SUSTAINABLE COMMUNITIES

Infrastructure Development Guidelines

CITY OF GREATER GEELONG
JUNE 2016














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CITY OF GREATER GEELONG



DOCUMENT GOVERNANCE

The Infrastructure Development Guidelines are produced by the City of Greater Geelong. Ensuring the information it contains is accurate and current would not be possible without the contributions and assistance of staff across the organisation.

The Infrastructure Development Guidelines are continually reviewed and updated, not only to account for changes in agency information, but also to better describe and define improvements and changes in the management of infrastructure and the development of sustainable communities.

Reference documents referred to within this document shall be taken as meaning the latest current edition of the document.

FORMAL INFRASTRUCTURE GUIDELINES DOCUMENT REVIEW

The Infrastructure Development Guidelines document is reviewed annually by a committee. Membership of the Committee will be drawn from a core group of officers from the City. The role of this group is to review the document and consult with other City departments and external agencies to ensure best practice in the development of infrastructure.

The core group consists of the following City of Greater Geelong officers:

- Co-ordinator Infrastructure Management (Chair),
- Co-ordinator Recreation & Open Space,
- Co-ordinator Community Facilities,
- Co-ordinator Urban Growth Area Planning,
- Co-ordinator Sustainability.

As part of the review process it may be deemed necessary to create sub-committees and working groups to investigate new standards or industry trends for inclusion into the Infrastructure Guidelines. It is proposed an updated version of the Infrastructure Guidelines is produced every 12 months.

Copies and updates to the Infrastructure Development Guidelines are available from the City's website **www.geelongaustralia.com.au**

Users of the Guidelines are also invited to suggest improvements and amendments via the City Web project page feedback box. These will be discussed and considered as part of the formal review process. Recommended changes to the infrastructure guidelines will be forwarded to the Executive Management team at the City of Greater Geelong for approval following a two-week exhibition period of the draft alterations.

ACKNOWLEDGEMENTS:

This document has been prepared by the City of Greater Geelong as a collaborative project by a number of internal CoGG departments.

The following Council officers are acknowledged as members of the Project Control Group:

John Bryce
Engineering Services

Stephen Parker
Sport, Recreation and Open Space

Robert Anderson
Urban Growth Area Planning

Burke Renouf
Environment and Natural Resources

Liz Coles
Community Facilities

Please Note:
These Infrastructure Development Guidelines have been prepared using the most relevant information available at the time of writing. It is acknowledged that it does not include everything that will be required for infrastructure development, but this document is a good starting point and guide for planning and construction.

The Australian Standards that are referenced in this document are current at the time of publication.

It is the responsibility of the individual to follow all the required policies and to seek clarification about any additional documents that may become relevant in the future.

Contents

1. Introduction 7

2. Transport and Movement 12

2.1. Objectives 12
2.2. Principles 12
2.3. Relevant Standards and Policy 13
2.3.1. Legislation 13
2.3.2. Industry Standards 13
2.3.3. Policy and Guidelines 13
2.4. Planning 14
2.5. Climate Change Considerations 14
2.6 Design and Construction 15
2.6.1. Circulation Infrastructure 15
2.6.1.1. Safety 15
2.6.1.2. Accessibility 15
2.6.1.3. Way-finding 15
2.6.2. Footpaths, Cycle Ways and Shared Paths 15
2.6.3. Car Parking 16
2.6.4. Public Transport Infrastructure 17
2.6.5. Utilities 17
2.6.6. Street Lighting 17
2.6.7. Waste Management 17

3. Landscape and Streetscape 18

3.1. Objectives 18
3.2. Principles 19
3.3. Relevant Standards and Policy 19
3.3.1. Legislation 19
3.3.2. Industry Standards 19
3.3.3. Policy and Guidelines 19
3.4. Planning 20
3.4.1. Landscape Plans 20
3.5. Climate Change Considerations 20
3.6. Design and Construction 20
3.6.1. Plant and Turf Selection and Management 20
3.6.2. Planting in Roundabouts and Traffic Control Devices 22
3.6.3. Landscape Materials 22
3.6.4. Trees and Underground Services 22
3.6.5. New Developments – Maintenance Period 23
3.6.6. Weed Management 23
3.6.7. Furniture and Other Infrastructure 23
3.6.8. Owners Corporations 23
3.6.9. Signage 24
3.6.10. Entry Treatments 24
3.6.11. Public Art 25

4. Water Management 26

4.1. Objectives 26
4.2. Principles 27
4.3. Relevant Standards and Policy 27
4.3.1. Legislation 27
4.3.2. Industry Standards 27
4.3.3. Policy and Guidelines 28
4.4. Planning 28
4.4.1. Permits and Permissions 28
4.4.2. Integrated Water Cycle Management Plans 28
4.5. Climate Change Considerations 29
4.6. Design and Construction 29
4.6.1. Wetlands and Waterways 29
4.6.2. Drainage 30
4.6.3. Alternative Water Supplies 30
4.6.4. Stormwater Harvesting and Reuse 30
4.6.5. Rainwater Tanks 30
4.6.6. Irrigation Design and Installation 31

5. Sport, Recreation & Open Space 32

5.1. Objectives 32
5.2. Principles 33
5.3. Relevant Standards and Policy 34
5.3.1. Legislation 34
5.3.2. Industry Standards 34
5.3.3. Policy and Guidelines 34
5.4. Planning 34
5.4.1. Master Planning 34
5.5. Climate Change Considerations 35
5.6. Design and Construction 36
5.6.1. Informal Parks 36
5.6.1.1. Development Standards for Informal Parks 38

5.6.2. Sports Reserves and Active Playing Surfaces 41
5.6.2.1. Development Standards for Active Sports Reserves 42
5.6.2.2. Pavilions and Built Infrastructure for Sporting Reserves 45
5.6.2.3. Sporting Surface Dimensions 46
5.6.2.4. Sporting Maintenance and Storage Facilities 46
5.6.3. Play Spaces 47
5.6.3.1. Local/Neighbourhood Playgrounds 47
5.6.3.2. District/Sub-regional Playgrounds 47
5.6.3.3. Regional Playgrounds 47
5.6.4. Linkages and Connections 48
5.6.5. Lighting in Open Space 48
5.6.6. Public Toilets 48

6. Social & Community Facilities 49

6.1. Objectives 49
6.2. Principles 50
6.3. Relevant Standards and Policy 50
6.3.1. Legislation 50
6.3.2. Industry Standards 50
6.3.3. Policy and Guidelines 50
6.4. Planning 51
6.4.1. Community Hubs 51
6.4.2. Benchmarking 52
6.4.3. Benchmarking Standards 54
6.4.4. Importance of Community Spaces 56
6.5. Climate Change Considerations 56
6.6. Design and Construction 57
6.6.1. Design Principles for Community Services Facilities 57
6.6.2. Critical Floor Space Allocations 58
6.6.3. Playgrounds within Community Facilities 58

7. Biodiversity & Conservation Areas 59

7.1. Objectives 59
7.2. Principles 60
7.3. Relevant Standards and Policy 60
7.3.1. Legislation 60
7.3.2. Standards 60
7.3.3. Policy and Guidelines 60
7.4. Planning 61
7.4.1. Identification and Assessment of Environmental Significance 61
7.4.2. Planning Principles 61
7.4.3. Planning to Avoid and Minimise Impacts on Areas of Environmental Significance 61
7.5. Climate Change Considerations 62
7.6. Design 62
7.6.1. Areas of Environmental Significance 62
7.6.2. Access 62
7.6.3. Recreation Facilities and Furniture 63
7.6.4. Fencing 63
7.6.5. Rehabilitation 64
7.6.6. Revegetation 64
7.6.7. Wildlife Management 64
7.6.8. Salvage of Significant Flora 64
7.6.9. Constructed Wetlands and Water Sensitive Urban Design (WSUD) Infrastructure 64
7.7. Construction 65
7.7.1 Construction Environmental Management Plans (CEMP) 65
7.7.2 Protection of Native Vegetation 65
7.7.3. Erosion Prevention 65
7.7.4. Weed Control Prior, During and Post Construction 66
7.8. Management 66
7.8.1 Fire Management 66
7.8.2. Weed Management 67
7.8.3. Pest Animals 67
7.8.4. Vegetation Restoration Plan 67
7.8.5. Signage 67
7.8.6. Dogs and Other Domestic Animals 67
7.9. Stakeholder Consultation 67

8. Process for Application/Approval 69

8.1. Pre Application 69
8.2. General Planning Permit Application Process 70
8.3. Demonstration of Compliance 70


City Plan 2013 - 2017: Our Vision
“Geelong: coast, country and suburbs is the best place to live through prosperous and cohesive communities in an exceptional environment.”



1 INTRODUCTION

These guidelines have been prepared to facilitate the development of Sustainable Communities through quality planning, design and construction of infrastructure in the City of Greater Geelong. They will assist with the upgrade and redevelopment of existing infrastructure as well as the establishment of new communities throughout the municipality.

Sustainable Communities:

- Are places where people want to live, work and play,
- Meet diverse needs of existing and future residents,
- Offer a high quality of life and promote community connectedness,
- Lead the way with environmental outcomes and maximising natural settings,
- Are safe, inclusive and engaging,
- Possess economic vitality that promotes diverse activity,
- Focus on integrated planning of all aspects of community and liveability,
- Offer good access to quality services and community facilities, and
- Are well connected and welcoming for residents and visitors.

Community infrastructure is the collection of physical and publicly accessible assets used by the community that support its health, well being, sense of place and community. The City of Greater Geelong expects that infrastructure will be of high quality, responsive to changing community needs and aspirations and will be able to be maintained within operational budgets. Minimum standards may be specified to ensure that an acceptable standard of development is achieved; however creative design that maximises a sites' natural settings and features will be encouraged.

Innovative design solutions and construction techniques will result in communities that are individual and promote their unique qualities.

City Plan 2013-2017 identifies outcomes for the communities of Greater Geelong as:

Community Wellbeing

Objective: To improve the health and quality of life of all residents of Greater Geelong

Outcomes:

- Improved healthy eating and physical activity,
- Increased lifelong learning and literacy,
- Liveable neighbourhoods.

Objective: The City of Greater Geelong leads the community in sustainable planning and environmental action.

- Increased use of public transport and active transport
- A reduction in the organisation's environmental footprint
- Agreed standards for sustainable development are in operation
- The Climate Change Adaptation Strategy is established
- Enhancement and protection of natural areas

Growing the Economy

Objective: Securing Geelong's Economic Future

Outcomes:

- Plan and develop the National Transport and Logistics Precinct,
- Development of the Cosmopolitan Heart,
- Managed Growth.

INTRODUCTION

The City of Greater Geelong acknowledges the importance of balancing economic growth, providing vibrant and informed communities and preserving and protecting the City's unique environmental assets. The Geelong Sustainability Framework 2006 - 2011 establishes directions to be pursued to be a more sustainable City.

Geelong's natural assets – forests, air, water, land, plants, animals and climate – must be protected and a balance between their use and maintaining the ecosystem services they provide must be achieved.

Consideration must also be given to how natural resources are used and the need for greater efficiencies to reduce consumption of resources and the generation of waste.

The Geelong community also needs to understand how choices made in their everyday lives can reduce their impact on the environment. To this end, the importance of environmentally sustainable design (ESD) is reinforced throughout this document.

It is important to plan, design and construct community infrastructure in a responsible and sustainable way because such infrastructure:

- Affects people's ability to go about their everyday life,
- Can incorporate adaptable and flexible environments that cater for changing needs over time,
- Increases people's chance of meeting others, accessing services and being active members of communities,
- Preserves natural values and incorporate environmental features, and
- Enhances health and well being through opportunities for physical activity and active lifestyle.

It is anticipated that these guidelines will be used by Developers, Agencies and Authorities, CoGG staff, and Consultants on behalf of Clients.

The next few sections of these guidelines outlines the various types of infrastructure and the relevant standards and reference documents that should be used in the planning, design and development of infrastructure. In some cases, the requirements are summarised with reference to other documents that contain greater detail, in other cases, the requirements are detailed in this document. These sections should be closely followed to ensure that minimum requirements are achieved.

Some sections refer to infrastructure in terms of its hierarchy - e.g. regional, sub-regional, local, etc. These levels of hierarchy, which will guide development standards, may differ for various types of infrastructure. Each section should be read according to its own definition of hierarchy.

Master planning is an important consideration and often a requirement for community and open space infrastructure. It will be important that master plans are prepared by professionals with appropriate qualifications and are developed in accordance with these development standards.

This document has been prepared with a standard format for each type of infrastructure.

Within each section:

- The objectives and principles of development are summarised,
- The relevant standards and policies are outlined including legislation, industry standards, policies and guidelines,
- Planning considerations are discussed with particular reference to relevant resource materials that should be used in planning phases, and
- Design and construction guidance and requirements are covered to ensure that there is consistency and compliance with minimum standards of infrastructure development.

The infrastructure discussed in these guidelines includes:

Transport and Movement	Roads, Footpaths and Pathways Public Transport Street Lighting, Utilities and Waste Management
Landscape and Streetscape	Park and Street Planting Turf and Planting Preferences Weed Management Furniture and Signage Entry Treatments
Water Management	Irrigation Water Sensitive Urban Design Wetlands and Waterways – constructed/modified
Sport, Recreation and Open Space	Informal Parks Sporting Open Space Pavilions and Built Infrastructure Play Spaces Linkages and Connections Public Toilets
Social and Community Facilities	Community Hubs Libraries Infrastructure for all age groups
Environment and Biodiversity	Conservation of Flora and Fauna Natural Waterways Fire Management

INTRODUCTION

These guidelines are intended to be used as a guide for planning, design and development. While there are many aspects of the guidelines that are quite specific about development outcomes, the City encourages innovation and creative solutions to the development of sustainable communities.

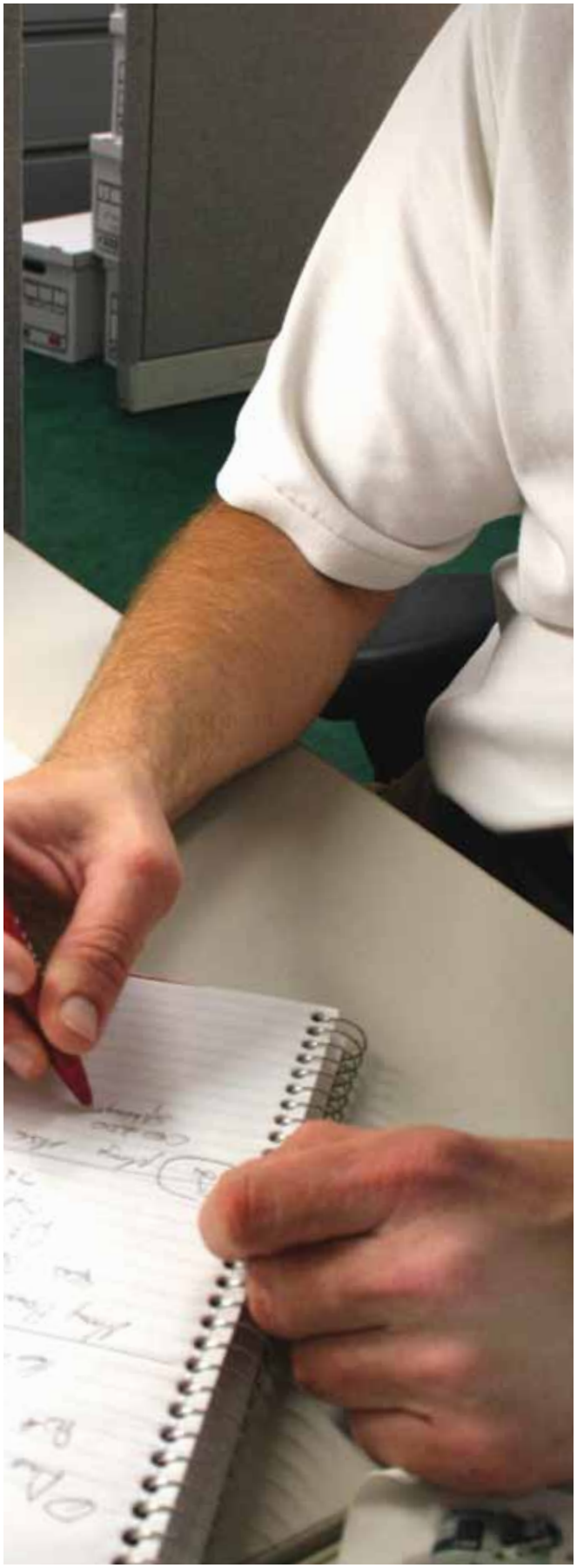
A pre-application meeting for applicants seeking planning approval is critical to discuss and negotiate aspects of proposed developments. Any application area will form part of the larger neighbourhood or region and it will be important to understand the context for every development and consider other requirements for community outcomes that will be important for the City to achieve.

It should be noted that strategic planning documents that include structure plans, urban development frameworks and urban growth plans provide critical detail and/or direction in relation to streetscapes, road and footpath treatments, linkages and landscapes. These documents should be examined to ensure infrastructure provision is consistent with these approved documents.

Examples of key documents are:

Structure Plans	Barwon Heads Corio - Norlane Geelong St Leonards Indented Head Lara Ocean Grove West Fyans Point Lonsdale Drysdale - Clifton Springs Leopold
Urban Growth Plans	Armstrong Creek Jetty Road
Precinct Structure Plans	Armstrong Creek East Armstrong Creek West Armstrong Creek North East Industrial Lara West
Urban Design Frameworks	Portarlington Leopold St Leonards Barwon Heads

Section 8 of this document describes the process for application and approval. It also provides points of contact within the City of Greater Geelong should further information be required.



INTRODUCTION



CLIMATE CHANGE CONSIDERATIONS CONSIDERATIONS

Climate change effects are already experienced today and even in the most optimistic scenarios, additional effects are already locked in. Even if we could stop all greenhouse gas emissions today, inertia in the climate system means that temperatures are likely to continue to increase. It is important that infrastructure within the City of Greater Geelong considers the potential impacts of climate change, to reduce the risks facing the city in future. However, incorporating climate change can be challenging because of the uncertainty associated with timing, extent and geographic location of the impacts.

Infrastructure design in Geelong should consider the following principles to ensure that:

- Future climate (rather than current climate) is considered when designing new infrastructure or developments.
- Design responses do not result in maladaptation, ending up worse than you started prior to implementing adaptation measures, either through overestimating or underestimating the effects of the climate change impacts.
- Integrated and multi-benefit responses are considered whenever appropriate.

THE PRINCIPLES

The infrastructure or developments should be designed in such a way that:

1. They remain viable under the widest range of probable climate futures.
2. They can be implemented within planned budgets, or refer to sufficient evidence to justify budget/ revenue increases.
3. They incorporate flexible features (eg. for future upgrades) and preserve options (wherever possible).
4. Due consideration is given to systemic interdependencies when considering climate impacts.

The application of these principles to specific categories of infrastructure is illustrated in each section by high level examples.

Appendix A outlines a checklist of key issues to consider when considering the potential implications of climate change.





2 TRANSPORT & MOVEMENT

2.1. OBJECTIVES

Urban infrastructure is designed to promote on-street activity and community life by promoting amenity for pedestrians and cyclists and safety for all road users. This includes canopy shade; seating; appropriate on-path lighting; comfortable and accessible public transport infrastructure; transport stop infrastructure that facilitates access by aged and disabled persons; comfortable places with visual amenity for resting and relaxing; and interesting spaces for children and young people.

The City of Greater Geelong encourages developers to take an integrated and innovative approach to designing new infrastructure.

Streetscapes and roads must facilitate efficient and safe movements for road users; include water sensitive urban design; encourage active and public transport; be easy to maintain; and include street trees whilst minimising issues with access and damage to underground utility services. *(Refer to Section 3 for Landscape and Streetscape and Section 4 for Water Management)*.

This section generally applies to the following Planning Zones:

- (GRZ, RGZ, NRZ and MUZ) – Residential Zones
- (RDZ1 and RDZ2) – Road Zones
- (C1Z and C2Z) – Commercial Zones
- (IN1Z, IN2Z and IN3Z) – Industrial Zones
- (PUZ) – Public Use Zone
- (SUZ) – Special Use Zone

Planning Overlays may also apply to the land that influence the type and nature of development, examples of these include: flood, land subject to inundation, environmental significance, vegetation protection, special building, public acquisition, heritage, design and development and development plan overlays.

2.2. PRINCIPLES

The design of urban form, streets and infrastructure must ensure that:

- Transport corridors, pedestrian networks and cycling networks are designed to recognise the long term use of the area.
- Open space corridors and green belts are promoted and encouraged.
- Current and projected community demographic characteristics inform the design process.
- Infrastructure provides for people of all abilities.
- Non-motorised modes of travel are encouraged.
- Streets are designed to: maximise community life; look and feel safe; and connect people to their community and destinations of choice.
- Infrastructure is responsive to the nature, sustainable capacity and characteristics of proposed locations.
- Construction and material selection enables easy and cost effective maintenance.
- Environmental impacts are minimised.
- A consistent aesthetic is provided across the City of Greater Geelong (branded development styles are to be negotiated).
- Treed community spaces including both parks and streets reduce the heat island effect as part of the overall benefit provided by treed environments.
- Materials used for construction are sustainable and readily sourced.

2.3. RELEVANT STANDARDS AND POLICY

Key documents relating to the design and construction of new communities include the following:

2.3.1. LEGISLATION

Disability Discrimination Act 1992 (Com).

Road Management Act 2001 (Vic).

Subdivision Act 1988 (Vic).

2.3.2. INDUSTRY STANDARDS

AS 1742.9 – Manual of uniform traffic control devices – Bicycle Facilities.

AS 2890.3-1993 –Parking facilities – Bicycle parking facilities.

AS/NZS 2890.1-2004 – Parking facilities part 1: Off street car parking.

AS 2156.1-2001 – Walking tracks – Classification and signage.

AS 2156.2-2201 – Walking tracks – Infrastructure design.

AS1428 (Set):2010 – Design for Access and Mobility.

AS/NZS 3661.1.1: 1993 – Slip resistance of pedestrian services.

AS/NZS 3661.2: 1994 – Guide to the reduction of slip hazards.

AS/NZS 1158 (Set): 2010 – Lighting for roads and public spaces.

AS 1742.5 – 1997
Street name and community facility name signs.

AS 3996 – 2006
Metal access covers, road grates and frames.

AS/NZS 3000 :2007
Australian/New Zealand Wiring rule.

Australian Standards that provide references for Way Finding.

Austroads– Guide to traffic engineering practice, Parts 1-20.

Austroads – AP R194/01 – Forecasting demand for bicycle facilities.

Austroads – AP R193/01 – Traffic flow model allowing for pedestrians and cyclists.

Austroads - Guide to Road Design.

VicRoads Cycle Notes.

VicRoads Supplement to Austroads – Guide to Road Design.

2.3.3. POLICY AND GUIDELINES

City of Greater Geelong Infrastructure Design Manual, (2009).

Standard Drawings 500 series, City of Greater Geelong.

Standard Path Design, City of Greater Geelong (2009).

City of Greater Geelong Planning Scheme including State Planning Provisions Clauses 55 and 56.

Appropriate Structure Plans.

Central Geelong Urban Design Guidelines.

Walking and Cycling Development Guidelines, City of Greater Geelong, (February 2009).

Healthy by Design: A Planners Guide to Environments for Active Living – National Heart Foundation.

The Bicycle Parking Handbook – Bicycle Victoria.

Safer Design Guidelines for Victoria – Department of Sustainability and Environment.

Clause 56 Walkability Toolkit – City of Greater Geelong.

Greater Geelong Cycle Strategy – Volume 1 (2008) – includes works toolkit.

Walking More: Walking Safely – City of Greater Geelong Walking Study (2004).

Street Sign Policy 9, City of Greater Geelong, (October 2009).

Guidelines for Walkable Coastal Environments – City of Greater Geelong.

Fire Services Guidelines.

Growth Areas Authority – Engineering Design and Construction Manual for Subdivision in Growth Areas – April 2011.

City of Greater Geelong City of Greater Geelong – Street Tree Policy.

City of Greater Geelong City of Greater Geelong – Street Tree Strategy.

2.4. PLANNING

Whilst the Infrastructure Design Manual provides a guide to road reserve widths and the types and styles of infrastructure built within; the City encourages developers to consider the full range of road users or uses and infrastructure for inclusion within the road reserve prior to simply applying the road width standards.

Figure 2.1 below illustrates the range of road uses and infrastructure that needs to fit within the road reserve.



Innovative road reserve designs that facilitate efficient and effective motorised transport; includes water sensitive urban design; encourages active and public transport; are easy to maintain; and considers the need for street trees whilst minimising issues with access and damage to underground utility services are encouraged. All designs need to be cognisant of all recurrent operational costs involved in maintenance.

Many areas will contain paths for use by both pedestrians and cyclists. Wherever possible, pedestrian and cyclist routes should be physically delineated from vehicular movements and clear site lines should be maintained at vehicular crossovers.

2.5. CLIMATE CHANGE CONSIDERATIONS

Transport and movement infrastructure may not only be sensitive to extreme climate change events (for example materials degradation or failure and exposure to flooding) but are also critical in maintaining a service to the community: i.e. it provides safe access for emergency services or even escape routes for the population. Service disruption can have impacts on businesses and the daily life of a large number of community members (accessing workplaces or services). As such, it is worth investing time in carefully thinking through how transport infrastructure can be made more resilient to climate change.

Climate variables that may impact most upon the transport and movement infrastructure include **(non exhaustive list):**

- Increasing frequency of extreme hot days.
- Increased intensity of extreme rainfall events.
- Potential sea level rise.

For a more comprehensive list of climate variables see: Climate change in Victoria (2008)

Key elements to consider when designing and building transport and movement infrastructure include:

- Climate change impacts on resilience of materials.
- Any potential risk or impacts on users from climate events or from potential design solutions.
- Interdependencies that might arise that may impact on the functioning of the infrastructure.

Examples of these types of considerations include:

- Can materials used in transport infrastructure withstand extreme heat on hot days? What is the temperature tolerance range for materials?
- Does the design consider heavy rain, or potential impacts of sea level rise and storm surge?
- How can people be encouraged to walk even on hot days?
- Are there trade-offs for managing some risks that increase other risks? For example, tree planting increases shading but may also increase potential for cracking of footpaths. This trade could be reduced by correct tree species selection.
- Does the design consider any potential climate change impact on asset integrity, such as frequency of condition assessments and/or preventative maintenance requirements, and/or physical damage from climate events?
- Does the design consider any potential change to the likelihood of asset failure under climate change conditions?
- Does the location of the asset increase the insurance costs of the City or affect the ability of the City to obtain insurance?

2.6. DESIGN AND CONSTRUCTION

2.6.1. CIRCULATION INFRASTRUCTURE

2.6.1.1. SAFETY

Urban form, streets and all associated infrastructure should be designed in accordance with the 'Clause 56 Walkability Toolkit' and 'Safer Design Guidelines for Victoria' to maximise the safety of people. Safety shall be improved by:

- Maximising visibility and surveillance of the public environment.
- Providing safe movement, good connections and accessibility.
- Maximising activity in public places.
- Clearly defining private and public space responsibilities.
- Ensuring that public space can be easily maintained to ensure ongoing attractiveness and use.

2.6.1.2. ACCESSIBILITY

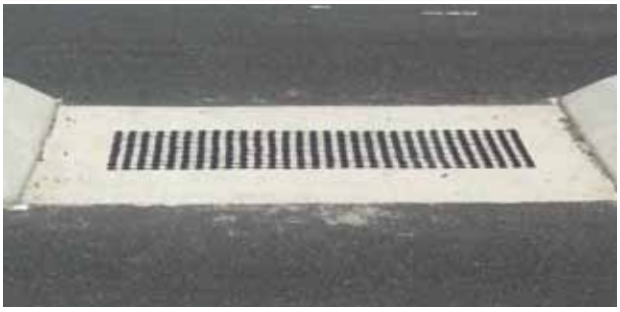
Footpaths shall be designed and provided in accordance with Australian Standard AS1428 'Design for Access and Mobility'.

Tactile Ground Surface Indicators (TGSI's) shall be provided along pedestrian networks in accordance with Australian Standard AS1428.4 - 'Design for Access and Mobility – Part 4: Tactile Indicators'.

Refer to Table 2.1 below for the range of tactile indicators approved for use by City of Greater Geelong.

Table 2.1: Tactile indicators approved for use.

TACTILE INDICATORS	APPROVED FOR USE
Plastic Strip Cut	Yes
Ceramic	Yes
Rubber with contact adhesive	Yes (less effective in high traffic streetscapes)



2.6.1.3. WAY-FINDING

Way-finding signage is to be designed to enable people to maximise their use and enjoyment of their surroundings.

Street name signs must be standard street blades on galvanised poles in accordance with City of Greater Geelong Standard drawing CGG710.

Signage should indicate distance and time by foot and cycle to key destinations including public transport, shops, parklands, schools and other amenities. Heads-up maps must be included at key points in the walking and cycling networks and at all destinations. Signage must be included to enable people to most easily navigate their environment. These must be fixed at a reasonable height to ensure a seven year old child, or person in a wheelchair can read and see this information and include Braille and or other acceptable indicators for visually impaired persons.

2.6.2. FOOTPATHS, CYCLE WAYS AND SHARED PATHS

The principles for design of footpaths must comply with Walking tracks, Classification and Signage - AS2156.1; and Walking tracks, Infrastructure Design - AS2156.2. The principles for design of cycle paths must comply with AS1742.9; AS2890.3; Austroads – AP-11.14/99; Austroads – AP R194/01; Austroads – AP R193/01; and VicRoads Cycle Notes.

To complement these standards, the City of Greater Geelong has developed strategies to guide walking and cycling development for both commuting and recreational users throughout the municipality. These include:

- Walking More: Walking Safely – City of Greater Geelong Walking Study (2004).
- Guidelines for Walkable Coastal Environments – City of Greater Geelong.
- Greater Geelong Cycle Strategy – Volume 1 (2008).

Footpaths must be a minimum of 1.5 metres wide and be constructed in accordance with the Standards. The desirable maximum crossfall on footpaths is 1 in 50 and the absolute maximum crossfall is 1 in 40.

Kerb crossings shall be provided in accordance with Australian Standard AS1428 'Design for Access and Mobility' at locations identified in consultation with the City's Engineering department.

Footpaths shall be constructed of either concrete or asphalt, and shall conform to Australian Standards AS1428 'Design for Access and Mobility' Parts 1 – 3 for surface finish.

Pedestrian and shared paths shall be constructed from concrete, asphalt or finished with a gravel topping. The gravel topping shall be in accordance with Council approved material. As per clause 56.06 of the Planning Scheme - footpaths should be widened to a minimum of 2.0 metres in vicinity of a school, shop or other activity centre.

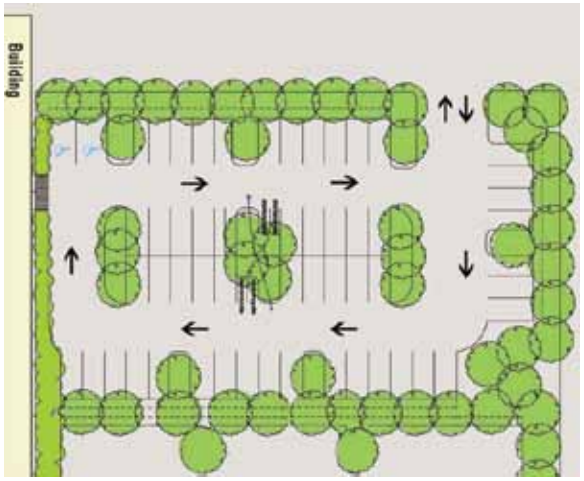
2.6.3. CAR PARKING

- Car parking and efficient vehicle circulation are key design considerations. Parking areas should provide an adequate number of spaces for any proposed use or development.
- Car drivers prefer to park in the shade therefore all car parking areas are to be landscaped and planted to an appropriate level to provide shade and screening for cars and a safe environment for users. Integration of car parking within the landscape design is an essential requirement for both aesthetic and functional outcomes.

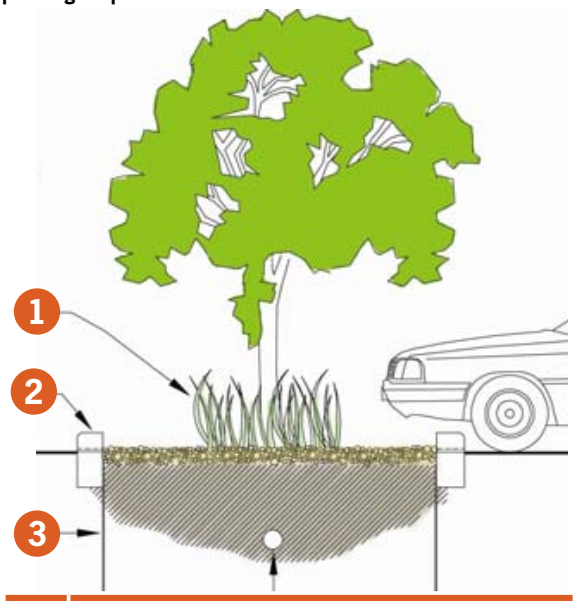
The following guidelines should inform design:

- The car park layout is to be designed to be sympathetic with the building form and surrounding landscape,
- Car parks must include canopy trees which are spaced to provide shade for vehicles at the rate of approximately one large canopy tree to every six vehicles. Planting "islands" should be incorporated into very large car parking areas,
- Plant species for all landscape areas (including canopy trees) are to be selected to allow clear sight lines for all users,
- Car parking areas must be provided in accordance with Clause 52.06 of the Greater Geelong Planning Scheme,
- Wherever possible, car parking areas should be visible from inside relevant buildings,
- Set backs are to be landscaped to partially screen cars whilst preserving site lines into and throughout the car park for user safety. Planting must not provide hiding spaces,
- Designs must provide for all vehicles to enter and exit car parks in a forward direction,
- Overall designs should minimise the probability of vehicle/vehicle or vehicle/pedestrian conflict,
- Car parks should provide direct access via pedestrian paths to designations,
- Provision of car parking spaces for people with disabilities should be provided and conform to Australian Standards. Full width access ramps should be provided along the front of disabled car parking bays,
- Sealed pavements must be used rather than gravel surfaces. Pervious pavements could be used to harvest storm water run-off to provide plant irrigation,
- Sufficient lighting must be provided where car parking will be regularly used after dusk,
- Car parking areas must not be sited adjacent to outside air intake or natural ventilation,
- Car parking areas must not be used for the temporary or permanent storage of goods for servicing, usage or loading,
- Designs of car parks must take into account site drainage, sewer mains, water pipes and easements,
- Common themes in design and materials should be used for car parks and driveways,
- In addition to these guide lines, all car parking must comply with the standards set by the Greater Geelong Planning Scheme and the relevant Australian Standards,
- Planting islands shall be of suitable size to accommodate trees selected.

PICTURED BELOW: Diagram showing indicative car park layout.



PICTURED BELOW: Indicative car park cross section showing water harvesting. Water from the car park to be harvested to planting strip.



#	DESCRIPTION
1	Grass or groundcover planting
2	Wheel stop structures to allow water to drain into planting strip
3	Root barrier as required

2.6.4. PUBLIC TRANSPORT INFRASTRUCTURE

Bus stops must be placed approximately every 400 metres along bus routes. Shelters must be designed and installed in accordance with City of Greater Geelong standard drawings CGG711 and CGG712.

Bus shelters and benches must be installed in appropriate locations based on modelled patronage and each areas demographic characteristic.

2.6.5. UTILITIES

Service utility corridors are to be installed in accordance with the adopted Infrastructure Design Manual. Where possible, utilities are to be installed along corridors that will minimise disruption to roads and footpaths and avoid street tree roots.

2.6.6. STREET LIGHTING

The main requirements of the relevant Public Lighting Code and guidelines are set by the Essential Services Commission and the Australian Standards AS/NZS 1158 – Lighting for roads and public spaces.

Globes must be selected to minimise greenhouse gas emissions. Recently approved 42W CFL lighting shall be used as a minimum application unless T5 or LED technology is approved prior to commencement of development.

Non standard lighting might only be approved for use in un-metered supply situations.

The first development within growth areas and strategic development sites shall set the adopted precedence for street lighting type and colour to ensure new developments present a consistent neighbourhood character and integration between all landowners.

The City of Greater Geelong endorses black and silver as the standard adopted colours for street light poles across the municipality, with any alternative to these being deemed to be non-standard and requiring Council approval.

Un-metered off street lighting schemes will be subject to the City's Asset handover approval process and specific criteria will apply to ensure energy efficient technologies are utilised.

Solar powered lighting (and other sustainable lighting solutions) should be considered in preference to mains powered lighting supply, and consideration should be given to minimising shade across the location of solar panels.

Grid connected solar lighting utilises renewable energy with the back up of mains power. Suitable applications would be all Community facilities, such as halls, club rooms and associated buildings due to the availability of installation opportunities. Grid tied solar lighting is also highly visible, demonstrating sustainability practices and making an environmental statement to the community.

Street trees planted near street lighting shall be spaced/sized so that there is minimal impact on luminance.

Table 2.2 below describes the lights recommended for use across the City of Greater Geelong.

Table 2.2: Recommended lighting types.

LIGHTING TYPES	RECOMMENDED FOR USE
Compact fluorescents (CPL)	YES
Twin fluorescents (T5)	YES - with separate metering
High Pressure Sodium	YES - at major traffic intersections
250watt Metal Halide	YES - high use pedestrian areas
Mercury Vapour	NO
Solar	YES

2.6.7. WASTE MANAGEMENT

The design of road and streetscape infrastructure must ensure that all residential collections be completed in a single loop without the need to reverse at any time. Road and nature strip widths should be able to accommodate collection vehicles with the following dimensions:

- Height – 3.63m
- Width – 2.48m (5.98m with bin lifter extended)
- Length – 9.67m
- Weight – 25 tonnes

The provision of street litter bins shall only be in commercial precincts and active recreation reserves and must be within 20 metres of the closest vehicle access point and any identified litter source (i.e., takeaway shop etc).

A minimum unobstructed road width of four metres is required for waste collection vehicles to travel along.

Pavement strength must be sufficient to enable 25 tonne gross weight for two waste collection cycles per tenement per week.

Where collection vehicles are required to drive into a development for kerbside collections, minimum vehicle clearance and pavement gradients will apply.

Where staged construction results in a dead end, a temporary turnaround facility shall be provided by the construction of a suitable all weather hard stand area to accommodate the turning radius of 12.5 metres required by the collection vehicle.

The placement of trees and other road furniture shall be such to allow for two bins to be presented side by side. A minimum of 1.76 metres per bin will be required.

The placement of trees in nature strips shall also consider that when mature, they do not inhibit street sweeping operations.

Nature strips shall have a maximum of 10% crossfall in all directions to accommodate the placement of bins for collection. If this cannot be achieved, the construction of a suitable bin standing area may be required.



3 LANDSCAPE & STREETSCAPE

3.1. OBJECTIVES

High quality streetscape and landscape development, enhancement and protection shall aim to achieve the following goals:

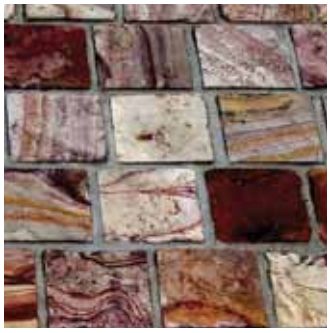
- Integration of engineering infrastructure and buildings with the landscape features to create a unified and visually appealing design.
- Creation of aesthetically pleasing landscape environments, increased community enjoyment of everyday life and a greater sense of meaningful connection between people and the environment.
- Development of desirable community living environments through microclimate modification, air quality improvement and noise attenuation.
- Fulfilment of the recreational and social needs of the wider and evolving community that reflect the values of the surrounding regional community.
- Application of water sensitive design principles and improved stormwater quality through the protection of stream flow and environments.
- Maximisation of ecological benefits through acknowledging wildlife habitat, soil conservation and enhanced biodiversity.
- Incorporation of heritage values through the protection of landscape features with recognised special significance.
- Contribution to the economic vitality of the municipality and its attraction of ecologically sound economic development, particularly tourism.
- Contribution to a stronger sense of community commitment to improvement and promotion of community environmental responsibility and ethics.

This section generally applies to the following Planning Zones:

- (GRZ, RGZ, NRZ and MUZ) – Residential Zones
- (RDZ1 and RDZ2) – Road Zones
- (C1Z and C2Z) – Commercial Zones
- (IN1Z, IN2Z and IN3Z – Industrial Zones
- (PUZ) – Public Use Zone
- (SUZ) – Special Use Zone
- (PPRZ) – Public Park and Recreation Zone

Planning Overlays may also apply to the land that influence the type and nature of development, examples of these include: flood, land subject to inundation, environmental significance, vegetation protection, special building, public acquisition, heritage, design and development and development plan overlays.






3.2. PRINCIPLES

Ensure that the planning and design for landscape in Streetscape and Open Space settings is sustainable and follows the City's guidelines and best practice principles.

These principles are:

- To make open space areas contribute to the health of the local community and to provide an experience and landscape that creates opportunity for active and passive recreation.
- Develop a sustainable landscape that is drought tolerant and minimises maintenance requirements.
- Enhance biodiversity through maximising the use of indigenous vegetation in appropriate settings.
- Develop street and landscape designs that are consistent with water sensitive design principles.
- Encourage the use of materials used in design that are sustainable and readily sourced.

3.3. RELEVANT STANDARDS AND POLICY

The following standards and policy apply to the design of landscape in Streetscape and Open Space settings including species selection, planting and maintenance.

3.3.1. LEGISLATION

3.3.2. INDUSTRY STANDARDS

AS 1428 -2003
Design for access and mobility.

AS/NZS 3661.1.1: 1993
Slip resistance of pedestrian services.

AS/NZS 3661.2: 1994
Guide to the reduction of slip hazards.

AS/NZS 1158 Set: 2007
Lighting for roads and public spaces.

AS 1742.5 – 1997
Street name and community facility name signs.

AS 3996 – 2006
Metal access covers, road grates and frames.

AS/NZS 3000: 2007
Australian/New Zealand Wiring rule.

AS 1250/Amdt 2 – 1984
The use of steel in structures.

AS 4373:
Pruning of Amenity Trees, Standards Australia.

AS 4970:
Protection of Trees on Development Sites.

AS/NZS 1768: 2007
Lightning Protection.

3.3.3. POLICY AND GUIDELINES

Armstrong Creek
Tree planting species list 2010.

Table 3 of Clause 21,
City of Greater Geelong Planning Scheme.

Environmental Weeds Brochure,
City of Greater Geelong.

"Garden Thugs, a national list of invasive and potentially invasive garden plants" from Plant Protection Quarterly, Volume 16, Issue 4, 2001.

Street Tree Profile Plan.

Indigenous Plants of the Geelong Region Information Sheets, City of Greater Geelong.

City of Greater Geelong Street Tree Policy.

City of Greater Geelong Street Tree Strategy.

City of Greater Geelong Street Tree Planting Guidelines.

City of Greater Geelong Park Furniture Style Guide (2015).

National Aquatic and Recreational Signage Style Manual, Victoria (2006).

Appropriate Structure Plans.

3.4. PLANNING

All new streets, reserves, parks, housing developments and industrial developments should be fully landscaped as per the following requirements.

3.4.1. LANDSCAPE PLANS

A Landscape Plan, addressing both form and function, is required for all street and open space reserves (environmental areas to have separate guidelines) for final approval before landscape construction commences. The Plan shall include, but not be limited to the following components: park furniture, shelters, bridges, paths, fencing, lighting (if required), car parking, playground, garden areas, tree planting, turf, mulch material, plant selection, irrigation (if required), and traffic control devices.

This plan is to be undertaken by a suitably qualified Landscape Architect, who is a member of the Australian Association of Landscape Architects.

A plant selection schedule should form part of the landscape plan detailing the plant species used, planting locations, container size and numbers of plants used in each location and totals of plantings to be used.

Landscape plans are to reflect best practice in water sensitive design.

Landscape plans with engineering requirements and details will require the approval of the City's Engineering Department.

Landscape plans shall not incorporate the use of environmental weeds. For a list of environmental weeds, refer to the City's Environmental Weeds Brochure.

It is advisable that Landscape Architects consult with the City in the 'concept' stages of the planning and prepares a planting schedule for all locations referred to in the plans for discussion with the City of Greater Geelong.

3.5. CLIMATE CHANGE CONSIDERATIONS

Streetscapes and landscaped infrastructure can be used to increase the community's resilience (e.g. by providing shading or interacting with water management) but will also be affected by climate change events.

Climate variables that may impact most upon the infrastructure include (non exhaustive list):

- Decreasing average annual rainfall.
- Increased intensity of extreme rainfall events.
- Increasing frequency of drought conditions.
- Increase number of extreme hot days.

For a more comprehensive list of climate variables see: Climate change in Victoria (2008).

Key elements to consider when designing and building landscape and streetscape infrastructure include:

- Climate change impacts on materials and vegetation.
- Any potential risk or impacts on users from climate events or from potential design solutions.
- Interdependencies that might arise and that impact upon the functioning of the infrastructure.

Examples of these types of considerations include:

- Consider increased plant maintenance schedules to replace plants that may die through drought or extreme heat?
- Can the materials of street furniture withstand high temperatures, 35° and above?
- Can some plantings and infrastructure be designed to counteract some climate risks, such as urban heat island effect?
- Have trade-offs in developing solutions been identified? For example, plantings can be used to counter UHI, but species selection should consider risks associated with increasing watering requirements, particularly in light of potential increasing likelihood of drought.

3.6. DESIGN AND CONSTRUCTION

3.6.1. PLANT AND TURF SELECTION AND MANAGEMENT

Plant selection is to be based upon the use of plants that are indigenous to the Geelong region as per the 'Indigenous Plants of the Geelong Region Information Sheets' available from the City of Greater Geelong's Environment Unit.

Park and street trees should be selected from the approved species lists provided at appendices X and Y. All species selections will be subject to approval by the relevant City of Greater Geelong Department.

Further information on indigenous plants suitable for each location can be sourced through the City's Tree Planner or the City's Environment Unit.

As a general guideline:

- Plants for parks should be indigenous in all or nearly all cases.
- Trees for streets should be native in most cases. Indigenous trees should be used near environmental areas in streets.
- Exotic trees are good for deciduous species.

Unless there is an overriding design objective (for example: specific form or solar outcomes, etc), plantings must be allied as closely as possible to indigenous species. Any plants along road reserves or traffic control devices must be clumping forms rather than running forms. Clumping varieties such as Chrysocephalum apiculatum, Dianella revoluta, Dianella tasmanica are examples. Only local running form examples such as Kennedia Prostrata will be considered as an exception.

If plant species are selected outside of this list then, as part of the permit approval process, the developer will be required to have discussions with the City regarding the species selected, where it will be used, and must provide a full description 'fact sheet' from the plant breeder detailing the growth habit and requirements.

Any discussion on other plant selections should be held at the concept stages of the design project for approval.

Turf species must be suitable warm season varieties and be selected taking into consideration the soil type and environmental conditions and available water.

Grassed areas are to have a minimum 90% recognised grass cover of the approved grass species selection at the time of inspections and handover to the City of Greater Geelong.

Grassed slopes or gradients in a reserve or open space must not be greater than 1 in 6 where possible. If this cannot be avoided an alternative landscape design/treatment will need to be implemented that would not require the use of machinery to maintain. Any form of grassed slope or gradient must have a significant run-off area at the base of the slope for machinery to operate on safely.

Retaining walls of one metre or more require a safety barricade to avoid the risk of falls.

Street tree plantings must be in accordance with the City of Greater Geelong Street Tree Planting Guidelines. In the case of new subdivisions and approved developments, the developer is responsible for the planting and establishment of all street trees.

Tree planting is recommended between the months of May through to September as this is the optimum time for planting success.

Tree planting undertaken within streets or on public land shall be completed in accordance with all relevant City engineering standards (i.e. footpath clearances) and legislative requirements.

The City requires a minimum of one street tree per average house block; two to three street trees would be considered where frontages or nature strips are larger than the average size or where smaller trees are used.

Two to three street trees may be required on the long side frontage of blocks depending on spacing requirements.

Street trees will be selected on the basis of "Planting the Right Tree in the Right Place' taking into account nature strip width or available planting space to select the most appropriate tree for the location. The City can advise further on tree selection criteria to minimise future engineering damage.

No tree planting will be permitted on the floor of a drainage basin or in locations where earthworks have been raised above ground level.

The use of large 'iconic' trees will be considered in public park and recreation reserves greater than 1 hectare in size to develop planting vistas and avenue plantings. The use of 'iconic' trees will not be limited to only Geelong region indigenous trees however where possible indigenous Geelong region trees should be considered. Other native trees from Australia will be considered and possibly some exotic trees will be considered depending on the location and rationale. Any tree other than Geelong Region trees must be selected on the basis that they will not become an environmental weed species.

All plant species (trees, shrubs, ground covers etc) selected need to be able to thrive on natural rain fall when established at the end of the maintenance period.

Plant material selected for planting within each reserve must be of a minimum container size suitable for each particular landscape treatment, and must be discussed with City Officers prior to planting.

For parks and reserves less than 1 hectare in size –

- Trees must be in 300mm minimum size containers with a minimum height of 1 metre,
- Shrubs must be in 150mm size containers or greater, and
- Grasses /sedges in tube stock size containers or similar.

For parks and reserves greater than 1 hectare in size –

- Other planting arrangements using smaller stock can be negotiated with City of Greater Geelong Officers.

Street trees are to be in a minimum 45 litre size container with a minimum height of 1.5 metres depending on the tree species. Trees must be self supporting in the container and in a sound and healthy condition. Where indigenous trees are to be used they need to be ordered early enough for supply to be ensured.

All tree plantings are to be fully mulched with a minimum mulched area of 0.75m radius from the tree trunk with mulch 100-150mm in depth. Due to the current hotter climatic conditions, larger tree mulched areas are required to cool soil and prevent water loss to established trees.

All street trees are to be planted with a constructed water well berm.

The City of Greater Geelong encourages the installation of street tree storm water treatment systems that capture and utilise storm water to assist with tree irrigation.

A water retention material is to be used during planting to assist in water retention and establishment of new plantings.

3.6.2. PLANTING IN ROUNDABOUTS AND TRAFFIC CONTROL DEVICES

The design and planting of traffic control devices including roundabouts must consider the following:

- Roundabouts must have a concrete or similar apron.
- Any planting must maintain sightlines at all times.
- Plant heights on roundabouts must not exceed 400mm when in flower.
- The surface mulches including gravels must be of a binding nature.
- Roundabouts and small traffic islands are not to be planted up with turf.
- Road centre medians of a width 5 metres or greater can include warm season turf varieties, with trees planted along the centre of the median strip.
- Road centre medians less than 5 metres can be planted with appropriate tree species, but must be then mulched with gravels or tree mulches approved by the City. The use of grass in these areas will not be approved.

3.6.3. LANDSCAPE MATERIALS

Mulches are to be approved by the City. Mulch types will include organic and inorganic materials; e.g. stone mulches, for consideration. The mulch should be free of propogule and green material.

Landscape treatments adjacent to footpaths must have suitable edging to retain mulch and should be mulched with a binding material that will resist scattering by pedestrian traffic or wind. Edging next to paths are a potential tripping and maintenance hazard. Mulch should be flush with the path but rebated to 50mm deep.

Soil samples, like mulch and other materials, must be suitable for the purpose and approved by the City of Greater Geelong. Imported soil must be totally weed and fungi free and be certified as weed and fungi free.

3.6.4. TREES AND UNDERGROUND SERVICES

It is recommended that total avoidance be a priority to trees, their root systems and other plantings during any renewal and maintenance periods involving works to Utility Services Infrastructure.

An underground tree planting zone with no underground services should be equal to 50% of the nature strip width located in the centre of the nature strip. To assist with this occurring a desired model would see a “common trench” adopted and utilised in agreement with service providers; using individually color coded sustainable materials.

(Refer to Section 2 – Circulation Infrastructure).








3.6.5. NEW DEVELOPMENTS – MAINTENANCE PERIOD

All landscapes including Street Trees, Park Trees, Reserves, Park and Playground Equipment and Traffic Control Devices are to be fully maintained by the Developer for two (2) years, or a greater period of time if agreed with the Developer.

Maintenance responsibilities include grass and plant establishment, weed and litter control, mowing and weekly inspections/cleaning of play spaces, barbecue facilities and surrounds. All plantings are to be maintained by the developer in a sound and healthy condition as per approved plans and specifications. Failure to maintain plants to these specifications will result in an extension of the maintenance period to suitably cover the required establishment of plants to the City's satisfaction. The maintenance period could be extended for a further 12 months or more.

An inspection is required of the landscape on Practical Completion to authorise the commencement of the maintenance period. This inspection is to be arranged by the Developer.

The Developer is to arrange six monthly inspections throughout the maintenance period to review the establishment of the landscape.

At the end of the Maintenance Period a final inspection, arranged by the Developer, is required to assess readiness for hand over to the City of Greater Geelong.

If rectification works are required at any of the six monthly inspections or the hand over inspection, the Developer may be asked to undertake a further extension of the Maintenance Period for up to 12 months (or more) depending on the rectification works required.

Works are to be bonded with an independent report by an appropriately qualified consultant at the end of the maintenance period.

3.6.6. WEED MANAGEMENT

A weed management plan must be developed prior to hand over which includes a risk base assessment framework to identify and prioritise weeds and areas for control. The plan shall include the following:

- An action that requires a minimum 95% reduction of noxious weed infestations prior to hand over.
- An action that requires infestations of priority Environmental Weeds reduced by an agreed minimum with the City of Greater Geelong.
- Control of woody weeds to consider habitat values and in some cases re-poisoned and left in situ to provide habitat until revegetation is established.

3.6.7. FURNITURE AND OTHER INFRASTRUCTURE

Street furniture, park furniture and other infrastructure should be confined to those items in the City of Greater Geelong Park Furniture Style Guide that specifies both urban design and park standards. They must be:

- Constructed of appropriate material with high durability that is capable of withstanding intensive use, and a reasonable level of maintenance. Recycled materials can be considered.
- Designed in accordance with a contextually relevant theme.
- Located to achieve optimum usage being positioned in appropriately designed areas and encourage shared use by different facilities.
- Resilient to vandalism and cost effective to repair and replace.
- Of a high quality and construction standard.
- Public seating should be sited in accordance with the "Clause 56 Walkability Toolkit". Benches must have armrests and backrests.
- Installed with a base material that considers need for accessibility.
- All materials, structures and fittings should be sourced in Australia and parts readily available.

3.6.8. OWNERS CORPORATIONS

Owners Corporations can not assume ongoing maintenance responsibility for City owned assets including public open space, sporting reserves or streetscapes within new subdivisions. Following asset hand over at the conclusion of the standard two year maintenance period, maintenance of City owned assets and facilities will revert to the City of Greater Geelong.

3.6.9. SIGNAGE

Signs are required for the following purposes:

- Identification – to identify entrances to places and open space.
- Information – to increase user appreciation of a site, minimise management problems and maximise safety. These may include:
  - notice signs indicating a current location (e.g. car park),
  - information signs relating to features and facilities,
  - interpretive signs providing a deeper understanding of the site and its surroundings,
  - maps giving graphic and/or worded indication of a current location, landmarks, features, routes and amenities, and
  - regulatory/advisory signs controlling movement and activity, informing users of known dangers, and warning against unsafe behaviour.
- To provide directions – to specific destinations, attractions, facilities and amenities.

Signage should be clear and provide simple communication, maximising use of universal signs wherever possible. Consideration should also be given to the need for signs to contain communication in other languages.

Signage must be included to enable people to most easily navigate their environment. These must be fixed at a reasonable height to ensure a seven (7) year old child, or person in a wheelchair can read and see this information and include Braille and or other acceptable indicators for visually impaired persons.

Signs should be able to withstand graffiti and vandalism. Recycled materials should be considered in construction. There should be no use of vinyl adhesive lettering in any signs.

No private signage, permanent or otherwise will be approved in any City controlled park, street or other public area.

3.6.10. ENTRY TREATMENTS

Entry treatments involve beautification at the entry points to new subdivisions. They are not encouraged and the City will not take responsibility for the management or maintenance of these areas either during development or following completion of subdivisions.

Entry treatments are not considered to be permanent developments or public open space.

Design for any entry treatments will be approved as part of the Landscape Plans that are prepared for planning permit approval.

Estate Identification Signage will be the responsibility of the developer for the life of the signage.

Figure 3.1: Example of Place Name Sign for Conservation Reserve.



Figure 3.2 Example of Place Name Sign for Recreation Reserve.



3.6.11. PUBLIC ART

Public Art provides opportunities for local communities and broader audiences to relate in new ways to the natural and built, and new or changing environments. Art in a broad range of forms presented in the public arena is now accepted as a vital element in most quality housing estate developments and new town centres which service them; providing interest and opportunities for a deeper connection with place, environmental interpretation, story telling, way finding, and importantly, differentiation from similar developments.

All public Art will require formal approval prior to installation. The City of Greater Geelong does not support the 'common place use' of public art to 'decorate' public areas without proper consideration of elements that are essential to achieving the best potential public art outcomes. These include consideration of: cultural context; community demographics and characteristics; local art sector activity; urban design and community facilities; and potential for establishment of links between the various cultural activities and production.

Planning for Public Art needs to identify opportunities for artists with diverse practices to respond to. This results in the generation of real and far-reaching community cultural benefits. This can only be achieved through thorough consideration of opportunities presented by the design of the precinct, its context and the makeup of the community, resulting in better art, urban design and community outcomes.

The development of a Public Art Master Plan will provide a well considered and responsive framework that: identifies a hierarchy of artwork opportunities; facilitates the early delivery of 'keystone' public art commissions, integrate artworks with new and significant infrastructure and urban design features; and sets out a process for future delivery of public art projects/programs within the precinct.

Developers are encouraged to contribute to the commissioning of a Public Art Master Plan prepared by an independent public art consultant in line with the City's Public Art Strategy.

The Master Plan should include:

- Precinct context investigation/ description
- Community demographic overview
- Curatorial approach statement
- Landscape master plan response identifying relevant features and art opportunities: nodes, trails, links, activation points, landmarks and urban design infrastructure and features
- Public Art opportunity hierarchy identifying opportunities for: stand alone sculpture; context/ site specific and integrated public art; and cultural initiatives etc

Art inspired advertising signage will be subject to a planning permit.





4 WATER MANAGEMENT

4.1. OBJECTIVES

Sustainable water resource management is a challenge for all new urban developments given predictions for a warmer, drier climate in south eastern Australia.

Developments are to be designed to facilitate the efficient and sustainable management of the whole of the water cycle including:

- Natural aspects (e.g. waterways and floodplains),
- Built aspects (e.g. major drainage, land use, public open space, roadways and water sensitive urban design features), and
- Service aspects (e.g. drinking water, sewerage and alternative, fit-for-purpose water sources).

The central premise of this is the need for a whole-of-system approach to manage all these aspects of the urban water cycle to achieve multiple community outcomes. The City of Greater Geelong (CoGG) has entered into a formal commitment with the Corangamite Catchment Management Authority (CCMA), Barwon Water (BW) and Southern Rural Water (SRW) to work cooperatively towards a holistic and integrated approach to urban water cycle management.

Several documents outline the City's approach to water cycle management including the City's Environment Management Strategy; the Water Futures Strategy; The Sustainable Water Use Plan, the Stormwater Harvesting policy and an endorsement of Melbourne Water's Water Sensitive Urban Design Engineering Procedures: Stormwater. Urban Growth Strategies and Infrastructure Delivery Plans support the City's holistic approach to the management of the region's water resources.

This section generally applies to the following Planning Zones:

- (GRZ, RGZ, NRZ and MUZ) – Residential Zones
- (RDZ1 and RDZ2) – Road Zones
- (C1Z and C2Z) – Commercial Zones
- (IN1Z, IN2Z and IN3Z) – Industrial Zones
- (PUZ) – Public Use Zone
- (SUZ) – Special Use Zone
- (PPRZ) – Public Park and Recreation Zone
- (PCRZ) – Public Conservation and Recreation Zone

Planning Overlays may also apply to the land that influence the type and nature of development, examples of these include flood, land subject to inundation, environmental significance, vegetation protection, special building, public acquisition, heritage, design and development and development plan overlays.

4.2. PRINCIPLES

The City of Greater Geelong has endorsed principles for new urban developments that seek to recognise all aspects of the urban water cycle and to encourage developer investment in contemporary sustainable water cycle management design and construction practices.

Key principles include:

- Adopting an integrated approach to stormwater and flood management that meets objectives for hydraulic capacity, flood management and water cycle management,
- Protecting existing flora and fauna attributes in the preservation of existing environments and ecosytsems,
- Minimising the disturbance of waterways created by altered flow regimes and protect natural drainage and aquatic ecosystems,
- Maintaining and protecting the water quality in receiving waters and the down stream environment,
- Enhancing the value and public amenity of the existing stream corridors, biodiversity and environment,
- Including the principles of water sensitive urban design and water re-use/conservation, and
- Encouraging the full range of urban design, water conservation and local stormwater infrastructure options.



4.3. RELEVANT STANDARDS AND POLICY

Drainage infrastructure including water quality treatment, wetlands, storage ponds, swales, sedimentation basins and other WSUD features are to be planned, designed and constructed in accordance with the following standards and policies:

4.3.1. LEGISLATION

Water Act 1989 (Vic).

City of Greater Geelong Planning Scheme Clause 56.07 – Integrated Water Management.

4.3.2. INDUSTRY STANDARDS

AS3500.3:
Stormwater Drainage.

4.3.3. POLICY AND GUIDELINES

Stormwater Management Plan 2002, City of Greater Geelong.

MUSIC Guidelines – City of Greater Geelong

Stormwater Harvesting Policy, City of Greater Geelong (December 2009).

Water Futures Strategy, City of Greater Geelong (2009).

Water Management Policy, City of Greater Geelong (2012).

Wetlands Strategy, City of Greater Geelong.

Sustainable Water Use Plan, City of Greater Geelong.

Infrastructure Design Manual.

Water Sensitive Urban Design: Engineering Procedures: Stormwater, Melbourne Water - CSIRO Publishing (2005).

WSUD Engineering Procedures, Melbourne Water.

Urban Stormwater Best Practice Environmental Management Guidelines, CSIRO (1999).

Urban Stormwater Best Practice Environmental Management Guidelines 1999.

VicRoads Road Design Guidelines Part 7 – Drainage.

Tender specification for irrigation design, City of Greater Geelong (2009).

National Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1 Guidelines), Natural Resource Management Ministerial Council, Environment Protection and Heritage Council and the Australian Health Ministers' Conference (2006).

Guidelines for Environmental Management of Reclaimed Water, Environment Protection Authority (Victoria) (2003).

Australian Guidelines for Water Recycling: Stormwater Harvesting and Reuse (Phase 2 Guidelines), Environment Protection and Heritage Council, National Health and Medical Research Council and the Natural Resource Management Ministerial Council (2008).

Guidelines for Water Safety - Urban Water Developments, Royal Lifesaving Society of Australia.

Water Supply Code of Australia: Melbourne Metropolitan Reticulation Design (Potable and recycled network).

Austroads - Guide to Road Design - Part 5 - Drainage.

Best practice Guidelines for Urban Irrigation, Irrigation Association of Australia (2006).

Rainwater use in urban communities. Guidelines for Non–drinking Applications in Multi-residential, Commercial and Community Facilities. Victorian Government, Department of Human Services, Victoria (2007).

City of Greater Geelong Planning Scheme Provisions.

Australian Rainfall and Runoff – Flood Analysis and Design (2001).

Guidelines for Water Safety in Urban Water Developments – Royal Lifesaving Society Australia.

4.4. PLANNING

4.4.1. PERMITS AND PERMISSIONS

There are a range of permits and permissions that may need to be obtained for the construction and use of infrastructure designed to capture and use stormwater. Some of these permits and conditions include:

- Farm dam licence (Southern Rural Water).
- Irrigation licence (Southern Rural Water).
- Works on waterways permit (Catchment Management Authority).
- Works approval (Environment Protection Authority).
- Cultural Heritage Management Plan.
- Section 173 Agreement.
- Council's Open Space Development Approval Process.

Designs should be prepared by certified designers with appropriate qualifications and expertise.

4.4.2. INTEGRATED WATER CYCLE MANAGEMENT PLANS

Development proposals (in relation to water management) should comprise assessments of each of the following aspects of the water cycle.

	ASPECT OF THE WATER CYCLE	RELEVANT AUTHORITIES
1	Waterways and floodplains	CCMA, SRW, CoGG
2	Major drainage	CoGG, CCMA
3	Land use	CoGG
4	Water sensitive urban design	CoGG
5	Drinking water servicing	BW
6	Sewerage servicing	BW
7	Alternative water sources	CoGG, BW, SRW, CCMA








The assessments should be carried out in the order shown in the table on the opposite page (i.e. the land required to cater for the waterways, flooding and major drainage infrastructure needs to be determined before finalising development plans or lot layout). Integrated Water Cycle Management plans will clearly define a preferred scenario of complimentary options based on these assessments. Sustainable options for use and supply of water will be encouraged.

By working with the relevant agencies and incorporating the above principles and processes early, developers and consultants can save time, resources and money.

4.5. CLIMATE CHANGE CONSIDERATIONS

The supply and management of water could be greatly affected by climate change, and this should be considered when designing water management infrastructure. The City of Greater Geelong is committed to implementing water sensitive design and to close the water cycle by increasing water reuse. Reducing reliance on reticulated water will make the Geelong community more resilient to climate change.

Example climate variables that may impact upon the infrastructure include:

- Decreasing average annual rainfall.
- Increased intensity of extreme rainfall events.
- Sea level rise in coastal low lying areas.
- Increasing frequency of drought conditions.

For a more comprehensive list of climate variables see: Climate change in Victoria (2008).

Example considerations include:

- Can the planned infrastructure manage extreme intense rainfall flows and also declining rainfall averages?
- Does infrastructure reuse water where possible?

4.6. DESIGN AND CONSTRUCTION

4.6.1. WETLANDS AND WATERWAYS

Wetlands are an integral part of the City's overall strategy to protect water quality.

A secondary function of wetlands is the provision of storage for flow retardation to minimise the environmental impact of flood flows on down-stream areas. Retardation of stormwater flows, hence flood peaks and water velocities, reduces the erosion and damage potential of floodwaters. Also, flow retardation can lead to reduced floodway capacity requirements and hence reduced land take requirements for drainage reserves in downstream areas.

Wetlands must be off-line from the channel system to ensure that macrophytic growth is not impeded by regular high flows, which would flatten them.

Other secondary functions of wetlands are related to the provision of enhanced environmental amenity.

The benefits are:

- Habitats for nature conservation.
- Potential source of second class water for reserve irrigation.
- Improved landscape values.
- Restricted recreational uses.

Grassed slopes or gradients in retention basins and surrounding wetlands and water features must not be greater than 1 in 6 where possible. If this cannot be avoided an alternative landscape design/treatment will need to be implemented that would not require the use of machinery to maintain. Any form of grassed slope or gradient must have a significant run-off area at the base of the slope for machinery to operate on safely.

Retaining walls of one metre or more require a safety barricade to avoid the risk of falls.

Ongoing maintenance of artificial wetlands shall be in place for a minimum of two (2) years.

It is recognised that once established, wetlands may become a natural environment over time.

4.6.2. DRAINAGE

Drainage infrastructure is to be designed and installed in accordance with the adopted Infrastructure Design Manual; Australian Rainfall and Runoff – Flood Analysis and Design - 2001 and Australian Standard AS3500.3 Stormwater Drainage.

Stormwater treatment systems must be designed and tested conceptually with the latest version of MUSIC. Input parameters must be in accordance with the City of Greater Geelong's MUSIC input parameters guidance note.

MUSIC simulations must use the City of Greater Geelong's rainfall data available from City officers and from the City's website.

4.6.3. ALTERNATIVE WATER SUPPLIES

Community facilities must be constructed in a way that potable water use is minimised. Facilities must be designed to accommodate water smart appliances and conserve water as a first priority.

Water used to irrigate open space and to flush toilets must utilise alternative water sources including recycled water, stormwater or roof water. If it is proposed that recycled water will not be supplied to some community facilities, stormwater harvesting and rainwater tanks must be included in the design and construction of these facilities.

The use of alternative water for other purposes is also encouraged.

4.6.4. STORMWATER HARVESTING AND REUSE

Stormwater connections to drainage infrastructure must be designed; installed and managed in accordance with the City's Stormwater Harvesting Policy.

Treatment and storage of water must be in accordance with WSUD guidelines; the Australian Guidelines for Water Recycling: Stormwater Harvesting and Reuse (Phase 2 Guidelines); and the Guidelines for Water Safety - Urban Water Developments - Royal Life Saving Society.

The City supports Managed Aquifer Recharge (MAR) as a potential method of storing and reclaiming stormwater for reuse. Any MAR projects must be designed in accordance with the Australian Guidelines for Water Recycling: Managed Aquifer Recharge (Phase 2 Guidelines).

Pumps; transfer infrastructure and irrigation equipment must be adequately sized and designed to efficiently supply demand centres whilst minimising running and maintenance costs.

It is appropriate to model the estimated yield, treatment and demand profile for stormwater harvesting and reuse in MUSIC in accordance with the MUSIC User's guidelines and the City of Greater Geelong's input parameters guide.

Where it is proposed that stormwater will be captured and reused within a precinct, a report must be submitted that details:

- The catchment size.
- The catchments hydraulic characteristics such as the extent of urbanisation and open space and estimates of area of impermeable surfaces. This should be broken down into sub-catchments where appropriate.
- Estimates of the harvestable volume of stormwater in accordance with best practice (and legislated) harvest limits in a 3rd decile and 5th decile rainfall year using a minimum of daily time-steps.
- A description of the demand centres characteristics such as the proposed use and usage rates of active and passive surfaces, area estimates, soil types, proposed plant varieties and irrigation system. Alternatively, a demand centre might be a public toilet or an industrial use. In any instance, describe the demand centre and the characteristics of the water use.

Calculations illustrating the volume of water required by a demand centre (such as an oval or sporting precinct) in a 5th decile and 3rd decile rainfall year. These estimates must include:

- Peak annual, monthly, weekly, daily and instantaneous demand for water.
- Design details of storage and water quality treatments.
- Details of proposed pumps and transfer infrastructure.
- Estimates of supply volume available to a demand centre tracked against the demand profile.

4.6.5. RAINWATER TANKS

Rainwater tank installations must be designed and installed in accordance with HB 230-2008: Rainwater Tank Design and Installation Handbook.

Rainwater tanks at community facilities must also be installed in accordance with the City of Greater Geelong's Rainwater Tank Policy 2008. Tanks are to be fitted with an approved connection that allows for CFA tankers to connect to.

The Victorian Department of Human Services provides detailed information regarding planning for and managing risks associated with the use of rainwater in their publication "Rainwater use in urban communities. Guidelines for Non–drinking Applications in Multi-residential, Commercial and Community Facilities".

4.6.6. IRRIGATION DESIGN AND INSTALLATION

Irrigation systems will be designed to achieve the best possible efficiency in water application and use, measuring and reporting and maintaining the landscape or facility to the desired level. Irrigation system designs are to be approved by the City's Irrigation Officer. Following installation, Practical Completion approvals will require an inspection including a satisfactory commissioning process as approved by the City's Irrigation Officer.

All irrigation systems must be designed and installed according to industry best practice. Appropriate guidelines include City of Greater Geelong's tender specification guidelines for installation (COGG 2009a) and the Irrigation Association of Australia's "Urban Irrigation Best Management Practices".

Irrigation designs must be completed by a suitably qualified and certified irrigation designer and include details for:

- Layout,
- Flow,
- Pressure,
- Precipitation rates,
- Water budget,
- Irrigation schedules.

Each irrigation system will incorporate flow meters and rain gauges connected to the controller. Soil moisture sensors should also be considered. All irrigation system equipment must be compatible with the City of Greater Geelong's current water management system.

Where possible Water Sensitive Urban Design should be provided or considered to water all new tree plantings in streets and parks. Where possible, alternate sources of water should be supplied to irrigation systems. Appropriate potable water alternatives include stormwater and recycled water, but must meet strict quality criteria to ensure no detrimental affects on soil, plant or irrigation equipment.

Alternative supplies must be fully assessed and tested as part of the design process to ensure:

- Suitable treatment processes are incorporated to ensure water quality,
- That the supply will meet expected seasonal demands,
- That the water quality is fit for the intended use.

Irrigation equipment specified and used must be of commercial quality and where possible smart watermark approved.

Irrigation systems should generally not be installed in passive parkland areas. Consult with City officers when seeking to design and install irrigation systems in public open spaces. An approximation of irrigation demand profiles for typical open space facilities can be obtained from CoGG officers.

Active playing surfaces are to have pop-up sprinklers installed as a preference but sub-surface irrigation systems will be considered.

Policy, Guidelines and Standards

- **IAA**
- **CoGG Design Guidelines**
- **Barwon Water**

4.7. MAINTENANCE DURING DEFECTS LIABILITY PERIOD

During the Defects Liability Period the City shall carry out operational maintenance (e.g. street sweeping) in accordance with its normal practice, unless specified otherwise.

The Developer shall be held responsible for all maintenance costs arising from design error, defective workmanship and/or defective materials.

The Developer shall enter into an agreement with the City regarding defects responsibilities for maintenance and correction of defects (e.g. those items arising from defective workmanship or materials) during this period. The agreement shall be signed prior to issue of Statement of Compliance.

Defective items becoming apparent during the Defects Liability Period will be referred to the Developer's Representative for remedial action by the Developer

It must be noted that during the Defects Liability Period the Developer no longer has possession of site, and an "Occupation of a Road for Works" permit or equivalent shall be required for any works undertaken in the road reserve.

The Defects Liability Periods are a minimum of 12 months for civil assets and two (2) years for vegetated assets.

4.7.1. MAINTENANCE AND MANAGEMENT PLANS

Developers shall provide Maintenance & Management Plans for all new major drainage infrastructure such as wetlands, basins, pumps, treatment facilities etc.

Maintenance & Management Plans shall clearly describe the operations and maintenance requirements for any new infrastructure and include at least:

- Plans and drawings,
- Access tracks/points,
- Waste/sludge storage areas,
- Machinery operations manual(s),
- Planting schedules for the vegetation within basins and wetlands,
- A description of each area/major component defining, its function and operation,
- Drainage points eg for maintenance of basins or u/g drainage to raingardens,
- Show markers (or sacrificial layers) limiting excavation e.g for silt removal.



5 SPORT, RECREATION & OPEN SPACE

5.1. OBJECTIVES

The provision of sport, recreation and open space in communities is vital to provide for the long term recreation and sporting needs of an active and healthy community.

The objectives for the development of sport, recreation and open space are designed to promote 'sense of place' and community for people of all ages, providing opportunities to meet and interact in appropriate spaces in suitable ways and times. They can also give character to an area, define landscapes and provide a focus to connect a community.

Sport, recreation and open space should provide popular and responsive active (sport and active recreation) and passive (including walking, sitting, contemplating, picnicking, etc) spaces and landscapes.

Spaces should be well designed and create places that are 'fit-for-purpose', useable and be places where people want to be. They should maximise active and passive surveillance from adjoining areas and passersby. Benefits for the community should be easily and clearly defined.

Active recreation spaces and facilities should be designed to facilitate shared use including schools and community and different community users.

Open space should have due regard to the environmental and cultural heritage values that are embedded in the landscape. *(Source: Study of Open Space Networks August 2001).*

Master planning for sport, recreation and open space sites should be undertaken by appropriately qualified professionals with consideration to the principles and development standards contained in this document and other relevant industry standards.

This section generally applies to the following Planning Zones:

- PPRZ – Public Park and Recreation Zone
- (GRZ, RGZ, NRZ and MUZ) – Residential Zones
- (PCRZ) – Public Conservation and Recreation Zone

Planning Overlays may also apply to the land that influence the type and nature of development, examples of these include flood, land subject to inundation, environmental significance, vegetation protection, special building, public acquisition, heritage, design and development and development plan overlays.






5.2. PRINCIPLES

Council endorsed principles as part of its Study of Open Space Networks (Aug 2001) that are applicable to the provision of sport, recreation and open space. These form the basis of the following principles:

Conserve and protect the natural and cultural environment:

- Protect and enhance natural and cultural environments, particularly areas of remnant vegetation/habitat/indigenous cultural value.
- Maximise visual amenity and maximise views into and out of each space.

Reflecting community needs:

- Decisions guided/influenced by community interests, needs and aspirations, actual participation trends and demographic characteristics.
- Encourage participation in physical activity and social activities to connect people within a community.

Enhancing recreation and tourism opportunities:

- Reflecting importance of recreation and tourism to the City of Greater Geelong and regional economies.

Improving provision and optimising access:

- High priority will be given to creating an equitable distribution of open space types, linkages between various origins and destinations throughout communities. (Open space types include linear and linkage, sports, informal parks, landscape and amenity, conservation and heritage, waterways and lakes, etc).
- Optimising circulation, parking, access and egress in sites to provide safe and accessible arrival and departure for users.

Ensuring diversity of provision:

- Open spaces with a wide range of characteristics will be developed, ensuring that conservation and heritage values and retained and where possible, enhanced.

Expanding the network of linkages:

- Enhance existing pedestrian and bicycle trail networks and provide additional trails to meet recreation and commuter needs.

Providing for people with disabilities:

- Providing for the needs of all community members, including those who may have disabilities.

Site responsive uses:

- Ensuring appropriate uses of space for the capture, sustainable capacity and characteristics of sites.
- Maximising amenity and safety of sites and minimising hazards.
- Minimising the use and reliance on potable water.

Maintenance:

- Ensuring that sites are located, planned and maintained to agreed service and safety standards with due regard for economic sustainability.

Providing clear guidance to the City:

- Planning processes must provide the City with clear actions that are affordable and consistent with government policy and funding criteria.

Contribute to social and/or economic well-being and growth:

- Planning and provision should contribute to the social and/or economic wellbeing of the community.

A flexible and long term focus:

- A focus on long term strategic outcomes will provide flexible opportunities to meet and adapt to future needs. All outcomes should ensure that alienation of open space is minimised.

Provision partnerships:

- Opportunities for partnerships in planning and management should be integral to any planning process.

5.3 RELEVANT STANDARDS AND POLICY

5.3.1. LEGISLATION

The Subdivision Act, 1988 (Vic).

The Planning and Environment Act, 1987 (Vic.)

The Sport and Recreation Act, 1978
(Revised February 2008).

5.3.2. INDUSTRY STANDARDS

Open Space Planning and Design Guide 2010
– Currently a Report in Progress.

Precinct Structure Planning Guidelines 2009
– Growth Areas Authority (Vic).

Planning for Community Infrastructure in Growth Areas 2008
– Cities of Wyndham, Casey, Hume, Melton and Whittlesea.

Crime Prevention through Environmental Design
– Safer Design Guidelines for Victoria (DSE).

Healthy by Design – A Planners Guide to Environments for Active Living 2004 (National Heart Foundation).

Supportive Environments for Physical Activity
(National Heart Foundation).

Sport Dimensions for Playing Areas – 2008 (WA Govt).

Design Standards for Urban Infrastructure
– Territory and Municipal Services, ACT Govt.

Royal Lifesaving Guidelines for Water Safety.

Sport and Recreation Victoria Skate Park Guide.

SRV – Football and Netball Lighting Guide 2008.

AS/NZS 1158 Set 2007
– Lighting for roads and public spaces.

For Play Spaces:

- AS NZS 4422 (1996) Playground Surfacing.
- AS NZS 4486 (1997) Playground Development and Installation.
- AS 1924 Part 1 (1981) Playground General Requirements.
- AS 1924 Part 2 (1982) Playground Design and Construction.
- AS 4685.1 (2004) General safety requirements and test methods.
- AS 4685.2 (2004) Particular safety requirements and test methods for swings.
- AS 4685.3 (2004) Particular safety requirements and test methods for slides.
- AS 4685.4 (2004) Particular safety requirements and test methods for runways.
- AS 4685.5 (2004) Particular safety requirements and test methods for carousels.
- AS 4685.6 (2004) Particular safety requirements and test methods for rocking equipment.

For Sports Facility Development: Specifications and requirements of various sporting codes, for example:

- AFL Preferred Facility Requirements, 2006 and GRFA Regulations.
- FFV Regulations.

5.3.3. POLICY AND GUIDELINES

City of Greater Geelong Planning Scheme Provisions including State and Local Planning Provisions Clauses 55 and 56, and 52.01:

Open Space Networks Study 2001 City of Greater Geelong.

City of Greater Geelong Cycling Strategy 2008.

City of Greater Geelong Irrigation Guidelines.

City of Greater Geelong Public Toilet Guidelines 2007.

City of Greater Geelong Walking More Walking Safely 2004.

City of Greater Geelong Walking and Cycling Guidelines for External Agencies.

City of Greater Geelong Playground Development Guidelines.

Bellarine Peninsula Recreation and Leisure Needs Study 2005.

City of Greater Geelong Skate Park and BMX Management Plan 2010.

5.4. PLANNING

Sport, recreation and open space planning is based on the following hierarchy:

- Regional (municipal wide and can also provide for surrounding municipalities).
- Sub-regional (part of municipality that cover numerous townships/suburbs).
- District (whole township/suburb as a key facility for a community).
- Local/Neighbourhood (providing for communities usually within walking distance).

All aspects of development will need to define which level of the hierarchy is the relevant context for development.

5.4.1. MASTER PLANNING

A detailed master plan must be developed for all sport, recreation and open space facilities that are proposed as part of community infrastructure. Each plan must provide detail about linkages and connections, access/circulation and car parking, key components including playing fields, pavilions, other built infrastructure, parkland facilities/ furniture, shelters, lighting (if required), fencing, irrigation, drainage and landscape features.

This plan is to be undertaken by a suitably qualified Landscape Architect who is a member of the Australian Association of Landscape Architects.

5.5. CLIMATE CHANGE CONSIDERATIONS

Sport, recreation and open space are usually quite exposed to climate change impacts and trade-offs may need to be considered between service levels and adaptation costs. In particular the criticality of maintaining a given level of service for the community and ongoing cost of repairs and maintenance are considerations that may prove particularly relevant for this type of infrastructure.

Climate variables that may impact upon the infrastructure include (non exhaustive list):

- Decreasing average annual rainfall.
- Increasing frequency of drought conditions.
- Increasing average daily temperatures.
- Increase number of extreme hot days.

For a more comprehensive list of climate variables see: Climate change in Victoria (2008).

Potential impacts of climate change that should be considered when designing and building sport, recreation and open space infrastructure include:

- Climate change impacts on materials and vegetation.
- Any potential risk or impacts on users of a given facility (e.g. sport oval) from climate events or from potential design solutions.
- Interdependencies that might arise and that impact upon the functioning of the infrastructure (e.g. damage to surrounding access roads that impede users from accessing sport and recreational facilities).

Example considerations include:

- Are there alternatives to vegetation selection that reduces water consumption, increases shading and reduces urban heat island effect? Are there further opportunities for stormwater reuse?
- Is the plant species selection able to adapt to climate change conditions? Does it have a wide temperature tolerance range?
- Does the open space or recreational infrastructure expose the City of Greater Geelong to increased liability from increased frequency or severity of injuries to community members?
- Does the infrastructure consider the resources required to maintain the condition of the open space or recreational infrastructure under climate change? i.e. water costs for maintaining green spaces.
- Does the infrastructure consider the need to maintain an appealing visual aspect based on the benefits of green spaces on the community?



5.6. DESIGN AND CONSTRUCTION

5.6.1. INFORMAL PARKS

Informal parks are sites developed to meet a range of casual and passive recreation activities. The following provides a guide for the development of informal parks:

Table 5.1: Guide for provision of informal parks.

HIERARCHY	POPULATION RANGE	CHARACTERISTICS
Local/ Neighbourhood	750 – 3,000	Generally minimum of 1ha, but if a special feature is identified, could be as small as 0.5ha
District	3,000 – 5,000	Minimum of 2ha
Sub-regional	30,000+	Minimum of 5ha
Regional	200,000+ or 20 mins drive	Minimum of 5-10ha

Informal parks should be of a size (and shape) that allow for flexibility of use and diversity across a range of activities, and be planned, designed and constructed in response to the principles for provision of sport, recreation and open space.

It is important that informal parks are designed and constructed within subdivisions to create safe, useable and valued open space reserves. Parks should be developed on unencumbered land and in accordance with clause 56.02 of the Greater Geelong Planning Scheme that states public open space should:

- Be provided along foreshores, streams and permanent water bodies,
- Be linked to existing or proposed future public open spaces where appropriate,
- Be integrated with floodways and encumbered land that is accessible for public recreation,
- Be suitable for the intended use,
- Be of an area and dimensions to allow for easy adaptation to different uses in response to changing community active and passive recreational preferences,
- Maximise passive surveillance,
- Be integrated with urban water management systems, waterways and other water bodies, and
- Incorporate natural and cultural features where appropriate.

Informal parks should have street frontage on at least three sides with the edges of the open space being open and welcoming to encourage a range of activities and uses by the local community.

All households should be located within 400m of informal parkland and these open space areas should demonstrate good connection to other open space sites and community facilities/destinations.



Integrated art at Poppykettle Park

SPORT, RECREATION & OPEN SPACE



SPORT, RECREATION & OPEN SPACE

5.6.1.1. DEVELOPMENT STANDARDS FOR INFORMAL PARKS

The following guide is to be used for the design and construction of informal parks.

INFRASTRUCTURE	LOCAL NEIGHBOURHOOD	DISTRICT	SUB-REGIONAL	REGIONAL
Park Theme/attractor	×	×	✓	✓✓
Pathways	✓✓	✓✓	✓✓	✓✓
Circuit pathway	✓	✓	✓✓	✓✓
Disability/wheel access	✓ where landform allows	✓	✓✓	✓✓
Car Parking – on-site	××	✓	✓✓	✓✓
Car Parking – off-site	✓	✓✓	✓✓	✓✓
Bicycle rack	✓	✓✓	✓✓	✓✓
Picnic table	✓	✓✓	✓✓	✓✓
BBQ	××	✓	✓✓	✓✓
Access to water	✓	✓	✓✓	✓✓
Drinking fountain	×	✓	✓✓	✓✓
Shelter	××	✓	✓✓	✓✓
Shade	✓✓ Natural shade only	✓✓ Natural shade preferred	✓✓	✓✓
Public toilet[3]	××	✓	✓✓	✓✓
Seating[1]	✓✓	✓✓	✓✓	✓✓
Play space	✓	✓✓	✓✓	✓✓
Fitness station[2]	××	××	✓	✓
Basketball backboard/ hitting wall/half court	××	×	✓	✓
Signage	✓	✓✓	✓✓	✓✓
Lighting	××	✓	✓	✓✓
Bin	✓	✓✓	✓✓	✓✓
Dog litter bag dispenser	✓	✓	✓✓	✓✓
Landscape – trees	✓✓	✓✓	✓✓	✓✓
Landscape – garden beds	×	✓	✓	✓✓
Lawn area	✓	✓✓	✓✓	✓✓
Fencing/barriers	✓	✓	✓	✓
Ornamental water features	××	××	×	×
Public Art – in appropriate setting	✓	✓	✓	✓✓
Irrigation	××	×	✓	✓

✓✓ = *Must have* ✓ = *Might have* × = *Should not have* ×× = *Must not have*

1. SEATING:

- Should be spaced at distances of 200 metres apart for shared paths.

2. FITNESS STATIONS:

- Fitness station proposals will be assessed for merit and compliance with these guidelines upon application.
- In the absence of Australian Standards applicable to fitness equipment, the City of Greater Geelong will require Playground Safety Standards to be applied to any fitness equipment proposed for approval.
- A design inclusive of any scissor type motion or alternative moving part will not be approved.
- A risk assessment of the concept design and a post construction assessment by a credible risk assessor would be required as a condition of permit approval.

3. BBQ'S AND PUBLIC TOILETS:

- Provision of a BBQ will only be approved when accompanied with Public Toilet facilities.
- Public Toilet facilities will be compliant with the City's Public Toilet Design Guidelines.

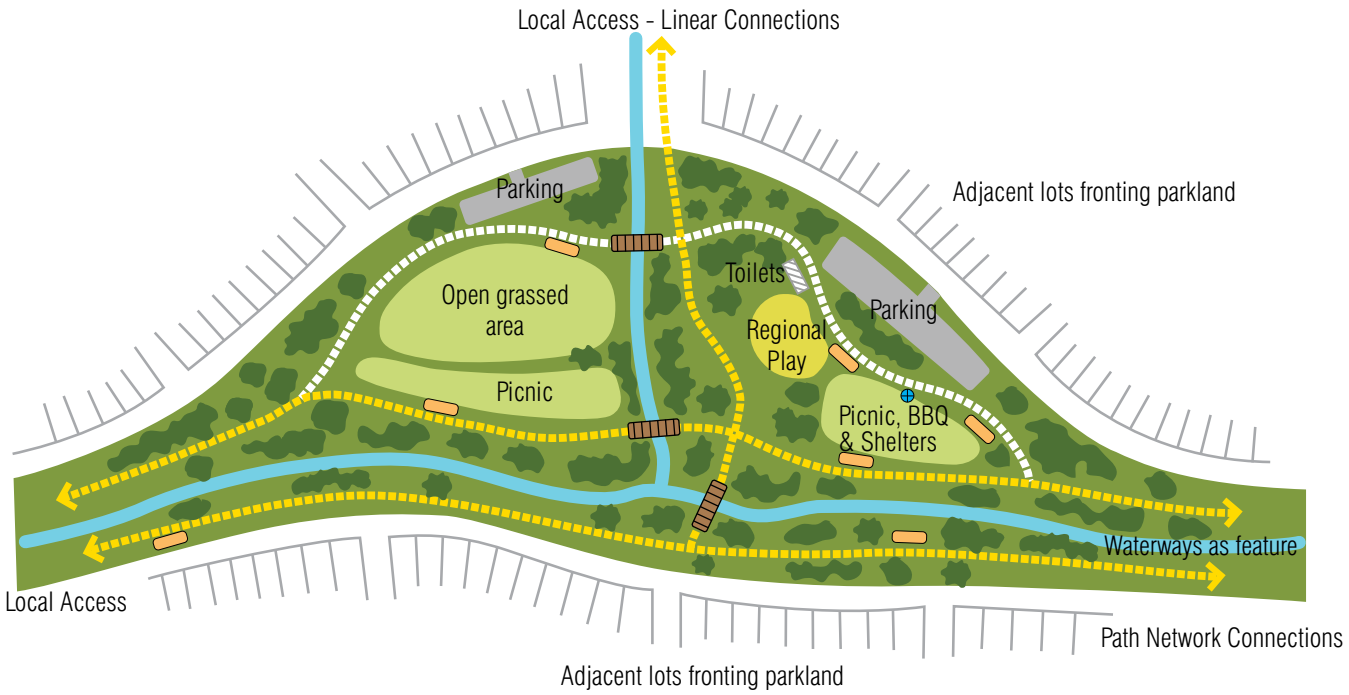


FIGURE 5.1: Example of Regional Parkland - typically 8ha.

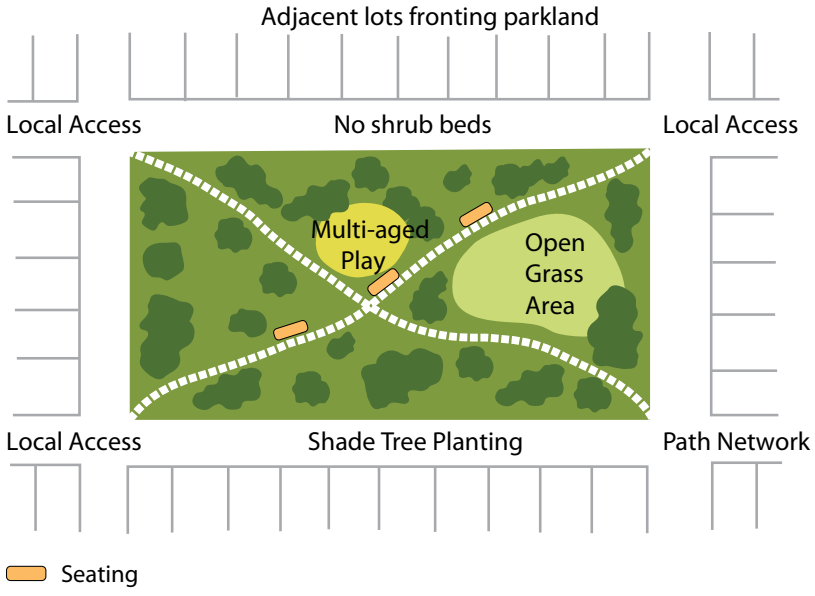
Seating *Bike racks* *Connector Path* *Drinking Fountain*



FIGURE 5.2: Example of District Parkland - typically 2ha



FIGURE 5.3: Example of Local Parkland - typically 1ha



5.6.2. SPORTS RESERVES AND ACTIVE PLAYING SURFACES

Sports open space sites are used for active, competitive recreation. They include sports grounds used for a wide range of team and individual competitions and often have associated facilities such as change rooms and spectator areas. It is important that passive and unstructured activities are also provided for in the planning and design of sporting reserves.

Sporting open space should be of a size and shape that offers flexibility and diversity for various sports and activities. They should accommodate future growth of sports and emergence of new and different sports to the area. Single use provision should be avoided.

Where relevant and/or possible, the level of provision should reflect research into the minimum number of playing areas to provide for viable sporting clubs and competitions.

The following information provides a guide for the development of sporting reserves:

TABLE 5.2: Guide for provision of sporting reserves.

HIERARCHY	POPULATION RANGE	CHARACTERISTICS
Local/ Neighbourhood	N/A	
District	3,000 – 5,000	Minimum 8ha At least one for every township/suburb/ community
Sub-regional	30,000+	Minimum 10ha+ Covering a sub-region of the municipality, e.g. Bellarine Peninsula
Regional	200,000+ or 20 mins drive	Size dependent on type of provision

The development of sports reserves and active playing spaces will take into consideration the standards of each sport to be provided, through reference to the state/peak sporting body.

For irrigation requirements for sporting reserves, see section 4.5.6. – Irrigation Design and Installation.



Landy Field Regional Athletics Facility

5.6.2.1. DEVELOPMENT STANDARDS FOR ACTIVE SPORTS RESERVES

The following guide is to be used for the design and construction of active sports reserve – it should be noted that active, passive and informal components are very important in all park developments in this category of open space.

INFRASTRUCTURE	LOCAL/ NEIGHBOURHOOD	DISTRICT	SUB-REGIONAL	REGIONAL
Buffer distance from sporting boundary to				
Residential Boundary – side	20m	20m	20m	20m
Residential Boundary – goal posts	30m	30m	30m	30m
Roadway – side	30m	30m	30m	30m
Roadway – goal posts	40m	40m	40m	40m
All playing fields:				
Turf/playing surface	Warm season turf	Warm season turf	Synthetic warm season turf	Synthetic warm season turf
Irrigation/drainage	✓	✓✓	✓✓	✓✓
Power – 3 phase	✓	✓✓	✓✓	✓✓
Sports lighting	✓	✓✓	✓✓	✓✓
Fencing around playing surface	×	✓ (up to 1 oval)	✓✓ (up to 2 ovals)	✓✓ (up to 2 ovals)
Player shelters	✓	✓✓	✓✓	✓✓
Oval playing fields	✓(maybe 1)	✓(up to 2)	✓(up to 4)	✓(up to 4)
Cricket wicket	✓ Synthetic	✓ Turf/synthetic	✓✓ Turf/synthetic	✓✓ Turf/synthetic
Cricket practice nets	✓	✓	✓✓	✓✓
Scoreboard	×	✓	✓✓	✓✓
Coaches boxes	×	✓	✓✓	✓✓
Scorer/timekeeper box	×	✓	✓✓	✓✓
Rectangle playing fields	✓	✓	✓✓	✓✓
Athletic track	××	×	✓ Grass/synthetic 100m straight	✓ Synthetic
Pavilion	✓<100m²	✓✓<350m²	✓✓<450m²	✓✓<600m²
Change rooms	✓1 - 2	✓✓2 - 4	✓✓2 - 4	✓✓4 - 6
Kitchen/canteen	×	✓	✓✓	✓✓
Spectator areas	×	✓	✓✓	✓✓
Storage	×	✓✓	✓✓	✓✓
Umpires change rooms	×	✓✓	✓✓	✓✓
Office	×	✓	✓✓	✓✓
First Aid room	×	✓✓	✓✓	✓✓
Public toilets	✓	✓	✓✓	✓✓
Gym/trainers/massage room	×	✓	✓✓	✓✓
Social room/bar	××	✓	✓✓	✓✓
Media rooms	××	××	×	✓

✓✓= Must have ✓= Might have ×= Should not have ××= Must not have

INFRASTRUCTURE	LOCAL/ NEIGHBOURHOOD	DISTRICT	SUB-REGIONAL	REGIONAL
Tennis and netball				
Tennis courts	✗	✓5 - 8	✓8 - 12	✓✓16 - 22
Netball courts	✗	✓1 - 3	✓4 - 6	✓✓6 - 9
Netball/tennis multi-lined courts	✓1 only	✓	✓	✓
Fencing	✓	✓✓	✓✓	✓✓
Sports lighting	✗	✓✓	✓✓	✓✓
Surface	Asphalt or acrylic	Acrylic	Acrylic	Acrylic
Player/coach etc shelters	✗	✓✓	✓✓	✓✓
Passive assets within active sporting reserves				
Park theme/attractor	✗	✗	✓	✓✓
Pathways	✓	✓✓	✓✓	✓✓
Circuit pathway	✓	✓	✓✓	✓✓
Universal access	✓✓ Where landform allows	✓✓	✓✓	✓✓
Car Parking – on-site	✓Unsealed <50	✓Unsealed/sealed <150	✓✓Sealed 200+	✓✓Sealed 500+
Car Parking – off-site	✓	✓✓	✓✓	✓✓
Bicycle racks	✓	✓✓	✓✓	✓✓
Picnic table	✓	✓	✓✓	✓✓
BBQ	✗✗	✓	✓✓	✓✓
Access to water	✓✓	✓✓	✓✓	✓✓
Drinking fountain	✓	✓	✓✓	✓✓
Shelter/rotunda	✗✗	✓	✓✓	✓✓
Shade	✓✓ Natural shade only	✓✓ Natural shade preferred	✓✓	✓✓
Public toilet	✗✗	✗	✓✓	✓✓
Seating	✓✓	✓✓	✓✓	✓✓
Play space	✓	✓✓	✓✓	✓✓
Fitness station	✗✗	✗✗	✓	✓
Basketball half court/ rebound wall	✗✗	✗	✓	✓
Signage	✓	✓✓	✓✓	✓✓
Lighting	✗✗	✓	✓	✓✓
Bin	✓	✓✓	✓✓	✓✓
Dog litter bag dispenser	✓	✓	✓✓	✓✓
Landscape – trees	✓✓	✓✓	✓✓	✓✓
Landscape – garden beds	✗	✓	✓	✓✓
Lawn area	✓	✓✓	✓✓	✓✓
Fencing/barriers	✓	✓	✓	✓
Ornamental water features	✗✗	✗✗	✗	✗
Public art	✓	✓	✓	✓✓

✓✓= Must have ✓= Might have ✗= Should not have ✗✗= Must not have

FIGURE 5.4: Example of a Sub-Regional/Regional Sporting Facility - Typically 20ha.

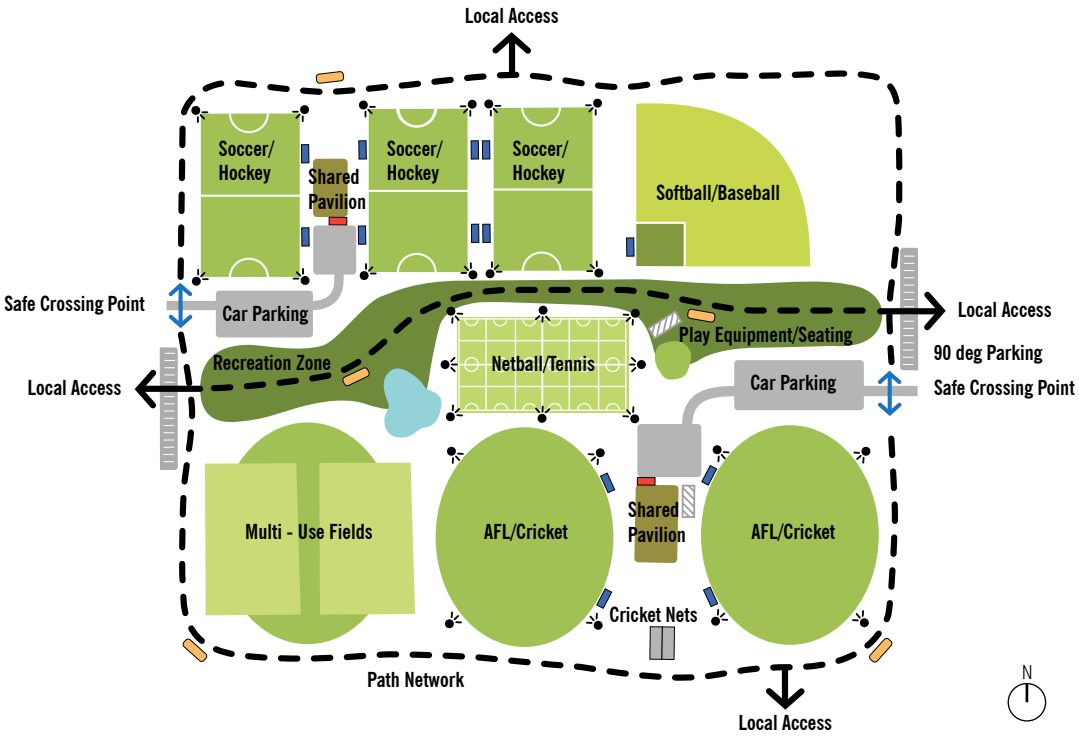
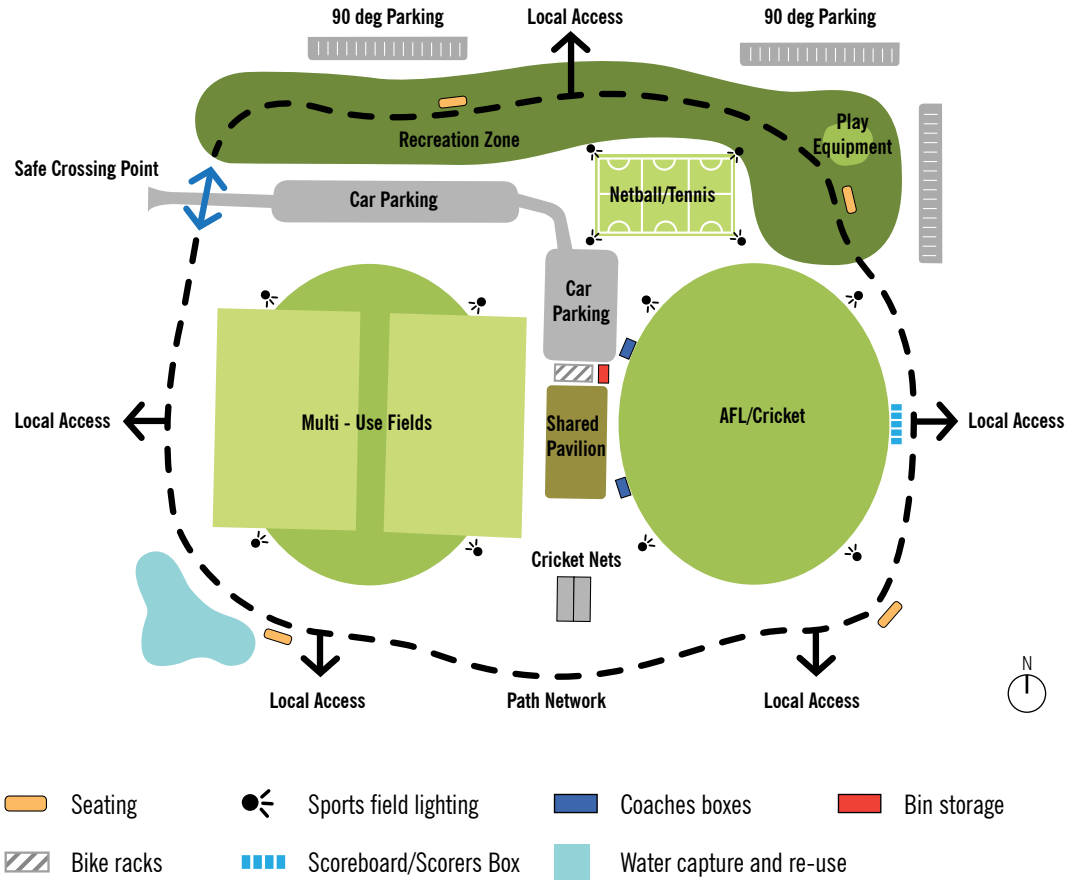


FIGURE 5.5: Example of a District Sporting Facility - Typically 10ha (NTS).








5.6.2.2. PAVILIONS AND BUILT INFRASTRUCTURE FOR SPORTING RESERVES

Typically, sporting facilities and their spatial requirements will be determined by:

- The type of sport being played,
- The level of competition - (Local, District, Sub-Regional, Regional),
- The number of club members/competitors (number of teams),
- Other community user groups.

The space allocation and total building areas of the facility will vary according to some or all of the above factors. Other factors that may affect the requirements include:

- The playing conditions (summer/winter seasons),
- The level of sport(s) being played e.g. AFL vs Local,
- Either and/or Male or Female competitors,
- Combined sports being played,
- Access to other community groups for multi-use and shared access,
- Disability access.

As there are many factors influencing the functional requirements of a purpose built sporting facility, general building area allocations and arrangements need to be established based on an assessment of the sports competition; team, support personnel and spectators numbers.

Design of these facilities will incorporate Environmentally Sustainable Design (ESD) principles in both construction and for the benefit of operations, minimising energy consumption wherever possible.

The table below summarises some of the key requirements for pavilions.

Peak sporting organisation guidelines should also be consulted for more specific details.

COMPONENT	REGIONAL	SUB-REGIONAL	DISTRICT	LOCAL
Change rooms	✓✓	✓✓	✓✓	✓✓
Numbers	4-6	2-4	2-4	*1-2*
Genders	Male and female			
Access	Internal and external			
Showers	All partition cubicles			
Umpires	20m² Separate showers and toilets male and female/internal and external access			
Bench seating	450mm per player			×
Area	Each: min 30m²	Each: min 15m²	Each: min 15m²	Each: min 15m²
Showers	Up to 5/6 showers per team			
Toilets	2-4 toilets and up to 2m of urinals			
Store room	12m²	8m²	8m²	6m²
Social rooms	1.5m² per team member	1.2m² per team member	1.2m² per team member	1m² per team member
Kitchen/kiosk	Up to 35m²	15m² – 35m²	15m² – 35m²	Up to 15m²
First Aid room	8m²			

✓✓ = *Must have* ✓ = *Might have* × = *Should not have* ×× = *Must not have*

5.6.2.3. SPORTING SURFACE DIMENSIONS

For minimum and maximum dimensions for all sporting surfaces, including run-off distances and buffers, refer to the peak sporting bodies' documentation regarding their surface requirements. Also refer to Sports Dimensions for Playing Areas – 2008 (WA).

The information provided in the table below can be used as an initial guide:

5.6.2.4. SPORTING MAINTENANCE AND STORAGE FACILITIES

Wherever possible, storage and maintenance facilities should be provided within the building footprint of the main pavilion. While the City recognises the need for these facilities, it is inefficient and often unsightly for these facilities to be stand alone structures.

The City of Greater Geelong will not approve the use of shipping containers for these purposes.

AFL: AFL Preferred Facility Requirements, 2006	The guide provides a thorough outline of specifications required for grounds and infrastructure at a number of competition levels: state league, district and local. Listed elements such as change room size and quantity are listed as either a core or optional facility component. Included are generic pavilion floor plans for each level.
Baseball International Standards	The international standards provide details referring to field dimensions, lighting and pitch layout. Requirements at a district and local level require consultation with Baseball Victoria.
Cricket Victoria – Strategies for maximising use of cricket facilities	A brief publication that outlines ways to ensure that all cricketers have access to appropriate facilities throughout the cricket season.
Hockey - Synthetic Hockey Pitches Information Manual	Hockey Victoria has developed this manual to assist clubs and the City in the planning and installation of synthetic hockey pitches.
Netball - Netball Court Planning Guide	The Netball Court Planning Guide provides details for developing and upgrading netball precincts. Including surface type, run off, multi use and positioning of adjacent infrastructure, in addition to technical details: court dimensions and goal post height. The guide overviews a number of case studies, which highlight factors that need to be taken into consideration when developing facilities in line with standards.
Soccer – Football Stadiums: Technical recommendations and requirements, 2007 (FIFA) 2009 Rules of Competition Guidelines for the lighting of Football Pitches	The 2009 Rules of Competition includes details for all levels of play regarding facilities and ground arrangements, essential requirements for the different levels: playing area measurements, player and officials amenities, spectator amenities, other (including media room, public address system and scoreboard details). The lighting guidelines outline the function of lighting, details regarding levels of illumination and design criteria, maintenance requirements, training and competition standards, along with best practice management by clubs in obtaining appropriate lighting for their facility.



5.6.3. PLAY SPACES

Play occurs in a range of environments and children interact with natural and built features through playful activity in a diverse range of settings. While play in all places is valuable and is to be encouraged, this section addresses playgrounds in defined open space areas with playground equipment.

Playgrounds will be provided at a rate of one playground for every 250 children under the age of 12 and will be developed in open space parkland within 500m walking distance from every household, with consideration given to barriers such as major roads, railway lines, rivers and creeks, etc. In addition to the guidance provided below for the development of playgrounds, the City's Playground Development Guidelines should be referred to for site selection and other key considerations.

All new playground areas should have a tree planting plan for the planting of trees for aesthetic and shade purposes.

Play spaces are to be maintained for a minimum of 24 months as detailed in section 3.5.5.

5.6.3.1. LOCAL/NEIGHBOURHOOD PLAYGROUNDS

Neighbourhood playgrounds should be small facilities located so that "mobile" children (five years and above) may access at least one site without having to travel long distances or cross main roads or other major barriers. The size of these facilities will vary depending on their location in regard to other facilities and the demographics of the area.

The play structures should be designed primarily for children aged 3 - 7 years with standard access to all levels. It is considered appropriate to have a selection of activities suitable for:

- Solitary play – where children like to spend time playing on their own,
- Parallel play – where children shadow and play alongside one another, and
- Group play – where children interact more, share and take turns.

Multi-activity play equipment is encouraged to ensure all levels of play are catered for. The play structures should be designed primarily for children aged 3 - 7 years with standard access to all levels. Swings should be fitted with both toddler and strap seats to ensure suitability for all ages. All equipment at these locations should be carefully sited to maximise the available open space for other sports and activities. A seat for carers should also be provided.

5.6.3.2. DISTRICT/SUB-REGIONAL PLAYGROUNDS

District or sub-regional playgrounds should be medium to large facilities with equipment catering for both Public Junior (3 - 7) and Public Senior (7 - 14) age groups. Sites should be chosen with regard to location, visibility and accessibility.

This type of playground should also have adequate seating, shade/shelter and access to toilet facilities and drinking fountains to ensure the comfort of parents who will bring young children to the site. It should be noted that well sited district playgrounds with comfortable facilities, attract far less vandalism due to the consistent presence of adults.

5.6.3.3. REGIONAL PLAYGROUNDS

Regional playgrounds should be facilities that because of their size and standard of provision draw from a broader catchment of the community than the smaller playground facilities. In some instances they not only provide for the whole of the City of Greater Geelong but for neighbouring communities as well.

All age groups should be catered for at a regional playground. Junior equipment should be low theme based structures to encourage role play whilst providing a list of challenges within the capabilities of that age group. Senior equipment should be more activity based providing linked accessories which will assist in the development of motor skills, hand-eye coordination, balance and agility.

This type of facility should also incorporate good supporting infrastructure such as toilets, drinking fountains, picnic facilities, park furniture and access to people with disabilities.


Example of a District Playground


Example of a Neighbourhood Playground

5.6.4. LINKAGES AND CONNECTIONS

See 2.6.2 for details about resource documents for footpaths and shared pathways. In addition to these considerations, the following also applies:

- It is important that linkages and connections are permeable and safe for users. They may also serve as habitat/landscape corridors and might include land such as easements, road reserves as well as open space set aside for cycle and pedestrian paths.
- The size and length of linkages and corridors will depend on the physical features of the site, the key purpose and location, but it will be a requirements that cycling and pedestrian pathways clearly show origins and destinations to demonstrate that they are genuine connections within a community.
- As a guide, active transport/walkways should be no less than 10m and no more than 20m in width. In addition, should a section of pathway be less than 10m wide it should be no longer than 50m without a point of safe entry/exit.
- Pathways within open space will generally be unsealed, however major shared use pathways and pathways for active transport and walkways in urban areas will generally be sealed.

The following guide should be used to provide linkages and connections for active transport and recreation access:

- All-weather shared pathways should be of a minimum width of two (2) metres,
- Safe entry and exit points with high level of visibility for passive surveillance,
- Seating on concrete pads required for resting points along pathway and adjoining the main path, with sufficient room for wheeled access,
- Natural shade to be provided through planting of high canopy trees of appropriate species along the pathway edges,
- Vegetation along linkages should be compatible with the landscape character of the surrounding area and should be designed to maximise passive surveillance, and
- Signage should be provided to indicate distances to specific destinations and any guidance about recommended users for pathway.

5.6.5. LIGHTING IN OPEN SPACE

The main requirements of the relevant Public Lighting Code and guidelines are set by the Essential Services Commission and the Australian Standards AS/NZS 1158 – Lighting for roads and public spaces.

Public open space lighting should maintain adequate lighting standards whilst minimising the number of lighting installations.

Consideration should also be given to sustainable options such as solar lighting and timer automated cut-off sensors, etc.

5.6.6. PUBLIC TOILETS

Planning and design consideration for the provision of public toilets will consider the following key points:

- Location, visibility and high profile.
- ESD principles.
- Access and accessibility.
- Safety.
- Construction materials and standards.
- Power and lighting.
- Signage.
- Maintenance.





6 SOCIAL & COMMUNITY FACILITIES

6.1. OBJECTIVES

The built environment, with appropriate housing, public spaces and community facilities provides a basic platform to ensure residents have the best opportunity to build their own community. An ideal sustainable community will be planned and well resourced, with attractive and functional built form and open space, providing opportunity for life long education, recreation and cultural activity. It will foster citizenship and be safe and accessible.

Sustainable communities are places where people want to live and work, now and in the future. When planning new community facilities it is important that they are well connected to other community facilities, public transport services, open space, recreation facilities, and employment and education opportunities.

Although this document is primarily concerned with hard community infrastructure, it is also important that the corresponding services are relevant to local people and can be flexible enough to respond to changing needs. In addition community services infrastructure should be equitably distributed so that all groups in the community are able to benefit.

The provision of or advocacy for community services infrastructure is a key responsibility of local government to meet local needs in a range of service areas including family and children, aged, youth, libraries, community programs, lifelong learning, information and arts and culture.

It is important that this infrastructure is integrated well into its surroundings and the landscape and natural attributes of sites and settings.

The City of Greater Geelong will collaborate and partner with government and other stakeholders to realise quality healthy sustainable community precincts.

This section generally applies to the following Planning Zones:

- (GRZ, RGZ, NRZ and MUZ) – Residential Zones
- PUZ – Public Use Zone
- SUZ – Special Use Zone
- PPRZ – Public Park and Recreation Zone

Planning Overlays may also apply to the land that influence the type and nature of development, examples of these include flood, land subject to inundation, environmental significance, vegetation protection, special building, public acquisition, heritage, design and development and development plan overlays.

SOCIAL & COMMUNITY FACILITIES

6.2. PRINCIPLES

The following articulate the values and characteristics of sustainable communities from a social and community facilities perspective:

- Equitable, accessible, welcoming, flexible and inclusive, providing for the whole community.
- Provide for community health and wellbeing including the most basic of community needs: housing, education, employment and basic health support.
- Develop community life and connection with others.
- Engaging and including all people to enable high participation in community life.
- Demonstrating economic vitality and providing support.
- Using resources sustainably and showing environmental leadership.
- Co-located or well connected with compatible services, facilities and land uses being integrated where possible (community hubs).
- Provide diverse, safe, attractive, vibrant, active public places.
- Assist in reducing disadvantage through prevention and early intervention strategies.

6.3. RELEVANT STANDARDS AND POLICY

6.3.1. LEGISLATION

A range of legislation and industry standards are relevant to the provision of social and community facilities including but not limited to:-

- Local Government Act 1989.
- Local Government Regulations 1990 - Victorian State Regulations.
- Australian Human Rights Commission Act 1986.
- Disability Discrimination Act 1992.
- Equal Opportunity Act 2010.
- Human Rights Charter.
- Transport Integration Act 2010.
- Education and Care Services National Regulations 2011.
- Food Act 1984.
- Building Code of Australia 2010 & Building Regulations, 2003.
- Occupational Health & Safety & Welfare Act & Regulations.
- Heritage Act 1977.
- Building Fire & Safety Regulation 1991.
- Child Wellbeing and Safety Act 2005.
- Children, Youth and Families Act 2005.

6.3.2. INDUSTRY STANDARDS

- Shared Facility Partnerships – A Guide for Good Governance for Schools and the Community – DEECD (December 2007).
- PRAV – Play Spaces for Early Years Services.
- All Playground equipment must meet Australian Standards:

  AS 4685: 2004 – Playground equipment,

  AS 4422: 1996 – Playground Surfacing, Specifications, Requirements & Test Methods,

  AS 4486.1: 1997 – Playground and playground equipment, Part 1: Development, installation, inspection, maintenance and operation.
- Crime Prevention through Environmental Design – Safer Design Guidelines for Victoria (DSE).

AUSTRALIAN STANDARDS

- Healthy by Design: A Planners Guide to Environments for Active Living (Heart Foundation, 2004).
- Safer Design Guidelines (DSE, 2012).
- Urban Design Charter for Victoria (DPCD).
- National Quality Standards for Education and Care.
- Maternal and Child Health Program Standards.

6.3.3. POLICY AND GUIDELINES

- Municipal Strategy Statement (MSS).
- City of Greater Geelong Planning Scheme Provisions.
- Relevant Structure Plans and Urban Growth Area Plans.
- Housing Diversity Strategy.
- Youth Strategy 2007-2011.
- Retail Strategy 2006.
- Public Library Buildings Development Strategy.
- Neighbourhood Houses Policy.
- Municipal Early Years Plan 2013 - 2030.
- Council Policy – Community Facility Partnership (April 2009) City of Greater Geelong.
- Relevant place based Council reports and studies.
- Spatial Guidelines for Critical Floor Space Allocations – Refer City of Greater Geelong Community Facilities Unit.
- Geelong Play Strategy 2012 - 2022.
- CoGG Sustainable Buildings Policy.
- City Plan.
- Municipal Health and Wellbeing Plan.
- G21 Region Plan.
- Social Infrastructure Plan 2014 - 2031.
- Well Positive Ageing Strategy.
- Healthy Together Geelong.
- Greater Geelong Cycle Strategy.
- Multicultural Action Plan.

- Public Art Strategy.
- Council's Play Strategy.
- Council's Sustainable Buildings Policy.
- Municipal Children's Services Infrastructure Plan.
- Children's Services Policy 2012.
- Domestic Animal Management Plan.
- Bellarine Peninsula Strategic Plan.
- Gaming Policy.
- Victorian Facilities Capital Grants Guidelines.

6.4. PLANNING

Community infrastructure needs to be considered from a local, neighborhood and regional perspective.

The way that buildings are planned and arranged will affect people's use and connection to the services provided within the infrastructure. The City encourages the joint use/co-location of services that are compatible and where the management of services allows for multi-use with other services. At a minimum, locating multiple services in their own sections of a single building or precinct provides efficiencies and improved access to services for the general community.

Planning for new precincts in subdivisions should consider the broader regional context, linkages and connections that provide good access and placement in a high profile and visible location in addition to the co-location and siting near other compatible services such as schools, local shops and open space. Providing infrastructure in central locations improves the community's capacity to access facilities and services by public transport and active transport such as walking and cycling.

Some larger community precincts facilities may need to be able to operate as Emergency Relief Centres (ERC). Enquiries may need to be made to see if any such provision needs to be designed into a building so as to achieve a dual purpose.

Master Planning

A concept master plan must be developed for all proposed social and community facilities. Plans should be prepared by an appropriately qualified consulting team, e.g. architect, social planner, urban designer and must include precinct context and landscaping.

6.4.1. COMMUNITY HUBS

International, Federal and State policy direction encourages the development of 'Community Hubs' which supports the co-location and/or integration of community spaces services. Community Hubs provide multiple spaces clustered together on one site servicing the neighbourhood/district/sub-region/region. The City of Greater Geelong's future planning approach is reflective and responsive to this trend.

COMMUNITY HUBS

- Create a sense of belonging and community
- Allow different people to meet and interact
- Create an important focal point for community activity
- Bring people together and build a sense of place
- Increase efficiencies in the built form and services
- Provide better return on infrastructure costs as they enable multiple service providers to share facilities over an increased span of hours

A community hub may include all or some of the following:

- Library
- Community hall and performance space
- Meeting spaces
- Kindergarten
- Improve access to a more comprehensive range of services and community activities
- Family support, playgroup and toy library spaces and parenting information
- Maternal and Child Health services
- Senior's centre
- Consulting services
- Outreach support services
- Community garden
- Customer services and community information
- Computer and other IT facilities for communities
- School and before and after school care/vacation care
- Children's health services
- Recreation and open space
- Neighbourhood House programs

Pictured below:
An example of a Community Hub.



SOCIAL & COMMUNITY FACILITIES

6.4.2. BENCHMARKING

Effective planning distributes community facilities and services in accordance with an activity centre or hub hierarchy that serve varying sized catchments. The composition of each activity centre or hub and the size of the population it serves will vary depending on local conditions. The hierarchy that is used by the City of Greater Geelong for guiding planning for sustainable communities is shown in the following table, not withstanding any other statutory documents or agreements.

At each order of the network, community facilities should be geographically co-located, central to their catchment and close to public transport. Clustering of facilities and services encourages single destination, multi-purpose trips and walkability to services. The availability of centrally located facilities and services also contributes to community building by providing opportunities for social interaction and reduces social isolation by making essential services accessible to all.

HIERACHY	DESCRIPTION	EXPECTED POPULATION CATCHMENT	RELEVANT ACTIVITY CENTRES
REGIONAL LEVEL	Social infrastructure at the regional level meets most health and community support needs, offers the full range of education, training and employment avenues, fosters community participation and cultural expression and offers a high level of expertise in supporting quality of life. This includes health infrastructure such as hospitals, community health services and specialist health services such as mental, paediatric and geriatric health; education facilities/spaces such as universities and TAFE institutes with satellite campuses; the full range of government services (Local, State and Commonwealth); correctional centres; cultural infrastructure such as entertainment centres; and major sporting facilities. In some instance regional level facilities/spaces may service more than one local government area. Given CoGG's role as a regional centre in the G21 region, as well as the location of existing regional level facilities, it is expected that future provision of regional facilities/spaces will be located in this area. It may also provide services (including full-cost services) to overseas residents, particularly those from the Asia-Pacific region. Such infrastructure is generally planned and funded at state or commonwealth level, usually with local government participation. As such, regional social infrastructure has an important role in resourcing and supporting facilities/spaces and services at district and local level.	This catchment can cater for a population in the order of 150,000 +.	Regional Centre.
DISTRICT LEVEL	At a district level, social infrastructure is expected to address the range of universal needs, support people's life-cycle needs (from maternal health to comprehensive in-home services for older people) and address issues of disadvantage. Planning at district level therefore needs to consider a diverse range of community needs - health, education, training, support, employment assistance, emergency services, participation and service delivery requirements. The provision of hubs is appropriate at district level to support local health, learning, and support networks. The catchment of district-level social infrastructure generally ranges from 20,000-30,000 people and often encompasses several local centres. In some cases, larger districts of up to 50,000 people can be identified, depending on urban form. The scale of facilities/spaces is larger to accommodate a larger population and geographical area, and higher-order services. Areas designated in Council's activity centres hierarchy as sub-regional centres will increasingly assume a district provision role.	This catchment caters for up to 50,000 people.	Sub-Regional Centres.

SOCIAL & COMMUNITY FACILITIES

HIERACHY	DESCRIPTION	EXPECTED POPULATION CATCHMENT	RELEVANT ACTIVITY CENTRES
LOCAL LEVEL	Local level social infrastructure is provided to meet health, learning, and support needs and foster participation and social capital at a local level. With the exception of state - provided facilities, local social infrastructure is usually planned in partnership between community organisations and local governments (and with developers in the case of major development areas). Planning for new local areas needs to include a facility/space which will act as a catalyst for developing social capital. Depending on the scale of development, this may range from provision of a park with club house facilities, to the conversion of a sales office to a neighbourhood house, to construction of a small multi-purpose centre. Such centres can provide access to social infrastructure such as information and services through community networks and computer access. Areas designated in Council's activity centres hierarchy as neighbourhood centres and town centres will increasingly assume a local provision role. Example of local level infrastructure includes community hall, primary school and child care.	This catchment caters for up to 10,000 people.	Neigh-bourhood Centres. Town Centres.



SOCIAL & COMMUNITY FACILITIES

6.4.3. PROPOSED BENCHMARKS

Community infrastructure benchmarks are developed for a region based on demographic, planning and lifestyle conditions and influences. There is no single optimum benchmark for each type of community facility. Furthermore, facilities that service the whole population in a community such as meeting spaces do not tend to have benchmarks.

Therefore, while proposed benchmarks provide a basic guide for the provision of services and facilities they need to be complemented by investigation into the local social, political and economic conditions within an area and the needs and priorities of each local community.

FACILITY SPACE	RESPONSIBILITY FOR DELIVERY OF SPACE	PROPOSED BENCHMARKS
Cultural Facilities/Spaces		
Regional Performing Arts/Theatres/Cultural Space	State Government	200,000
Regional Art Gallery	State Government	150,000
Regional Museum	State Government	200,000
Convention Centre/Exhibition Space	State/Local Government	200,000
Central Library	Local Government	150,000
Branch Library	Local Government	15,000
Neighbourhood Library	Local Government	NA
Arts and Cultural Space	Local Government	40,000
Museum	Local Government	30,000
Civic Space	Local Government	120,000
Education and Training		
University	Federal Government	150,000
TAFE Regional Facility/Space	State Government	150,000
TAFE District Facility/Space	State Government	30,000
Prep/Primary Schools	State Government Non Government Sector	8,000
Secondary Schools	State Government Non Government Sector	20,000
Health, Safety and Emergency Services		
Hospital	State Government	Public - 2.6 beds/1,000 people Private - 1.7 beds/1,000 people
Police	State Government	30,000
SES	State Government	30,000
Fire	State Government	30,000
Ambulance	State Government	30,000
Community Health Space	State Government/ Non Government Sector	30,000

FACILITY SPACE	RESPONSIBILITY FOR DELIVERY OF SPACE	PROPOSED BENCHMARKS
Leisure and Recreation		
Regional Sports Facility/Space	State/Local Government	250,000
Aquatic/Leisure Space	Local Government	40,000
Level 1 Indoor Stadium (1 court)	Local Government	10,000
Level 2 Indoor Stadium (2-3 courts)	Local Government	20,000
Level 3 Indoor Stadium (4-6 courts)	Local Government	40,000
Targeted Support (Youth, Seniors, CALD)		
Seniors Space	Local Government/ Non Government Sector	15,000
Youth Space	Local Government/ Non Government Sector	20,000
Men's Shed	Local Government/ Non Government Sector	NA
Day Respite Space (Planned Activity Groups)	Non Government Sector	15,000
Migrant Resource Space	Non Government Sector	NA
Aboriginal Service Space	Non Government Sector	NA
Community Centres and Spaces		
Neighbourhood House and Space	Local Government	10,000
Multi-purpose Community Space	Local Government	20,000
Community Meeting Rooms/Halls	Local Government	6,000
Community Gardens	Local Government/ Non Government Sector	NA
Tourism Facilities		
Tourism Information Space	Local Government	NA

Notes: Enrolment Minimum for New School – Catholic Education.

- Primary. For new parish primary schools in metropolitan areas, the estimated long-term enrolment usually planned is 400 students and would normally be somewhere between 300 and 500 students. In non-metropolitan regions, a new school is normally planned for not less than 200 long-term enrolments, or one stream. The Department of Education and Training long-term enrolment benchmark for a new primary school is currently 450 students (2010).
- Secondary. New co-educational secondary schools (Years 7–12) in metropolitan areas are planned to have an estimated long-term enrolment of between 900 and 1200 students. The DET long term enrolment benchmark for a new secondary school is currently 1100 students, and is the same for each campus of a multi-campus setting (2010).
- Preparatory to Year 12. Any new Years P–12 school is planned to have a long-term enrolment of between 900 and 1400 students.

Source: Planning for Catholic Schools in the Archdiocese of Melbourne 2010.

It should be noted that the benchmark analysis has not been undertaken for early years infrastructure and sport and recreation infrastructure due to extensive work already undertaken through other recent studies to determine overall needs and recommendations.

6.4.4. IMPORTANCE OF COMMUNITY SPACES

Social sustainability draws from a variety of underlying ideas and principles. The following provides guiding principles with respect to planning, design and locational requirements for community infrastructure.

Community infrastructure or facilities are physical buildings and spaces that are publicly accessible and offer opportunities, programs and services for a range of affordable, locally appropriate, recreational, social, developmental and cultural activities.

Outcomes for social sustainability relate to:

Access and equity

- Advocate for housing mix and choice – with an adequate proportion of affordable and adaptable housing opportunities – to meet the needs of a diverse and balanced population and respond to changing demographic requirements,
- Convenient and equitable access to local facilities and services at the neighbourhood level,
- Advocate for locally available and appropriate employment opportunities,
- Access to opportunities for lifelong learning and training;
- Connectivity with the surrounding district and access to services, facilities and resources in the wider region – particularly by public transport,
- Integration with the surrounding area – social as well as physical – to promote social cohesion and inclusiveness and ensure fair access to resources.

Health and well-being

- Appropriate urban design features and built form to create a healthy, supportive, safe, high quality and attractive environment,
- Providing pedestrian friendly, walkable neighbourhoods that encourage an active street life and healthy lifestyles,
- Providing meeting and gathering spaces,
- Providing access to a network of open space and recreational opportunities,
- Providing access to a range of social, recreational and cultural facilities that utilise resources efficiently, have flexibility to adapt to changing needs, and allow for sustainable management and maintenance arrangements.

Identity and expression

- Creating memorable and distinctive places and spaces that give rise to a sense of place and identity for the community,
- Creating opportunities for cultural expression that promote creativity, place-making, civic pride and celebration of the community,
- The recognition, interpretation and understanding of natural and cultural heritage,
- Developing community life and connections with others.

6.5. CLIMATE CHANGE CONSIDERATIONS

For community facilities, two key considerations are essential:

- Criticality of offering access to the facility at all required times (for delivering the corresponding service); and
- Potential for the facility to play a role in managing adverse climatic impacts on the population (e.g. by providing a refuge from the heat or even an emergency management facility) – such facilities can therefore be multi-purpose and should be particularly resilient.

Example climate variables that may impact upon social and community facilities include **(non exhaustive list)**:

- Increasing average daily temperatures.
- Increased intensity of extreme rainfall events.
- Sea level rise in coastal low lying areas.
- Increase number of extreme hot days.

For a more comprehensive list of climate variables see: Climate change in Victoria (2008).

Potential climate change considerations when designing, building or upgrading social and community facilities include:

- Location;
- Use of facility; and
- Connectivity to other services and precinct planning.

The design of social and community facilities could respond to climate change through:

- Neighbourhood infrastructure planning (needs of the community, facilitate social inclusion, ease of access and connectivity); and/or
- Design features for specific buildings increasing resilience to intense rainfall, heat and other climate variables.

Examples of considerations include:

- Do the facilities consider vulnerable people and how climate change may affect their ability to access the facilities? (e.g. disabled access and associated facilities)
- Does the design consider the use of the facility for multiple purposes, including refuges in case of catastrophic event (emergency management sites: floods, cyclones)?
- Is the building designed to withstand catastrophic events?
- Are there complementary actions that can be implemented together to mitigate risks and plan for the future? For example, include room for expansion of Heating, Ventilation and Air Conditioning systems within the facility design in case it is required in future.

6.6. DESIGN AND CONSTRUCTION

6.6.1. DESIGN PRINCIPLES FOR COMMUNITY SERVICES FACILITIES

The way that places and buildings are planned and arranged will affect people's use and connection to the services provided within the infrastructure. Community facilities provide spaces for meeting, learning and connecting to the community for the residents are key in creating liveable and sustainable communities. The way they are designed and where they are located are key elements for any development of a neighbourhood.

Flexibility and innovation

Community infrastructure must recognise the dynamic and changing nature of communities. The design of facilities needs to be flexible, innovative and adaptable to meet the needs of the present and future population.

Joint provision

The option of providing facilities in partnership with other organisations could be considered by the City to broaden access, maximise usage and rationalise costs.

Safety

Where possible the location should be a mixed use area, close to shops, services and public transport. The design of the facility must consider the Safe Design Guidelines including natural surveillance and lighting.

Sustainability

The building design must also utilise environmentally sustainable concepts such energy efficiency and waste minimisation.

Building materials, standards and long term maintenance

The facility must be built according to City of Greater Geelong standards using appropriate and durable materials, adhering to building standards and other regulatory requirements. Prior to construction there needs to be sign off by the City on the maintenance implications of any structure.

Co-location

The City encourages the joint use/co-location of services and facilities that are compatible. At a minimum, locating multiple services in their own sections of a single building provides efficiencies and improved access to services for the general community.

Compatible facilities should be clustered where possible and related services co-located at the one site to increase participation opportunities and include a range of amenities to meet community needs.

Access

In order to enhance pedestrian safety community facilities will be located away from arterial roads and roads with high traffic volumes. Walking distances to bus stops, shops and associated facilities should not involve crossing such roads except where safe crossings are provided.



SOCIAL & COMMUNITY FACILITIES

All community facilities providing direct services to the community should be located on or near public transport routes appropriate to the user groups of the facility within 500 metres of public transport.

Location

It is important that community facilities are located adjacent to other activity areas such as public open space, retail centres or mixed use areas.

Community precincts and facilities should not be located near area of potential hazards or risks to health and safety including but not limited to industrial areas, toxic materials and heavy traffic corridors.

Separation

Facilities likely to generate noise (such as performance venues) should be located so that they do not reduce residential amenity, nor constrain or preclude later residential development in surrounding areas.

6.6.2. CRITICAL FLOOR SPACE ALLOCATIONS

Many services that form part of social and community infrastructure are highly regulated and the minimum floor space requirements are determined through government policy or legislative requirements and change from time to time. These details must be sought and any design needs to clearly demonstrate compliance with relevant regulations. In addition, the footprint of the facility and the level of fit out will vary depending on the number and type of identified functions as well as other adjacent services and where the particular facility fits within the hierarchy of facilities.

The ability to deliver effective operational multi use facilities is dependent on the appropriate allocation of floor and storage space.

Spatial Guidelines can be obtained from the City's Community Development Department in regards to the various community services components. Footprints will vary depending on, number and types of identified components, adjacent community services, regulatory requirements and contextual place based planning.

It is important that facilities (both indoor and outdoor spaces) are on the one hand flexible, and designed for multi-purpose, and on the other hand, responsive to modern standards and innovations in design and usage.

6.6.3. PLAYGROUNDS WITHIN COMMUNITY FACILITIES

Playground requirements for early childhood services are different from public playgrounds.

Playgrounds need to provide a diverse range of quality, fun, accessible, well designed and easily maintained amenities that assist children's physical, cognitive, social and emotional development.

Playgrounds attached to community facilities are usually part of the children's services program and are not available to the general public.

The planning and design of outdoor spaces should focus on how children interact with materials, equipment, the environment, other children and adults.

They should be adaptable to many different activities across the hours of the day, the four seasons and the age of children.

Spaces and structures that can be used in a variety of ways are always preferred over single-use items.

An outdoor space should be flexible enough to enable staff to set out a variety of experiences to meet the individual needs of children to offer them variety and challenge in their play experiences.

The design and development of play spaces should be based on Council's Play Strategy and consider the guidelines and principles in Section 3 - landscape and streetscape.

Play Strategy Principles:

- Offer a diversity of experiences
- Be inclusive and accessible
- Be inviting and welcoming
- Be unique in design
- Be connected to communities and transport links
- Be safe, yet challenging
- Be sustainable
- Promote community interactions
- Be well designed and planned
- Respect and protect heritage, natural, biodiversity and cultural features
- Incorporate the natural environment
- Be well maintained
- Extend children's learning, skills and early development





7 BIODIVERSITY & CONSERVATION AREAS

7.1. OBJECTIVES

Assessment completed as part of the Geelong *Biodiversity Strategy, 2003* indicates that there is less than 5% of the pre 1750 indigenous vegetation left in the greater Geelong region. Areas that are left provide critical biodiversity and habitat resources that in many instances cannot be replaced if lost. The planning and design of infrastructure or completion of works inside or within close proximity to areas of environmental significance such as waterways, wetlands, lakes, coastal areas, bushland, grassland areas and even single trees has the potential to cause fragmentation and loss of habitat values. While it may also limit the potential for restoration, regeneration or expansion of environmental values into the future, it also presents opportunities to protect and enhance these values

Potential impacts of climate change should be considered when planning developments that may impact of biodiversity.

The objective for permitted clearing of native vegetation is no net loss in the contribution made by native vegetation to Victoria's biodiversity.

The Permitted clearing of native vegetation – *Biodiversity Assessment Guidelines 2013*, on how impacts on biodiversity should be considered when assessing an application for a permit to remove, lop or destroy native vegetation have been incorporated into the City of Greater Geelong Planning Scheme.

The key strategies for ensuring the objective is achieved at the permit level are:

- Avoiding the removal of native vegetation that makes a significant contribution to Victoria's biodiversity.
- Minimising impacts on Victoria's biodiversity from the removal of native vegetation.
- Where native vegetation is permitted to be removed, ensuring it is offset in a manner that makes a contribution to Victoria's biodiversity that is equivalent to the contribution made by the native vegetation to be removed.

BIODIVERSITY & CONSERVATION AREAS

7.2. PRINCIPLES

Planning for developments to occur within or in close proximity to areas of environmental significance need to incorporate each of the following principles:

- The strategic planning of biodiversity conservation, enhancement and impact mitigation approaches,
- Identification of areas of environmental significance including isolated remnant vegetation and habitat,
- Permanent protection of environmentally significant areas,
- Creation of sustainable biodiversity corridors within the development and the open space network, by improving links between identified areas of remnant vegetation, waterways, wetlands and coastal areas,
- Improving habitat and biodiversity values through natural regeneration, weed control, indigenous\ revegetation, wetland creation and waterway rehabilitation to increase resilience of environmentally significant areas and migration of fauna between them,
- Allowing where possible the continuation of natural processes such as erosion, inundation and regeneration, minimising the need for human intervention,
- Consideration of the future impacts of climate change on natural systems, in the planning and design of infrastructure,
- Minimising the potential for wildfires to impact on human life, communities and community infrastructure, industries, the economy and environment,
- Management of human impacts on biodiversity values while acknowledging the importance of interaction with the natural environment to health and wellbeing,
- Improvement of community understanding and appreciation of intrinsic biodiversity and natural values.

7.3. RELEVANT STANDARDS AND POLICY

Key documents relating to the planning, design and management of areas of environmental significance that bring responsibilities and obligation to the land owner include the following:

7.3.1. LEGISLATION

Commonwealth Legislation

- Environment Protection and Biodiversity Conservation Act 1999.
- International Treaties for the protection of migratory species JAMBA, CAMBA and Bonn.
- Ramsar Wetlands.

Victorian Legislation

- Catchment and Land Protection Act 1994.
- Environment Effects Act 1978.
- Fisheries Act 1995.
- Flora and Fauna Guarantee Act 1988.
- Planning and Environment Act 1987.
- Wildlife Act 1975.

7.3.2. STANDARDS

- AS4970 - 2009 – Protection of trees on development sites. Standards Australia.
- City of Greater Geelong Areas of Environmental Significance: Fencing and Gate Guideline, City of Greater Geelong, 2014.
- City of Greater Geelong Areas of Environmental Significance: Infrastructure Materials Guideline, City of Greater Geelong, 2014.
- City of Greater Geelong Areas of Environmental Significance: Interpretative Signage Guideline, City of Greater Geelong, 2014.
- City of Greater Geelong Flora and Fauna Assessment Methods Guideline, City of Greater Geelong, 2014.
- City of Greater Geelong Indigenous Plants of the Geelong Region, 2014.
- CCF Environmental Guidelines for Civil Construction, Civil Contractors Federation, 2010.

7.3.3 POLICY AND GUIDELINES

- Biodiversity Strategy, City of Greater Geelong, 2003.
- City of Greater Geelong Environment Management Strategy 2013 - 2017, City of Greater Geelong.
- City of Greater Geelong Planning Scheme Provisions including State and Local Planning Provisions, specifically native vegetation management Clauses 12.01 - 2, 52.16, 52.17 and overlay control requirements and latest updates.
- Code of Practice for Bushfire Management on Public Land, Department of Sustainability and Environment, 2012.
- Domestic Animal Management Plan 2013 - 2017, City of Greater Geelong.
- Matters of National Environmental Significance – referral guidelines for the EPBC Act 1999.
- National Aquatic and Recreational Signage Style Manual, State Government of Victoria, 2006.
- *Permitted clearing of native vegetation – Biodiversity Assessment Guidelines*, Department of Environment and Primary Industry, 2013 and updates.
- Roadside Vegetation Management Strategy, City of Greater Geelong.
- Victorian Coastal Strategy, Victorian Coastal Council, 2013.

7.4. PLANNING

The City of Greater Geelong Planning Scheme requires development to avoid and minimise adverse impacts on biodiversity.

7.4.1. IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL SIGNIFICANCE

In considering the development of new infrastructure or replacement of existing infrastructure, the following must be confirmed prior to commencement of design.

a) Is there native flora in the area?

b) Is the area home to or used by native fauna?

c) What is the significance and legislative protection for native flora and/or fauna found in the area?

This may require an assessment to be undertaken by a qualified Ecologist *(Refer: City of Greater Geelong Flora and Fauna Assessment Methods Guideline)*.

If the proposal is considered likely to have a significant impact on national or state environmentally listed species or communities, the proposal may require to be referred to Federal and State Government authorities.

An Existing Conditions Plan is required to inform initial strategic planning of the development. The Plan must include accurate mapping of:

- Any existing native vegetation on site, condition and percentage cover in accordance with DEPI guidelines.
- Any existing native trees including species, canopy width, diameter at breast height (dbh), health and tree protection zone in accordance with AS4970.
- Any high threat weeds including those listed under the Catchment and Land Protection Act 1994, with species distribution and percentage cover.
- Any significant species listed under the EPBC Act or FFG Act.
- Natural watercourses and man made features including drainage lines.
- Flood and inundations levels for waterways and wetlands.
- Pest animal harbour.

7.4.2. PLANNING PRINCIPLES

Consider the following when planning open space for the primary purpose of protecting and enhancing biodiversity:

- Large conservation reserves are more likely to support viable populations of a wider range of species and greater genetic diversity. They adapt better to more natural disturbance regimes such as fire, potential for a wider range of habitats and resilience to disturbance including climate change.
- Small and medium sized conservation reserves are important in protecting areas of existing environmental significance and populations of certain species. They also provide important habitat connectivity and refuges.
- Connectivity between areas of environmental significance is important in supporting sustainable populations. Connectivity also supports recolonisation of habitats after breeding or disturbance.
- Buffer zones around areas of environmental significance are important in reducing the impacts of adjoining land use and potentially enhancing existing and future habitat connectivity but also for providing access and fire protection zones.
- Isolated habitat areas are of greater environmental significance when located near larger conservation areas and individuals and more likely to be recolonised.
- Continuous open space reserves eg. along waterways require sufficient corridor width to allow for environmental protection/rehabilitation and recreation/ water way drainage function. Pedestrian and vehicular access where permitted within environmentally significant areas must be limited and controlled.
- Biodiversity areas require effective ecological management including ecological burning where appropriate to assist in plant regeneration and weed suppression.

7.4.3. PLANNING TO AVOID AND MINIMISE IMPACTS ON AREAS OF ENVIRONMENTAL SIGNIFICANCE

In planning and design of infrastructure minimise the future impacts that development or upgrade/replacement of infrastructure may have on long term environmental values including:

- Ongoing impacts from increasing site visitation, use and infrastructure management requirements such as vehicle access.
- Impacts and increasing need for more support infrastructure, additional facilities and access once initial services are provided in the area.
- Restrictions imposed by infrastructure, access requirements and maintenance on future environmental rehabilitation and biodiversity improvement opportunities.

7.5. CLIMATE CHANGE CONSIDERATIONS

Potential impacts of changes to climate variables due to climate change should be considered when managing biodiversity and conservation areas within City of Greater Geelong. Climate change will impact upon local biodiversity in different ways, potentially changing the composition of biodiversity through changing temperatures and rainfall patterns, and increasing the need for connectivity to enable species migration.

Example climate variables that may impact upon the infrastructure include:

- Decreasing average annual rainfall.
- Increasing frequency of drought conditions.
- Increasing average daily temperatures.
- Potential sea level rise.
- Increasing frequency and severity of bushfires.
- Decreasing relative moisture in the air.

For a more comprehensive list of climate variables see: Climate change in Victoria (2008).

Example considerations include:

- Has the asset considered the open space's vulnerability to climate variables over time?
- Does the asset build resilience through open space connectivity?
- Has the asset considered potential impacts from sea level rise if the area is close to the coast?
- Has the asset considered the ecological requirements when reducing fuel loads?
- Does the asset consider the community benefits of the increased biodiversity area?
- Does the asset consider the urban heat island benefits of the works (if any)?
- Does the asset consider the potential changes to invasive species under climate change?

7.6. DESIGN

7.6.1. AREAS OF ENVIRONMENTAL SIGNIFICANCE

If infrastructure must be placed within an area of environmental significance specialist input will be required during the planning and design process to determine siting or alignments which minimise impacts.

- Provide accurate assessment and mapping of environmental values and disturbed areas so the impacts of various siting, alignment and design options can be properly considered.
- Where possible utilise areas which have already been disturbed or already have existing infrastructure in place which will preclude further environmental rehabilitation.
- Where vegetation removal is required identify offset and other permit requirements as part of draft design so cost and permit implications can be assessed.
- Consider options for greater legal protection of existing areas of environmental significance.
- Utilise high quality durable materials that require replacement less frequently and can better withstand natural events such as fire, flood and coastal conditions (Refer CoGG Areas of Environmental Significance: Infrastructure Materials Guideline).
- Consider impacts of increasing use, by high speed cyclists and pedestrians/dog walkers which may threaten wildlife crossing the path, cause fragmentation of habitat and limit future opportunities for revegetation and rehabilitation.
- Consider ongoing maintenance requirements that may impact on natural habitat values, including removal of dead trees and overhanging limbs for safety, pruning/removal of midstorey shrubs to maintain sightlines and slashing/removal of grasses/groundlayer species to reduce fire risk/ presence of snakes.

7.6.2. ACCESS

In accordance with this provision, shared pedestrian trails, bridges and other access infrastructure shall largely be accommodated outside areas of environmental significance and only enter into these areas where minimal impacts on the natural environment and processes can be demonstrated.

- Where a shared trail is to be located within or in close proximity to an area of environmental significance the design needs to consider the key design criteria outlined in the City of Greater Geelong Areas of Environmental Significance: Shared Trails Guideline.
- Design in accordance with current Austroads Standards and City of Greater Geelong Standards. The need to later upgrade a non standard or unsafe path increases the potential impact on sensitive environmental areas.
- Alignment to minimise the need for removal of native vegetation.
- Alignment is to remain outside Tree Protection Zones (TPZ) as assessed in accordance with AS4970.
- If upgrading an existing trail which passes within the TPZ or where site constraints mean the new path must be constructed inside this zone an assessment by a specialist Level 5 Arborist (including sub surface root assessment) will be required to determine if establishment or upgrade of the path will result in long term loss of the tree. Without arboricultural endorsement of no net loss of Useful Life Expectancy the loss of the tree must be factored into site assessment and offset calculations.






- Alignment is to maintain minimum 5.0 metres clearance to top of bank along natural waterways with increased set back where possible to allow for retention of natural waterway erosion processes without engineering intervention and to allow for bank revegetation works. Where the path needs to be located within an area potentially subject to active erosion specialist hydraulic engineering assessment will be required to confirm bank stability and remediation works completed as part of path establishment works.
- Allow for establishment and maintenance of a clearance zone of at least 1.0 metre to shrubs and trees along either side of the trail for retention of sightlines and safety/security for trail users. These areas must be assessed as 'loss' areas in assessments. This area is to be revegetated with appropriate low indigenous groundlayer vegetation consistent with the prevailing EVC and the CoGG Indigenous Plants of the Geelong Region, and maintenance requirements i.e. periodic slashing must be outlined and approved by CoGG Parks and Support Services.
- Locate above 1 in 10 year ARI flood protection level. If this is not possible establish alternate flood bypass routes and review safety measures. Note this review is to be completed in consultation with Corangamite CMA or Melbourne Water who have floodplain management responsibility.
- Shared paths located in environmentally significant areas will need to be designed to allow for maintenance vehicle access to reduce the need for establishment of additional tracks through sensitive bushland/coastal reserves or along waterways and wetlands leading to further removal and impact on native vegetation. Due to the often significant environmental impacts and permit requirements associated with construction, maintenance and replacement of shared trails in environmentally significant areas use of durable materials is preferred *(Refer City of Greater Geelong Areas of Environmental Significance: Infrastructure Materials Guideline)*.
- Use of central line marking is not preferred in environmentally significant areas unless in sections constrained by topography/handrail/retaining walls where line marking is required to assist in safe management of pedestrian/cyclist traffic.
- Natural regeneration of low growing plants is to be encouraged within 1.0 metre of the trail, or revegetation to be undertaken using appropriate low indigenous species consistent with the prevailing EVC and the CoGG Indigenous Plants of the Geelong Region.
- Low impact interpretation nodes designed for walkers that connect to a shared trail outside an area of environmental significance or new conservation reserve can be accommodated within the these areas where it can be demonstrated that there is minimal to no impact on the natural environment and processes.
- Vehicle access for fire and vegetation management requirements must be considered in the development of access within new conservation reserves.
- Lighting of shared paths is typically not preferred within or near environmentally significant areas due to potential impacts on habitat for nocturnal species.

7.6.3. RECREATION FACILITIES AND FURNITURE

A range of park furniture and infrastructure can be included in areas of environmental significance where minimal impact on the environment can be demonstrated. (*Refer 7.6.2.).*

7.6.4. FENCING

Fencing or bollards to restrict public vehicle access is required for all areas of environmental significance. All proposed fencing must take into consideration the broader impacts on fauna movement especially in habitat corridors or along waterways.

Use of rabbit proof fencing to areas of environmental significance will be required where rabbit control in surrounding areas cannot be assured.

Fencing with additional measures to restrict pedestrian access e.g. Chicane, may be required at some locations to protect significant flora and fauna. Fencing is to be designed in accordance with CoGG Environmental Areas: Fencing and Gate Guideline.

7.6.5. REHABILITATION

Protection and rehabilitation of existing environmentally significant areas is preferred to construction and/or revegetation of new or degraded areas. Rehabilitation can include efforts to control weeds and enhance native vegetation quality through the reintroduction of absent life forms, ecological burns, assisted regeneration and/or adding habitat components such as logs. Rehabilitation of retained vegetation may also involve the installation of permanent fencing in areas of environmental significance to minimise damage by pest animals such as rabbits.

To ensure effective rehabilitation of environmentally significant areas the following needs to be taken into consideration:

- A rehabilitation plan must be prepared by a qualified ecologist and should take into consideration the general principles for natural regeneration and revegetation that are emerging as standards from across the professional sphere of the bushland, grassland, wetland and coastal vegetation management industry. Just planting trees is no longer acceptable.
- Contractors or staff undertaking and/or supervising rehabilitation works in environmentally significant areas must be suitably qualified with relevant ecological restoration experience.
- Contractors or staff employed to undertake weed management works should be encouraged to adopt a 'best practice' policy that does not compromise other environmental values through:
  - the excessive use of herbicide,
  - the inadvertent spread of environmental weeds,
  - the inadvertent damage or destruction of species of conservation significance.

7.6.6. REVEGETATION

- All revegetation works within 200metres of environmentally significant areas should aim to be undertaken using appropriate indigenous species refer to the City of Greater Geelong Indigenous Plants of the Geelong Region. Revegetation should attempt, as far as possible, to reproduce the Ecological Vegetation Class (EVC) that would have occurred naturally in the area. Selecting species for revegetation requires careful consideration of what is indigenous to the area, and EVC descriptions should only be used as indications of vegetation type. In most cases an assessment of the surrounding intact vegetation provides a guide to species selection.

All revegetation plans for new plantings within 200 metres of existing environmentally significant areas:

- Must nominate the relevant EVC benchmark for each area of revegetation.
- Should represent at least 30% of the original community's (EVC) diversity.
- Should be based on EVC benchmark tree densities.
- Should aim to represent all life forms (i.e. herbs, grasses, shrubs and trees).
- Must ensure all revegetation is to be indigenous and of local provenance (i.e. sourced from seed collected with the local area) and include hold points for written confirmation of where plants/seeds were sourced refer to the City of Greater Geelong Indigenous Plants of the Geelong Region.
- Should include only species suitable for propagation and that are available from locally available seed / nursery sources.
- May include a modified EVC benchmark for constructed wetlands and altered environments such as pipelines embankments, easements and retarding basins.

7.6.7. WILDLIFE MANAGEMENT

Where trees marked for removal contain hollows an inspection and relocation plan for any wildlife impacted is to be prepared by a Zoologist prior to the tree being removed. The Arborist responsible for the tree removal is to be informed about the relocation plan. A Zoologist must be on-site to supervise the removal of the tree and the implementation of the relocation plan.

7.6.8. SALVAGE OF SIGNIFICANT FLORA

Where indigenous vegetation must be removed salvage of individual rare plants and collection of seed to grow on new plants must be considered.

Where mature native trees are removed consider reuse of logs as snags and roosting sites in new wetlands and retain and secure larger logs on site where possible to maintain and enhance habitat values.

7.6.9. CONSTRUCTED WETLANDS AND WATER SENSITIVE URBAN DESIGN (WSUD) INFRASTRUCTURE

Generally WSUD features and major stormwater infrastructure should not be located in areas of environmental significance. Constructed wetlands can provide significant added biodiversity value over time however their primary role is removal of nutrients, litter and other pollutants from urban stormwater. This function often requires vehicle access and maintenance activities to many areas including sediment removal, dewatering and draw down of water levels which are inconsistent with management requirements for some environmentally significant areas.

- Ensure all active management zones including coarse sediment traps, litter and oil traps and inlet and outlet structures are located away from areas of environmental significance.
- Ensure sufficient clearances for machinery access and dewatering activities including establishment of protection berms or other measures to protect environmentally significant areas.

- Outline future management and maintenance requirements as part of the design process so future biodiversity management can be taken into consideration.
- Assess the potential for future migration of significant species to new wetlands in the design process for WSUD system maintenance activities to minimise potential impacts.

7.7. CONSTRUCTION

Construction of infrastructure in environmentally significant areas possess a significant risk to these values. Planning and design of infrastructure must identify and develop practical and implementable construction techniques during the design development phase to minimise impacts on the environment.

7.7.1. CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLANS (CEMP)

A detailed CEMP will be required to ensure protection of environmental values during construction to minimise threats and potential impacts from construction activities such as machinery access, physical disturbance, noise, spread of weeds, changes in hydrology, sediment, dust, contamination, fuel spills and use of chemicals. The CEMP should include detailed drawings indicating the location of all environmental management controls to be installed on site. All personal working on the site will need to undertake an environmental induction prior to commencement of the work and records of the induction need to be maintained.

Where construction of infrastructure is undertaken in proximity to areas of existing environmental significance there are also risks to contractors and landowners including delays, fines and loss of reputation. Breaches of the EPBC Act can result in civil penalties of up to $5 million and criminal penalties of up to seven (7) years in prison.

Key elements to be considered in development of CEMPs for sites adjoining or within areas of environmental significance include:

7.7.2. PROTECTION OF NATIVE VEGETATION

Areas identified as native vegetation within or adjacent to the construction zone must be identified in the CEMP and clearly signed and fenced to avoid any inadvertent or unapproved clearing or damage. Significant areas of native vegetation and all Tree Protection Zones need to be clearly identifiable on the site to all contractors and staff.

To ensure native vegetation that is not approved for removal is not damaged or inadvertently removed during the proposed works the following steps should be taken into consideration:

- Install temporary fencing and silt protection measures around all protected vegetation areas and any identified tree protection zones prior to commencement of works.
- Brief/induct contractors regarding the importance of protecting native vegetation and the purpose of avoidance and impact minimisation.
- Attach clear temporary signage identifying areas as environmentally sensitive stating that access and other disturbances are prohibited adjacent to construction zones.
- Wherever possible, operate vehicles and machinery from the road/path or construction zone formations minimising potential impacts on native vegetation, ground compaction and spread of weeds.
- Select the appropriate type and size of machine so that disturbance and impact to native vegetation is minimised and the chances of successful rehabilitation (if applicable) are enhanced.
- Consider the impacts of construction vehicles, fencing, noise, lighting and dust on local fauna.
- Undertake regular auditing of site protection measures as outlined in the approved CEMP.

7.7.3. EROSION PREVENTION

Areas of exposed and destabilised soil will inevitably be created during the construction process. Erosion mitigation measures need to be clearly identified in the CEMP and must be applied in areas close to creeks, drainage lines and to protect areas of adjoining vegetation native vegetation from sediment. A wide variety of soil erosion techniques can be applied using a range of materials.

The following key principles are to be considered to avoid erosion and impact on environmentally significant areas. *Further information is available in Environmental Guidelines for Civil Construction.*

- Limit machinery and earthworks to construction areas only, and wherever possible, operate vehicles and machinery from the road, path construction formation.
- Limit the exposure of disturbed soil for the shortest possible time (i.e. do not clear an area prior to a weekend if rain is forecast).
- Divert water away from exposed soil or loose material where possible.
- Apply temporary silt trapping techniques in drainage lines and along construction zones.
- Apply energy reduction techniques to the flow of storm water.
- Retain the natural drainage lines of the sites as much as possible to prevent changes in the hydraulic regime which may impact on area of existing native vegetation.
- Complete follow up weed control to areas used for sediment trapping to prevent the accumulation and spread of weeds.

7.7.4. WEED CONTROL PRIOR, DURING AND POST CONSTRUCTION

Soil and vegetative matter carrying weed seeds and soil borne pathogens is easily trapped in construction equipment and tyres. Weeds are easily introduced into construction sites or spread into relatively weed free areas. One of the most common forms of introduction is from mud containing weed seeds on tyres being deposited into new areas.

One of the most significant diseases associated with disturbed native vegetation is Phytophthora *(Phytophthora cinnamomi)*. Phytophthora is a microscopic disease causing dieback and death of plants by limiting the flow of nutrients and water the plant needs for healthy growth. Once infected, plants are often highly stressed and usually die during dry weather. Many native and indigenous species of plants are highly susceptible to Phytophthora, and for this reason the spread of this disease is listed as a threatening process under both the FFG Act 1988 and the EPBC Act 1999. Once established Phytophthora infestations cannot be eradicated from site.

Works within or in close proximity to areas of environmental significance must ensure a high level of machinery hygiene i.e. that all machinery, vehicles and materials are free of weed propagules and/or material carrying potential soil diseases.

CEMPs must detail measures taken to ensure weeds and diseases are not brought onto work sites, or existing weeds and diseases (if they occur) are not spread to other sites.

A higher standard will be applied to areas within or in close proximity to areas of environmental significance including:

- Preparation of a contractor environmental hygiene manual as part of the CEMP outlining the necessary action required to prevent weeds and diseases entering sites within areas of environmental significance. This may include establishment of temporary wash down facilities.
- Where possible, avoiding work at times of prolific seed set of noxious weeds, or remove weeds/seeds prior to commencement of works, to avoid spread by machinery.
- In areas at high risk for Phytophthora pre works testing to identify sites where preventative hygiene should occur may be required.

7.8. MANAGEMENT

Where an area of environmental significance is to be included in a larger open space reserve or as a new conservation reserve a Management Plan will be required. Where sites are to be considered as an Offset, a Vegetation Offset Management Plan will be required indicating targets over the full 10 year period prior to handover to the City. A Vegetation Offset Management Plan may be a component of the overall Management Plan or a stand alone document. Management plans will address the following items.

7.8.1. FIRE MANAGEMENT

Areas of public open space must be designed in accordance with the *Code of Practice for Fire Management on Public Land, 2012*.

Fire Management Zones (FMZs) are to be identified as part of all new open space plans. FMZs are to be developed in consultation with the CFA and the City of Greater Geelong when planning and considering management of all new public open space. The four FMZs are:

1. Asset Protection Zone (APZ)

Provides the highest level of localised protection to human life, property and key community assets and are to be located outside areas of environmental significance where possible.

2. Bushfire Moderation Zone (BMZ)

This zone aims to reduce the speed and intensity of bushfires to complement the APZ. Where practical the BMZ will aim to achieve ecological outcomes by seeking to manage for ecologically desirable fire regimes.

3. Landscape Management Zone (LMZ)

Within this zone planned burning is used for three broad aims:

- Bushfire protection outcomes by reducing overall fuel and hazard.
- Ecological resilience through appropriate fire regimes.
- Management of the land for particular values including regeneration and protection of water catchments.

4. Planned Burn Exclusion Zones (PBEZ)

This zone excludes the use of planned burning in areas intolerant to fire.

- If an area of environmental signficance is located within a Bushfire Management Overlay (BMO,) a Bushfire Management Statement and Bushfire Site Assessment must be prepared in accordance with the requirements of the planning scheme. The impact on areas of environmental significance of requirements under a BMO must be considered in planning new development.
- Where fire is planned to be used as a management tool or where required as part of a future management of an open space area FMZ a Burn Plan must be prepared, submitted and approved by the City of Greater Geelong and the CFA. The Burn Plan will be prepared with the Vegetation Restoration Plan. (*Refer 7.8.4.).*

7.8.2. WEED MANAGEMENT

A Weed Management Plan must be developed for all new open space reserves as part of the design process. The Weed Management Plan will be required to:

- Identify and map any existing weeds listed under the *Catchment and Land Protection Act 1994* and other high risk weeds, including species distribution and percentage cover.
- Outline methods and targets for eradication and control of weeds in the difference areas of native vegetation in accordance with best practice.
- Outline targets for eradication and control at Practical Completion, post one year and post two years prior to handover to the City of Greater Geelong.

Note: CoGG acceptance of the Weed Management Plan and confirmation targets have been achieved is a key hold point prior to confirmation of Practical Completion.

7.8.3. PEST ANIMALS

Rabbits pose one of the biggest threats to the areas of environmental significance. Management actions to control rabbits such as rabbit proof fencing, and other pest animals such as foxes, cats or European Hares are to be specified in the Management Plan.

7.8.4. VEGETATION RESTORATION PLAN

A Vegetation Restoration Plan is required to identify which areas of the open space will require natural regeneration and/or revegetation. Where revegetation it is to undertaken, species selection must be consistent with the prevailing EVC and the CoGG Indigenous Plants of the Geelong Region. The Vegetation Restoration Plan and the Burn Plan need to be prepared concurrently.

7.8.5. SIGNAGE

A signage plan is required for all new conservation reserves. The plan will describe the regulatory, warning and information signage to be installed around each reserve and at key entry points. Signage is not to be installed inside areas of environmental significance unless otherwise approved by the City of Greater Geelong for a specific risk.

Information Signage

- Signage to alert visitors to the environmental significance of a particular area is required for all conservation reserves. Signage is to be developed in accordance with the CoGG Areas of Environmental Significance: Interpretative Signage Guideline.

Community Information Boards

- In larger areas where there is a friends group or interested community organisation installation of a community notice board can be considered. Information boards are to be developed in accordance with the City's Design Guideline and must be placed outside areas of environmental significance.

Regulatory and Warning Signage

- Where required regulatory and risk signage is to be installed at entries to conservation reserves. Signage near waterways and coastal areas must be designed and installed as per the National Aquatic and Recreational Signage Style Manual. All signage must be placed outside the area of environmental significance unless otherwise instructed by the City.

7.8.6. DOGS AND OTHER DOMESTIC ANIMALS

Areas of environmental significance provide critical habitat for native flora and fauna.

All areas of environmental significance are to be dog on lead in accordance with the City of Greater Geelong's Domestic Animal Management Plan.

In environmentally significant areas which are home to rare and threatened fauna and/or provide critical seasonal habitats dog and other domestic animal access including horses will need to be restricted by fencing unless otherwise approved by the City.

7.9. STAKEHOLDER CONSULTATION

Various land managers including City of Greater Geelong departments may need to be consulted. In some instances where there are areas of environmental significance a community group or friends group may exist or consultation may be required within the broader community. Any community consultation will be done with staff from the City's Environment and Waste Services Unit.



BIODIVERSITY & CONSERVATION AREAS

Table 7.1: Fire Management Zones and Objectives

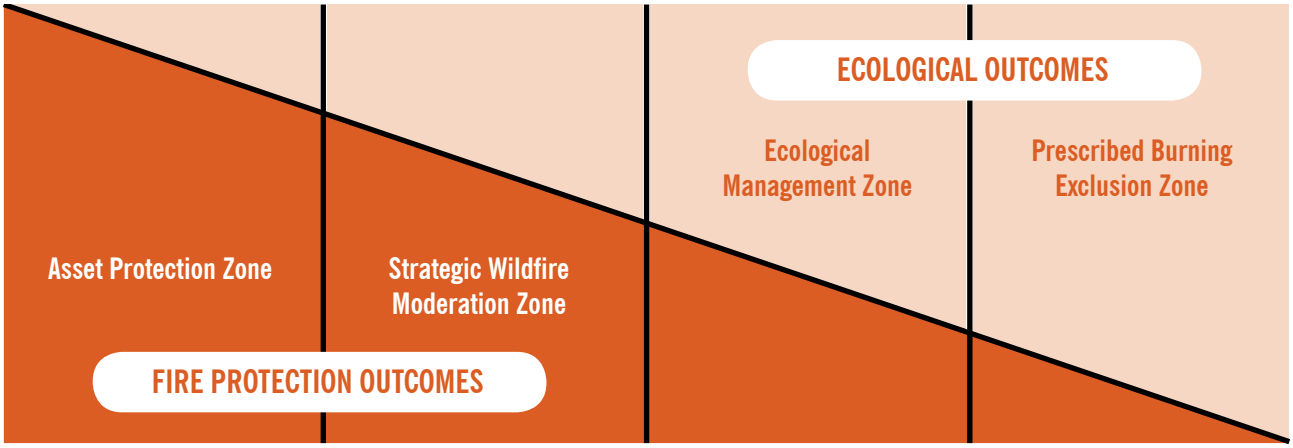
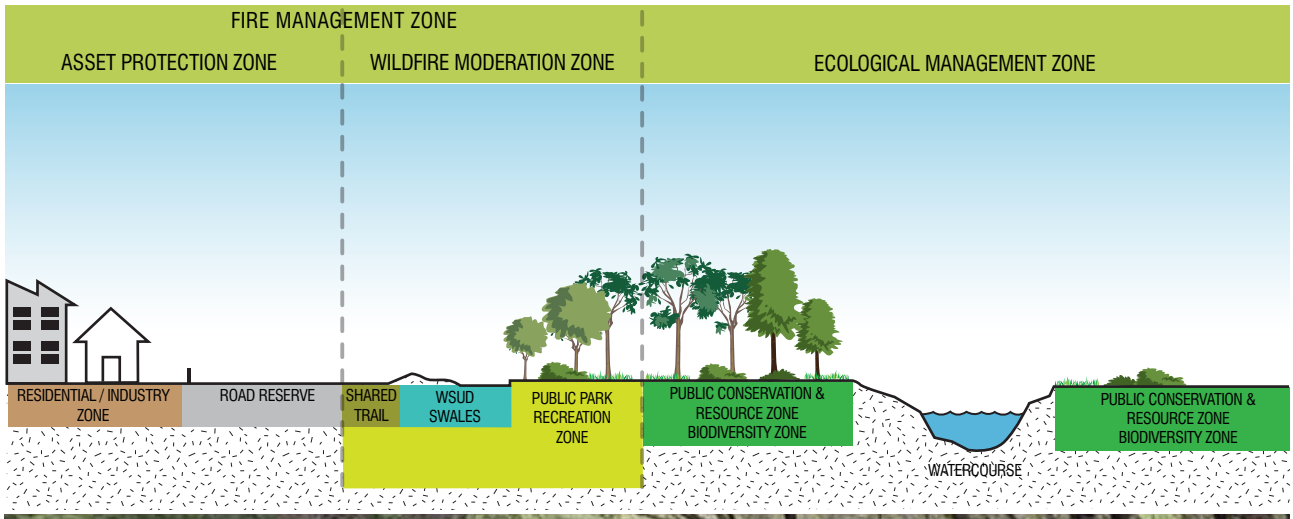


Table 7.2: Conservation Resource Management Zoning - Fire Management







8 PROCESS FOR APPLICATION/APPROVAL

These guidelines are intended to be used as a guide for planning, design and development. While there are many aspects of the guidelines that are quite specific about development outcomes, the City of Greater Geelong encourages innovation and creative solutions to the development of sustainable communities.

8.1. PRE APPLICATION

The pre-application meeting for applicants seeking planning approval is critical to discuss and negotiate aspects of proposed developments. Any application area will form part of the larger neighbourhood or region and it will be important to understand the context for every development and consider other requirements for community outcomes that will be important for the City of Greater Geelong to achieve.

PROCESS FOR APPLICATION/APPROVAL

8.2. GENERAL PLANNING PERMIT APPLICATION PROCESS

The general steps that guide the subdivision and development application process are shown below.

PRE-APPLICATION MEETING

LODGE APPLICATION

REFERRAL PROCESS (INTERNAL COUNCIL UNITS AND EXTERNAL AGENCIES/AUTHORITIES)

FURTHER INFORMATION REQUEST (IF REQUIRED)

DRAFT PERMIT CONDITIONS (FOR LARGER APPLICATION A DRAFT PERMIT MEETING IS HELD WITH THE APPLICANT TO CONFIRM THE EXTENT OF CONDITIONS)

PERMIT ISSUED



8.3. DEMONSTRATION OF COMPLIANCE

A critical component of the application process and ongoing implementation of subdivision/development permits is the clear assessment of projects against key planning controls, standards and guidelines (eg: Development Plans, Precinct Structure Plans, the Planning Scheme, etc).

This involves applicants demonstrating how the subdivision/development application meets the requirements of the Planning Scheme, along with relevant supporting documentation that guide the standards of future CoGG assets. This includes, where appropriate, the assessment of Masterplans and detailed designs against these Guidelines.

In many cases, the delay in the processing of subdivision/development applications can be traced back to the inadequacy of application information or lack of detail demonstrating compliance with relevant City of Greater Geelong standards and guidelines.

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