Subdivision Act 1988; however a plan cannot be certified before a planning permit is issued.

The subdivision process can be summarised as occurring in four (4) broad stages and must be undertaken in this order:

1. A planning permit is required for subdivision under the provisions of the Warrnambool Planning Scheme;
2. Certification of the plan of subdivision, which approves the subdivision under the Subdivision Act 1988;
3. Obtaining a Statement of Compliance, which is the final approval stating that all requirements have been met; and
4. Lodgement of the documents at Land Victoria. This allows the new titles to be issued for each lot created under the subdivision.

A flow chart of the overall process is shown below.
4.2 Subdivision Process Flow Chart

Start

Developer has preliminary discussions with Council

Application referred to Council Engineering Dept. & relevant authorities

Planning and Subdivision applications received

Community consultation

Proposal proceeds no further

Council considers planning application

Planning application approved

VCAT appeal successful?

No

Yes

Planning Permit issued by Council

Planning Permit

Yes

No

Developer reconsiders proposal?

Yes

Plan Certification

Yes

No

Council planner requests agreement from referral authorities to issue of Statement of Compliance

Council’s Engineering Dept. & other referral authorities agree to issue of Statement of Compliance

Subdivision constructed

Plan of Subdivision certified by Council

Developer prepares road/drainage design and seeks agreements with other relevant authorities

Council’s Engineering Dept. approves road/drainage design & Developer reaches

Statement of Compliance

Council’s Planning Dept issues Statement of Compliance

Certified plan and Statement of compliance lodged with Land Victoria

Individual land titles issued and allotments available for sale

Release Lots

End

Individual land titles issued and allotments available for sale

Yes

No
5.0 Formulating a Subdivision/Development Application

5.1 Site Information
Before formally applying to Council to develop and/or subdivide, a considerable amount of information about the site needs to be sought. The Developer should be aware of the nature of title of the land, easements, items of heritage, aboriginal or cultural significance, topography, slope and aspect, stormwater flows, surrounding development, vegetation, trees, road and traffic situations and other physical characteristics pertinent to the design of the development.

5.2 Sketch Plan
It is advantageous to prepare a preliminary sketch plan at this early stage indicating the location, aspect and size of the various elements of the development including subdivision patterns surrounding the site. The more information shown on the preliminary sketch plan, the more likely the consultations with Council and others will give a true indication of possible success with a subsequent formal application.

5.3 Early Consultation
It is recommended that a preliminary consultation with Council will enable the Developer to determine what general planning requirements are applicable, what zone classification applies and which legislative requirements are applicable and most importantly whether professional assistance is recommended.

5.4 Purpose of Consultation
The purpose of consultation about preliminary sketch plans/proposals (which may be accompanied by explanatory reports or background material) is to:

a) Assess whether any modifications to the proposal are necessary prior to its being formally submitted;

b) Identify Council’s requirements in regard to the particular Development Application;

c) Identify any problems which may necessitate the Developer reviewing his/her approach;

d) Indicate Council’s likely subsequent requirements (eg financial contributions for services and amenities, standards for construction, for the asset to be accepted by Council, etc.).

5.5 Consultation is Not Mandatory
While consultation with Council at this early stage and the preparation of preliminary sketch plans is not mandatory, it is obviously in the Developer’s interest. It will reduce costs in preparing plans, increase the likelihood of development consent, and reduce the time the Council needs to consider the formal application. Similarly early consultation with Public Utility Authorities is also advantageous to ascertain their requirements, eg water, sewer, gas, telephone, electricity.

5.6 Development Plan
In some cases a Development Plan will be required to be submitted to Council prior to the approval of an application for subdivision. The Development Plan (if required) must respond to the corresponding Development Plan Overlay (DPO) if applicable to the site. The Development Plan must show the broader picture and show road layouts and
linkages to existing roads, public open space, indicative lot layout, etc. The Development Plan is notified to affected parties and can only be approved by Council resolution.

5.7 Fees/Contributions
Throughout the subdivision process, there are a number of fees required. Fees include, but are not limited to:

- Planning Permit Application fee;
- Certification Application fee;
- Open space contributions;
- Service Authority fees and/or costs;
- Land Victoria fees for lodgement of Certified Plans;
- Council infrastructure design checking fee;
- Council works supervision fee;
- Maintenance of works bonds; and
- Professional fees for relevant parties (eg Consultant Engineers and Licenced Land Surveyors)
- Development contribution plan fees, or equivalent

Fees for Planning Permit Applications are prescribed in the Planning & Environment (fees & Charges) Regulations 2000. These are required to paid as part of lodgement of application and a fee schedule can be found on Council’s website or offices. A fee schedule, including fees/contributions that are not prescribed, may be required as a condition of development consent.

6.0 Making Application for Subdivision/Development

6.1 Development Application Information
A Planning Permit Application is only required if stated in the Planning Scheme. Minor development and subdivisions such as boundary adjustments that meet specified standards do not require consent. All the necessary information should have been compiled in consultation with Council. Whilst formulating the application and preparing the development/subdivision sketch plan, a description of the existing and proposed site and a statement of environmental effects should be included. If a proposal is prohibited there is no point in making an application as it will only be refused.

6.2 Owner’s Approval
The written approval of the owner is not required if the application is not by the owner. However, the Planning Application is required to indicate the name of the owner (if not the applicant) and be signed by the owner or a declaration that the owner has been notified of the application completed.

6.3 Planning Permit Application Form
A person or company making application to develop and/or subdivide an area of land within Warrnambool Council’s area will be required to lodge an Application for Planning Permit. Council has a standard application form, while the form of the subdivision (certification application) is provided by the licensed land surveyor carrying out the subdivision requirements. In all cases the application must be accompanied with supporting information which is detailed on Council’s website. Copies of Council’s
current Application for a Planning Permit Form can be obtained from Council’s offices at Warrnambool or Council’s website.

6.4 Details of Consultation with Public Authorities
The Developer may be required to provide details of consultation with public authorities responsible for provision, alteration or amplification of utility services required by the proposed development/subdivision as part of the application process.

6.5 Site Context Description and Design Response
The requirements are set out at Clause 56.01 of the Warrnambool Planning Scheme for subdivision in residential areas. These can be viewed at the municipal offices or downloaded from the State Government website of:

6.6 Additional Information
Council may require additional information about the proposed development to be provided where that information is essential to the assessment of the Development Application.
Additional information required may include:

a) principles, assumptions and calculations behind stormwater drainage and on-site detention (OSD) proposals;
b) rationale for the design of utilities, roads, open space, bicycle and pedestrian ways, bus routes, etc;
c) a contamination assessment.
d) evaluation of housing types, house type distribution, building lines, fencing, building materials etc.

6.7 Staged Development
In some cases a development may be of sufficient magnitude that it requires staging. Where staged development is proposed, the Developer should prepare a sketch plan showing the complete concept so that Council can see the various stages in the overall context. Each stage should comply with the standard requirements.

7.0 Council’s Planning Considerations of Applications for Subdivision/Development

7.1 Assessment Criteria
Council will deal with each application on its merits and in accordance with the requirements of the Planning Scheme.
A number of issues need to be considered when assessing a proposal to subdivide. These include:

- Environmental conditions – slope of land, fire and erosion risks, native vegetation, location of streams and disposal of effluent. (For sensitive environments or locations without sewerage, a more detailed land capability assessments may need to be submitted);
- The requirements of the Warrnambool Planning Scheme, not limited to, but may include building envelopes and/or restrictions;
- Any conditions placed on the land by other authorities (water, gas, electricity, roads); and
- Any planning permits that have been issued for the development of the land, such as multi-dwelling development.

7.2 Public Open Space Requirements

In residential, subdivisions Council requires the creation of an area of public reserve (open space) useable for recreation, equivalent to a minimum of 5% of the net developable area of land or payment of a monetary contribution of up to 5% of the site value of all the land in the subdivision or a combination of both.

Council may propose a higher percentage in cases where it is identified that the open space requirements of a particular area exceed 5%.

7.3 Infrastructure Requirements

Council’s Warrnambool Planning Scheme, Structure Plans, Developer Contribution Plans and other planning instruments incorporate minimum design standards for different types of developments. These standards should not be interpreted as relieving the Developer of the responsibility to properly address all criteria and to use sound planning and engineering practices in the development of designs. Council is prepared to consider alternative approaches to development/subdivision design where the Developer satisfies Council that its objectives have been achieved.

The Developer will be required to provide power, gas, water and sewerage infrastructure as required by the relevant utility authorities as well as road and drainage requirements detailed below.

Applicants will also be required to contribute towards road and drainage infrastructure works outside the subdivided land boundaries, where works can be attributed as being necessary because of the development.

“Part 2 Guidelines for the Design and Construction of Road and Drainage Infrastructure” of this document provide details of Council’s requirements for road and drainage infrastructure in regard to subdivision development.

7.4 Heritage Items - Aboriginal and other Relics

Any sites of Aboriginal carvings or relics or sites significant to heritage for other reasons shall be identified in the application. Aboriginal Affairs, Victoria should be contacted for details and verification.

All recognised heritage items, including natural features of the site and man-made buildings, works and sites are to be identified and retained, wherever possible. Heritage Victoria should be contacted for details and verification. Adequate area is to be retained around any heritage item to protect its setting. Where a heritage overlay is in place the requirements of the overlay must be complied with.

7.5 Determination within 60 days

Planning legislation requires Council to determine applications within 60 days of receipt of the application. This time is extended if Council requests the applicant to provide further information regarding the application. Upon determination of any application, a written notification will be sent to the Developer stating that consent has been granted subject to detailed conditions, or that consent has been refused (with reasons).
7.6 Appeal to Victorian Administrative Appeals Tribunal (VCAT)

The Developer may lodge an appeal with the Victorian Civil Administrative Tribunal (VCAT) where they are dissatisfied with the determination. Such an appeal is required to be lodged with VCAT within 60 days of Council giving a Notice of Refusal to Grant a Permit, on permit conditions or failure to decide.

7.7 Appeal by Third Party

Developers are reminded that any third party person may lodge an appeal to VCAT within 21 days of receipt of Council's Notice of Decision to Grant a Permit where they lodged an objection to the proposal.

7.8 Cancellation of, or Amendment to, Permit

Council may apply to the Victoria Civil and Administrative Tribunal to cancel or amend a permit where there has been a mis-statement or concealment of fact in relation to the application for permit.

7.9 Maximum 5 Year Limit on Development Consent

A planning permit for development/subdivision requires works to be commenced within the consent period two (2) years (or such other shorter period stipulated in the consent). The subdivision should be fully completed within five years of the certification of the plan of subdivision under Section 6 of the Subdivision Act 1988.

8.0 Road/Drainage Design and Construction Approvals

Following planning permit approval being issued by Council, the more detailed requirements of the development or subdivision are investigated during the preparation of engineering designs and other matters for completion as indicated in Council’s conditions of consent.

Design approvals from Council’s Infrastructure Services Branch, together with approvals from other utilities and referral authorities are required before any works may be commenced.

The approval process below shall be followed for road and drainage infrastructure design and construction approvals by Council:

- Initial consultation with Council and approval of preliminary designs by Council;
- Approval of final designs by Council;
- Construction;
- Issue of Certificate of Practical Completion by Council and commencement of Defects Liability Period; and
- Issue of Final Certificate by Council and completion of Defects Liability Period

Flow charts providing the detailed processes involved in each stage are provided in Appendix A.

Design standards for road and drainage infrastructure are contained in Part B Guidelines for Design & Construction of Road & Drainage Infrastructure.
9.0 Certification of Plan

A subdivision plan must be certified when the conditions on the planning permit have been met or arrangements have been made to meet those conditions, along with any other matter set out in Section 6(l) of the Subdivision Act 1988.

A plan certified under the Subdivision Act 1988 has a life of 5 years. The plan lapses if it is not registered at the Titles Office within that time.

Each Council must keep a register of plans and decisions made.

10.0 Statement of Compliance

The Statement of Compliance is the main tool Council uses to seek compliance with the requirements placed on subdivisions through the planning permit.

When subdivision construction works have been completed to the satisfaction of Councils Infrastructure Services Branch and the other utilities and referral authorities, and all relevant fees and bonds have been paid, Council issues a Statement of Compliance to the Developer.

A Statement of Compliance cannot be issued before a plan is certified and it must be obtained before a plan can be registered at the Titles Office.

Before a Statement of Compliance can be issued, written advice must be received from a Licensed Land Surveyor must be provided to Council in the prescribed form to the effect that the subdivision (including all lots, roads, common property and reserves) has been marked out or defined.

Council must issue a Statement of Compliance as soon as the applicant has provided all the prescribed information and has satisfied all requirements under the planning system and the Subdivision Act 1988.

11.0 Early Release of Allotments by Application of Bonds

Some Developers seek to register subdivision lots for sale prior to all the relevant public works (eg. roads, drainage, utilities) being completed. In these cases Council and/or other referral authorities may request the submission of a bond to cover outstanding works prior to agreeing to the issue of the Statement of Compliance for the development.

Warrnambool City Council’s policy in regard to bonding of outstanding works (refer to Council Resolution dated 15 May 2006) is as follows:

“Public works that are considered necessary for the safe operation of the development will not be subject to bonding. These works include fire services, drainage infrastructure, road formation earthworks and pavement, kerb and channel, safety signs and payment-in-lieu for public open space (if applicable).

Outstanding relevant public works that Council would consider to bond include the following:
- Final asphalt/bituminous wearing course;
- Minor sections of kerb and channel if delayed due to Utilities Authorities works;
- Footpaths and driveway crossings;
- Naturestrip grading/top dressing, grassing and street trees;
- Landscaping; and
- Signage which is not safety related.

A Statement of Compliance will not be issued unless the relevant public works are:
• Completed; or
• Bonded in the form of either cash or unrestricted bank guarantee in favour of the Council, and based on the estimated value of the outstanding works plus a 25% margin together with the 12 months defects rectification bond, being 5% of the estimated value of the relevant public works, as assessed by the delegated Council Officer; and
• Estimated values are to the satisfaction of Council.”

Applications for bonding of works shall be made in writing to the Delegated Council Officer setting out clearly the grounds for bonding, the value of outstanding works, estimated date for completion of the works and the form of bond proposed to be lodged with Council.

In assessing a submission for bonding, the Delegated Council Officer will consider the Council’s duty of care requirements for both existing and new residents and/or tenants of the area.

12.0 Occupation Certificate

Prior to the occupation of a new building (excluding a Class 1a or 10 building under BCA), an Occupation Certificate is required to be issued by a Certified Building Surveyor.

13.0 Subdivision Registration and Title Issue

Following endorsement of the final plan of subdivision, the Developer may lodge the plan for registration by Victoria Title Registration Services, level 10, 570 Burke Street, Melbourne. Separate titles for the new lots created will subsequently be issued.

Under the Subdivision Act 1988, reserves and roads are automatically created in the name of the relevant authority (Warrnambool City Council).

At completion of the subdivision and following release of titles from the Land Titles Office the Developer shall submit to the appropriate Council Officer within five (5) working days all titles in the name of the Warrnambool City Council. Failure to comply with this requirement will result in the maintenance bond being held for security until such time as all titles have been delivered to Council.
Part B – Guidelines for Design & Construction of Road & Drainage Infrastructure
Part B – Guidelines for Design & Construction of Road and Drainage Infrastructure

1.0 Introduction

These guidelines have been prepared to assist developers, surveyors, consulting engineers, Warrnambool City Council Staff and planners in the preparation, submission, and examination of plans of subdivision and engineering documentation to facilitate subdivisional works.

It is expected that by clearly setting out Council’s procedure and design criteria for subdivisional development, time and effort will be saved on the part of both designers and Council officers.

These guidelines are intended to be a general guide, and it is expected there will occasionally be circumstances where a departure from the standards contained herein can be justified.

The issue of these guidelines should not inhibit the submission by Consultants of alternative designs, based on professional experience and established engineering practice and such alternative solutions will always be considered by Council on their merits.

The distribution of these guidelines does not imply limitation in any way of Council’s rights to impose differing conditions when assessing subdivision proposals, nor limitation of Manager Subdivision’s discretion to vary as it considers necessary the engineering requirements in respect of a particular subdivision, having regard to good engineering practice.

It is to be noted that in the event of a conflict, the provisions of the Subdivisions Act, Planning and Environment Act, and regulations made pursuant to the provisions of these Acts, as amended from time to time, take precedence over these guidelines.
2.0 Residential Subdivision Engineering Design & Construction Approval Process

2.1 Initial Design Submission

**Consultant/Developer responsibilities**

The following items must be included with the initial submission:

(a) a certified plan of subdivision;
(b) one complete set of engineering drawings;
(c) an overall drainage concept for the entire development and details of the impacts of upstream and downstream catchments. Drainage is to be designed to best practice Water Sensitive Urban Design principles;
(d) a catchment plan showing Q100 flow path for the entire development;
(e) drainage computations for Q10 & Q100 storms. Drainage computations shall also be provided within the body of the complete set of plans referred to in (b) above;
(f) a traffic study for multi stage developments to establish road hierarchy in accordance with the Warrnambool Planning Scheme 56.03 definitions as required;
(g) a landscape plan for all road reserves and public open space
(h) a soil report and pavement design based on “Pavement Design Guidelines for New Subdivisions” by R.W. Stamp & Associates, October 2007. (See Appendix C); and
(i) a Design Certification Report (See Appendix B).

**Council Responsibilities**

(a) Check all data submitted against Council’s “Guidelines for the Subdivision & Development of Land”;
(b) Arrange where required a meeting with consultant to discuss design issues, seek clarification and further information as required; and
(c) Respond in writing within 28 days of receipt of plans outlining any amendments required before plans are approved.

2.2 Final Design Submission

**Consultant/Developer Responsibilities**

(a) Submit two complete sets of amended drawings, upon which one will be returned stamped approved;
(b) Submit a construction specification if insufficient information is provided in the drawings;
(c) Submit a detailed estimate, with a schedule, for all works to be supervised by Council;
(d) Include a Certified Plan of Subdivision;
(e) Provide a third party design Road Safety Audit in any of the following situations:
   • for new roads classified as Collector, or above, in the road hierarchy;
   • when any of the desirable horizontal or vertical alignment criteria are not met; or
   • when desirable sight distance criteria are not met.
Guidelines for the Subdivision & Development of Land

(f) provide evidence of any agreement/approval from a responsible authority or a referral authority; and.

Council Responsibilities

(a) Check amended computations and plans;
(b) Check that the following documents have been received:
   i. Detailed schedule of quantities and estimate
   ii. Certified Plan of Subdivision
   iii. Agreement/approval from a responsible authority or referral authority
   iv. Plan checking fee;
(c) If requirements of (a) & (b) have been met, advise consultant by letter that the plans (referenced by date and amendment No.) have been approved;
(d) If plan checking fee has not been paid, advise in approval letter that both plan checking fee and supervision fees will be required prior to issue of Certificate of Compliance.

2.3 Post Design Approval – Pre Construction

Consultant/Developer Responsibilities

(a) Submit for approval the following documents:
   i. Traffic Management Plan
   ii. Environmental Management Plan
   iii. Road Reserve Works Permit (for any works on existing Council road reserves);
(b) Inform Council in writing one week before commencement of works, the name, address and contact details of the contractor; and
(c) Arrange an on-site meeting between the consultant, contractor and Council’s representative before works commence.

Council Responsibilities

(a) Advise the consultant whether or not the documents submitted in 2.3(a) above meet Council requirements, and if required, issue Road Reserve Works Permit; and
(b) Council representatives to be available for the pre-construction meeting

2.4 Post Construction

Consultant Responsibilities

(a) Submit a certified copy of the construction cost tender schedule for purposes of calculating the supervision fee;
(b) Submit all outstanding fees as required:
   • Pay design checking fee – 0.75% of actual cost (excl. GST)
   • Pay supervision fee - 2.5% of actual construction cost (excl. GST).
   • Pay Developer contribution (if required).
   • Pay outstanding works bond - estimate (incl. GST) plus 25%.
   • Pay maintenance bond - 5% of actual cost (incl. GST).
Guidelines for the Subdivision & Development of Land

(c) Submit electronic and hard copy version of “as-built” plans. The electronic copy of the plans shall be in a PDF format and CivilCad, DXF or DWG format stored on a CD including plot definition files and any unique symbol, line types and fonts utilised in the production of the drawings.

(d) Request issue of “Practical Completion” certificate from Council Engineering Department;

(e) Request issue of “Statement of Compliance” from Council Planning Department.

(f) At the end of the “Defect Liability Period”, request final inspection and Final Completion certificate from Engineering Department.

Council Responsibilities

(a) Issue the Certificate of Practical Completion if all works completed to Council’s standards, and advise of start date of “Defects Liability Period” (normally 12 months);

(b) Ensure that that all fees and bonds in 2.4 above have been paid;

(c) Process the issue of Statement of Compliance expeditiously if all consultant responsibilities have been met;

(d) After expiration of Defect Liability Period, and upon written request from consultant, attend final inspection and issue final completion certificate releasing developer from the Defects Liability Period; and

(e) Upon written request from consultant return all Bank Guarantees and bonds no longer required.
Guidelines for the Subdivision & Development of Land

3.0 Policies

3.1 General

The provision of infrastructure within all subdivisions must, where appropriate, comply with the following documents:

(a) Warrnambool Planning Scheme
(b) Relevant Structure Plans & Development Plans
(c) Clause 56 of the Warrnambool Planning Scheme
(d) Warrnambool Sustainable Transport Strategy
(e) Warrnambool Drainage Strategy
(f) Warrnambool Stormwater Management Plan
(g) Pavement Design Guidelines for New Subdivisions – RW Stamp & Associates, October 2007 (Appendix C)
(h) Road and Drainage Infrastructure Standard Drawings – (Appendix D)
(i) Non Standard Street Lighting Policy (Appendix H)
(j) Disability Act 2006
(k) Australian Standard AS 1428 Design for Access and Mobility
4.0 Engineering Planning

4.1 Subdivision Layout
The layout of roads and streets within areas to be subdivided requires most careful consideration. When designing the road layout, cognisance must be taken of the following factors:

(a) Character of the neighbourhood;
(b) Type of residential development;
(c) Location and inter-relationship of schools, shops and open space;
(d) Ingress and egress from the subdivision for construction vehicles, garbage collection vehicles, bicycles and pedestrians;
(e) Public transport system and routing;
(f) Conveyance of flood flows;
(g) Treatment of drainage using best practice Water Sensitive Urban Design principles;
(h) Nature and topography of the terrain;
(i) Hierarchy of roads; and
(j) Costs of works.

Individual layouts must conform to Council's Outline Development Plan and Structure Plan for the area. Should no such plan be available for a particular location, the owner or surveyor is to liaise with Council's Manager of Infrastructure Services to determine the most suitable configuration.

Although the engineering design of roads is the province of the Consulting Engineer, it is essential that the Surveyor or Planner preparing the subdivision proposal plan be fully aware of the engineering requirements for the various types of roads, and ensure that the road locations proposed are satisfactory. Should this not be the case, major alterations to the subdivision layout may be necessary to enable engineering criteria to be fulfilled.

The engineering factors affecting road location include: grades, site distances, alignment, intersection location, and design and access to lots.

It is essential also, that full and accurate topographical information be available at this stage, to enable an accurate assessment of the suitability of the proposed road locations.

4.2 Traffic Assessment
Council may request submission of a detailed report on the traffic impact, both internal and external, to a proposed subdivision.

Council may also request a Road Safety Audit. Such Audit is to comply with AustRoads, Road Safety Audit 2nd Addition 2002.

These Reports and Audits may be requested at the time of the Planning Permit application, or at a later date, if considered necessary by Council's Manager Infrastructure Services.

4.3 Works on Existing Roads Reserves Abutting New Developments.
Should the development abut an unmade road, or the existing is road deemed unsatisfactory for the development, the developer will required to upgrade the full width
of the road to the nearest satisfactory intersection, which will include upgrade works to
the intersection.

However the above shall not be case in the event of the following:

(a) The works are defined in Council’s 5 year program. Should this be the case the
developer will be required to make a contribution to the works from the centre of the
road to the boundary of the development.

(b) Intersection upgrade works are defined in Council’s 5 year program. Should this
be the case the developer will be required to contribute a percentage of the cost,
which the development may impact on the intersection from an approved traffic
study.

4.4 Hierarchy of Roads

A description of various categories of roads with their specific requirements are as
follows:-

4.4.1 Access Lane

Those roads whose function is to provide access to parking for lots with another street
frontage. The target traffic speeds for these roads should be in the order of 15 km/hr.
Provides for less than 300 vehicles per day and less than 10 dwellings.

4.4.2 Access Place

Those minor roads whose function is to provide local residential access with shared
traffic / pedestrian and recreation use. The maximum length of an access place is
100m. The target traffic speeds for these roads should be in the order of 15 km/hr.
Provides for less than 300 vehicles per day and less than 30 dwellings.

4.4.3 Access Street (A)

Those roads that do not have a significant through traffic function and pedestrian and
bicycle movements are facilitated. The target speed should be in the range of 30 km/hr.
Provides for less than 1,000 vehicles per day.

4.4.4 Access Street (B)

Roads having a more significant through traffic function and providing access to
abutting properties. Target speed should be in the order of 40 km/hr. Provides for 1,000
to 2,000 vehicles per day.

4.4.5 Collector Road

Important local roads whose function is to distribute traffic with higher volumes between
arterial roads and access places / access streets and to provide access to abutting
properties. Target speed -50 km/hr. (20 km/hr at designated pedestrian or bicycle
crossings). The design layout will generally provide for indented parking and provision
of road narrowings to physically limit the speed of vehicles. Provides for 2,000 – 6,000
vehicles per day.

4.4.6 Trunk Collector Road

Those roads which provide major links to primary arterial roads and collector roads.
Target speed- 60/km/hr or as directed. Provides for at least 6,000 vehicles per day.

A trunk collector road provides connection from a neighbourhood to an arterial road and
provides frontage to abutting lots. A trunk collector road must also be suitable for use
as a bus route to serve the area.

The general location of trunk collector roads should provide traffic routes as direct as
possible between each “pocket” of the subdivision and traffic foci either within or
external to the subdivision, such as nearby arterial roads, neighbourhood shopping
centres, neighbourhood sporting facilities etc.
4.4.7 Arterial Road

An arterial road is one that provides direct access from one district to another. Generally speaking, arterial roads have restricted frontage development and have dual carriageway pavements. In general, the location of arterial roads will be determined by the overall development plan.

4.4.8 Industrial Road

An industrial road is one that services a subdivision which is zoned for industrial development.

4.4.9 Residential Rural Road

A residential rural road is one within a low density residential development where lot sizes are in excess of 1 hectare.

4.4.10 Service Road

A service road is one located at the side of a through carriageway to provide frontage access to the adjacent properties.

4.4.11 Pathways - Pedestrian and Bicycle

Provision shall be made for Pedestrian and Bicycle Pathways where required by Council. Such locations shall be to the satisfaction of Council, and should address the objectives of Council's Sustainable Transport Strategy.

4.5 Road Reserves

4.5.1 Widths (Urban)

<table>
<thead>
<tr>
<th>ROAD CLASSIFICATION</th>
<th>KERB TYPE</th>
<th>WIDTH OF SEAL (MIN)</th>
<th>NATURAL STRIP WIDTH (MIN)</th>
<th>CONCRETE FOOTPATH</th>
<th>ROAD RESERVE WIDTH (MIN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Lane – serving less than 10 dwellings &amp; less than 300 vehicles per day</td>
<td>Semi-mountable (SM)</td>
<td>5.5</td>
<td>4m</td>
<td>Not required if serving 5 dwellings or less. 1.5m wide on one side if serving more than 5 dwellings</td>
<td>15m</td>
</tr>
<tr>
<td>Access Place - serving less than 30 dwellings &amp; less than 300 vehicles per day</td>
<td>SM</td>
<td>3.5m – 8m (1)</td>
<td>4m</td>
<td>Not required if serving 5 dwellings or less. 1.5m wide on one side if serving more than 5 dwellings.</td>
<td>15.0m</td>
</tr>
<tr>
<td>Access Street (A) – serving less than 1,000 vehicles per day (Through Road)</td>
<td>SM</td>
<td>7.0m</td>
<td>4.5m</td>
<td>1.5m wide path on one side? Allow for 1.5m wide path on other side at owner’s future request</td>
<td>17.2m</td>
</tr>
<tr>
<td>Road Type</td>
<td>Width</td>
<td>Minimum Path Width</td>
<td>Pathway Width</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------</td>
<td>--------------------</td>
<td>---------------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Access Street (B) – serving 1,000 to 2,000 vehicles per day (Through Road)</td>
<td>SM</td>
<td>8.0m</td>
<td>5.0m</td>
<td>1.5m wide path both sides</td>
<td></td>
</tr>
<tr>
<td>Collector Road serving 2,000 VPD → 6000 (Through Road)</td>
<td>Barrier (B)</td>
<td>12.0m Intended to leave 6m min clear carriageway</td>
<td>4.0m</td>
<td>1.5m wide path both sides</td>
<td></td>
</tr>
<tr>
<td>Trunk Collector &gt; 6000 VPD</td>
<td>B</td>
<td>14.0m Intended to leave 6m min clear carriageway</td>
<td>4.0m</td>
<td>1.5m wide path both sides</td>
<td></td>
</tr>
<tr>
<td>Arterial &gt; 6000 VPD</td>
<td>B</td>
<td>Duel Carriageway 2x3.5m lanes each way + 1x2.5m parking lane to each carriageway Median 4.0</td>
<td>5.0m</td>
<td>1.5m wide path both sides</td>
<td></td>
</tr>
<tr>
<td>Industrial Road</td>
<td>B</td>
<td>10.0m</td>
<td>5.0m</td>
<td>1.5m wide path required on one side</td>
<td></td>
</tr>
<tr>
<td>Service Road</td>
<td>B</td>
<td>6.0m</td>
<td>5.0m</td>
<td>1.5m path required on one side</td>
<td></td>
</tr>
<tr>
<td>Pathway</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>2.5m path required</td>
<td></td>
</tr>
</tbody>
</table>

1. Width will be determined by requirements for off street parking accessibility.
2. For Roads less than 50 metres long a footpath is not required, and the width may be reduced by 3.0m.
3. Road widths less than 5.5m will require further approval by the Country Fire Authority (CFA).

Whilst the above table indicates the current minimum standards, the Warrnambool City Council reserves the right to vary these standards without prior notice. Variations from the above geometric details require the consent of the Warrnambool City Council.
### 4.5.2 Widths (Rural)

<table>
<thead>
<tr>
<th>ROAD TYPE</th>
<th>SEAL WIDTH (M) (MIN)</th>
<th>SHOULDER WIDTH (M)</th>
<th>VERGE WIDTH (M)</th>
<th>ROAD RESERVE WIDTH (M) (MIN)</th>
<th>VEHICLE CROSSINGS (RURAL TYPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural – Local Roads Rural Residential Access Court serving 5 Lots. (Est. AADT 50 and/or vehicle speed &lt; 80km/hr. No Through Road</td>
<td>5.5</td>
<td>1.0</td>
<td>1.0</td>
<td>15</td>
<td>Required – Culvert &amp; Endwalls.</td>
</tr>
<tr>
<td>(b) Rural Residential serving 6 Lots (Through Road – speed up to 100km/hr)</td>
<td>6.0</td>
<td>1.0</td>
<td>1.0</td>
<td>16</td>
<td>As Above</td>
</tr>
<tr>
<td>(c) Rural Residential (Local Through Road – speed 100km/hr)</td>
<td>7.0</td>
<td>1.5</td>
<td>1.0</td>
<td>20</td>
<td>As Above</td>
</tr>
<tr>
<td>2. Rural Collector Road</td>
<td>7.0</td>
<td>1.5</td>
<td>1.0</td>
<td>20</td>
<td>As Above</td>
</tr>
<tr>
<td>3. Secondary Rural Arterial Road</td>
<td>8.0</td>
<td>2.0</td>
<td>1.0</td>
<td>22</td>
<td>As Above</td>
</tr>
<tr>
<td>4. VicRoads Declared Main Roads</td>
<td>Refer to VicRoads standards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 4.5.3 Splays

In residential areas, the minimum splay at the intersection of access, collector and trunk collector roads shall be 3 metres by 3 metres. Intersections of all other roads shall have minimum splays of 5 metres.

### 4.6 Public Open Space Requirements

Where a plan of subdivision creates land set aside for use as public open space, a landscaping plan must be submitted, and approved by the Warrnambool City Council prior to the commencement of works to the development.

All works identified on the landscaping plan must be carried out as part of the subdivision, and constructed to the satisfaction of the Warrnambool City Council.

Where the Warrnambool City Council deems it necessary, proposed and existing pedestrian routes shall be linked with 2.5m wide concrete paths which shall be 100 mm thick and reinforced with F72 mesh centrally placed.

Where the Warrnambool City Council deems it necessary, public lighting to B2 Standard (AS 1158) is to be provided along the route of the footpath, with all cabling to be underground. Council has designated standard poles for specific areas throughout the city. These standards must be observed.

Reserves shall be uniformly graded, topsoiled and grassed prior to hand over to Council. Reserves shall be drained with well-graded grassed, open swale drains connected to underground pipe drains at appropriate locations and, more particularly, to prevent stormwater run-off from entering residential blocks.
Reserves shall be fenced on all sides adjoining private property with minimum 1.8m high paling fences. Appropriate vehicle barriers in the form of bollards or post and rail fences shall be installed on street frontages.

4.7 Drainage & Flood Prevention

For all works on creeks and major waterways, including crossings, and drainage discharge outfall points, the Glenelg Hopkins Catchment Management Authority is the responsible authority. Prior to the commencement of works a Works on Waterway permit must be obtained from this authority.

For other minor and major drainage, the Warrnambool City Council is the Responsible Drainage Authority.

Before a Plan of Subdivision is certified, the developer must submit an overall catchment plan and a subdivision layout plan showing:

(a) Design levels at corners of all proposed allotments and design contour lines;
(b) the total catchment;
(c) zoning;
(d) proposed property boundaries and construction stages;
(e) drainage layout;
(f) contributing area and calculated discharge capacity of all drains serving an area greater than 10ha and all drains discharging out of the proposed development;
(g) proposed drainage works upstream and downstream of the proposed development; and
(h) water quality treatment measures.

4.7.1 Drainage Available to All Lots

Care is to be taken when subdivisional layouts are being designed to ensure that every lot can be adequately drained to either street underground drainage or a drainage easement drain provided for the purpose.

Property drains connected directly to kerb and channel will generally not be permitted, unless there are exceptional circumstances, because of potential crushing of pipes and kerb adapters by vehicles.

4.7.2 Provision for Q100 Storm

Provision shall also be made to ensure that the run-off resulting from a storm having a 100 year frequency of occurrence is able to pass through the subdivision along streets and reserves. This is to ensure that there is no likelihood of dwellings being flooded by a storm of this magnitude. For this purpose it is desirable that a road or a drainage and sewerage reserve be located along each natural drainage line, as the roadway will then provide a channel for overland stormwater flow during storms of greater than capacity of underground drainage system. Surcharging of the stormwater drainage system that results in overland flow through allotments will not be permitted.

4.8 Easements

4.8.1 Provision

Where it is necessary that drains, sewers, electricity cables, telecom cables etc., be located within a lot, an easement in favour of the relevant authority is to be provided.
4.8.2 Size
The width of an easement is to be determined by the relevant authority, however for drainage, the minimum width is 2.00 metres and for drainage and sewerage, the minimum width is 3.00 metres.

4.8.3 Location
Easements are to be matched with those existing on adjacent properties to ensure the proposed locations conform therewith and the use for which the easement is created can be achieved.

4.9 Fencing of Lot Boundaries
The design plans must show that 1.8m high fences are to be provided on all side and rear lot boundaries as part of the subdivision construction. The height of side fences should be reduced to a max of 1.2m at the road/property boundary for driveway sight distance purposes. Fencing must have a design life of at least 10 years and may be timber paling, or colorbond steel construction.

All fences must be constructed prior to the issue of Statement of Compliance.

4.10 Planning Permit and Certification of Plan of Subdivisions
Refer to Planning Services for issue of Planning Permit and Certification of Plan of Subdivision.

4.11 Building Permit
Building permits will be required for any of the following infrastructure items constructed in conjunction with a subdivision development.

(a) Buildings
(b) Retaining walls in excess of 600mm in height
(c) Entrance structures
(d) Gazebo’s
(e) Bridges/walkways

4.12 Construction of Works
4.12.1 Works to Comply with Plans
All works shall comply with the certified plan, the approved engineering plans and specifications and the requirements of the Planning Permit.

4.12.2 Works May Commence After Certification
Works shall not be commenced until the plan has been certified, the engineering plans and specifications have been approved and any agreement required by a Responsible Authority or referral authority has been entered into.
4.12.3 Design Checking Fee and Construction Supervision Fee

(a) The fee to be paid to Council for checking engineering designs shall be 0.75% of the certified cost of works (excl. GST).

(b) Construction of road and drainage for the subdivision will be supervised by officers of Council and a charge of 2.5% of the certified cost of the work (excl. GST) will be made.
5.0 Engineering Plans

5.1 Presentation

5.1.1 Preparation

Full engineering plans for all road works and associated stormwater drainage, easement drains and allotment improvement works are to be prepared and certified by a qualified Civil Engineer.

5.1.2 Size of Sheets

All engineering plans shall be drawn on standard size sheets, the following sheet sizes only being acceptable:

<table>
<thead>
<tr>
<th>Size</th>
<th>Overall Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>841mm x 594 mm</td>
</tr>
<tr>
<td>A2</td>
<td>594mm x 420 mm</td>
</tr>
<tr>
<td>A3</td>
<td>420mm x 297mm</td>
</tr>
</tbody>
</table>

5.1.3 Content

Plans should, in general, include the following:

(a) Title Block
(b) Locality Plan
(c) Layout and Stage Plan
(d) Plan of each new road
(e) Detail Plan of each Intersection
(f) Longitudinal Section of each road
(g) Longitudinal Section of all kerb returns
(h) Standard Cross-Sections
(i) Cross Sections of each road
(j) Longitudinal Section of each drainage line

The following information should be included in each of the above drawings.

5.1.4 Title Block

(a) Estate Name (if any)
(b) Scales
(c) Plan Number and Sheet Number
(d) Schedule and Date of Amendments
(e) Signed design certification, by a qualified Civil Engineer
(f) Signed checking certification, by a qualified Civil Engineer
(g) Survey Reference Data

5.1.5 Locality Plan

The Locality Plan shall show the location of the subdivision in relation to adjacent suburbs, main roads, major streets etc.
5.1.6 Layout and Stage Plan

For large subdivisions, the layout plan should show the relationship of all new roads to each other, and to existing roads adjoining the subdivision.

Where development is to be carried out by stages, the boundaries of proposed stages should be shown on this plan, and the stages identified by numbering.

For small subdivisions, where all new roads can be shown on one detail plan, the layout plan may be omitted.

5.1.7 Plan

The plan of each road shall include:

(a) Road reserve boundaries & names;
(b) Allotment boundaries, both existing and proposed, including lot numbers;
(c) Centre-line, or other construction line;
(d) Chainages, on centre-line or construction line;
(e) Bearings of the centreline or construction line;
(f) Offsets, if the construction line is not the centreline;
(g) Tangent point of chainages of each curve;
(h) Radius, arc length, tangent length and secant distance of each curve;
(i) Road reserve boundaries, centreline, and bearing of each intersection road;
(j) Chainage of the Intersection Point of road centrelines;
(k) Kerb lines, kerb radii, and chainage of all tangent points of the kerb line at edge of road location;
(l) Edge of pavement where no kerb is to be constructed;
(m) Dimensioned road reserve, footpath, and pavement widths, where these differ from the standard cross-section;
(n) Locations and construction details for all existing and new vehicle crossings;
(o) Locations of all new Permanent Survey Marks (PSM);
(p) Location and details of signs, and road markings to be provided;
(q) Drainage line locations, diameters, and class of pipe;
(r) Drainage pit locations, pipe inlet and outlet invert levels, and design surface levels;
(s) Location and levels of existing & proposed utilities or other existing works within the site;
(t) Limits and levels of allotment filling or grading;
(u) Location and levels of Bench Marks and reference pegs; and
(v) North Point.

5.1.8 Detail Plan of Intersections

Intersection detail plans shall include all the relevant information required for plans, as listed above, together with additional details such as set-out details, design pavement levels on all kerb returns and pavement contours.

5.1.9 Longitudinal Sections of Roads

All longitudinal sections shall extend sufficiently past the extent of works to show how the new design grades shall match into existing.
The longitudinal section of each road shall include:

(a) Chainages;
(b) Existing surface and peg levels;
(c) Design road centreline and kerb edge of road levels;
(d) Cut or fill depths;
(e) Design grades;
(f) Chainage and levels of grade intersection points;
(g) Chainage of tangent points of vertical curves;
(h) Lengths of vertical curves;
(i) Sections on control lines on superelevated curves (i.e. pavement edges, kerb, or lane edges).

5.1.10 Longitudinal Sections of Kerb Returns

The longitudinal section of each kerb return shall include:

(a) Chainages at all set-out points and references to road chainages;
(b) Design grades and vertical curve lengths; and
(c) Design finished road pavement levels;

5.1.11 Standard Cross-Sections

A standard cross-section shall be shown for each road, including:

(a) Road reserve width;
(b) Pavement widths;
(c) Footpath widths;
(d) Cross-falls of pavement and footpaths;
(e) Pavement depth and design details for pavement layer
(f) Type of kerb and channel
(g) Type of pavement surfacing
(h) Subsurface drainage

5.1.12 Cross-Sections of Roads

A cross-section shall be shown for each pegged chainage on each road, except in flat country where all cross-sections conform to the standard cross-section. Cross-sections shall show:

(a) Road reserve boundaries;
(b) Pavement centre-line (or other construction line);
(c) Natural surface;
(d) Design cross-section; and
(e) Cross-fall of pavement and footpath, pavement and footpath widths, and pavement depths wherever these differ from the standard cross-section.

5.1.13 Longitudinal Sections of Drain lines

A longitudinal section of each drainage line shall be shown, including:

(a) Chainages;
(b) Existing & finished surface levels, including top of pit levels;
(c) Design invert levels;
(d) Manhole chainages, and inlet and outlet invert levels;
(e) Distances between manholes;
(f) Grade of each pipe;
(g) Diameter of each pipe length;
(h) Class of each pipe length; and
(i) Hydraulic Grade Line.
(j) Anchor Blocks if required
(k) Utility Services locations
(l) Location and details of special backfill in trenches
(m) Location of the pipe (i.e., street name, reserve, lot number)
(n) Typical cross section of open drains
(o) Pit Schedule, detailing pit numbers, pit types, inlet pipes & invert levels, outlet pipes & inverts levels, pit dimensions, pit depth, lid type and finished level.

5.1.14 Scales

a) General

Scales used for all plans should preferably to those recommended by the Standards Association, namely 1:1, 1:2 and 1:5 and multiples of 10 of these scales.

Although not preferred, the following scales will be accepted 1:25 and 1:125 and multiples and sub multiples of 10 of these scales. No other scales are acceptable.

b) Typical Scales

The following scales are suggested for particular uses but these may be varied as appropriate to the works concerned.

<table>
<thead>
<tr>
<th>Scales</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>1:1000 or 1:500</td>
</tr>
<tr>
<td>Longitudinal Section</td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>1:1000 or 1:500</td>
</tr>
<tr>
<td>Vertical</td>
<td>1:100 or 1:50</td>
</tr>
<tr>
<td>Intersection Details</td>
<td>1:200 or 1:100</td>
</tr>
<tr>
<td>Cross-Sections</td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>1:100</td>
</tr>
<tr>
<td>Vertical</td>
<td>1:100 or 1:50</td>
</tr>
</tbody>
</table>

5.1.15 Dimensioning on Plans

Linear dimensions on all road works plans will be in metres, with the exception of some detail plans of small structures (e.g., manholes) and some standard plans (e.g., kerb and channel), which may be in millimetres.

Details of methods of dimensioning shall be in accordance with A.S 1155 - Appendix A - Metric Units in Construction.
5.1.16 Standard Pegging Intervals

Centrelines (or other construction lines) should be pegged and levelled at 20.0m intervals, with further subdivision to 10.0m to 5.0m intervals where necessary due to horizontal or vertical curvature.

5.1.17 Chainage

Chainage on plans shall be expressed to 0.01 metre.

5.1.18 Levels

All levels shall be reduced to Australian Height Datum and shall be expressed to 0.001 metre. Reduced levels of Bench Marks and Reference Pegs shall also be expressed to 0.001 metre.
Guidelines for the Subdivision & Development of Land

6.0 Road Design

6.1 Standard Cross-Section
The standard Cross Section for various roads is shown in new subdivisions shall be as follows:

- Urban Residential Streets - Refer to Standard Drawings WCC-01.
- Rural Residential Streets - Refer to Standard Drawing WCC-02.

6.1.1 Cross-Section Elements
Standard Cross Section elements for use in any special cases where standard road types are inapplicable, shall be as follows:

- **Travel Lane**
  - absolute min. - 3.0m
  - slow speed - 3.4m
  - standard - 3.7m
  - one-way - 4.0m

- **Parking Lane**
  - minor road - 2.6m
  - major road - 3.0m

- **Turn Lane**
  - minimum - 3.0m
  - standard - 3.4m

- **Median**
  - absolute min. - 1.2m
  - desirable min. - 2.0m
  - incorporating turn lane - 5.2m

- **Rural Shoulders**
  - Access Road - 1.20m
  - Collector Road - 1.20m
  - Arterial Road - 2.00m

6.2 Design Speed & Target Speed
The Design Speed, on which the geometric design of each road type is based, shall be as indicated in the Table below.

Appropriate traffic calming devices may need to be included in designs for urban residential streets to encourage the lower Target Speeds for urban traffic. The Target Speeds for the various road classifications are the maximum desirable speeds for traffic on the road, taking into account other road users such as cyclists and pedestrians, and taking into account the amenity of the neighbourhood. The Target Speeds for each road classification are also indicated in the Table below.
6.3 Grade

6.3.1 Maximum Grades

The desirable maximum grades, listed below, are to be considered the maximum for normal design purposes.

Where the topography makes it difficult to provide a road location which will conform to these grades, grades up to those shown as “Absolute Maximum” may be used.

In extreme cases, the Council may give approval to the use of grades steeper than “Absolute Maximum” values, but such approval will only be given when all other possible alternatives have been fully investigated, and proven to be impracticable.

<table>
<thead>
<tr>
<th>ROAD TYPE</th>
<th>DESIGN SPEED</th>
<th>TARGET SPEED</th>
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</thead>
<tbody>
<tr>
<td>Urban Residential</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Collector</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Trunk Collector</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>Commercial &amp; Industrial</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>Access</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>Trunk Collector</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Urban Arterial</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>No Frontage Access</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>Access Place</td>
<td>50 km/h</td>
<td>15 km/h</td>
</tr>
<tr>
<td>Access Street</td>
<td>50 km/h</td>
<td>40 km/h</td>
</tr>
<tr>
<td>Collector Road</td>
<td>60 km/h</td>
<td>50 km/h</td>
</tr>
<tr>
<td>Trunk Collector</td>
<td>70 km/h</td>
<td>60 km/h</td>
</tr>
<tr>
<td>Access</td>
<td>60 km/h</td>
<td></td>
</tr>
<tr>
<td>Arterial</td>
<td>60 km/h</td>
<td>80 km/h</td>
</tr>
</tbody>
</table>

6.3.2 Minimum Grades

The minimum grade for all roads, based on kerb and channel drainage requirements, shall be:

(a) Desirable Minimum 0.5%
(b) Absolute Minimum 0.4%
6.4 Vertical Curves
A vertical curve, of parabolic form, shall be provided at every change of grade where the algebraic change of grade is more than:

- Access, Collector and Trunk Collector - 0.8%
- Arterial roads - 0.6%

Every effort should be made to provide vertical curves as long as possible, for improved appearance.

All vertical curves shall be designed in accordance with the current VicRoads “Road Design Guidelines”.

6.5 Sight Distance
The designer shall check and provide for the following sight distances along roadways having regard to the applicable speed limit:

(a) Car Stopping Sight Distance
(b) Truck Stopping Sight Distance
(c) Overtaking Sight Distance
(d) Manoeuvre Sight Distance

At intersections the following sight distances on all approach roads are to be checked and comply with requirements as set down in Section 2.3 of Vic Roads Design Guidelines Part 2:

(a) Approach Sight Distance
(b) Safe Intersection Sight Distance
(c) Truck Stopping Sight Distance
(d) Tail Light Stopping Sight Distance

Absolute Minimum sight distance is that required for a driver to perceive an object 0.20m high on the road ahead, and to stop the vehicle before reaching the object.

6.6 Cross fall
6.6.1 Normal Cross Section
On straight lengths of two-way road the pavement cross section will normally be graded with the high point (crown) on the pavement centreline, with a fall to each channel.

However, on steep side slopes, the crown may be offset, towards the higher side of the road to obtain better conformity of road levels with the natural side slope.

On divided roads each pavement will normally be graded to fall from the median to the outer channel.

6.6.2 Normal Crossfall
The normal crossfall of pavement and shoulders on straight alignment shall be:

- Asphalitic Concrete surfaced pavements - 1 in 33 (3%)
- Bituminous Sealed Shoulders - 1 in 33 (3%)
Gravelled Shoulders - 1 in 25 (4%)

6.6.3 Maximum and Minimum Crossfall
Where steeper or flatter crossfalls than the normal are required, for example at intersections, or turning circles of cul-de-sacs, the maximum and minimum permissible pavement crossfalls shall be:

- Maximum Crossfall - 1 in 20 (5%)
- Minimum Crossfall - 1 in 50 (2%)

6.7 Horizontal Alignment

6.7.1 General
The minimum permissible radius of horizontal curve is dependent on the design speed, and the maximum acceptable superelevation of the curve.
Horizontal alignment of all roads shall be designed in accordance with the requirements of VicRoads Design Guidelines.

6.8 Cul-De-Sacs

6.8.1 Length
The length of a cul-de-sac shall not exceed 200m in an Urban Residential Subdivision, 200m in an Industrial Subdivision, or 500m in a Rural Residential Subdivision.

6.8.2 A Turning Area
A turning area shall be provided at the end of every cul-de-sac to meet the requirements of the Country Fire Authority and to make provision for turning of garbage trucks.

6.8.3 The Minimum Radius
For a cul-de-sac with a circular court bowl, the minimum radius of the kerb and channel invert shall be:

(a) within the turning circle:
   i. in an Urban Residential or Rural Residential Subdivision - 8m;
   ii. in an Industrial Subdivision - 16m.
(b) In the approaches to the turning circle
   i. in an Urban Residential or Rural Residential Subdivision - 15m;
   ii. in an Industrial Subdivision - 20m.

6.8.4 Hammer Head
For a hammer head in an Urban Residential Subdivision, the length of each head shall be at least 8 metres measured from the centre point of the head with a trafficable width of 4 metres.
6.8.5 Footpath and Nature Strip Width
The footpath and nature strip width shall be not less than the minimum width specified in Section 4.5 any point in the turning area, or in the approach to the turning circle.

6.9 Intersections & Traffic Calming Devices
For the purposes of these guidelines it is assumed that the type of intersection to be designed has clearly been decided upon as part of an earlier investigation and planning process, including any necessary land acquisitions. Designers must provide for the safe and efficient movement of traffic and also provide for the safety of pedestrians and cyclists. A strong emphasis must be placed on the correct number and placement of road markings and signage and also pay special attention to the overall landscape/amenity of the intersection.

The designer shall ensure that provisions are made at curves and intersections for a minimum design turning template of an 8.8m long service vehicle unless otherwise specified.

Intersections and calming devices must be designed in accordance with the following documents.
(c) AustRoads "Guide to Traffic Engineering Practice" Part 5- Intersections at Grade, Part 6- Roundabouts, & Part 7-Traffic Signals
(d) VicRoads - Trucks on Roads - Design Guide
(e) Australian Standards AS1742.13 Part 13 Local Area Traffic Management.

Watts profile road humps and flat top road humps are considered to be a last priority treatment for traffic calming because of noise issues in residential areas and because of the need to design for larger vehicles like buses and trucks. Other measures such as slow points, splitter islands and roundabouts should first be considered for traffic calming, prior to consideration of road humps.

For all new roads which intersect existing roads it will be required that the entire width of the existing road be overlayed with an asphalt overlay, as specified for the road of the new subdivisions, to the TP's of the intersection. If the road pavement on the existing road is suspect, the Developer will be required to pay Council the estimated cost of the asphalt overlay and Council will add the road rehabilitation and resurfacing of the intersection to its future works program.

6.10 Traffic Signs and Line Marking
All required traffic signs and line marking shall be detailed on the design plans and shall be in accordance with Vicroads Traffic Engineering Manual Vol 2 and Australian Standards (AS 1742.1 series)

6.11 Access To Allotments
6.11.1 Construction Standards
All vehicle crossings in the municipality must be constructed in accordance with Council’s Standard Drawings.

The width of vehicle crossings shall not exceed 33 percent of the property’s street frontage. The minimum width of “double” driveway vehicle crossings shall be 6.0 metres and the minimum width of “single” driveway vehicle crossings shall be 3.0 metres.
6.11.2 Location
The location of all vehicle crossings for all allotments of a subdivision must be shown on the design plans and the crossing shall be constructed as part of the subdivision construction.

Vehicle crossings to properties must be placed in locations to provide adequate sight distance as per the design of an intersection.

The minimum distance a driveway may be located from an intersection is 10 metres, measured from the from the intersecting road kerb line.

For corner allotments the driveway must be located on the minor traffic road.

6.11.3 Driveway Grades
The desirable maximum and minimum driveway grades are shown on Standard Drawings WCC-53 and WCC-54. Driveways should be checked to ensure the vehicle type entering/exiting the property does so without “bottoming out”.

6.11.4 Maximum Sideslope
The maximum acceptable sideslope, based on grading driveways to the natural surface at a distance of 6.0m from inside the building line, for various standard road cross-sections, is:-

(a) Residential Access Road - 1 in 8.4
(b) Residential Collector - 1 in 9.0
(c) Residential Distributor - 1 in 9.6
(d) Industrial Access - 1 in 13.7
(e) Industrial Collector or
(f) Trunk Collector - 1 in 18.0
(g) Sub-Arterial - 1 in 12.6
(h) Arterial with Access - 1 in 15.0

6.12 Alternative Cross-Sections
Where steeper side-slopes than the above occur, the following variations of the standard cross-section may be adopted, used either separately or in combination, subject to the approval of Council.

6.12.1 Excavation of Driveways and Garage Sites
Excavation of driveways and garage sites, on lots on the high side of the road, is a possible solution where only a small number of lots (e.g 4 or 5) is affected, such as in a short cutting or at the end of a cul-de-sac.

6.12.2 Offsetting of the Crown
Offsetting of the crown, on a two-way road, is permissible, provided that sufficient stormwater capacity is retained in the channel and roadway on the high side of the road. Required capacity will depend on catchment, and on the spacing of storm water entry pits.

In extreme cases, where drainage requirements can be adequately provided, a pavement with one-way crossfall may be approved.

6.12.3 Reverse Crossfall
Reverse crossfall, on the uphill lane of divided roads, is permissible provided that adequate drainage capacity is provided in the uphill median channel, and precautions taken to intercept flow at median openings.
6.12.4 Median Crossfall
Median Crossfall, on divided roads, is acceptable with a maximum of 16% (1 in 6) being desirable, and 0.33 (1 in 3) as an absolute maximum, unless a retaining wall is provided.

At median openings however, the pavement crossfall shall not exceed 5% (1 in 20).

6.12.5 Pavement Crossfalls
Pavement Crossfalls, may be steepened if required, to an absolute maximum of 5% (1 in 20).

6.12.6 Modification of the Footpath Cross-Section
Modification of the footpath cross-section, on the downhill side of the road, by reducing the width of the area graded to the kerb to an absolute minimum of 3m, may be carried out subject to the approval of Council.

As this solution increases the catchment area discharging stormwater into the downhill frontage lots, it should be avoided where possible.

6.12.7 A Split-Level Road
A split level road will permit access to allotments on each side of the road on side slopes up to the maximum acceptable for subdivision.

Preferably, subdivision layout should be such that one-way operation is possible on each level.

Where this is not possible, the standard split level cross-section may still be used, provided that the number of allotments with access to each level of the road does not exceed six. Where the number of lots with access to either level of the road exceeds six, the pavement width of that level of the road shall be the same widths as for a standard road of that type.

Where split levels are used in a cul-de-sac, the levels shall come together at the neck of the court bowl.

6.13 Footpaths & Nature Strips
Refer to Standard Drawings WCC-51, WCC-52, WCC-53 and WCC-54 for design details for footpaths

6.13.1 Cross-section
The cross-section of the footpath and nature strip shall conform to the cross-section shown on the Standard Drawings, unless otherwise approved by Council.

6.13.2 Crossfall & Longitudinal Grade
The crossfalls shown on the Standard Drawings, must not be exceeded at any location where vehicular access to allotments may be required.

Where full width concrete footpath paving is to be provided, the footpath crossfall shall be a maximum of 1 in 40 to meet the requirements of Australian Standard AS 1428 Design for Access & Mobility.

Longitudinal grades should not exceed 1:20 to meet AS 1428 requirements. Council will consider exceptions where the terrain does not make this requirement achievable.

6.13.3 Location
The footpath shall be located abutting the property alignment unless otherwise approved by Council. Footpaths shall not be placed against kerb lines unless site restrictions dictate otherwise, or a low traffic speed environment, which still will be subject to Council approval.
Adjacent to commercial sites, paving shall extend the full width of the footpath, from the property alignment to the kerb.

**6.13.4 Thickness - Residential**
In residential subdivisions, concrete footpath paving shall be minimum 125mm thick, reinforced with F72 mesh, centrally located.

**6.13.5 Thickness - Industrial**
Concrete footpath paving shall be minimum 125mm thick, with F72 mesh centrally located.
Concrete driveways to be a minimum of 150mm thick, with F82 mesh centrally located.

**6.13.6 Interlocking Paving**
The use of interlocking paving blocks as an alternative to concrete will be considered in individual cases and approval determined by Council's Engineer.

**6.13.7 Width of Shared & open Space Paths**
All shared offroad bicycle and pedestrian paths shall be 2.5m wide.

**6.13.8 Nature Strip Treatment**
One Hundred millimetres (100mm) of loosely compacted thickness of approved topsoil shall be placed over cut and fill areas on all nature strips and on all areas where scour may be a problem in accordance with the Standard Specification.
Such areas shall be grass seeded, fertilised and maintained in by the Developer until the expiration of the Defects Liability Period

**6.13.9 Pram Crossings**
Pram crossings shall be provided at all kerb crossings regardless of kerb type.
Tactile Ground Surface Hazard & Directional indicators shall be installed where necessary in accordance AS 1428.4. Refer to Standard Drawing WCC-52

**6.14 Provision for Cycleways and Pathways at Structures**
Designers shall consider the best way to provide for the uninterrupted movement of cyclists and pedestrians at proposed and existing structures wherever possible. Structures include bridges and underpasses over rivers, roads or railways.
The reference and source documents provide information on:
(a) acceptable widths and clearances
(b) types of cycleways and pathways
(c) handrails
(d) bicycle bridges
(e) approach ramps, etc.

**6.14.1 Signage and Pavement Marking**
The Designer shall provide adequate signposting for cycleways and pathways.
Signs and pavement marking shall comply with AS 1742.9 and AS 1742.10.

**6.14.2 End of Journey Facilities**
Consideration must be given to the design of adequate facilities at common destinations of cyclists and pedestrians so as to encourage cycleway and pathway usage.
Such facilities could include:
Guidelines for the Subdivision & Development of Land

(a) seats
(b) standby areas
(c) secure bicycle parking
(d) picnic facilities

Bicycle parking installation design should meet appropriate criteria discussed in the AUSTROADS Guide to traffic engineering practice Part 14 and be fabricated to meet AS 2890.3

6.14.3 Design Criteria

Notwithstanding the guidelines provided in this Specification and referenced documents Table 1.1 gives minimum standards.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cycleway</th>
<th>Pathway</th>
<th>Shared Use Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path Width</td>
<td>2.0 m</td>
<td>1.5 m</td>
<td>2.5 m</td>
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<tr>
<td>Formation Width</td>
<td>3.0 m</td>
<td>2.0 m</td>
<td>3.0 m</td>
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<tr>
<td>Crossfall</td>
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<td>1:40</td>
<td>1:40</td>
</tr>
<tr>
<td>Grade max.</td>
<td>2% for 450 m</td>
<td>NA</td>
<td>2% for 140 m</td>
</tr>
<tr>
<td></td>
<td>5% for 90 m</td>
<td></td>
<td>3% for 70 m</td>
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<tr>
<td></td>
<td>10% for 30 m</td>
<td></td>
<td>4% for 409 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% for 30 m</td>
</tr>
</tbody>
</table>

6.15 Utility Allocations

6.15.1 Location

The location of utility services is to be in accordance with the recommendation of the Co-ordinations of Streetworks Code of Practice, Victoria.

6.15.2 Backfilling

Backfilling of Utility Services must be in accordance with Council’s Standard Drawing WCC-02. For all existing sealed roads new services must be under bored, unless approved by Council.

Prior to any works on existing road reserves a Road Reserve Works Permit must be obtained from Council.

6.16 Kerb and Channel

6.16.1 Location

Concrete kerb and channel shall be provided on both sides of all urban residential, commercial and industrial roads.
6.16.2 Kerb and Channel Types
The standard kerb and channel profile shall be as shown on standard drawing number WCC-11. In general the SM2 profile is to be used in residential developments.

The exception to the use of this profile kerb and channel may occur at the following locations:
(a) Barrier kerb & Channel may be used with one-way crossfall pavements and reverse fall nature strip on high side;
(b) Medians, Traffic Islands, and Roundabouts, where semi-mountable is shown, shall be SM1 and in accordance with Standard Draining WCC-11
(c) Barrier kerb must be used for roads as specified under Section 4.5.

6.16.3 Grading
The grading of kerb and channel will normally conform to the road centreline grading and shall not be less than an absolute minimum of 0.4% (1 in 250). The Desirable minimum grade is 0.5% (1 in 200)
Vertical curves shall be used at changes in grades as per Section 6.4.

6.16.4 Kerb Radii
The minimum radius of the kerb and channel at an intersection shall be as follows:
- Access Street to any Street - 8.5m
- Collector or Trunk Collector Street to Trunk Collector or Arterial - 12.00m
- Arterial to Arterial - 15.00m

6.17 Surface Drainage
6.17.1 Flow
The maximum depth of flow in the channel, for a design storm, shall be 0.14m for barrier type kerb and channel and 0.11m for roll-over type kerb and channel;
The maximum width of flow in the channel and roadway for a design storm shall be not greater than the parking lane width or 3.0m, whichever is the lesser;
These requirements will determine the maximum spacing of entry pits.
At locations where the level at the property alignment is below the kerb level, particular care must be taken that the maximum allowable depth of flow (in Clause 6.16 (a) is not exceeded, to prevent flooding of frontage properties.

6.17.2 Crossfall
The minimum crossfall of the pavement shall be 2.5% (1 in 40) for concrete, and 3.0% (1 in 33) for bituminous sealed pavement.

6.17.3 Superelevated
Where curves are superelevated, it is necessary to ensure that any low points in the kerb and channel resulting from the application of superelevation, are adequately drained.

6.17.4 Intersection Drainage
At intersections, particularly where traffic islands are provided, care must be taken to ensure that all low points are drained.
Concentrated flow across the pavement, eg, from the end of a traffic island to the channel, must be prevented by the provision of additional entry pits as necessary.
Guidelines for the Subdivision & Development of Land

Drainage entry pits at intersections should, where possible, be located where they are unlikely to be run over by traffic, eg. Preferably at the tangent points of kerb returns, rather than on the return, to prevent possible damage to the pit, and danger to cyclists.

6.18 Bridges

6.18.1 Cross Section

A bridge, or a box culvert with the top of the deck at road level, with a length measured along the centre line of the road of 6.0m or less, shall extend the full width of the road reserve.

A bridge, or box culvert with the deck at road level, with a length measured along the road centreline of greater than 6.0m, shall have a width between kerbs equal to that of the approach road, and a 1.2 metre wide footway on each side.

6.18.2 Footway Clearance

A pedestrian footway shall have a clear width of not less than 1.2m, from the inside face of the handrail to the top of the kerb.

6.18.3 Surfacing

A bridge or box culvert with the deck at road level shall be surfaced with asphaltic concrete of minimum thickness 40mm.

6.19 Permanent Survey Marks (PSM’S)

For all new roads and subdivisions, Permanent Survey Marks (PSM’s) shall be installed at locations, as directed by Council’s representative. PSMs must be installed at each intersection of the development, or at intervals no greater than 200m. All new PSMs must be levelled to Australian Height Datum (AHD), AMG – coordinated and registered with the Surveyor General, Land Victoria, by a licensed surveyor. New PSMs must be installed in accordance with the Survey Practice Handbook Victoria, and to the Warrnambool City Council Standard Drawing No. WCC 91.

6.20 Road Safety Audits

A Design Road Safety Audit shall be carried out by a third party Road Safety Auditor for designs in the following circumstances:

- for new roads classified as Collector, or above, in the road hierarchy;
- when any of the desirable horizontal or vertical alignment criteria are not met; or
- when desirable sight distance criteria are not met.

The Road Safety audit must be carried out in accordance with AUSTROADS Road Safety Audit, and submitted to Council as part of the design approval process.

6.21 Integrated Public Transport Planning

The following requirements are set out at Clause 52.36 in the Warrnambool Planning Scheme.

6.21.1 Purpose

(a) To ensure development supports public transport usage.

(b) To ensure that public transport facilities are provided to meet the needs of the scale of the development

(c) To integrate development and the transport system.
(d) To ensure development incorporates adequate transport networks, public transport facilities and pedestrian linkages to these facilities.

**6.21.2 Referral Requirements**

Where a Developer proposes a development of the kind listed below, it must be referred, in accordance with Section 55 of the Act, to the Director of Public Transport.

An application to subdivide land, to construct a building or to construct or carry out works for any of the following:

(a) a residential development comprising 60 or more dwellings or lots

(b) a new retail premises of 4000 or more square metres of leasable floor area

(c) an increase to the leasable floor area of an existing retail premises which is 20,000 or more square metres leasable floor area

(d) a commercial or office development of 10,000 or more square metres of leasable floor area

(e) an industrial subdivision of 20 or more lots

(f) a development which closes a road adjoining a public transport stop or which would use land within a closed road adjoining a public transport stop

These requirements do not apply to:

(a) a proposal that, in the opinion of the Council, satisfies requirements or conditions previously agreed to in writing between the Council and the referral authority

(b) a development consistent with an adopted Structure Plan that has been prepared in consultation with and endorsed by the Public Transport Division of the Department of Infrastructure.

**6.21.3 Information to Accompany Referral**

An application that is referred under Clause 52.36-01 must be accompanied by a plan which sets out the following:

(a) the proposed road network

(b) connections to existing roads

(c) existing and proposed traffic signalisation

(d) existing and proposed public transport stops and infrastructure (including shelters, indented bays, signage, pedestrian crossings and taxi ranks)

(e) pedestrian and bicycle paths and connections to stops

**6.21.4 Warrnambool Planning Scheme Standard C13**

The Warrnambool Planning Scheme requires that the street and road network should provide for access to public transport within a reasonable safe and convenient walking distance of all dwellings.

Proposed bus routes should connect efficiently with existing or likely future bus routes, to provide for ease of movement of buses between developments, and to Local major activity centres internal and external to the development.

Buses should be able to safely access the development and move safely between developments without complicated turning manoeuvres.

The alignment and geometry of streets that form bus routes should provide for the efficient and unimpeded movement of buses.
Guidelines for the Subdivision & Development of Land

Streets suitable for bus routes through the development should be no more than 30 percent longer than the bus routes available on the adjacent traffic route network.

Street networks near railway stations and major light rail routes should be focussed towards stops to provide high levels of accessibility and surveillance.

At least 90 percent of dwellings should be within 400 metres safe walking distance from an existing or proposed bus, tram or light rail route and should not be more than 500 metres from the nearest stop, or within 800 metres of a railway station.

6.21.5 Provision of Bus Stops

All major subdivisions must be designed to cater for bus movements and bus parking in accordance with the relevant Structure Plan. Provision of bus infrastructure, including bus stops shall be in accordance with the relevant Development Contribution Plan.
7.0 Drainage Design

7.1 Introduction

This section sets out the requirements for drainage works to be installed within the municipality. It is not intended to prohibit any alternative arrangements or approaches. Innovative or non-standard designs may be considered, but not necessarily accepted. Sufficient data and principles of design for any innovative or non-standard design must be submitted for consideration. Council reserves the right to impose additional requirements, or permit exceptions to any design.

Aspects not specifically referred to in these notes should be generally in accordance with one or more of the following documents:

(a) “Australian Rainfall and Runoff”, Institution of Engineers, Australia (AR&R).
(b) “Warrnambool City Council Drainage Strategy”
(c) “Drainage Design Guidelines”, Vic Roads
(d) “WSUD Engineering Procedures Stormwater Technical Manual”
(e) “Guidelines For Treatment of Stormwater Runoff From The Road Infrastructure”, Austroads.
(f) “Australian Runoff Quality”

7.2 Planning & Layout

In proposed subdivisions, the drainage system must have provision for runoff from the upstream catchment, and downstream drainage works if required.

Drainage for new subdivisions must be designed taking into account Water Sensitive Urban Design (WSUD) principles. Designers are referred to the “WSUD Engineering Procedures Stormwater Technical Manual”

All stormwater run-off from developments must be collected and discharged to an approved outlet, or retained onsite to Council’s satisfaction.

Stormwater discharge from the development must be limited to the equivalent of the predevelopment site run-off as determined by engineering computations (base parameters C=0.3, ARI =10 years).

Main drains should follow the valleys in reasonably straight alignments, with a minimum of deviation. Natural drainage paths serving areas greater than 5ha shall be preserved, in the form of roadways, parkland, walkways, etc., and shall have a discharge capacity at least equal to that of the pipe drain. Private allotments will not be permitted downstream of low points in roadways, downhill court bowls, or any other locations where drainage flows may concentrate.

The Q100 overload flow must be confined to roadways and reserves and under no circumstances encroach on private allotments.

Under exceptional circumstances Q100 through an easement will be permitted provided pit entry and pipe capacity can cater for the Q100 flow.

Where a low point occurs in a longitudinal road grading or at the end of a court bowl or any other location, the footpath shall 75mm above the top of kerb at the low point.

The drainage design shall incorporate water quality treatment measures to enhance quality of the drainage runoff before discharging it to a creek or other main drainage network.

For all works on creeks and major waterways, including crossings, and drainage discharge outfall points, the Glenelg Hopkins Catchment Management Authority is the responsible authority. Prior to the commencement of works a Works on Waterway
permit must be obtained from this authority. For other minor and major drainage, the Warrnambool City Council is the Responsible Drainage Authority.

7.3 Computation of Runoff
Computation of runoff shall be determined using the Rational method:

\[ Q = CIA/360 \]

Where
- \( Q \) = design discharge (\( \text{m}^3/\text{s} \))
- \( C \) = runoff coefficient
- \( I \) = rainfall intensity (\( \text{mm/h} \))
- \( A \) = catchment area (ha)

All stormwater facilities must be designed to cater for the Return Period specified in Section 7.5.

7.4 Rainfall Intensity
Rainfall Design Intensity Charts for Warrnambool are provided in Appendix E

7.5 Return Period

<table>
<thead>
<tr>
<th>Component</th>
<th>ARI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban &amp; Rural Residential Developments</td>
<td>10 years</td>
</tr>
<tr>
<td>Road with no Overland Flow Path</td>
<td>100 years</td>
</tr>
<tr>
<td>Business, Commercial &amp; Industrial Areas</td>
<td>20 years</td>
</tr>
<tr>
<td>High Density Urban Areas &amp; CBD</td>
<td>20 years</td>
</tr>
<tr>
<td>Car parks</td>
<td>20 years</td>
</tr>
<tr>
<td>Major Culverts &amp; Bridges on Collector Roads</td>
<td>50 years</td>
</tr>
<tr>
<td>Major Culvers &amp; Bridges on Arterial Roads</td>
<td>100 years</td>
</tr>
</tbody>
</table>

7.6 Time of Concentration

<table>
<thead>
<tr>
<th>Area</th>
<th>Minimum ( t_c )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Reserve (Road water to Drainage Pit)</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Allotments (Building to Property Boundary)</td>
<td>5 minutes</td>
</tr>
</tbody>
</table>
7.7 Runoff Coefficient C

<table>
<thead>
<tr>
<th>Component</th>
<th>C Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential areas (low density)</td>
<td>0.45</td>
</tr>
<tr>
<td>Residential areas (medium density, flats, etc)</td>
<td>0.52</td>
</tr>
<tr>
<td>Business, Commercial &amp; Industrial Areas</td>
<td>0.90</td>
</tr>
<tr>
<td>Residential Road Reserves</td>
<td>0.52</td>
</tr>
<tr>
<td>Parks and Gardens</td>
<td>0.25</td>
</tr>
<tr>
<td>Paved Areas</td>
<td>0.90</td>
</tr>
</tbody>
</table>

7.8 Hydraulics

Drainage design shall be based on computation of the hydraulic grade line, generally as in Australian Rainfall & Runoff, but incorporating realistic assessment of pit head losses.

7.9 Alignment at Pits

Drops and deflections should be minimised to maintain the flow through pits as a jet, with minimum head loss.

Required drops (at invert):

- Generally 50mm to 100mm for same size pipes.
- Match springing lines for change in diameter, but the drop should not be less than 60mm.

Drops in the range 100mm to 1.5\(D_o\) are not permitted except:

(a) where springing lines are matched
(b) for minor branches (\(D_b < \frac{2}{3}D_o\) ) \((D_b = \text{branch diameter})\)(\(D_o = \text{outlet diameter}\))
(c) to dissipate head in steep terrain.

Drops greater than 1.5\(D_o\) are acceptable on long pipe reaches (where there are considerable savings in excavation) for pipe sizes up to 450mm.

Deflections:

\[
\begin{align*}
\text{Do} & < 600\text{mm} : & 0^\circ - 50^\circ : & \text{align as in standard detail} \\
& & 50^\circ - 90^\circ : & \text{provide deflector in pit floor} \\
& & >90^\circ : & \text{not permitted} \\
\text{Do} & > 675\text{mm} : & \text{Maximum deflection} - 22\frac{1}{2}^\circ \\
\end{align*}
\]

For larger changes of direction, construct segmented curves using splayed pipes or bandage joints, with deflections of 12 - 22\(\frac{1}{2}\)° and segment lengths in the range \(D - 2D\).
7.10 Pit Locations

Pits shall be located to minimise the chance of them coinciding with vehicle crossings. Pits should, preferably, be located at or about the mid-point of the frontage of allotments, to reduce the likelihood of conflict with future driveway locations.

Side Entry Pit locations:
(a) adjacent to tangent points at intersections where the channel falls towards the intersection;
(b) at low points; and
(c) at construction boundaries, unless existing drainage is adequate.

Additional Side Entry pits shall be provided;
(a) near low points of streets where one or both channel grades are greater than 6%.
(b) at large “flat” vertical curves approximately 10m either side of the low point. (i.e. where the channel levels 10m either side of the low point are not more than 100mm above the channel level at the low point).

Double Side Entry pits shall be provided;
(a) where approach grades to intersections are in excess of 6%
(b) at low points in roads where surcharge would seriously affect private property.

In all cases design consideration shall be given to pit location and pit inlet capacities, to ensure flows are not directed onto private property.

Side Entry pits shall be properly shaped, as in the standard drawings, to achieve maximum capture of gutter flows.

Inlet capacity for overland Q greater than Q10 shall be calculated to ensure flows enter pipe system.

Pit Spacing

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Maximum Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two way crossfall, or where grades are less than 6%</td>
<td>75 metres</td>
</tr>
<tr>
<td>One way crossfall, or where grade are more than 6%</td>
<td>45 metres</td>
</tr>
</tbody>
</table>

7.11 Pit Headlosses

To be calculated using procedure in the Vic Roads “Road Design Guidelines Part 7 - Drainage” and Australian Rainfall & Runoff.
7.12 Pipe Friction

<table>
<thead>
<tr>
<th></th>
<th>Manning n</th>
<th>Colebrook - White k (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>0.013</td>
<td>0.6</td>
</tr>
</tbody>
</table>

7.13 Minimum Pipe Size

- **Easement:** 150mm for a max. of one residential property
- **Within road reservation:** 300mm
- **Industrial property connection:** 225mm

7.14 Pipe Joints

All drainage pipes must comply with the applicable Australian Standard. All pipes in industrial/commercial areas and all pipes under road pavements must be rubber ring jointed. If a pipeline is to be located near trees which are known to have aggressive root systems, rubber ring joints must also be specified. Elsewhere, interlocking cement grouted pipes or solvent welded plastic pipes are permitted.

7.15 Pipe Flow Velocity and Grade

The following is based on pipes running full but not under head.

<table>
<thead>
<tr>
<th></th>
<th>Desirable</th>
<th>Absolute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>1.0 m/s</td>
<td>0.8 m/s</td>
</tr>
<tr>
<td>Maximum</td>
<td>4.0 m/s</td>
<td>6 m/s</td>
</tr>
</tbody>
</table>

Minimum and maximum grades are to be based on these velocities, but grades must not be less than 1 in 300. Consideration may be given to grades less than 1 in 300 in special circumstances only.

7.16 Pipe Alignment

Pipes shall be uniformly graded and shall be constructed on a straight alignment between pits.
7.17 **Minimum Cover (to top of pipe)**

In road reserve: 600mm
Elsewhere: 450mm

7.18 **Freeboard**

The hydraulic grade line should be at least 450mm below the surface, and not more than 2m above the pipe obvert.

7.19 **Anchor Blocks**

Anchor blocks shall be provided where the pipe slope is steeper than 1 in 6 and the pipe length is greater than 15m.

7.20 **Property Connections**

Care is to be taken when subdivisional layouts are being designed to ensure that every lot can be adequately drained to either street underground drainage or a drainage easement drain provided for the purpose.

Each property connection shall be placed at the lowest point of the property.

Property drains connected directly to kerb and channel will generally not be permitted, unless there are exceptional circumstances, because of potential crushing of pipes and kerb adapters by vehicles.

7.21 **Water Quality**

The drainage design shall incorporate water quality treatment measures to enhance quality of the drainage runoff before discharging it to a creek or other main drainage network. Reference is to be made to “WSUD Engineering Procedures Stormwater Technical Manual”.

Swale drains, rain gardens and other filter systems and detention basins proposed to meet the objectives must be designed to minimise future maintenance costs for Council. The Consultant is required to submit a recommended inspection and maintenance regime as part of the design approval process for proposed water quality treatment facilities.

7.22 **Downstream Control**

The downstream water surface level requirements are given below:

a) Known hydraulic grade line level from downstream calculations including pit losses at the starting pit in the design event.

b) Where the downstream starting point is a pit and the hydraulic grade line is unknown, a level of 0.15 m below the invert of the pit inlet in the downstream pit is to be adopted.

c) Where the outlet is an open channel and the design storm is the minor event the top of the outlet pipe shall be the downstream control.

d) Where the outlet is an open channel, the design storm is the major event and downstream flood levels are not known, the top of the outlet pipe shall be the downstream control.
e) Where the outlet is an open channel, the design storm is the major event and
downstream flood levels are known, the downstream control shall be the 1% probability flood level.
f) The designer shall comply with any special design requirements of the Glenelg
Hopkins Catchment Authority.

7.23 Major System Criteria

7.23.1 Surcharging

Surcharging of drainage systems which would provide for water depth above the top of
kerb is not permitted except:

a) Surcharging of drainage system for storm frequencies greater than 5% probability
may be permitted across the road centreline where the road pavement is below the
natural surface of the adjoining private property.

b) Flow across footpaths will only be permitted in situations specifically approved by
Council, where this will not cause flooding of private property.

7.23.2 Velocity/depth criteria

The velocity \( \times \) depth product of flow across the footpath and within the road reserve
shall be such that safety of children and vehicles is considered.

The maximum allowable depth of water is 0.2 metres and the maximum velocity \( \times \) depth
product of 0.4 m\(^2\)/s is permitted.

Where the safety of only vehicles can be affected, a maximum velocity \( \times \) depth product
of 0.6 m\(^2\)/s is permitted.

In open channels the above velocity \( \times \) depth product criteria will be followed where
possible or the design shall address the requirements for safety in relation to children
by providing safe egress points from the channel or other appropriate methods.

7.23.3 Freeboard

Freeboard requirements for floor levels and levee bank levels from flood levels in
roadways, stormwater surcharge paths and open channels are given below:

a) In roadways:
   i) A minimum freeboard of 0.3 m shall be provided between the 100 year flood
      level and floor levels on structures and entrances to underground car parks. A
      higher freeboard may be required in certain circumstances.
   ii) Where the road is in fill or overtopping of kerbs and flow through properties
       may occur a 100 mm freeboard shall be provided between the ponding level of
       water in the road and the high point in the footpath. Driveway construction in
       these instances needs to consider this requirement.

b) In stormwater surcharge paths—A minimum freeboard of 0.3 m shall be provided
   between the 100 year flood level and floor levels on structures and entrances to
   underground car parks.

b) In open channels—A minimum freeboard of 0.5 m shall be provided between the
   100 year flood level and floor levels on structures and entrances to underground
   car parks.

7.23.4 Roadway capacities

For road designs, flow capacities of roads should be calculated using Volume 1 of
AR&R.
7.24 Gross Pollutant Traps

It is Council policy to reduce the volume of water borne pollutants such as industrial, commercial and domestic litter, vegetation and course sediments from entering water courses and streams, via the underground drainage system, by a program of installation of litter traps at strategic locations.

Where Council determines that an area is likely to have a “litter concentration”, a gross pollutant trap shall be designed and installed by the Developer.

Any unit installed shall be capable of capturing all material larger than 20mm from all flows up to a storm with an average recurrence interval of three months (i.e. 0.9 cubic metres). The unit shall be capable of providing for the bypassing of stormwater flows in excess of the treatment capacity of the unit. The bypass shall protect the operational integrity of the drainage system during floods and be designed such that scour and/or re-suspension of pollutants previously collected does not occur during periods of high flow or bypass flow conditions. The unit shall be designed so that there is no capacity loss of existing drainage system.

The unit shall be designed so that all collector pollutants are able to be removed by mechanical means.

7.25 Stormwater Pumps

Where there is insufficient grade to outfall for the stormwater system to flow by gravity alone, pumps may be installed of a size and type approved by Council. All pump wells are to be fitted with non-return valves.
8.0 Pavement Design

8.1 Residential, Rural and Industrial Road Pavements
All urban residential, rural, and Industrial road pavements shall be designed in accordance with the document “Pavement Design Guidelines for New Subdivisions”, October 2007, prepared for Warrnambool City Council by R.W. Stamp & Associates. (See Appendix C) Computations are required to be submitted with the Engineering Design Plans to verify the adopted pavement design.

8.2 Asphalt Surfacing for Urban Streets
All urban streets shall be surfaced with a 30mm thickness of 10mm Type H asphaltic concrete. A prime or primerseal should be applied to the crushed rock pavement prior to laying the asphalt surface.

8.3 Asphalt Surfacing for Industrial Roads
All roads in industrial subdivisions shall be surfaced with a 40mm thickness of 10mm Type H asphaltic concrete. A prime or primerseal shall be applied to the crushed rock pavement prior to laying the asphalt surface.

8.4 Surfacing for Rural Roads
All rural roads shall be surfaced with a 10mm primerseal followed by a 10mm final seal 12 months later, at the Developer's cost. Council will bond the final seal at the request of the Developer.

Depending on traffic volume and type, some rural intersections may be required to be surfaced with asphaltic concrete at the discretion of the Council Engineer.
9.0 Service Conduits

9.1 Location
Service conduits to each allotment, on the opposite side of the road to the proposed gas and/or water main, shall be provided under the pavement of all subdivision roads.

9.2 Cover
The cover to conduits is to be 450mm below the finished pavement surface. Conduits are to be laid at a grade of 1 in 100 falling to side of the proposed gas or water main.

9.3 Marking
The position of conduit is to be marked on the face of the kerb on each side of the road with a 50mm high letter G for gas conduit and W for water conduit imprinted into the concrete.

9.4 Trench Backfill
Trenches in which conduits are laid are to be backfilled in accordance with the requirements of Standard Drawing WCC-21 which details the differing requirements for backfill under roads, nature strips and footpaths.
10.0 Sub-soil Drainage

10.1 General
Sub-soil drainage is to be provided by means of agricultural drains placed immediately at the back of kerb as detailed in Standard Drawing WCC-31. The drainage trench shall be backfilled with clean 5-10mm size bluestone aggregate.

The pipe for agricultural drains shall be 100mm corrugated PVC.

The pipes shall discharge into pits at a level above the highest overt and any stormwater pipe open to the pit.

10.2 Salinity prevention
In salinity affected areas, the Designer should consider providing a separate drainage system for subsurface drains to discharge to a basin where controlled release or desiccation treatment and removal can be facilitated as a maintenance operation.

Saline subsurface drainage should not be routinely discharged directly into natural watercourses.

Reference to water quality targets for downstream watercourses is essential and the Designer shall provide advice on discharge operations and maintenance compatible with water quality targets and the requirements of the relevant land and water resource authority.
11.0 Street Nameplates

11.1 Installation
All street nameplate signs shall be installed in accordance with Standard Drawing WCC-102.

11.2 Graphics
Graphics on all street signs will be as detailed on Standard Drawing WCC-102. Logos on all signage shall comply with Council’s Corporate Logo specification.
12.0 Street Lighting

All roads created by the subdivision, intersections, and any traffic management devices shall be provided with street lighting in accordance with the requirements of AS 1158.1.1-1997, Road Lighting, Vehicular Traffic (Category V) Lighting, and AS 1158.1.3-1999, Road Lighting, Pedestrian Areas (Category P) Lighting.

When it is proposed to use street lighting poles and lanterns other than the standard poles and lanterns installed by the Electricity Supply Company, all such non standard lighting must accord with Warrnambool City Council Policy for Non Standard Lighting. (Refer Appendix G)
13.0 Public Open Spaces & Streetscape

All public open space and streetscape works, including landscaping, tree planting, and estate entrance treatments shall be undertaken in accordance with the plans approved by Council. The Consulting Engineer shall liaise with Council’s Open Space Planner on matters relating to open space and streetscape.

13.1 Site Regrading

13.1.1 Suitability of Site

Areas of a site proposed for building or recreational purposes may not be suitable in their natural state for their intended function without improvement works to:

(a) Alleviate flooding of low-lying ground.

(b) Fill gullies or create emergency flowpaths after underground stormwater piping has been installed.

(c) Allow improved runoff from flat ground.

(d) Regrade excessively steep slopes that would preclude economical construction of building foundations.

(e) Allow effective recreational use or give reasonable access.

The Designer shall review the natural surface contours and where necessary shall design finished surface levels that ensure the land is suitably prepared.

13.1.2 Drainage

Where practical, areas should be regraded to minimise the necessity for underground drainage systems with surface inlet pits, and allow surface water to flow naturally to roads or drainage reserves without excessive concentration.

13.1.3 Natural Environment

The Designer shall consider the implications of site regarding in relation to the existing natural environment. Generally site regrading shall be minimised in heavily treed areas.

13.1.4 Overland Flow

Care shall be taken to provide depressions for overland flow from low points and over major drainage lines, to direct stormwater for storms up to a 100 year average recurrence interval (ARI).

13.1.5 Minimal Road Haulage

The design of site regrading areas in conjunction with the design of roadworks shall be considered with the objective of balancing cut to fill and achieving both an economical works and to minimise the haulage of imported fill or spoil to and from the works site.

Bulk haulage should always be considered an adverse effect on adjacent development, and infrastructure.

13.2 Special Treatment for Particular Areas

13.2.1 Areas Abutting the 100 Year ARI Flood Levels

Areas abutting the 100 year ARI flood levels shall be site regraded to a minimum level of 0.5 metres above the 100 year ARI flood levels. In doing so, the Designer shall ensure that other areas are then not affected by flooding.
The site shall be identified on the Drawings with appropriate notation of site specific requirements.

13.2.2 Inundation Areas
In the event that an area is known to be affected by or inundated by local stormwater flows, the Designer shall investigate the existing conditions as they relate to the proposed works and advise the Council in the preliminary design report on all data obtained in the investigation and recommend appropriate contour adjustments.

The report should normally be accompanied by sketch plans to clarify recommendations.

13.2.3 Restrictions on Land Use
Constraints either natural or otherwise may be required to be identified as a burden on the developed site. It is recommended that the Designer take this into account when preparing the design.

The property may ultimately be affected by a ‘restriction as to user’, which may be controlled by a legal instrument placed on a title to the land advising prospective purchasers of any restrictions affecting the land.

13.2.4 Piped Gullies or Depressions
The finished surface of filled areas shall be designed to levels allowing an adequate cover depth over the pipeline (if piped) and permitting surface stormwater flow to be guided to inlet pits if depressions are retained in the finished surface contouring.

13.2.5 Site Regrading Plans
The location of features shall be clearly defined on the site regrading plans and defined by distance to corner boundaries, monuments, etc. for purposes of relocation at the geotechnical testing stage for work as executed drawings.

A geotechnical report specifying the site specific preparation and compaction requirements will be required to be incorporated with the site regrading plan. A description of the minimum acceptable quality of the fill shall also be specified on the plans, supported by geotechnical recommendations.

All documentation necessary from various authorities to support the filling of dams and watercourses shall be supplied with the Drawings.

13.2.6 Finished Level of any Building Area
The finished level of any building area shall be designed to ensure a desirable surface grading of 1.5% (1% minimum) oriented in the direction of the drainage system designed to cater for its catchment.

Building areas containing natural ground slopes of an excessively steep nature, i.e. greater than 15% shall be brought to the attention of a Geotechnical Engineer for investigation of compatibility with the works proposed. Specific requirements shall be noted on the Drawings.

13.2.7 Salinity Prevention
In known salt affected areas, or areas found to be salt affected by the geotechnical investigations, the Designer shall evaluate the existing conditions as they relate to the proposed development.

The Designer shall also take advice from the relevant land and water resource authority and advise the Developer, in the preliminary design report, of areas requiring action to prevent salinity development.

Appropriate regrading strategies aimed at lowering the groundwater table should also be included in the preliminary design report together with primary measures to prevent extension of salinity problems.
13.3 Site Preparation

13.3.1 Clearing
Special requirements will apply where considered necessary by the Council but generally the site shall be cleared of low scrub, fallen timber, debris, stumps, large rocks and any trees which in the opinion of Council are approaching the end of their functional life or a dangerous or will be hazardous to normal use of the site.

Prior consultation with Council’s Tree Preservation Officer or equivalent is necessary. Such requirements shall be shown on the Drawings.

13.3.2 Disposal
All timber and other materials cleared from the site shall be removed and legally disposed of. All roots, loose timber, etc. which may contribute to drain blockage shall be removed. Such requirements shall be shown on the Drawings.

13.3.3 Overfilling Area of Trees
In areas to be filled over butts of trees, allowance is to be made for clearing of all trees and replanting with advances species, the number and type of which shall be approved by Council.

All replanting is to be clear of probable future building locations, and not to be commenced until filling has been completed and graded, with provision for watering and maintenance for duration of the contract. These specific requirements shall be shown on the Drawings.

13.3.4 Preservation of Trees
Selected trees shall be preserved by approved means to prevent destruction normally caused by placement of conventional filling or other action within the tree drip zone.

The Tree Preservation Officer or equivalent shall be consulted for advice and all specific requirements noted on the Drawings.

13.4 Fill

13.4.1 Fill Type
Filling is to be of sound clean material, reasonable standard and free from large rock, stumps, organic matter and other debris.

Placing of filling on the prepared areas shall not commence until the authority to do so has been obtained from the Council.

The above requirement shall be a notation on the relevant drawings.

13.4.2 Fill Quality and Compaction
All work shall be in accordance with AS 3798. Fill is to be placed in layers not exceeding 150mm compacted thickness.

All fill is to be compacted to 95% standard maximum dry density. Maximum particle size shall be 2/3 of the layer thickness.

13.4.3 Restricted Fill
Fill comprising natural sands or industrial wastes or by-products may only be used after the material type and location for its use is approved by the Council and will be subject to the specific requirements determined by prevailing conditions.

It is essential that prior advice be given of intended use of restricted fill materials. It should be noted that failure to obtain the Council’s approval may lead to an order for...
Guidelines for the Subdivision & Development of Land

removal of any material considered by the Council or other relevant authorities as unsuitable or in any way unfit for filling.

13.4.4 Old Dams, Wells & Disposal Pits

Any old dams, wells, disposal pits and fill areas of compacted depth greater than 300mm shall be located on the subdivision construction plans and shall be excavated, rehabilitated and filled in accordance with section 13.4.2.

13.4.5 Top Dressing

All areas where filling has been placed are to be dressed with clean arable topsoil, fertilized and sown with suitable grasses.

13.5 Cartage of Soil

13.5.1 Acceptable Haul Route

The Designer shall refer to Council for acceptable haul roads with applicable load limits. This detail shall be shown on the site regrading plan.

The payment of a Bond may be required where Council has some concern about the ability of a haul road to sustain the loads without undue damage or maintenance requirements.

13.5.2 Re-use of Topsoil

Unless otherwise approved by Council, the Drawings shall be annotated as follows – ‘All topsoil shall be retained on the site and utilized effectively to encourage appropriate revegetation’.

13.6 Landscaping

Warrnambool City Council requires all development proposals to respect the particular topography, landscape and existing features.

Designers are encouraged to maximise the landscape forms by the integration in their design (water ways, existing vegetation, etc.) and to consider these aspects at the time of developing the subdivision design.

13.6.1 General Requirements

(a) Landscaping plan shall comply with the Warrnambool City Council Street Tree Policy. In particular species chosen must be appropriate for the climate and soil conditions. It is the responsibility of the landscape architect to ensure that any tree planting which occurs under services or over services, if any, is clearly shown on the landscape plan and that the type of species chosen will not have any detrimental effect on the services above or below ground.

(b) Plans that demonstrate compliance with Guidelines for Residential Subdivision are encouraged.

(c) Advanced trees of a minimum height of 2.5 to 3m are to be provided.

(d) All trees to have two water tubes installed.

(e) All landscaping to be maintained for a period of 12 months or until the landscaping has been established to the satisfaction of Council, Maintenance is to include broad leaf weed control.

(f) All plants to be adequately secured against damage. See standard drawing WCC-81 for the minimum staking treatment.

(g) Landscape plans to be prepared by a qualified landscape engineer/architect.
Guidelines for the Subdivision & Development of Land

(h) Grass to be chosen that has a low maintenance requirement (water consumption and mowing).

(i) No CCA treated timber is to be used in any landscaping or playground equipment.

(j) Reticulated water supply is to be provided in a pit in each reserve.

(k) No permanent structures identifying estates will be permitted. Temporary structures may be permitted for the purposes of marketing the estate for a period not exceeding 5 years from approval of engineering plans. A bond to 200% of the cost of the temporary works is to be lodged prior to Compliance. This will be returned when the works are removed and the area made good.

(l) Any entry planting including median and round-a-bout planting must be capable of surviving without a reticulated irrigation system.

(m) All playgrounds and play equipment to conform to Australian standards and Council Playground Policy. Council has a preference for non-timber equipment.

(n) All landscape designs to ensure no trees are planted in easements or swale drains that may inhibit water flow in drains.

(o) Paths through Council reserves to be designed to be sympathetic with the neighbourhood character and facilitate disabled access.

(p) Fencing to be designed for a minimum life of 10 years. Fencing is to be a min 1.8m in height.

Proposed landscape plans to be provided with preliminary engineering plans to enable an integrated response.

13.6.2 Street Trees

Street trees shall be planted and maintained by the Developer in accordance with an approved Landscape Plan and Street Tree Planting Schedule

Species to be planted shall be selected from the “Tree Species List” provided in Appendix F

13.6.3 Water Conservation

The Council seeks to facilitate the conservation and sustainable management of freshwater resources by progressing the development and implementation of water-related environment policies in relation to all new developments. Council encourages Developers to consider the following approaches in relation to water management:

- Maximising the use of recycled water
- Provision of dual water reticulation where recycled water is available
- Trapping and using stormwater drainage
14.0 Construction

14.1 Notice Period
A minimum of 7 working days written notice shall be given to Manager, Infrastructure Services prior to the proposed commencement date of works.

14.2 Pre Commencement site meeting
The Consulting Engineer is to arrange a pre-commencement site meeting that will involve Council’s Construction Supervisor, the contractor and the consultants.

14.3 Environmental Management
When subdivisional works require the construction of additional roads, the Developer will be required to submit an Environmental Management Plan for approval by Council prior to works commencing. The site specific Environmental Management Plan (EMP) must be prepared in accordance with the EPA document “Environmental Guidelines for Major Construction Sites” February 1996 or its successor document. The EMP must detail the controls that will be in place to:

(a) Prevent erosion;
(b) Manage contaminated stormwater;
(c) De-water worksites;
(d) Control dust;
(e) Manage stockpiles and batters;
(f) Manage works in waterways and floodplains;
(g) Minimise noise and vibration nuisance;
(h) Minimise and manage site litter and waste;
(i) Manage contaminated material and waste;
(j) Manage exhaust gases;
(k) Store fuels and chemicals;
(l) Keep roads to and from the site clean of soil and litter;
(m) Establish emergency procedures; and
(n) Respond to complaints.

14.4 Traffic Management
When subdivisional works require works to be carried out on an existing Council managed road reserve, or works are likely to impact on the traffic flow on an existing road, a Road Reserve Works Permit application is required to be submitted to Council.

As part of the assessment of the Road Reserve Works Permit application, a Traffic Management Plan must be submitted to Council for approval, showing all road work signage proposed for the site, and how works will be safely managed to minimise inconvenience to road users.

14.5 Notice for Inspection
The Contractor shall give 24 hours notice to the Construction Supervisor when inspection is required.
14.6 Council Inspections

The Contractor shall at all times allow Council’s Construction Supervisor to inspect and measure any part of the works. No part of the works shall have further works placed there or shall be covered up or put out of view without the approval of the Construction Supervisor, whose approval shall not be unreasonably withheld or delayed.

Regular inspections are required at the various stages of the works and additional inspections may be required from time to time at the direction of the Construction Supervisor. Table 1 below details the stages of required inspections.

**TABLE 1 - Inspection Schedule**

<table>
<thead>
<tr>
<th>WORK</th>
<th>STAGE</th>
<th>INSPECTION OF</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthworks</td>
<td>Prior to placing filling</td>
<td>Stripped Area</td>
<td></td>
</tr>
<tr>
<td>Stormwater Drains</td>
<td>a) Prior to backfilling</td>
<td>Levels, laying jointing and haunching Material &amp; compactions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) After backfilling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stormwater Drainage Pits</td>
<td>Prior to pouring</td>
<td>Pit type, wall length thickness, A.G. connections Weep holes</td>
<td></td>
</tr>
<tr>
<td>Agricultural Drains</td>
<td>Prior to backfilling</td>
<td>Levels, line and laying</td>
<td></td>
</tr>
<tr>
<td>Conduits</td>
<td>Prior to backfilling</td>
<td>Laying and jointing, Location and Length</td>
<td>Locations to be verified with Superintendent prior to laying</td>
</tr>
<tr>
<td>Kerbs and Channel</td>
<td>a) Prior to placing bedding</td>
<td>Base and Agricultural drains</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Prior to pouring concrete</td>
<td>Bedding, lines, level, formwork reinforcement</td>
<td></td>
</tr>
<tr>
<td>Footpath</td>
<td>Prior to pouring</td>
<td>Bedding line &amp; level, formwork</td>
<td>House drains, sewer drains, and electrical conduits to be laid prior to inspection</td>
</tr>
<tr>
<td>House Drains</td>
<td>Prior to backfill</td>
<td>a) Laying and jointing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Connection to SW drains</td>
<td></td>
</tr>
<tr>
<td>Vehicle crossings</td>
<td>Prior to pouring</td>
<td>Bedding, line, level, formwork, reinforcement</td>
<td></td>
</tr>
<tr>
<td>Road pavement</td>
<td>a) Prior to first pavement course</td>
<td>(i) Line level and shape</td>
<td>All road crossings and conduits for water, gas, sewer, drainage and underground electricity are,</td>
</tr>
<tr>
<td></td>
<td>b) Prior to placement of each Pavement course</td>
<td>(ii) Subgrade material, pavement material and compaction (test results and proof roll)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Prior to priming</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Guidelines for the Subdivision & Development of Land

<table>
<thead>
<tr>
<th>Completion</th>
<th>Prior to commencement of Maintenance period</th>
<th>All works, including nature strip raking and seeding</th>
<th>Where applicable to be completed prior to placing first layer of F.C.R. A &quot;skin&quot; of FCR may be placed on the approved subgrade prior to construction of these crossings. All broken concrete is to be replaced, all nature strips topsoiled and all services laid, prior to laying wearing course asphalt.</th>
</tr>
</thead>
</table>

**14.7 Inspection After Normal Hours**

When construction works are carried on outside normal working hours of 7.30 am to 4.30 pm weekdays, or on week-ends or holidays, it will be necessary for the Contractor to give Council 24 hours notice of its intention to work so that the necessary arrangements of staff may be carried out.

Costs for inspections outside of normal working hours must be paid for by the relevant consulting engineer.
14.8 Specifications and Standard Drawings
All works shall be designed and constructed in accordance with Warrnambool Council’s suite of Standard Drawings for Roads and Drainage. (Refer Appendix D).
Where no Council Standard Specification exists for a particular type of work, Consultants may use their own standard specification for that work subject to the approval of the Manager Infrastructure Services.

14.9 Bonding of Works
Council or a referral authority may enter into an agreement with an owner providing for construction works to be completed after the issue of the Statement of Compliance for the subdivision.
Refer to Part A, “Land Subdivision and Development Process” Section A11 for details of what outstanding works Council will consider to bond.

14.10 Practical Completion Inspection & Start of Maintenance Period
At the completion of all works required under the planning permit, an inspection shall be arranged with the Council’s Construction Supervisor. Following the inspection, and if in the opinion of the Construction Supervisor, the works are practically complete; the works shall be placed on maintenance. Items identified as requiring attention during the maintenance period shall be advised to the Consulting Engineer in writing.

14.11 Maintenance
14.11.1 Developer Responsible for Maintenance
The Developer is responsible for maintaining the completed works for a period (generally 12 months) following the practical completion of works, as determined by Council.
Council may increase the maintenance period for landscaping to ensure all vegetation is maintained by the Developer for a full growing season and the vegetation is well established prior to Council taking over maintenance responsibility.

14.11.2 Maintenance Bond
To facilitate the registration of a plan of subdivision before the maintenance period on road and drainage work has expired, Council will require a bond in the form of cash or a bank guarantee for 5% of the certified final cost of the work which is to be held and used to maintain the works, during or at the end of the maintenance period, should the Developer fail to do so.

14.12 End of Maintenance Inspection
The works shall be maintained by the Developer for a period of 12 months from the date of practical completion.
At the end of 12 month maintenance period, the Consulting Engineer shall request Council to undertake a final inspection. It shall be ensured that all items identified for attention at the time of start of maintenance period, plus any other matters requiring attention due to bad workmanship or materials are completed before this inspection is convened. After the works have been satisfactorily maintained, a written advice shall be sent to the Consulting Engineer, and Council shall take over the ownership and ongoing management of the works.

14.13 Re-Establishment Survey
When construction works required by Council and referral authorities have been completed, the Surveyor shall re-establish any title boundary pegs that may for any reason be missing.
15.0 Statement of Compliance

Following the completion of all works required by Council in the planning permit, a satisfactory bonding of any outstanding works as approved by Council, and execution of any agreement required in the planning permit, the Construction Supervisor shall "release" Council requirements for all Road and Drainage works when requested to do so by Council's Subdivision Officer.
16.0 As-Constructed documentation

At the completion of all works and prior to Council taking over ownership of subdivisional works, the Consulting Engineer shall provide Council with the following “As Constructed” documentation.

(a) Construction Plan Transparencies
(b) Electronic copy of drawing in a PDF. format.

The works will not be placed on maintenance until this documentation is provided.
17.0 Appendices

Appendix A - Flow Charts of Road & Drainage Design and Construction Approval Processes

Appendix B - Design Certification Report

Appendix C - Pavement Design Guidelines

Appendix D - Warrnambool City Council Standard Drawings

Appendix E - Rainfall Design Intensity Charts

Appendix F - Tree Species List

Appendix G - Non Standard Street Lighting Policy

Appendix H - Reference Documents
Appendix A - Flow Charts of Road & Drainage Design and Construction Approval Processes
Guidelines for the Subdivision & Development of Land

Council Planning Department | Council Engineering Department | Developer’s Consulting Engineer

Start

Issue Planning Permit

Review Permit conditions. Discuss with Developer

Consult with Council Engineering Dept. Prepare Preliminary Design Plans. Submit to Council

Preliminary Design Acceptable?

Yes

Issue approval in principle to Consultant

No

Return mark-ups and comments to Design Engineer

Revise design and resubmit

Road/Drainage Final Design Phase – Process Flow Chart

Page 82 of 114
Road/Drainage Construction Phase – Process Flow Chart
From Detailed Design Phase

Tender works and award contract

Notify Council of intention to commence construction

Supervise construction of works

Supervise construction of works

Do any works need to vary from approved design?

Yes

Negotiate approval of changes with Council PRIOR to undertaking work

No

Works considered by Consultant Engineer to have reached “Practical Completion”
Road/Drainage Construction Phase – Process Flow Chart (cont.)

Council Planning Department

Council Engineering Department

Developer’s Consulting Engineer

Are constructed works satisfactory?

Yes

Arrange “Practical Completion” inspection with Engineering Dept.

No

Advise Consultant Engineer of works required

Advise Consultant Engineer of remaining defects & Defects Liability Period

Receive copy

Prepare letter of “Practical Completion”, advise of remaining defects & Defects Liability Period

Request agreement to issue of Statement of Compliance from referral authorities

All engineering conditions on Permit complied with?

Yes

Undertake actions required to comply with Planning Permit and advise Engineering Dept. when complete

No

Arrange & supervise works and advise Council when completed

Receive original

When all works are considered compliant with permit conditions, request Statement of Compliance from Planning Department

Are constructed works satisfactory?

Yes

Planners issue Statement of Compliance when all Referral authorities agree

No

Advise Consultant Engineer of outstanding Issues

Advise Planning Department that Engineering Dept. has no objections to issue of Statement of Compliance

Receive Original

Receive copy

Receive Original

Receive copy

Receive copy

Receive original

Receive copy
Road/Drainage Defects Liability Phase – Process Flow Chart

Council Planning Department  Council Engineering Department  Developer’s Consulting Engineer

From Construction Phase

Arrange joint inspection with Council Engineering Dept. about 1 week before “End of Defects Liability Period”

Attend “End of Defects Liability Period” inspection

Are works free of defects of workmanship & materials?

Yes

No

Issue list of remedial works to be undertaken

Forward letter of final construction approval and release from Defects Liability to Developer’s Consultant Engineer

Receive copy

Receive original

End
Appendix B - Design Certification Report
Design Certification Report

Project Title: __________________________________________

Council Drawing No: ______________________________________

Name of Designer: _______________________________________

I certify that the subject drawings represent a design for which the attached design check lists provide a valid record.

I certify that this design has been carried out in accordance with current standards of good industry practice and in accordance with Warrnambool City Council’s “Guidelines for Design & Construction of Road & Drainage Infrastructure”, and specific instructions received, with the exception of departures cited in the attached design check lists for Council’s advice.

I certify that this design will not significantly impact on the environmental factors of the area as interpreted under Planning and Environment Act.

I certify that this design is in strict compliance with the development consent conditions and where a variance to the consent is found, written confirmation has been received from Council approving of the variance prior to the lodgement of Design Drawings (this includes designs for staged construction).

I certify that all structural elements of the design have been designed by an Engineer deemed to be suitably experienced in the relevant field by Council and eligible for Chartered Professional Membership of the Institution of Engineers, Australia.

Contact Phone: ___________________________    ___________________________    ________
Design Engineer    Date

Contact Postal Address:

__________________________________________

Qualifications

__________________________________________

__________________________________________

__________________________________________
## Design Check List 1
### BASE PLOT OF EXISTING FEATURES

**Drawings:** General Layout, Drainage and Intersection Layout Plans.

<table>
<thead>
<tr>
<th>Check completed by</th>
<th>Date</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(initials)</td>
<td></td>
<td>(tick)</td>
</tr>
</tbody>
</table>

1.1 Initial plot verified by site inspection for existing drainage. .......... .../.../..... ✔

1.2 Initial plot verified by site inspection for existing property descriptions, boundaries and accesses. .......... .../.../..... ✔

1.3 Initial plot of contours verified as representative of site terrain. .......... .../.../..... ✔

1.4 Trees and significant environmental features affected by the works are clearly indicated and annotated. .......... .../.../..... ✔

1.5 Features significant to heritage considerations within the works boundaries are clearly indicated and annotated. .......... .../.../..... ✔

1.6 Existing public and private property likely to be affected by these Designs are clearly indicated and annotated. .......... .../.../..... ✔

1.7 Survey and bench-marks clearly indicated and annotated. .......... .../.../..... ✔

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**DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:**

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Design Check List 2
HORIZONTAL ROAD ALIGNMENT

Drawings: General layouts, typical road cross sections, plan and longitudinal sections, intersection layouts

<table>
<thead>
<tr>
<th></th>
<th>Check completed by</th>
<th>Date</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Alignment compatible with design speed.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.2</td>
<td>Alignment is adequate in relation to clearance of roadside hazards.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.3</td>
<td>Driver and pedestrian sight distance is adequate.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.4</td>
<td>Conflict with existing services is minimised.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.5</td>
<td>Road widths and lanes meet Council’s requirements and design traffic requirements.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.6</td>
<td>Alignment of bridges suits road alignment.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.7</td>
<td>Pedestrian, bicycle and parking requirements are met.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.8</td>
<td>Provision for large vehicles such as buses, garbage trucks and emergency vehicles is adequate.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.9</td>
<td>Intersection layouts meet turning requirements of design traffic including emergency vehicles.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.10</td>
<td>Pavement width tapers and merges are adequate.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.11</td>
<td>Pedestrians and prams are catered for.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.12</td>
<td>Conflict with existing public utility services has been identified and resolved.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.13</td>
<td>Horizontal road alignment has been provided in accordance with any conditions of development consent.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>2.14</td>
<td>Horizontal road alignment setout data is clearly defined and tabulated.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
</tbody>
</table>

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:
Design Check List 3
VERTICAL ROAD ALIGNMENT

Drawings: Plan and longitudinal sections, road cross sections.

<table>
<thead>
<tr>
<th></th>
<th>Check completed by (initials)</th>
<th>Date</th>
<th>Not applicable (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Grades meet maximum and minimum requirements.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.2</td>
<td>Vertical clearances to bridges and services meet standards.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.3</td>
<td>Vertical sight distance is adequate for drivers and pedestrians.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.4</td>
<td>Cover to drainage structures or services is adequate.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.5</td>
<td>Vertical alignment is adequate for disposal of surface drainage from properties and from road.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.6</td>
<td>Grades are satisfactory for 1:100 year flood levels.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.7</td>
<td>Vertical alignment is compatible with property access.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.8</td>
<td>The gradient on an intersecting road is not significantly greater than the cross slope of the through pavement and no greater than 3% at give way and stop signs.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.9</td>
<td>Sight distance is acceptable for all accesses to roundabouts.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.10</td>
<td>Alignment coordination with horizontal alignment is in accordance with the AUSTROADS design guides as referenced in the AUS-SPEC specifications.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.11</td>
<td>Conflict with existing public utility services has been identified and resolved.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
<tr>
<td>3.12</td>
<td>Vertical road alignment setout data is clearly defined on the longitudinal sections.</td>
<td>...............</td>
<td>....../...../.......</td>
</tr>
</tbody>
</table>

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

__________________________________________________________________________

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__________________________________________________________________________
## Design Check List 4
### ROAD CROSS SECTIONS

Drawings: Typical Road Cross Sections, Road Cross Sections and Longitudinal Sections.

|   |   |   |   
|---|---|---|---
| 4.1 | Typical cross sections have complete dimensions. | ................. | ....../...../.....   | ❑   
| 4.2 | Typical cross sections have kerb & gutter, road safety barrier and surface drainage indicated. | ................. | ....../...../.....   | ❑   
| 4.3 | Batter slopes are indicated and batter treatment is indicated where appropriate. | ................. | ....../...../.....   | ❑   
| 4.4 | Pavement description and surface treatment is indicated. | ................. | ....../...../.....   | ❑   
| 4.5 | Property boundaries, service allocations and location of known existing underground services and pathway treatments are indicated. | ................. | ....../...../.....   | ❑   
| 4.6 | Sufficient cross sections are shown to define all variations and width transitions. | ................. | ....../...../.....   | ❑   
| 4.7 | Cross sections are of sufficient width to fully assess impact of road level on adjoining property. | ................. | ....../...../.....   | ❑   
| 4.8 | Stability of embankment slopes, batters and retaining walls has been verified as satisfactory. | ................. | ....../...../.....   | ❑   
| 4.9 | Cross section reference level conforms with vertical road alignment. | ................. | ....../...../.....   | ❑   
| 4.10 | Approved landscape plans detailing naturestrip widths, tree planting details submitted and approved | ................. | ....../...../.....   | ❑   

**DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:**

________________________________________________________________________
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________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Page 92 of 114
### Design Check List 5
#### ROAD AND INTERALLOTMENT DRAINAGE

**Drawings:** Drainage Plan and Schedule of Drainage Elements, Drainage Profiles and Drainage Structure Details

<table>
<thead>
<tr>
<th>Check completed by</th>
<th>Date</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(initials)</td>
<td></td>
<td>(tick)</td>
</tr>
</tbody>
</table>

5.1 Drawings indicate existing surface drainage. .................................. .../.../....  

5.2 Hydrological data is the most current available. ............................ .../.../....  

5.3 Hydrologic and hydraulic design calculations are complete and fully recorded and available for audit. .......................... .../.../....  

5.4 Underground drainage and structures do not conflict with services. .......................... .../.../....  

5.5 The designed drainage lines are compatible with existing incoming lines and outgoing lines. .......................... .../.../....  

5.6 The length of line, type of pipe, size, class and bedding requirements are indicated for each drainage line on the schedule of drainage elements. .......................... .../.../....  

5.7 Height of fill over drainage lines is within allowable limits. .......................... .../.../....  

5.8 Drainage is provided for local depressions, e.g., median areas or areas adjacent to fills. .................................. .../.../....  

5.9 The effect of headwater and back-up water on private property has been assessed. .................................. .../.../....  

5.10 Subsurface drainage has been provided when required and clearly located by line and level, with details provided. .................................. .../.../....  

5.11 The need for batter drains has been considered for fills and cuttings. .................................. .../.../....  

5.12 The height and energy level of downstream drainage has been considered. .................................. .../.../....  

5.13 Drainage structures and flowpaths are located so as to ensure safe vehicular and pedestrian transit. .................................. .../.../....  

5.14 Drainage structure number, setout, type and pipe details indicated on the drainage plans and schedule of drainage elements. .................................. .../.../....  

5.15 Emergency flowpaths are located so as to minimise impact on private property. .................................. .../.../....  

5.16 Design prepared in accordance with the principles set out in the Urban Stormwater – Best Practice Environmental Management Guidelines. .................................. .../.../....  
Design Check List 5  (continued)
ROAD AND INTERALLOTMENT DRAINAGE

Drawings: Drainage Plan and Schedule of Drainage Elements, Drainage Profiles and Drainage Structure Details

<table>
<thead>
<tr>
<th>Check completed by (initials)</th>
<th>Date</th>
<th>Not applicable (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.17 Road drainage has been provided in accordance with Council's Guidelines for Design &amp; Construction of Road &amp; Drainage Infrastructure.</td>
<td>.............   ...../...../.....</td>
<td>☐</td>
</tr>
<tr>
<td>5.18 Interallotment drains have been designed in accordance with Council’s Specification and/or Australian Rainfall and Runoff (1987 Edition).</td>
<td>.............   ...../...../.....</td>
<td>☐</td>
</tr>
<tr>
<td>5.19 Appropriate land stabilisation and velocity controls have been implemented to pipe systems, open channels and embankments.</td>
<td>.............   ...../...../.....</td>
<td>☐</td>
</tr>
<tr>
<td>5.20 For allotments affected by flood controls, the floor height controls are to be compatible with road and drainage levels.</td>
<td>.............   ...../...../.....</td>
<td>☐</td>
</tr>
<tr>
<td>5.21 Gross pollutant Traps have been designed to meet the requirements of Water Sensitive Urban Design principles</td>
<td>.............   ...../...../.....</td>
<td>☐</td>
</tr>
</tbody>
</table>

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

_________________________________________________________________________________________
_________________________________________________________________________________________
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_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________
_________________________________________________________________________________________
## Design Check List 6
### SIGNS AND MARKINGS

<table>
<thead>
<tr>
<th>Drawings: Pavement marking and signposting</th>
<th>Check completed by (initials)</th>
<th>Date</th>
<th>Not applicable (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 Sign types, sizes, locations and support structure details are shown on the drawings in accordance with AS 1742 (All parts).</td>
<td>.................. ....../...../.....</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>6.2 Pavement line marking and pavement marking type and setout is indicated on the drawings to meet the requirements of AS 1742.2.</td>
<td>.................. ....../...../.....</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>6.3 Signs and line marking have been designed in accordance with Australian Standards, Vicroads Traffic Engineering Manual Vol 2 and Council’s Policies.</td>
<td>.................. ....../...../.....</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>6.4 Speed limits have been checked and a proposal submitted to Council for modification (if required) in accordance with Vicroads Traffic Engineering Manual Vol 1 Chapter 2.</td>
<td>.................. ....../...../.....</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
## Design Check List 7

### PAVEMENT DESIGN

**Drawings:** Typical road cross sections, road cross sections

<table>
<thead>
<tr>
<th>Check completed (initials)</th>
<th>Date</th>
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</tr>
</thead>
<tbody>
<tr>
<td>7.1 The pavement design and surface treatment is shown clearly on the typical road cross sections and any variations are indicated on appropriate cross sections.</td>
<td>............... ...../...../.....</td>
<td>□</td>
</tr>
<tr>
<td>7.2 The pavement design complies with Council’s “Pavement Design Guidelines for New Subdivisions 2007” by RW Stamp &amp; Associates</td>
<td>............... ...../...../.....</td>
<td>□</td>
</tr>
<tr>
<td>7.3 Pavement design is in accordance with any conditions of development consent.</td>
<td>............... ...../...../.....</td>
<td>□</td>
</tr>
<tr>
<td>7.3 Geotechnical data is assessed as adequate and is held on the design file.</td>
<td>............... ...../...../.....</td>
<td>□</td>
</tr>
<tr>
<td>7.4 All geotechnical data has been sourced and tested by a NATA accredited laboratory.</td>
<td>............... ...../...../.....</td>
<td>□</td>
</tr>
</tbody>
</table>

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Design Check List 8
BRIDGE/MAJOR CULVERT DESIGN

Drawings: Structure details

<table>
<thead>
<tr>
<th>Check completed by (initials)</th>
<th>Date</th>
<th>Not applicable (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 The design has been performed by an Engineer deemed to be suitably experienced in the relevant field by Council and eligible for Chartered Professional Membership of the Institution of Engineers, Australia.</td>
<td>...............</td>
<td>........./...../.....</td>
</tr>
<tr>
<td>8.2 Geotechnical data is assessed as adequate and is held on the design file.</td>
<td>...............</td>
<td>........./...../.....</td>
</tr>
<tr>
<td>8.3 The type and functional dimensions of the bridges meet AS 5100, AS 4100, AS 3600, AS 1684, AS 1170,.</td>
<td>...............</td>
<td>........./...../.....</td>
</tr>
<tr>
<td>8.4 The type and class of all materials are indicated on the drawings.</td>
<td>...............</td>
<td>........./...../.....</td>
</tr>
<tr>
<td>8.5 Records of all significant design calculations are available for audit.</td>
<td>...............</td>
<td>........./...../.....</td>
</tr>
<tr>
<td>8.6 The design complies with any conditions of development consent.</td>
<td>...............</td>
<td>........./...../.....</td>
</tr>
</tbody>
</table>

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

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__________________________________________________________________________________________
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Design Check List 9
EROSION AND SEDIMENTATION CONTROL PLANS

Drawings: Erosion and Sedimentation Control Concept Plans

<table>
<thead>
<tr>
<th>Check completed by (initials)</th>
<th>Date</th>
<th>Not applicable (tick)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.2  Erosion and sedimentation control has been designed in accordance with any conditions of development consent.</td>
<td>........</td>
<td>.../.../....</td>
</tr>
</tbody>
</table>

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

________________________________________________________________________________
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________________________________________________________________________________
________________________________________________________________________________
<table>
<thead>
<tr>
<th>Check Completed By</th>
<th>Date</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(initials)</td>
<td></td>
<td>(tick)</td>
</tr>
<tr>
<td>10.1 The design has been performed by a competent practicing Civil or Environmental Engineer.</td>
<td>/ /</td>
<td>☐</td>
</tr>
<tr>
<td>10.2 Geotechnical Data is assessed as adequate and is held on the design file.</td>
<td>/ /</td>
<td>☐</td>
</tr>
<tr>
<td>10.3 The design meets the requirement of the Water Sensitive Urban Design Engineering Procedures Manual and a recommended inspection/maintenance regime has been prepared.</td>
<td>/ /</td>
<td>☐</td>
</tr>
<tr>
<td>10.4 The type and class of all materials are indicated on the drawings, including appropriate landscaping.</td>
<td>/ /</td>
<td>☐</td>
</tr>
<tr>
<td>10.5 All structures including inlet, outlet and spillway structures are fully detailed.</td>
<td>/ /</td>
<td>☐</td>
</tr>
<tr>
<td>10.6 Records of all significant design calculations are available for audit as per Design Calculation Summary WUSD Manual.</td>
<td>/ /</td>
<td>☐</td>
</tr>
<tr>
<td>10.7 The design complies with any Conditions of Development Consent.</td>
<td>/ /</td>
<td>☐</td>
</tr>
<tr>
<td>10.8 Glenelg Hopkins Catchment Management Authority approval or endorsement of plans, has been obtained, where required.</td>
<td>/ /</td>
<td>☐</td>
</tr>
</tbody>
</table>
DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Appendix C - Pavement Design Guidelines

(Refer Attachment)
Appendix D –

Warrnambool City Council Standard Drawings

(Refer Attachment)
Appendix E – Rainfall Design Intensity Charts
Appendix E - Rainfall Design Intensity Charts

DESIGN RAINFALL INTENSITY DIAGRAM

LOCATION
36.375 S 142.475 E

* EXCESS RAINFALL INTENSITY ARE THOSE REQUIRED.
SINCE DATA IS BASED ON THOSE AND NOT THE LOCATION NAME.

ISSUED 4TH AUGUST 1997
REF. FY4674

PREPARED BY -- HYDRO-METEOROLOGICAL ADVISORY SERVICE -- MELBOURNE
(© COMMONWEALTH OF AUSTRALIA, BUREAU OF METEOROLOGY 1987)

Symbol: A B C D E F G
Average Recurrence
Interval (Years): 1 2 5 10 20 50 100

Rainfall Intensity in mm per hour

Duration in hours or minutes
### Guidelines for the Subdivision & Development of Land

**LOCATION** 38.375 S 142.475 E  *NEAR* Warrnambool

**ISSUED** 4th AUGUST 1997  **REFER:** FY4674

**PREPARED BY** HYDROMETEOROLOGICAL ADVISORY SERVICE  **MELBOURNE**

(C) COMMONWEALTH OF AUSTRALIA, BUREAU OF METEOROLOGY 1997

---

**LIST OF COEFFICIENTS TO EQUATIONS OF THE FORM**

$$\ln(i) = A + B(\ln(T))^2 + C(\ln(T))^2 + D(\ln(T))^2 + E(\ln(T))^2 + F(\ln(T))^2 + G(\ln(T))^4$$

- **T** = Time in Hours
- **I** = Intensity in Millimeters Per Hour

**RETURN PERIODS (YEARS):**

<table>
<thead>
<tr>
<th>Period (Years)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
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<tr>
<td>1</td>
<td>2.4619</td>
<td>-0.019</td>
<td>-0.014</td>
<td>0.01981</td>
<td>-0.01566</td>
<td>-0.006506</td>
<td>0.0001109</td>
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<tr>
<td>2</td>
<td>2.7227</td>
<td>-0.0205</td>
<td>-0.0269</td>
<td>0.01652</td>
<td>-0.01376</td>
<td>-0.005565</td>
<td>0.0000678</td>
</tr>
<tr>
<td>5</td>
<td>3.0807</td>
<td>-0.0290</td>
<td>-0.0175</td>
<td>0.00654</td>
<td>-0.01169</td>
<td>-0.002564</td>
<td>0.0000310</td>
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<tr>
<td>10</td>
<td>3.1241</td>
<td>-0.0404</td>
<td>-0.0149</td>
<td>0.00752</td>
<td>-0.01211</td>
<td>-0.00183</td>
<td>0.0000096</td>
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<tr>
<td>20</td>
<td>3.2392</td>
<td>-0.0519</td>
<td>-0.0215</td>
<td>0.00900</td>
<td>-0.01271</td>
<td>-0.000997</td>
<td>0.000016</td>
</tr>
<tr>
<td>50</td>
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<td>-0.0542</td>
<td>-0.0191</td>
<td>0.00738</td>
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<td>100</td>
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<td>-0.0733</td>
<td>-0.0352</td>
<td>0.00718</td>
<td>-0.01459</td>
<td>-0.000752</td>
<td>-0.000042</td>
</tr>
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**RANKED INTENSITY IN MILLIMETERS FOR VARIOUS DURATIONS AND RETURN PERIODS**

- **DURATION (HOURS):**
- **RETURN PERIODS:**

<table>
<thead>
<tr>
<th>Duration (Hours)</th>
<th>1 Year</th>
<th>2 Years</th>
<th>5 Years</th>
<th>10 Years</th>
<th>20 Years</th>
<th>50 Years</th>
<th>100 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0.005</td>
<td>39.94</td>
<td>52.38</td>
<td>57.1</td>
<td>67.4</td>
<td>107.1</td>
<td>138.1</td>
</tr>
<tr>
<td>6</td>
<td>0.106</td>
<td>27.15</td>
<td>40.61</td>
<td>51.6</td>
<td>99.5</td>
<td>127.7</td>
<td>150.7</td>
</tr>
<tr>
<td>10</td>
<td>0.157</td>
<td>30.2</td>
<td>42.3</td>
<td>54.4</td>
<td>64.8</td>
<td>78.5</td>
<td>99.2</td>
</tr>
<tr>
<td>20</td>
<td>0.223</td>
<td>31.1</td>
<td>39.8</td>
<td>38.1</td>
<td>44.8</td>
<td>52.6</td>
<td>68.8</td>
</tr>
<tr>
<td>30</td>
<td>0.306</td>
<td>17.5</td>
<td>23.1</td>
<td>30.3</td>
<td>36.1</td>
<td>41.9</td>
<td>51.9</td>
</tr>
<tr>
<td>60</td>
<td>1.000</td>
<td>11.7</td>
<td>15.3</td>
<td>19.7</td>
<td>22.7</td>
<td>26.0</td>
<td>33.0</td>
</tr>
<tr>
<td>90</td>
<td>1.339</td>
<td>7.67</td>
<td>10.6</td>
<td>12.7</td>
<td>14.5</td>
<td>17.1</td>
<td>20.8</td>
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<tr>
<td>120</td>
<td>1.857</td>
<td>7.97</td>
<td>9.17</td>
<td>11.1</td>
<td>12.1</td>
<td>15.8</td>
<td>19.1</td>
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<tr>
<td>180</td>
<td>3.000</td>
<td>5.97</td>
<td>7.33</td>
<td>8.77</td>
<td>11.1</td>
<td>13.1</td>
<td>15.8</td>
</tr>
<tr>
<td>270</td>
<td>5.000</td>
<td>3.87</td>
<td>4.95</td>
<td>6.35</td>
<td>7.10</td>
<td>8.30</td>
<td>10.0</td>
</tr>
<tr>
<td>360</td>
<td>8.000</td>
<td>2.47</td>
<td>3.19</td>
<td>3.86</td>
<td>4.51</td>
<td>5.26</td>
<td>5.52</td>
</tr>
<tr>
<td>480</td>
<td>12.000</td>
<td>1.53</td>
<td>1.99</td>
<td>2.49</td>
<td>2.82</td>
<td>3.29</td>
<td>3.95</td>
</tr>
<tr>
<td>720</td>
<td>24.000</td>
<td>0.81</td>
<td>1.18</td>
<td>1.50</td>
<td>1.70</td>
<td>2.00</td>
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<tr>
<td>1080</td>
<td>48.000</td>
<td>0.81</td>
<td>1.18</td>
<td>1.50</td>
<td>1.70</td>
<td>2.00</td>
<td>2.42</td>
</tr>
</tbody>
</table>

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Page 105 of 114
Appendix F – Tree Species List
Appendix F – Recommended Street Tree Species List

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Scientific Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corymbia maculata</td>
<td>Corymbia maculata</td>
<td>(Spotted Gum)</td>
</tr>
<tr>
<td>Angophora costata</td>
<td>Angophora costata</td>
<td>(Smooth Bark Apple)</td>
</tr>
<tr>
<td>Araucaria cunninghamii</td>
<td>Araucaria cunninghamii</td>
<td>(Hoop Pine)</td>
</tr>
<tr>
<td>Araucaria heterophylla</td>
<td>Araucaria heterophylla</td>
<td>(Norfolk Island Pine)</td>
</tr>
<tr>
<td>Ficus macrophylla</td>
<td>Ficus macrophylla</td>
<td>(Moreton Bay Fig)</td>
</tr>
<tr>
<td>Ficus rubiginosa</td>
<td>Ficus rubiginosa</td>
<td>(Port Jackson Fig)</td>
</tr>
<tr>
<td>Flindersia australis</td>
<td>Flindersia australis</td>
<td>(Australian Teak)</td>
</tr>
<tr>
<td>Phoenix canariensis</td>
<td>Phoenix canariensis</td>
<td>(Canary Island Date Palm)</td>
</tr>
<tr>
<td>Quercus canariensis</td>
<td>Quercus canariensis</td>
<td>(Algerian Oak)</td>
</tr>
<tr>
<td>Quercus ilex</td>
<td>Quercus ilex</td>
<td>(Holme Oak)</td>
</tr>
<tr>
<td>Quercus rubra</td>
<td>Quercus rubra</td>
<td>(Red Oak)</td>
</tr>
<tr>
<td>Zelkova serrata</td>
<td>Zelkova serrata</td>
<td>(Zelkova)</td>
</tr>
<tr>
<td>Lophostemon conferta</td>
<td>Lophostemon conferta</td>
<td>(Brushbox)</td>
</tr>
<tr>
<td>Ulmus glabra Lutescens</td>
<td>Ulmus glabra Lutescens</td>
<td>(Golden Elm)</td>
</tr>
<tr>
<td>Ulmus x hollandica</td>
<td>Ulmus x hollandica</td>
<td>(Dutch Elm)</td>
</tr>
<tr>
<td>Quercus palustris</td>
<td>Quercus palustris</td>
<td>(Pin Oak)</td>
</tr>
<tr>
<td>Platanus orientalis</td>
<td>Platanus orientalis</td>
<td>(Oriental Plane Tree)</td>
</tr>
<tr>
<td>Eucalyptus pryoriana</td>
<td>Eucalyptus pryoriana</td>
<td>(Manna Gum)</td>
</tr>
<tr>
<td>Eucalyptus pulchella</td>
<td>Eucalyptus pulchella</td>
<td>(White Peppermint)</td>
</tr>
<tr>
<td>Glochidion ferdinandii</td>
<td>Glochidion ferdinandii</td>
<td>(Cheese Tree)</td>
</tr>
<tr>
<td>Corymbia ficifolia</td>
<td>Corymbia ficifolia</td>
<td>(Red Flowering Gum)</td>
</tr>
<tr>
<td>Corymbia eximia</td>
<td>Corymbia eximia</td>
<td>(Yellow Bloodwood)</td>
</tr>
<tr>
<td>Hymenosporum flavum</td>
<td>Hymenosporum flavum</td>
<td>(Native Frangipani)</td>
</tr>
<tr>
<td>Banksia integrifolia</td>
<td>Banksia integrifolia</td>
<td>(Coastal Banksia)</td>
</tr>
<tr>
<td>Metrosideros excelsa</td>
<td>Metrosideros excelsa</td>
<td>(NZ Christmas Tree)</td>
</tr>
<tr>
<td>Fraxinus 'Raywood'</td>
<td>Fraxinus 'Raywood'</td>
<td>(Claret Ash)</td>
</tr>
<tr>
<td>Koelreuteria paniculata</td>
<td>Koelreuteria paniculata</td>
<td>(Golden Rain Tree)</td>
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<tr>
<td>Pistacia chinensis</td>
<td>Pistacia chinensis</td>
<td>(Chinese Pistachio)</td>
</tr>
<tr>
<td>Parrotia persica</td>
<td>Parrotia persica</td>
<td>(Persian Witch Hazel)</td>
</tr>
<tr>
<td>Ficus platypoda</td>
<td>Ficus platypoda</td>
<td>(Rock Fig)</td>
</tr>
<tr>
<td>Agonis flexuosa</td>
<td>Agonis flexuosa</td>
<td>(Willow Myrtle)</td>
</tr>
<tr>
<td>Eucalyptus leucoxylon 'Rosea'</td>
<td>Eucalyptus leucoxylon 'Rosea'</td>
<td>(Yellow Gum)</td>
</tr>
<tr>
<td>Koelreuteria bipinatta</td>
<td>Koelreuteria bipinatta</td>
<td>(Pride of China)</td>
</tr>
<tr>
<td>Quercus acutissima</td>
<td>Quercus acutissima</td>
<td>(Sawtooth Oak)</td>
</tr>
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</table>
Magnolia grandiflora Greenback (Magnolia)
Callistemon salignus (Willow Bottlebrush)
Tristaniopsis laurina (Water Gum)
Banksia ericifolia (Heath Banksia)
Banksia marginata (Silver Banksia)
Prunus x blireana (Purple Leafed Plum)
Elaeocarpus reticulatus (Blueberry Ash)
Syzygium luehmannii (Small-leafed Lilly Pilly)
Acmena smithii (Lilly Pilly)
Callistemon viminalis (Weeping bottlebrush)
Betula pendula (Silver Birch)
Pyres ussuriensis (Manchurian Pear)
Pyrus calleryana (Chanticleer Pear)
Prunus cerasifera 'Nigra' (Purple Leaved Cherry Plum)
Callistemon citrinus (Crimson Bottlebrush)
Callistemon 'Kings Park Special' (Kings Park Special)
Callistemon pallidus (Lemon Bottlebrush)
Grevillea banksii (Banks Grevillea)
Grevillea 'Misty Pink' (Misty Pink Grevillea)
Grevillea 'Honey Gem' (Honey Gem Grevillea)
Lagerstroemia indica x L. fauriei 'Acoma' (Crepe Myrtle)
Allocasaurina verticillata (Drooping She Oak)
Hakea laurina (Pincushion Hakea)

References:
- Warrnambool Local Plant Guide.
- Botanica’s Trees and Shrubs.
Appendix G - Non Standard Street Lighting Policy
Appendix H - Non Standard Street Lighting Policy

Objective

The objective of this Policy is to set out a Regime, which facilitates installation of non-standard lighting in Council owned streets.

Purpose

The purpose of this Policy is to enable, wherever desired by the Developer, installation of decorative lighting, which enhances the aesthetic appeal of the development.

The policy is also intended to enable Council to maintain control over the number of non-standard street lighting alternatives to be permitted in order to facilitate maintenance, replacement and consistency.

Definitions

Non-Standard Lighting - Lighting which is not maintained by the Electricity Company within its normal tariff structure.

Operational Arrangements

Council pays same lighting tariff as for standard lighting. The Electricity Company only maintains and replaces globes and P.E. cells (Photoelectric Cells). Council is responsible for ongoing supply of pole and fittings. The Electricity Company will provide labour to undertake required maintenance at no additional cost.

Developer Contribution

In order to compensate Council for the additional costs incurred to maintain and replace Non-Standard lighting, the developer shall:

- supply the entire initial stock of poles and lanterns;
- pay and arrange for all installation;
- be responsible for all maintenance and replacement of poles and lanterns until completion of the defects liability period where Non-Standard lighting is erected. All damaged or non-operational poles or lanterns shall be repaired/replaced within 48 hours.
Approval

Approval for the use of Non-Standard lighting shall be subject to Developer obtaining written agreement from the Energy Supply Authority to:

- the street lighting design and;
- the type of Non-Standard lighting; and
- for the standard lighting tariff to apply.

Conformity

- Must comply with Powercor Standards
- Poles shall be uniform in colour throughout an estate and all visible areas of a pole shall be identical colour;
- Minimum mounting height to be 5.5 meters above finished surface level;
- Only ground set poles are permitted to be used;
- Light fittings will be of the same colour as the poles;
- All fittings to have integral P.E. cells and be manufactured in accordance with AS 3771;
- Only one type of style of pole and lantern is to be used within an estate;
- Poles and light fittings to be hot dipped galvanised;
- Non-Standard lighting may be used on local, collector and main roads;
- All lighting designs must be in accordance with current Australian Standards;
- Lighting must comply with the Energy Supply Authority’s guidelines for Non-Standard Public Lighting Equipment for category B lighting - Minor Roads and category A- Main Roads;
- Non-Standard light fitting alternatives are limited to the types listed on the following schedule;
- Coated poles must meet the requirements for a marine environment and must be guaranteed against corrosion for a minimum of 5 years (guarantee documents must be submitted to Council)

Lamp Types

<table>
<thead>
<tr>
<th>Wattage</th>
<th>Manufacture</th>
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<tr>
<td>80mv</td>
<td>Sylvania Lighting</td>
<td>Bourke Hill</td>
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<tr>
<td>80mv</td>
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<td>Toorak Series</td>
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<td>150-250 HPS</td>
<td>Sylvania Lighting</td>
<td>Parkville Series</td>
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Permissible poles

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<tr>
<th>POLE PROFILE</th>
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<tr>
<td>Tapered Octagonal</td>
<td>Gooseneck</td>
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<tr>
<td>Tapered Octagonal</td>
<td>Standard URD</td>
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<tr>
<td>Round</td>
<td>St Kilda</td>
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<tr>
<td>Round</td>
<td>Waverly</td>
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<td>Promenade</td>
<td>Standard</td>
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Permissible colours

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<tr>
<td>Hawthorn Green</td>
</tr>
<tr>
<td>Black</td>
</tr>
</tbody>
</table>
Appendix H – Reference Documents
Appendix H – Reference Documents

The following Australian Standards have been referenced in relation to the development of these guidelines

**Aust Standards**

1170  Structural design actions  
1482  Design for access and mobility  
1684  Residential timber-framed construction  
1742  Manual of uniform traffic control devices  
1742.2 Manual of uniform traffic control devices—Traffic control devices for general use  
3600  Concrete structures  
4100  Steel structures  
5100  Bridge design

**Other References**

Australian Rainfall and Runoff (AR&R)  
Melbourne Water - Water Sensitive Urban Design Manual  
AustRoads AP-R232/03 Guidelines for Treatment of Stormwater Runoff from the Road Infrastructure  
Council's Policies and Guidelines  
Planning and Environment Act 1987  
Local Government Act 1989  
Subdivision Act 1988  
Vicroads Traffic Engineering Manual Vol 1 Traffic management  
Vicroads Traffic Engineering Manual Vol 2 Signs and Markings