

DOCKLANDS
DESIGN
AND CONSTRUCTION
STANDARDS
PUBLIC INFRASTRUCTURE WORKS

IMPORTANT INFORMATION

This *Docklands Design and Construction Standards Public Infrastructure Works* was Gazetted in March 2013 (publication date June 2013). It is available online at www.melbourne.vic.gov.au/docklands or in hard copy at Council libraries. Limited hard copies are also available by contacting Council's Engineering Services Branch.

This document replaces all previous versions of the *Docklands Design and Construction Standards Public Infrastructure Works* (VicUrban, 2005) and the *Melbourne Docklands Urban Design and Street Furniture Manual* (VicUrban, 2008).

It is expected these *Docklands Design and Construction Standards Public Infrastructure Works* will remain current for the duration of the development of the Docklands area. This 2013 version may be updated in that time, with the latest version available on the Melbourne City Council website. It is the responsibility of users to ensure they are referring to the most current version of this document.

When viewed online as a PDF, this document provides live web links to Melbourne City Council's Design Standards. These Design Standards may be updated more frequently to reflect best practice and are only available on the Melbourne City Council website. Users must ensure they are referring to the most current Design Standard.

References to other documents, such as Australian Standards, are also subject to change. It is the responsibility of users to ensure they obtain the latest editions of those documents.

The *Docklands Design and Construction Standards Public Infrastructure Works* were prepared by Melbourne City Council in consultation with Places Victoria.



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EXECUTIVE SUMMARY

Over the last 12 to 15 years, the Docklands area has been dramatically transformed from a derelict wasteland into a thriving waterfront destination for business, residents and visitors. By 2025, Docklands is expected to accommodate over 20,000 residents and more than 60,000 workers¹, aiming to be a well-connected extension of Melbourne's city centre, incorporating wonderful public spaces, waterfront vistas and vibrant streetscapes. Lanes, streets, waterfront promenades, parks, squares and forecourts will all combine to form the Docklands public realm.

To achieve a quality public realm for Docklands, overarching, long-term strategies, principles and guidelines are outlined in the [Docklands Public Realm Plan \(2012-2022\)](#). The plan clarifies important requirements for public space, waterfront and street design for all professionals (both private and public sector) engaged in facilitation, design approvals and implementation of the public realm. The *Docklands Public Realm Plan* recommends Melbourne's distinctive and high standard of public realm and street design is applied throughout Docklands.

Docklands Design and Construction Standards Public Infrastructure Works (Docklands D&C Standards) is an integral companion document to the *Docklands Public Realm Plan*. *Docklands D&C Standards* provides the next level of detail for public and private professionals to ensure the delivery of a high quality public realm for Docklands that is consistent with the rest of the municipality and in line with community expectations. *Docklands D&C Standards* will assist Melbourne City Council and developers to achieve their vision for Docklands by setting out mandatory technical and documentation requirements for all civil, landscape and infrastructure works occurring in the Docklands public realm.

The standards set out in this document draw on Melbourne City Council's field research and observation of products and materials that have provided a balance of aesthetic appeal and maintenance efficiency across the municipality for decades. *Docklands D&C Standards* will assist developers to deliver on the non-core components of their development parcels, while ensuring the staged precinct-by-precinct development of Docklands can be realised as one large-scale, integrated design.

¹ 'Docklands Community and Place Plan', July 2012, State Government of Victoria, Places Victoria, City of Melbourne

HOW TO USE THIS DOCUMENT

The *Docklands Design and Construction Standards Public Infrastructure Works (Docklands D&C Standards)* is intended for use by any entity (private or public) developing or delivering Docklands public realm that is or will be owned by Melbourne City Council (Council), vested in Council, where Council is or will be the Committee of Management, or by agreement.

Complying with the *Docklands D&C Standards* is a requirement of all precinct Development Agreements signed with Places Victoria and is a statutory requirement under Council's *Activities Local Law 2009*.

Developers of the Docklands public realm should start using this document on commencement of any Development Plan for any precinct or parcel of land in Docklands. The *Docklands D&C Standards* aim to provide information to assist developers to identify, budget and deliver the standard of public realm sought by the community and expected by Council.

The *Docklands D&C Standards* are used by Council as the basis for approval of all Docklands public realm works. Council will not approve any non-compliant public space, street or public realm element. The approval process and documentation requirements are clearly outlined in this document.

Developers submitting non-compliant public space, street or public realm elements risk the refusal of built works and subsequent handover to Council. Developers would then maintain all insurance and liability risks and maintenance responsibilities until such time as they were rectified.

The *Docklands D&C Standards* should not be read in isolation, but in conjunction with applicable legislation, related strategic and technical documentation issued by Council, and other standards and guidelines issued by State Government agencies, service providers and relevant authorities. References to relevant documentation are provided at the end of each chapter, but these should not be considered an exhaustive list.

When this document is viewed in hard copy, the Design Standards references are written as a Design Standard number (e.g. 201.02). Look for this icon for all Design Standards that can be viewed on Council's website.

 Design Standard

When viewed online as a PDF, the *Docklands D&C Standards* provides live web links to Council-issued documents (listed in the chapter references) and Council's Design Standards. The Design Standards are one-page PDF documents that provide details and illustrations on how public realm elements must be constructed, and include references to relevant [Engineering Standard Drawings](#). The Design Standards are likely to be updated more frequently than this document as changes in best practice occur. It is the responsibility of users to ensure they refer to the most current Design Standard.

All references to other documents (e.g. Australian Standards) are also subject to change. It is the responsibility of users to ensure they consult the latest editions of those documents.

INTRODUCTION

The purpose of the *Docklands D&C Standards* is to assist developers of the Docklands public realm by outlining the approval process and mandatory technical requirements for all civil, landscape and infrastructure works occurring in the Docklands public realm that will be owned by or vested in Council.

The *Docklands D&C Standards* are important to ensure that public realm works meet the demanding functional and safety standards required for public streets, routes and public spaces, and to ensure these spaces can be well-maintained without unreasonable expense. This document aims to ensure that the incremental development of projects contributes to the wider vision for Docklands as part of Melbourne, as identified in the *Docklands Community and Place Plan* and the [Docklands Public Realm Plan](#).

Consulting the *Docklands D&C Standards* at the outset of any development planning will assist developers to understand the quality of public realm sought by the Docklands community and Council.

The *Docklands D&C Standards* are available online at www.melbourne.vic.gov.au/docklands or in hard copy at Council libraries. Limited hard copies are also available by contacting Council's Engineering Services Branch.

DEFINITIONS

The *Docklands D&C Standards* apply to the legislated Docklands Area (as per the Docklands Act 1991) within the Melbourne City Council municipality (refer Figure 1.1).

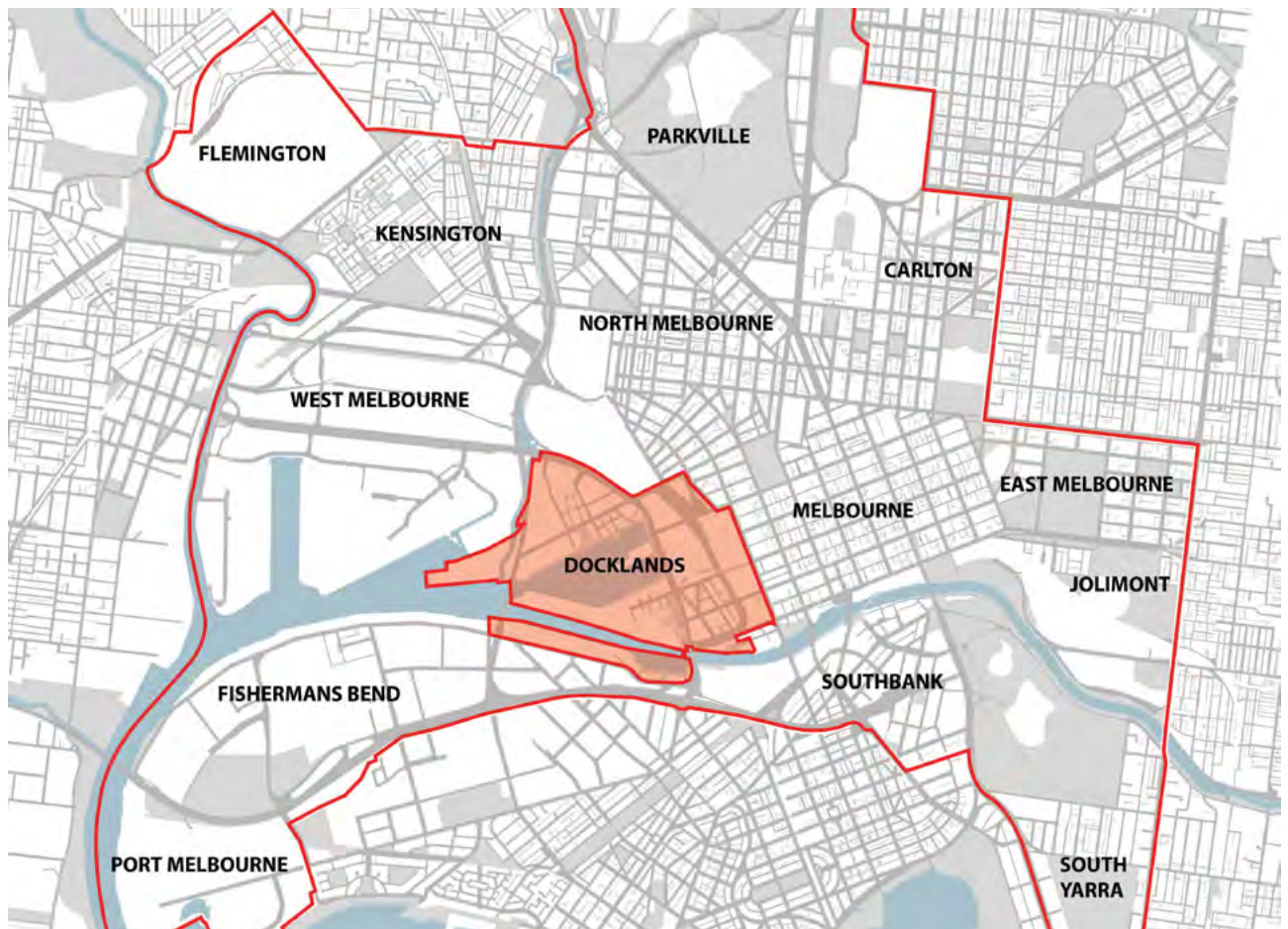


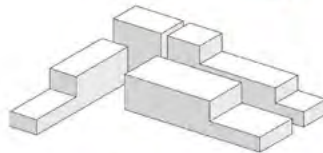
Figure 1.1 Legislated Docklands Area within the Melbourne City Council municipal boundary

INTRODUCTION

Public realm includes all publicly accessible areas including public spaces, streets and routes. Figure 1.2 illustrates the main elements that define the public realm.

Public space includes waterways, public marinas, parks, squares, forecourts, promenades and creek corridors.

Public streets and routes include roads, lanes, arcades, bridges and overpasses.



Buildings



Street trees



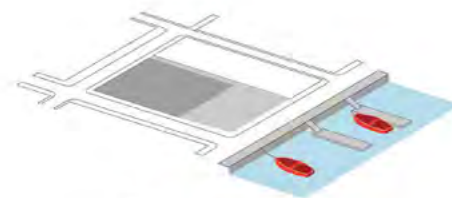
Materials/Vegetation



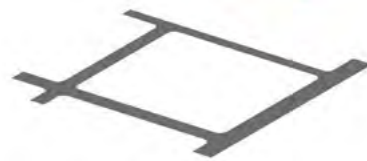
Users/Events



Street furniture, Lighting and Public art/Landmarks



Public spaces



Public streets



Infrastructure

Figure 1.2 Main elements that define the public realm (adapted from the Docklands Public Realm Plan)

The *Docklands D&C Standards* apply to all of the Docklands public realm that is, or will be, owned by Council, vested in Council, where Council is or will be the Committee of Management, or by agreement, whether the public realm works are undertaken by Council, Places Victoria or private developers.

The term 'developer' is used throughout this document and is intended as a generic term to describe the entity responsible for building the public realm, be it a public or private agency.

DOCUMENT STRUCTURE

The *Docklands D&C Standards* are set out in two parts.

Part A of this document outlines the **approval process**, providing a brief overview of the different stages of project development. The approval process for the first three stages of project development – Development Plan, Planning Permit and Subdivision – is provided by the relevant planning authority and is not detailed in this document. Detailed information, including documentation and submission requirements, is outlined for the final five stages of development:

- Municipal Design Approval
- Consent for Works
- Construction
- Practical Completion
- Defects Liability and Final Completion.

Part B of this document outlines **design standards, standard materials and elements** for development of the public realm in Docklands – what to use and how in various typical situations – which comprise the following chapter headings:

- Groundwater and geotechnical conditions
- Stormwater management
- Streets and routes
- Paving and surface materials
- Street, park and waterfront furniture
- Signs
- Lighting
- Landscape elements: plantings and irrigation
- Maritime structures.

References are provided to Council's Design Standards, which detail and illustrate how public realm elements must be constructed, and include links to relevant [Engineering Standard Drawings](#).

References to applicable legislation, related strategic and technical documentation issued by Council, and other standards and guidelines issued by State Government agencies and service providers are identified in *italics* throughout this document and listed at the end of each chapter. When viewed as a PDF, live web links are provided for Council-issued documents.

A **glossary of terms** is available on page 121.

INTRODUCTION



COMMUNITY VISION FOR DOCKLANDS: IN 2020, MELBOURNE DOCKLANDS WILL BE AN INTEGRAL PART OF A CREATIVE, WELL-CONNECTED 21ST CENTURY CITY. IT WILL CONTINUE TO BE A KEY DRIVER OF MELBOURNE'S ECONOMY AND OFFER A UNIQUE URBAN WATERFRONT, WHICH REFLECTS MELBOURNE'S ELEGANCE, DIVERSITY AND CULTURE.

DOCUMENT AUDIENCE

The *Docklands D&C Standards* are intended for two audiences:

- Developers of the Docklands public realm
- City of Melbourne staff responsible for assessing stages within the approval process.

CITY OF MELBOURNE STRATEGIC AND POLICY CONTEXT

In 2010, Council and Places Victoria started engaging with thousands of Melburnians to articulate and refine a community vision for Docklands. A vital and high quality public realm was identified as a clear priority for the community.

The *Docklands Community and Place Plan* was launched in 2012, articulating a community vision for Docklands and setting out three important themes:

- Capturing the essence of Melbourne in the Docklands experience

- Creating a 21st century city
- Embracing Melbourne's urban waterfront.

The *Docklands D&C Standards* will assist Council to achieve the high quality public realm aspired to by the community.

Docklands Public Realm Plan

Following completion of the *Docklands Community and Place Plan*, the [Docklands Public Realm Plan](#) was developed, outlining the value of the public realm and providing clarity to developers, designers and government regarding long-term strategies, principles and guidelines for the design and programming of public streets and spaces.

Key areas of the Docklands public realm, both existing and proposed, are identified in the *Docklands Public Realm Plan*, with a one-page briefing note provided for each. The map of key areas presented in the *Docklands Public Realm Plan* is reiterated in Figure 1.3 on the next page.

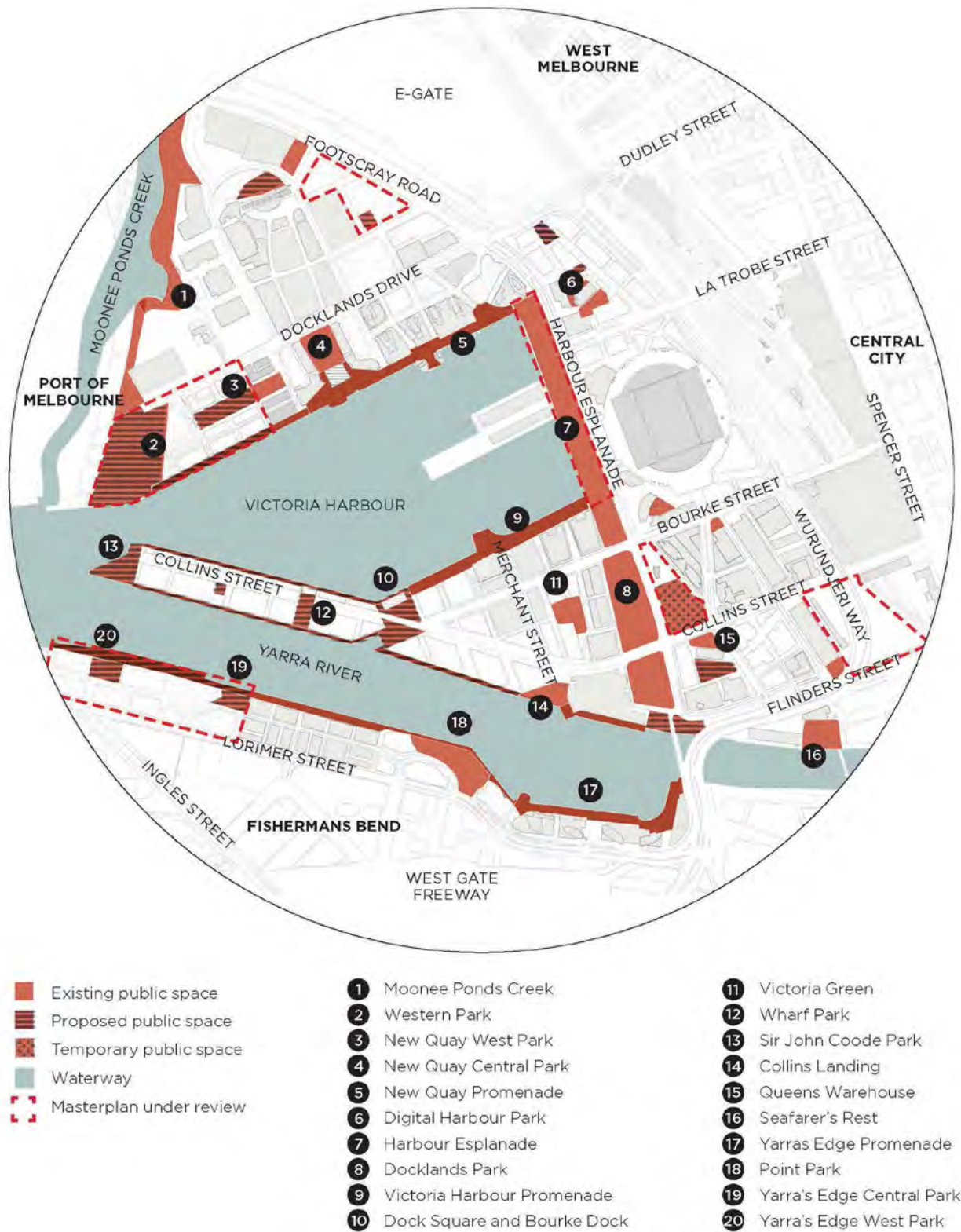


Figure 1.3 Key areas of the Docklands public realm

The [Docklands Public Realm Plan](#) provides an overview of challenges and opportunities in the Docklands context and demonstrates how seven design principles may be applied to streets and spaces:

- | | | |
|----------------------|---------------|-----------------|
| 1. Diversity of use | 4. Interfaces | 6. Community |
| 2. Identity of place | 5. Amenity | 7. Connectivity |
| 3. Sustainability | | |

INTRODUCTION

Importantly, the [Docklands Public Realm Plan](#) provides a strategic companion document to the *Docklands D&C Standards*.

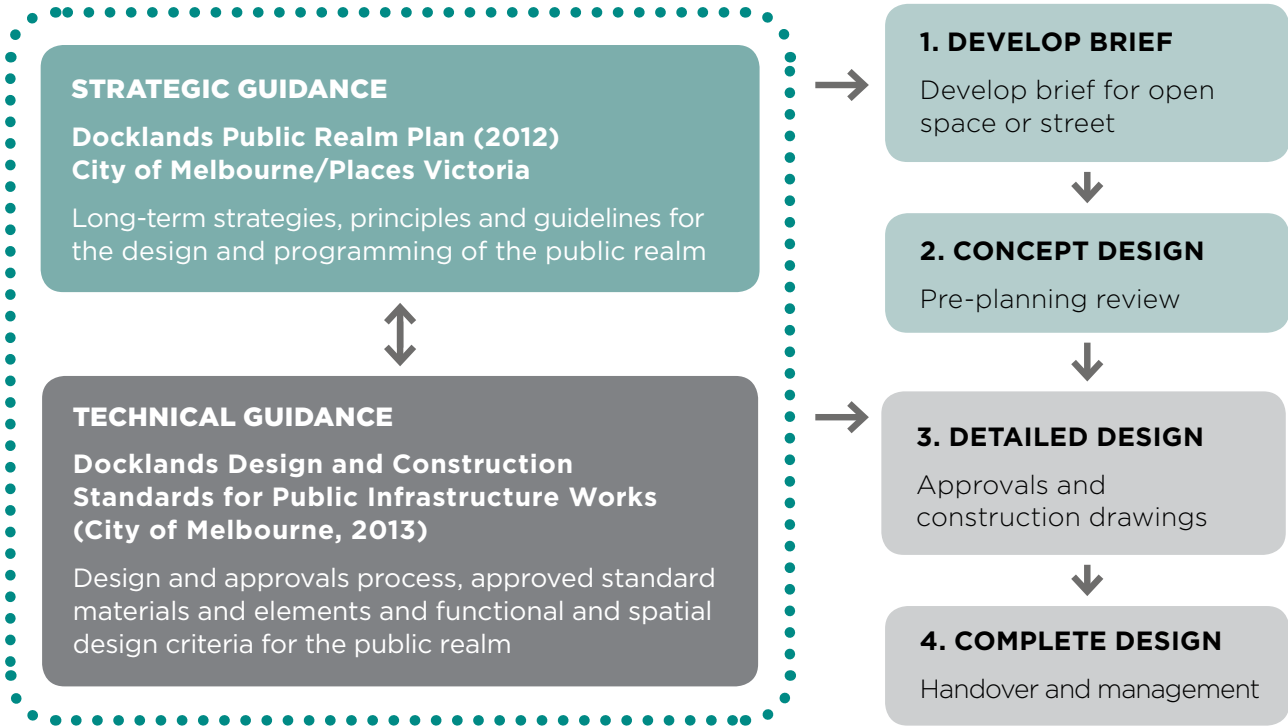


Figure 1.4 Mutually reinforcing companion documents

Melbourne City Council *Activities Local Law*

Melbourne City Council's *Activities Local Law 2009*, item 7.2, makes compliance with the *Docklands D&C Standards* a statutory requirement. As a result, this document is used by Council as the basis for approval of all Docklands public realm works.

Developers submitting non-compliant public space, street or public realm elements risk refusal of a Practical Completion Certificate and subsequent handover to Council. Developers would therefore maintain all insurance and liability risks and maintenance responsibilities until such time as they were rectified to the satisfaction of Council.

In addition, Places Victoria requires compliance with the current version of this document in all Docklands Development Agreements (contractual arrangements between Docklands developers and Places Victoria).

DOCKLANDS ROLES AND RESPONSIBILITIES

Day-to-day development of Docklands is shared between three main entities, each with different responsibilities – Places Victoria (the State Government's Urban Renewal Authority, successor to VicUrban), Melbourne City Council, and developers.

In addition, the Victorian Minister for Planning is the Responsible Authority for considering and deciding on all planning applications for developments with a gross floor area exceeding 25,000m².

Role of Places Victoria

Places Victoria, on behalf of the State Government, manages the delivery of development in Docklands.

Places Victoria is the State Government's land development agency, helping to meet the challenges of population growth and increased housing demand. Places Victoria facilitates large-scale urban renewal – for residential and mixed-use purposes – within established areas of Melbourne and strategic locations in regional Victoria. Its activities promote housing affordability and diversity and best practice in urban and community design. Places Victoria uses commercial skills to deliver housing choice to the market, increasingly in established areas, providing partnership opportunities for the private sector and encouraging the delivery of high quality, affordable and sustainable dwellings.

Places Victoria is responsible for managing the delivery of development in Docklands as a world-class waterfront destination. It does this through administering precinct Development Agreements.

Places Victoria is the **Referral Planning Authority** for all planning applications in Docklands.

Role of Council

The suburb of Docklands falls within the municipal boundary of Council.

As the ongoing **Municipal Authority**, Council delivers on the same responsibilities in Docklands as it does for the rest of the municipality – planning and providing services, facilities and infrastructure for the local community, strategically planning and regulating land use in the municipality, and other functions as prescribed by the *Local Government Act 1989*.

Importantly, Council is the ultimate custodian of the Docklands public realm and its assets – whether owned by, or vested in, Council.

Council is the **Responsible Planning Authority** for developments in Docklands of a gross floor area less than 25,000m².

It is Council's responsibility to ensure the public realm meets the needs of the growing population and contributes to the success of Docklands as a place. This document and the [Docklands Public Realm Plan](#) guide this process.

Role of developers

Developers bring their investment capabilities and market knowledge to enable the development of the Docklands area in accordance with the precinct Development Agreement with Places Victoria, the Planning Permit and any other approved plans. Developers liaise with Council to resolve the design of the public realm.

Developers of the Docklands public realm should reference the [Docklands Public Realm Plan](#) and start using the *Docklands D&C Standards* on commencement of a Development Plan for any precinct or parcel of land in Docklands. The *Docklands D&C Standards* provide information to assist developers to identify, budget for, and deliver the standard of public realm sought by the community and expected by Council.

CHAPTER REFERENCES

[‘Docklands Public Realm Plan’](#) (2012), City of Melbourne

‘Docklands Design and Construction Standards Public Infrastructure Works’ (2013), City of Melbourne

‘Docklands Community and Place Plan’ (2012), State Government of Victoria, Places Victoria, City of Melbourne

‘Docklands Act 1991’, State Government of Victoria

‘Melbourne City Council Activities Local Law 2009’, City of Melbourne

‘Local Government Act 1989’, State Government of Victoria

PART A: APPROVAL PROCESS

A1. INTRODUCTION

Design and implementation of works in the Docklands public realm usually spans several stages, requiring approval by the relevant Responsible Authority. This section provides a brief overview of the first three stages of development – Development Plan, Planning Permit and Subdivision stages – with more detailed information (including documentation and submission requirements) outlined for:

- Municipal Design Approval
- Consent for Works
- Construction
- Practical Completion
- Defects Liability and Final Completion.

Part A summarises the intent of these final five stages, the level of design resolution required to support the intent, and the documentation required to explain the proposed designs. It focuses exclusively on Council's requirements with respect to the public realm.

It is important to note that each stage has different permit and documentation requirements. Complying with the requirements of this document, and following the guidelines set out in the [Docklands Public Realm Plan](#), will assist developers to obtain approval at each development stage. Compliance with the *Docklands D&C Standards* is also a requirement of all precinct Development Agreements and a statutory requirement under Council's *Activities Local Law 2009*.

This document does NOT address:

- General Planning Permit and Subdivision application requirements (refer to the *Melbourne Planning Scheme* and the *Subdivision Act 1988*)
- The competitive tendering processes for development proposals or the Development Plan stages managed by Places Victoria
- Documentation and approval requirements of other stakeholders, agencies and authorities (e.g. VicRoads, Melbourne Water, Parks Victoria).

A1.1 GENERAL DOCUMENTATION AND DRAWING STANDARDS

All documentation submitted to Council during the approval process is expected to meet a minimum level of professionalism and detail.

All plans and drawings must:

- Be drawn to scale, with the size of the drawing original indicated
- Show north point and maintain consistent drawing orientation within the drawing set
- Provide accurate and complete annotations and dimensions
- Display an appropriate drawing title, number and date for reference
- Show all levels to Australian Height Datum (AHD) and all coordinates to Geocentric Datum of Australia (GDA) 1994.

Data format requirements include:

- CAD files must comply with Council's CAD standard (refer Chapter A8: 'Practical Completion')
- GIS electronic files must include descriptive documentation, spatial data and metadata
- PDF files must include embedded fonts for all text and symbols used
- Electronic copies of reports, maintenance manuals and other text documents must be in either Microsoft Office or PDF format
- GIS, PDF and CAD files must be provided.

The documentation of any proposed works must:

- Be comprehensive
- Be concise and well-ordered, with minimal duplication
- Present a fully coordinated design that integrates proposals for underground services, sub-structures and geotechnical elements with all above ground elements
- Be consistent and fully coordinated with other drawings in the set and professional inputs to avoid contradictions, omissions or ambiguities (e.g. civil engineering drawings coordinated with landscape architectural drawings and with services drawings)
- Include a plan showing the current and proposed title boundaries in relation to the proposed public realm works
- For public artworks, maquettes must be handed over to the *City of Melbourne Art and Heritage Collection*.

A1.2 FUNDING FOR WORKS

The developer of the public realm is required to undertake the following at its own expense (unless stipulated in an alternative formal agreement):

- Prepare complete designs and documentation, including the engagement and coordination of all consultants and sub-consultants
- Consult with all relevant authorities and agencies, and obtain approvals including payment of fees where applicable
- Prepare submission materials for each approval stage
- Construct the works as approved in their entirety, except for public realm elements specifically noted in the Municipal Design Approval.

Public realm elements supplied and installed by Council at its own cost, during the Municipal Design Approval stage, typically include:

- Parking meters and ticket machines. This does not include footings and underground conduits – these are to be provided by the developer of the public realm
- Maps and other paper inserts for illuminated pedestrian directional signs.

A1.3 COMMUNITY ENGAGEMENT

Some stages of the approval process may require community engagement. This may be deemed appropriate by the Responsible Planning Authority and/or Council.

In this event, the developer of the public realm must:

- Undertake community engagement as directed
- Provide presentation materials to support the community engagement process
- Attend community engagement meetings, as appropriate.

CHAPTER REFERENCES

'Docklands Public Realm Plan' (2012), City of Melbourne

'Melbourne City Council Activities Local Law 2009', City of Melbourne

'Melbourne Planning Scheme' (2013), Department of Planning and Community Development, State Government of Victoria

'Subdivision Act 1988', State Government of Victoria

A2. DEVELOPMENT PLAN

Places Victoria selects precinct development proposals using a commercial tender process. The proposals address private development and include the provision of Docklands public realm. Once the development proposal is selected, Places Victoria directs the developer to refine their proposals to form the basis of a Development Plan.

Development Plans prepared through this process are required to be approved by the relevant Responsible Authority under the Melbourne Planning Scheme. The Melbourne Planning Scheme includes particular requirements for the preparation and consideration of Development Plans. Once a Development Plan has been approved, a Planning Permit is still required for the development of individual buildings and must be consistent with the relevant approved Development Plan.

A3. PLANNING PERMIT

Planning Permits are issued by the relevant Responsible Authority and are required prior to the commencement of any works. Council is the Responsible Authority for developments with a gross floor area less than 25,000m² in the Docklands Zone. The State Government of Victoria Minister for Planning is the Responsible Authority for considering and deciding on all planning applications for developments with a gross floor area exceeding 25,000m².

Places Victoria is a Referral Authority for all planning applications for the use and development of land in the Docklands Zone.

Planning Permit conditions often require the submission of detailed information for further approval, including details of public realm works, access, waste management, drainage and public lighting. The conditions of the Planning Permit will specify which authority is responsible for approving the detailed information submitted.

A4. SUBDIVISION

Council is the Responsible Authority for assessing land Subdivision applications.

There are three potential types of plan and approval:

- Transfer of land to commence construction
 - start of the process (staged release)
- Subdivision of land for sale by developer
 - sell off of land
- Re-subdivision at the end of development
 - this may include redefinition of the public realm.

To receive Subdivision approval, all requirements of referral authorities must be completed to the satisfaction of Council's Planning and Building Branch (Land Survey) under the *Subdivision Act 1988*.

All issues must be resolved to the satisfaction of Council's Planning and Building Branch (Land Survey) prior to the issue of the Statement of Compliance.

CHAPTER REFERENCES

'Subdivision Act 1988',
State Government of Victoria

A5. MUNICIPAL DESIGN APPROVAL

Council's Engineering Services Branch is responsible for reviewing all works in consultation with Council's Urban Design Branch. The Manager of Engineering Services is responsible for approving designs for all works. Where approval by other Council branches is required (e.g. for soft landscape or art), the Engineering Services Branch will consult with those concerned. All applications for Municipal Design Approval must be directed to the Manager Engineering Services.

The Municipal Design Approval process ensures that the design is fit for purpose, consistent with all relevant standards and appropriate to the location. The Engineering Services Branch also reviews the consistency of the detailed design in relation to the approved Development Plan and Planning Permit.

If the works require a Planning Permit, an application for Municipal Design Approval must include evidence of an approved current Planning Permit, and compliance with all conditions placed on the Planning Permit by the Responsible Authority.

If this documentation is satisfactory, the Municipal Design Approval process does not re-examine the design approved by the Planning Permit (typically resolved to schematic design level) but focuses on its detailed resolution, unless functional or public safety problems are identified that result from the schematic design.

As part of the Municipal Design Approval, correspondence from the Manager Engineering Services will specify any items included in the works that will be supplied and/or installed by Council at its own cost. All other works are to be funded in their entirety by the developer. The developer must submit fully detailed design documentation to support construction.

Typical scale for drawings

- Set-out plans at 1:100
- Longitudinal and cross sections at 1:20 vertical and 1:200 horizontal
- Details as appropriate for construction purposes.

Copies of documents

- Unless otherwise indicated, submit multiple complete copies of all documentation including:
- Two full-size hard copy drawing sets
- Three A3-size hard copy drawing sets
- One disc of electronic files (PDF format) of all documents.

A5.1 SUBMISSION REQUIREMENTS

A5.1.1 Property Titles and Ownership Plan

Submit a Property Titles and Ownership Plan as required by the Planning Permit.

Drawings to show current and proposed title boundaries for the public realm.

A5. MUNICIPAL DESIGN APPROVAL

A5.1.2 Public Realm Plan

Submit a Public Realm Plan as required by the Planning Permit.

In addition, include details of:

- Drawings of street layouts, construction plan(s), cross sections, longitudinal sections, details and schedules showing all information as in the Planning Permit stage, and also:
 - comprehensive and detailed set-out of kerbs, channels, paving, tree planting pits, grates, and other features in plan and in levels
 - all street construction materials including kerbs, channels and pavements, identifying materials, location, and paving set out, including expansion joints
 - maritime works
 - construction details including paving substructure, joint details, etc.
 - street furniture types, materials, locations, quantities and installation details
 - all street sign types, locations, materials, quantities and installation details
 - all poles for signs, tramways, lighting etc.
 - locations of new utilities including depths and offsets
 - proposed spare conduits to allow for possible future services and to eliminate the need to excavate the paving in future
 - accurate locations and details (e.g. types, locations, sizes, cover lid types, etc.) of all underground service access points, pits, manholes, traps, outlets, cabinets for all utilities including water, sewer, power, gas, drainage, cathodic protection systems, traffic signals, council cabinets, irrigation controls, drainage pumping stations, telecommunications cables, mobile phone towers and gross pollutant traps.

Submit a geotechnical report for the site prepared by a National Association of Testing Authorities (NATA)-approved laboratory, with calculations and engineering details including:

- Pavement design assumptions and calculations
- Estimates of likely settlement of road and footpath pavements, adjacent structures and differential settlement, including details of the accuracy or confidence limits of this estimate
- Details of design measures to mitigate the impact of ground settlement and to allow for likely differential settlement between roads, footpaths and structures on piles.

A5.1.3 Traffic Management Plan

Submit a Traffic Management Plan as required by the Planning Permit.

In addition, submit:

- Plan and schedule(s) with details of all road line markings and traffic signal designs
- Plan and schedule with details of traffic, parking and any other regulatory signage in accordance with VicRoads standards
- Plan and schedule with details of all signage including:
 - street name plates for public roads
 - street name plates for private routes
 - street name plates for promenades
 - building / property address numbers
 - pedestrian directional signage
 - interpretive signs or plaques if appropriate
- Details of how *Disability Discrimination Act 1992* (DDA) requirements are met.

A5.1.4 Waste Management Plan

Submit a Waste Management Plan and Report as required by the Planning Permit.

A5.1.5 Stormwater Drainage and Management Plan

Following approval of the Stormwater Drainage Management Plan by the Manager Engineering Services, submit detailed designs, including a report, plans, drawing details and computations explaining stormwater management objectives and proposed treatments, including:

- Types and quantities of pollutants that will be generated on the site (pollutant load)
- Drainage - legal points of discharge
- Environmental Plan showing gross pollutant traps
- The design flow for pollutant capture/containment
- Stormwater treatment design to specifically target identified pollutants
- Effects of tides on the effectiveness of proposed treatments
- Required maintenance including the method, frequency and costs of pollutant removal
- For areas where chemicals or oils will be stored or transferred (e.g. loading docks), submit a Spill Management Plan (including the dangerous goods manifest) and implement an on-site spill management system to prevent spills from leaving the site.

A5.1.6 Public Lighting Plan

Submit a Public Lighting Plan including details of design lighting levels.

Submit a copy of CitiPower/Powercor's approval for any functional lighting, including cabling and associated works.

A5.1.7 Non-standard materials and elements documentation

Deviation from the use of standard materials and elements requires approval from Council. Developers must have discussed alternatives with Council prior to submitting drawings for Municipal Design Approval (refer Chapter B1, B1.1: 'The value of standards').

For non-standard materials or elements proposed for use submit the following:

- Details of maintenance requirements
- Certification that the item or material will have an asset life equivalent to, or longer than, an appropriate existing standard, if there is one. This must consider durability in a marine environment, where relevant. Documentation of tests and technical assessments must be submitted to support approval
- Supply sources (more than one if available) to enable maintenance and replacement.

The Engineering Services Branch will determine which of the following tests are required in relation to the use of non-standard materials or elements:

- A road safety audit
- An audit of DDA compliance or impacts on DDA compliance of the place of use
- A risk assessment
- Other safety tests, such as slip resistance for paving materials.

A5. MUNICIPAL DESIGN APPROVAL

A5.1.8 Landscape Construction Plan

Submit a Landscape Construction Plan for approval, providing details of:

- Soil analysis including assessment of suitability for horticultural purposes
- Management policy for any areas of soft landscaping where subsoil contamination has been identified
- Planting schedule detailing species/cultivar, approximate mature size, size to be supplied at time of planting, locations and quantities
- Details of turf types
- Soil preparation and planting details
- Irrigation layout, water tank design and details
- Water sensitive urban design (WSUD) elements
- Details of all park/street furniture, lighting, play equipment, etc.

For any containerised plantings, the following is required:

- Detailed Maintenance Management Plan
- Details of procedures for replanting
- Life expectancy of drainage and water-proofing systems.

A5.1.9 Public art drawings and documentation

For any artworks to be installed in a road reserve or any other public space owned or managed by Council, submit the following:

- Evidence of an approved and current Planning Permit (if one is required), and compliance with all conditions placed on that Planning Permit by the Responsible Authority
- Detailed design drawings
- Specifications of materials, finishes, and engineering calculations (e.g. footings, structural members)

- A Durability Plan describing:
 - the estimated maintenance free period and overall design life
 - assumptions regarding environmental conditions (e.g. salt spray)
 - a Life Cycle Maintenance Plan indicating (in at least 5-year timeframes) the appropriate maintenance regime including methods and costs
- Details of the Commissioning Agreement for the artwork, including any commitment to maintain the artwork for any period, which has been made by the Commissioner of the artwork and which has been agreed to in writing by Council
- For public artworks, maquettes must be handed over to the *City of Melbourne Art and Heritage Collection*.

For further details refer to the *Docklands Public Art Policy* and *Docklands Public Art Guidelines*.

A5.1.10 Certifications and third-party audits

Depending on the location and the nature of the proposed works, and at the discretion of the Manager Engineering Services, the following information may be required:

- Fire Brigade Report
- DDA Audit
- Public Realm Safety Audit
- Road Safety Audit
- Independent Structural Certification
- Playground Safety and Standards Compliance Audit
- Crime Prevention through Environmental Design (CPTED) Audit.

Each of these must be prepared by an independent person with recognised technical expertise relevant to the assessment and submitted with a signed declaration stating the designs comply with all relevant standards.

A5.1.11 Fees

Fees for checking drawings and construction supervision will be charged in accordance with the Subdivision Act.

At the submission of plans for Municipal Design Approval, the developer must provide an estimated cost of construction of public realm works proposed to transfer to Council. Council will provide confirmation of all fees when assessing the construction plans. Council will then provide the developer with an invoice for fees.

If the applicant chooses not to provide the estimated construction cost, Council will determine the appropriate construction cost for a fee of 0.25% of the estimated construction cost.

Fees are as follows:

- **Fee for checking engineering plans**
Payment of 0.75% of estimated construction cost for Municipal Design Approval checking of plans
- **Fee for supervision of works**
Payment of 2.5% of estimated construction cost for Municipal Construction Surveillance (if Council is undertaking surveillance).

If Council is not undertaking Municipal Construction Surveillance an administration fee of \$5,000 as an upper limit will apply. This fee includes approving the developers proposed Surveillance Plan and final audit of surveillance reports.

If, during construction, alterations to approved plans are required then further approval will be required before construction of that portion commences.

CHAPTER REFERENCES

'Disability Discrimination Act 1992',
Australian Government

'Docklands Public Art Policy' (2010),
Places Victoria

'Docklands Public Art Guidelines' (2010),
Places Victoria

'Subdivision Act 1988',
State Government of Victoria

A6. CONSENT FOR WORKS

Council's Planning and Building Branch (Construction Management – Site Services) is responsible for granting Consent for Works (Consent) under delegation for the developer to undertake works in public streets and other public spaces that are the responsibility of Council.

Consent only applies to work within the public realm as applicable under the *Road Management Act 2004* or Part 6 of Council's *Activities Local Law 2009*.

Consent is not required when works occur solely on private land. Consent to undertake works on existing public assets, such as roads, drains and lighting, must be obtained before construction can commence, regardless of any prior approval of the design.

The purpose of the Consent process is to ensure that works are carried out in a safe and logical manner, with minimal disruption to other activities in the public realm and without damage to other assets. The Consent process ensures the reinstatement of Council assets that may be affected by works.

An application for Consent to undertake works will only be considered after the design has been approved by the Manager Engineering Services.

The Consent to undertake works focuses on construction methodology and management and does not re-examine the design, unless insoluble problems with the construction process are identified that arise because of the design.

A6.1 SUBMISSION REQUIREMENTS

Submission requirements generally include:

- A cover letter
- Approved detailed design documentation including specifications and Durability Plans
- Estimated cost of construction of works
- Construction Plans and Traffic Management Plans and other information as required by the Public Safety and *Amenity – A Code of Good Practice at Construction Sites* document.

A6.1.1 Construction Management Plan

Submit a Construction Management Plan, which must indicate all traffic management measures during construction including but not limited to:

- The means of construction vehicle access to the site, including swept path diagrams to demonstrate accessibility
- Deliveries of materials and equipment, and removal of excavated spoil or demolished materials from the site
- Access to the site by over-dimensional vehicles such as cranes
- Any construction procedures, deliveries, crane operations etc. requiring temporary closure of a road or other public right-of-way including pedestrian and bicycle routes
- A Staging Plan.

A6.1.2 Tree Protection Plan

Submit a detailed Tree Protection Plan with management procedures to ensure protection of any existing trees on or adjoining the site, including protection of the canopy and root zone during and post construction. For information regarding tree protection, refer to Council's *Tree Protection Fact Sheet* and *Tree Retention and Removal Policy*.

A6.1.3 Other authority approvals

The developer must obtain approvals from all affected service authorities and agencies. This includes, but is not limited to:

- VicRoads approval if any construction procedures, deliveries, crane operations etc. require temporary closure of a VicRoads road
- Yarra Trams approval if any construction procedures, deliveries, crane operations etc. affect tramway operations
- Melbourne Water approval if the works involve any alteration to Melbourne Water drains. For any application to alter a Melbourne Water drain, plans must be prepared in accordance with the Melbourne Water Drainage Design Manual, Standard Drawings and Construction Specifications.

A6.1.4 Certifications and third-party audits

Depending on the location and the nature of the proposed works, and at the discretion of Council's Planning and Building Branch (Construction Management – Site Services), the following information may be required:

- Public realm safety review of the proposed Construction Management Plan
- Road safety review of the proposed Construction Management Plan.

CHAPTER REFERENCES

'Road Management Act 2004', State Government of Victoria

'Melbourne City Council Activities Local Law 2009', City of Melbourne

'Public Safety and Amenity – A Code of Good Practice at Construction Sites' (1999), City of Melbourne

'Tree Protection Fact Sheet' (2012), City of Melbourne

'Tree Retention and Removal Policy' (2012), City of Melbourne

'Melbourne Water Land Development Manual' (2013), Melbourne Water

A7. CONSTRUCTION

Council provides assistance to developers during the construction of the Docklands public realm. The following Council branches may be required to undertake inspection of hold points during work:

- Engineering Services Branch (Infrastructure Services)
- Engineering Services Branch (Traffic Engineering)
- Planning and Building Branch (Construction Management – Site Services)
- Parks Services Branch
- Urban Landscapes Branch.

A7.1 HOLD POINTS, PROGRESS INSPECTIONS AND APPROVALS

A variety of hold points are required during the construction process, beyond which work must not proceed without authorisation by Council's Engineering Services Branch. These apply to critical aspects of the work that cannot be inspected or corrected at a later stage because they will no longer be accessible.

Council's Engineering Services Branch must verify the quality of the work at each hold point and release the hold before work recommences.

A variety of 'witness points' are also required when the Engineering Services Branch may review, witness, inspect or undertake tests on any component, method or process of work, although these do not require a hold on further works.

Hold points and witness points are typically nominated in relevant work sections of technical specifications in the design documentation. Those required specifically by the Manager Engineering Services, listed below, should be incorporated into the technical specifications used for any construction contracts. Designers may also determine that additional hold points are appropriate, depending on the nature of the work.

The developer must arrange for site inspections at appropriate stages to support approvals at all hold and witness points. The developer must provide 3 days' notice for a hold point inspection.

A7.1.1 Hold points for civil works

Depending on the nature of the work, hold points may apply. The following list is provided as an example:

- Sub-grade inspection
- Proof rolling of road base
- Reinforcement prior to concrete pour
- Bluestone paving concrete base
- First 10m² of bluestone paving
- Pipe bedding and laying before backfilling
- Connection of legal point of discharge.

A7.1.2 Hold points for lighting works

Depending on the nature of the work, hold points may apply. The following list is provided as an example:

- Approval of design drawings must be obtained from Council prior to installation
- Details of the electrical contractor must be submitted to Council prior to starting work
- Approval must be obtained from Council before backfilling or concreting trenches or footings
- It is mandatory for Council to inspect the lighting system at the commissioning of electricity, at Practical Completion and at Final Completion.

A7.1.3 Hold points for landscape works

Depending on the nature of the work, hold points may apply. The following list is provided as an example:

- Trees to be removed and protected are marked on site
- Preliminary set out of garden beds/paved areas are marked on site
- Proposed final levels of soft landscape areas are marked on site
- Subgrades cultivated or prepared before placing topsoil
- Grassing bed prepared before turfing or temporary grassing

- Plant holes excavated and prepared before planting
- Underground irrigation works completed before backfilling
- Tree stock to be inspected at the supplier's nursery before delivery to the site
- Tree stock after delivery to the site, before planting
- Water sensitive urban design elements.

A7.2 SITE MINUTES AND RECORDS

The developer is responsible for recording all hold point inspections during the construction process.



Dragon boat racing, Victoria Harbour

A8. PRACTICAL COMPLETION

Council's Engineering Services Branch is responsible for overseeing construction, Practical Completion and the Final Completion processes of a development project within Docklands. 'Practical Completion' is commonly referred to as 'handover' – both terms are used throughout this chapter.

Inspections of work during this period often involve other Council branches that take over responsibility for the assets when they are completed, including the Engineering Services Branch (Traffic Engineering) and Parks Services Branch. Other organisations will be involved if their assets are affected such as CitiPower/Powercor.

Practical Completion indicates that the site is safe and usable for its intended purpose. Roads, walkways and parks can only be opened to the public once a Certificate of Practical Completion is issued, either for the whole site or a particular construction stage.

In the interest of opening a site for use, minor finishing works and rectification of defects or omissions may occur after Practical Completion is issued.

After Practical Completion, Council accepts responsibility for day-to-day maintenance including waste collection, street sweeping and other designated asset maintenance.

A8.1 PRE-HANDOVER CLEANING

A pre-handover clean is required to ensure a development project is presented to its highest standard. Building and construction projects require a thorough clean with fine attention to detail. Ideally pre-handover cleans should be done prior to the Practical Completion inspection.

Council may charge for cleaning works to achieve the standard required. Ultimately the pre-handover clean must be to the satisfaction of the Manager Engineering Services.

Pre-handover cleaning should include, but is not limited to, the following:

- Removal of tape and wrapping
- Wash down all street furniture, feature walls, architecture features and artworks
- Clean all light fittings
- Clean all traffic poles and signal cabinets
- Clean all grime and smears from glass
- Remove all grout residue from pavers and fixtures
- Remove all cement spray or residue on roads, pavers and fixtures
- Remove corking residue
- Remove tyre marks
- Remove stains on pavers
- Clean all grates and side entry pits of silt and litter
- Empty litter bins of all waste.

A8.2 PRACTICAL COMPLETION INSPECTION

The developer must provide 2 weeks' notice for a Practical Completion Inspection.

At the Practical Completion Inspection, in consultation with the developer and its contractors, a Defects List will be prepared by Council of all defects and minor omissions remaining to be rectified by the developer.

A8.3 DEFECT RECTIFICATION AND BONDING OF WORKS

Any or all defects may be required to be rectified before Practical Completion. The developer must rectify any defects or omissions in the work existing at Practical Completion as soon as possible.

At the request of the developer, and at the sole discretion of the Manager Engineering Services, the Engineering Services Branch may determine to bond works deemed unnecessary to complete before Practical Completion. In this instance the developer must provide an Electronic Funds Transfer, unconditional Bank Guarantee or Bankers Undertaking from a recognised bank for an amount set by the Engineering Services Branch (Insurance Bonds are not acceptable). The Bond will be returned to the developer when the Manager Engineering Services determines that the works have been completed.

A8.4 SUBMISSION REQUIREMENTS

A Practical Completion Certificate will not be issued until all as-built drawings, asset inventory spreadsheets, reports and manuals have been accepted by the Manager Engineering Services.

In lieu of the provision of these submission requirements, Council will accept a bond from the developer to the value of \$20,000 in the form of an Unconditional Bank Guarantee and issue a Practical Completion Certificate. The bond will be released on the provision of the outstanding as-built drawings, asset inventory spreadsheets, reports and manuals.

Developers are given a 3-month period after Practical Completion to provide the as-built information. After this period Council may access the bond in order to obtain the as-built information.

Submission requirements at Practical Completion include:

- As-built drawings
- Asset inventory, including GIS data
- Design reports
- Construction reports
- Operation and maintenance manuals
- Lighting requirements
- Other agency inspections and approvals
- Certifications and third-party approvals.

A8.4.1 As-built drawings

Full documentation of all assets as built must be submitted to the Manager Engineering Services before a Certificate of Practical Completion will be issued. As-built drawings are to be provided to Council's current *Engineering Services CAD Drawing Standards*.

As-built drawings must be the complete set of Council-approved construction drawings updated to show all changes since approval was given. A level survey plan only of as-built conditions is not acceptable.

As-built drawings are to be provided to Council's current *Engineering Services CAD Drawing Standards*.

A8. PRACTICAL COMPLETION

A8.4.2 Asset inventories

An inventory of as-built asset data is to be provided in Microsoft Excel spreadsheet format for all areas of the public realm constructed. The data must list all assets constructed as part of the contract by location, with quantities and construction costs for each asset, defined by type, and listed under the following asset categories:

- Art and heritage
- Aviation
- Barrier
- Bridge
- Building/Small structure
- Building component
- Decoration
- Electricity
- Financial asset
- Fire hydrant
- Fuel
- Furniture and equipment
- Gas
- Horticulture
- Hydraulic system
- Information and communications technology
- Land
- Lighting
- Marine structures
- Outdoor furniture
- Parking control
- Pneumatic systems
- Railway
- Recreation equipment
- Recreational surface
- Residential bin
- Road
- Security infrastructure
- Sewerage
- Signage
- Stormwater
- Structural support
- Syringe bin
- Telecommunications
- Traffic systems
- Transport assets
- Water.

The asset inventory must comply with the CAD layering standard document provided in the data table format identified in that document. Further, each record should be linked to an object in a CAD drawing by use of a unique ID for each object in both the drawing and data table.



Recreational cycling, Harbour Esplanade

A8.4.3 Design reports

A design report must be provided for each element of the works and must include:

- Design drawings
- Drawing numbers
- Design standards, assumptions and inputs
- Details of coordination and integration with other design elements
- Construction specifications
- Description of proposed operation and maintenance
- Documented design approvals
- Copies of all statements and certificates required under the Contract to demonstrate compliance.

A8.4.4 Construction reports

A construction report must be provided for each element of the works and must include:

- Certification by an independent verifier that the works have been built and tested as per the drawings and specifications
- Details of all non-conformances and defects detected during construction
- Details of all rectification and repair works undertaken prior to Practical Completion
- Details of all deviations of the constructed works from the design
- Closed-circuit television (CCTV) survey of new line of all drains.

A8.4.5 Operation and maintenance manuals

Operation and maintenance manuals must be provided before a Certificate of Practical Completion will be issued. Manuals are required for all types of work including civil works, landscape, and artwork. These manuals must be of sufficient detail to enable the works to be operated and maintained as intended.

The manuals must include:

- Details of manufacturers and suppliers and all warranty details
- Specifications and maintenance requirements for all paint, applied finishes, protective coatings or special finishes, including cleaning procedures, periodic maintenance/renewal, and repairs including retouching after minor damage, graffiti or other vandalism
- Details of interim maintenance contracts (landscaping, etc.)
- Details of all electrical and mechanical systems, including their purpose, mode of operation, operating instructions, maintenance requirements, suppliers' contact details, and part numbers
- A description of lighting, operation details and recommended life and replacement details
- An inventory of all installed equipment and software with details of type, manufacturer, capacity, size, operating parameters, serial number, supplier name and contact details
- Operating procedures including instructions for starting, stopping, and restarting after power interruption and in case of emergency

A8. PRACTICAL COMPLETION

- Inspection, testing and life cycle maintenance program in tabular form showing:
 - frequency and level of routine attention required for each component of the work throughout its intended lifespan
 - any special maintenance procedures for structures, including access for inspection and maintenance
 - any other special measures for conservation and preservation of artworks
- Notification procedure in case of claims under the defects liability provisions of the contract
- Contact details for designers, artists, and major subcontractors.

Maintenance specifications must be in a format suitable for incorporation into Council's asset maintenance contracts (consult with the Engineering Services Branch for details). Where necessary, the training of Council maintenance crews/contractors is also to be undertaken.

A draft of the manual must be prepared and submitted to the Engineering Services Branch 14 working days before the proposed date of Practical Completion. Any alterations to the manual required by the Engineering Services Branch must be made and resubmitted prior to completion of the work.

A8.4.6 Lighting requirements

Public lighting – unmetered

The developer must ensure that all CitiPower/Powercor requirements are met to enable CitiPower/Powercor to take ownership of the poles, cabling and luminaires at completion of works:

- The developer must arrange for all site inspections by CitiPower/Powercor for it to accurately record the horizontal and vertical location of public lighting conduits prior to backfilling trenches.

Public lighting – metered

The developer must ensure all Council requirements are met to enable Council to take ownership of the poles, conduits, cabling, luminaires and other accessories at completion of works:

- The developer must arrange for site inspections by Council prior to backfilling trenches, at the commissioning of electricity and at Practical Completion and Final Completion
- The developer must comply with the *Electricity Safety Act 1998* (section 76) and provide the records of all underground electricity lines installed by the developer to Council in accordance with the provisions of the Electricity Safety Act
- Provide a copy of the Certificate of Electrical Safety to Council
- Provide warranty documents to Council
- In accordance with the Electrical Safety Act, provide as-built electrical drawings to Council complete with locations of meters, cabinets, electrical pits, underground conduits including offsets and depths, poles and luminaires, general purpose outlet (GPOs) for all electrical circuits
- Place a laminated copy of the as-built drawing permanently fixed in the meter cabinet or the switchboard cabinet where the circuit originates.

Feature/decorative lighting is similar to public lighting – metered above.

A8.4.7 Other agency inspections and approvals

Where works alter or affect the assets of another agency or authority, a copy of written confirmation that the work has been inspected and approved by that agency must be provided to the Manager Engineering Services before Practical Completion will be issued.

This includes:

- Any work affecting a Melbourne Water drain
- Any work altering or creating a VicRoads asset. (After Practical Completion, traffic signals are handed over to VicRoads for management and maintenance at its cost.) The developer must arrange for sufficient and timely site inspections by VicRoads, in particular for underground conduits.

A8.4.8 Certifications and third-party audits

Depending on the location and type of works, and at the discretion of the Manager Engineering Services, the developer's design consultant(s) may be required to certify that as-built work complies with:

- The approved design
- The Planning Permit
- Their professional design intent.

Consultants must accept liability for omissions, errors or misrepresentations in this certification.

At the discretion of the Manager Engineering Services, third party audits may also be required at Practical Completion, including:

- Fire Brigade Report
- *Disability Discrimination Act 1992* Audit
- Public Realm Safety Audit
- Road Safety Audit
- Independent Structural Certification
- Playground safety assessment.

CHAPTER REFERENCES

'Engineering Services CAD Drawing Standards for As-built drawings' (2012) City of Melbourne

'Engineering Services CAD Template' (2012) City of Melbourne

'Engineering Services Excel Asset Inventory Spreadsheet' (2012) City of Melbourne

'Electricity Safety Act 1998', State Government of Victoria



Docklands Park, a play space for 0-12 year olds

A9. DEFECTS LIABILITY AND FINAL COMPLETION

Defects Liability Periods commence at Practical Completion. These vary in length depending on the type of work, and different periods may apply to different elements of the same project. Although a site (e.g. a street) as a whole may be handed over for management by Council at the time of Practical Completion, the developer must continue to undertake maintenance of elements throughout the applicable Defects Liability Period(s).

Final inspection of work involves other stakeholders and authorities who will take over responsibility for the assets (e.g. CitiPower/Powercor).

At the end of each applicable Defects Liability Period, Council's Engineering Services Branch will undertake an inspection of relevant aspects of the work and, if it is satisfactory, will issue a record of approval for those elements. At the end of each Defects Liability Period, a final inspection will be undertaken and if all work is satisfactory a Certificate of Final Completion for each relevant element of the project will be issued.

At any time prior to the 14th day after the end of the Defects Liability Period, the Manager Engineering Services may direct the developer to rectify any defect or omission in the work. The direction may set a date by which the defect or omission must be rectified, and may also require a separate Defects Liability Period to apply for the rectification work, commencing on the date the rectification is complete.

If a defect or omission is not rectified by the date specified, the Manager Engineering Services may have the rectification carried out at the developer's expense.

The developer must maintain the asset in good condition throughout the Defects Liability Period. Certificates of Final Completion will not be issued under any circumstances until all as-built information is provided.

A9.1 DEFECTS LIABILITY PERIODS

A9.1.1 Typical Defects Liability Period

The minimum Defects Liability Period for public realm works is 12 months unless noted otherwise. This applies to:

- Typical civil infrastructure works
- Public lighting.

A9.1.2 Artworks Defects Liability Period

The minimum Defects Liability Period for artworks is 12 months. During this time the developer is responsible for any construction defects and insurances associated with the artwork.

After Practical Completion, Council is responsible for basic maintenance which includes graffiti removal, cyclical cleaning and regular inspections. Programmed maintenance detailed within the artwork's maintenance manual remains the responsibility of the developer until Final Completion.

Final Completion is issued at the end of the 12-month Defects Liability Period. At this point, Council takes full ownership and responsibility for all defects and ongoing programmed maintenance.

A9.1.3 Landscape Defects Liability Period

The minimum Defects Liability Period for landscape works is 12 months, which includes accompanying irrigation systems.

A9.1.4 Maritime Works Defects Liability Period

The minimum Defects Liability Period for public realm wharves and other maritime structures is 36 months.

A9.2 FINAL COMPLETION

Once a Certificate of Final Completion has been issued for the public realm works, Council takes full ownership and responsibility for the ongoing maintenance of the public realm associated with the development.

Developers, Places Victoria, residents, businesses and visitors to Docklands are encouraged to contact Council's Customer Contact Centre to report any maintenance requirements:

MELBOURNE CITY COUNCIL

Phone: 9658 9658 (7.30am to 6pm)

Website: www.melbourne.vic.gov.au

Online Enquiries:
www.melbourne.vic.gov.au/contactus

National Relay Service:
Teletypewriter (TTY) users phone 13 36 77
then ask for 03 9658 9658

In person: Melbourne Town Hall
Administration Building 120 Swanston Street,
Melbourne 7.30am to 5pm, Monday to Friday

Postal address: City of Melbourne
GPO Box 1603 Melbourne VIC 3000

PART B:

DESIGN STANDARDS, STANDARD MATERIALS AND ELEMENTS

B1. INTRODUCTION

Part B of the *Docklands D&C Standards* stipulates the design standards, standard materials and elements to be applied to development of the Docklands public realm.

This section outlines what to use and how to use it in various typical situations:

- Groundwater and geotechnical conditions
- Stormwater management
- Streets and routes
- Paving and surface materials
- Street, park and waterfront furniture
- Signs
- Lighting
- Landscape elements – plantings and irrigation
- Maritime works.

This section outlines the options available in typical situations. References to Council's Design Standards are provided, which detail and illustrate how public realm elements must be constructed and include links to relevant [Engineering Standard Drawings](#).

When this document is viewed in hard copy, the Design Standards references are written as a Design Standard number (e.g. 201.02). Look for this icon for all Design Standards that can be viewed on Council's website.

 Design Standard

When this document is viewed as an online PDF, the Design Standard references become live web links directing the reader to the relevant Design Standard PDF on Council's website.

Complying with Council's Design Standards, standard materials and elements – as set out in this document – is a requirement of all precinct Development Agreements and a statutory requirement under Council's *Activities Local Law 2009*.

B1.1 THE VALUE OF STANDARDS

Docklands D&C Standards has been developed for many reasons:

- Locally-based design standards promote a cohesive character and strong sense of place
- Consistent use of the same details in similar situations makes the city easier to 'read' and navigate
- Consistency supports efficient management and maintenance, preservation of the original design and economies of scale benefits for supply and replacement of parts
- Standardised details ensure the staged precinct-by-precinct development of Docklands can be realised as one large-scale integrated design
- Together with the [Docklands Public Realm Plan](#), this document helps designs meet the long-term strategic vision for Docklands.

Artworks, architecture, window displays and, most importantly, the people using the public realm all contribute to the sense of place of various parts of the city. Standard materials and elements within the public realm complement these characteristics and help allow genuinely distinctive features to give places their special identity.

B1. INTRODUCTION



Simple and consistent designs of public streets, routes and street furniture provide a unifying background for diverse buildings and activities.

These design materials and elements have been proven through repeated use and subject to careful review. Developers of the Docklands public realm should exercise judgement and care to ensure that each standard is used in appropriate situations and in the correct way.

B1.2 WHEN DO STANDARD MATERIALS AND ELEMENTS APPLY?

Standard materials and elements must be used for all new works and reconstruction.

As a mix of street furniture and civil construction details exists across Docklands (as in the rest of Melbourne) – resulting from varied influences at different times – the greater context of the existing public realm site should be considered:

- Minor works and repairs: match existing materials and elements at and adjoining the works. If two or more materials/elements exist, use the one most typical of the site and its surroundings
- Conservation of significant features: maintain intact historic features unless they cause an unsafe or dysfunctional situation.

B1.3 WHEN MORE THAN ONE STANDARD MATERIAL / ELEMENT APPLIES

For some standard materials and elements, more than one standard exists to suit different contexts. These are not to be interchanged arbitrarily.

Guidance on which standard to use is provided through precinct plans, master plans, the [Docklands Public Realm Plan](#) and this document. Developers are encouraged to contact Council for further information.

B1.4 WHEN ARE NON-STANDARD MATERIALS AND ELEMENTS JUSTIFIED?

Standard materials and elements are to be used in all standard situations. If a relevant standard material or item is outlined in this document, it should be used.

Some standard materials and elements will not work in all situations. Departure from standard materials and elements requires approval from Council, and may be supported if:

- The site will never be managed and maintained by Council
- Functional requirements are not met by existing standard materials or elements
- The conservation of significant heritage features requires special treatments
- Unusually durable materials and protection from risks of damage ensures maintenance requirements will be minimal.
- In rare cases it is important that a particular space has a distinct identity.

B1.4.1 Public art

By definition, artworks are not standardised. Separate guidelines for commissions, acquisitions and transfers of artworks are available in the *Docklands Public Art Guidelines*.

Council's Arts and Culture Branch (Public Art Program and Art and Heritage Collection) must be involved at the onset of the commissioning process, including participation in the selection panel, for any artwork to be considered for accession to Council's collection.



Webb Bridge is one of the finest examples of integrated public art in Melbourne. Design standards support opportunities for art and good site-specific design such as this. By using standard design elements that must be easily replicated and replaced, funds to implement and maintain special designs can be saved for sites where they really make a difference.

B1. INTRODUCTION

B1.4.2 Play opportunities

Council seeks to provide play opportunities offering diverse experiences for different age groups. This often requires custom-designed facilities. In planning and designing for play, early consultation with Council is required.

This document does not set out any standard materials or elements for play opportunities.

Approval for play opportunities is provided by Council's Urban Landscapes Branch. Council's Engineering Services Branch will refer the proposed plans to the Urban Landscapes Branch for approval.

B1.5 APPROVAL FOR NON-STANDARD MATERIALS AND ELEMENTS

Municipal Design Approval is required for the use of all non-standard materials and elements (refer Chapter A5: 'Municipal Design Approval'). Approval is also required for any non-standard use of standard materials or elements (e.g. for functions other than those intended or in locations other than those specified).

As general guidance, developers of the Docklands public realm should note:

- Materials used must be able to be sourced in the future to enable maintenance and repair
- Asset maintenance requirements and issues must be detailed as part of the submission for approval
- Materials must provide an asset life that is equivalent to, or greater than, materials normally used and must be durable in a coastal marine environment.

CHAPTER REFERENCES

'Melbourne City Council Activities Local Law 2009', City of Melbourne

'Docklands Public Realm Plan' (2012), City of Melbourne

'Docklands Public Art Guidelines' (2010), Places Victoria

B2. GROUNDWATER AND GEOTECHNICAL CONDITIONS

This section sets out groundwater and geotechnical management for Docklands. It applies to all development applications in the public realm including public streets.

B2.1 SALINE WATER

Stormwater collection and storage systems must be designed and built to prevent the infiltration of saline water via percolation through subsoils, or via flows along service trenches or disused pipes.

Drains from water storage tanks and planters must be fitted with one-way valves to prevent the backwash of saline water from the Yarra River and Victoria Dock at high tides.

B2.2 GROUNDWATER MONITORING WELLS

When groundwater monitoring wells are required by EPA Victoria for a development, details including the location and operational requirements are to be provided to Council. When the groundwater monitoring well is to be located within the public realm the relevant party must obtain consent from Council's Manager Engineering Services for installation of the monitoring well.

It is always preferred that groundwater wells are located within private property. If this is not possible due to the nature of a development, Council may allow groundwater wells to be located in an adjoining footpath.

The responsibility for groundwater monitoring wells remains with the building owner.

Groundwater wells must be decommissioned and removed at such time that monitoring is no longer required. The building owner is responsible for the rectification of any asset affected by removal of the groundwater well.

B2.3 GROUND SETTLEMENT

Much of the Docklands area overlies deposits of Coode Island Silt at varying depths and thicknesses, and it is therefore expected that gradual ground settlement will occur over a very long period. As many buildings, wharves, bridges and other structures in Docklands are founded on deep piles – while pavements and public space treatments are not – there will be differential settlement between adjoining structures and surfaces.

An estimate of likely settlement and potential differential settlement of pavements and adjacent structures must be provided, detailing the accuracy or confidence limits of this estimate, as the basis for designs. The design of roads, footpaths and underground services must consider and allow for the predicted differential settlement.

B3. STORMWATER MANAGEMENT

This section sets out stormwater drainage design requirements for the Docklands area. It applies to all trunk drainage infrastructure and local drains, including those within road reserves and other public spaces.

For roads under VicRoads control, refer to VicRoads' specific design requirements.

This section does not apply to building roof drainage.

Stormwater drainage should be considered in an integrated way to maximise water sensitive urban design (WSUD) opportunities, including:

- Permeable ground surfaces to allow infiltration of rainwater into the soil
- Directing surface runoff into planted areas to provide passive irrigation
- Vegetated swales, buffer strips and bio-filtration systems to filter runoff prior to its discharge into waterways
- Collection and storage of stormwater for landscape irrigation.

The application of WSUD principles, materials and products is in its infancy and continually being improved. Liaison with Council will help ensure the most appropriate materials and/or products at the time they are applied. Guidelines regarding the above can be found in Council's Water Sensitive Urban Design Guidelines.

B3.1 WATER QUALITY AND POLLUTION CONTROL

EPA Victoria regulates environmental aspects of water management in Victoria within the framework of the *Environment Protection Act 1970*. The associated *State Environment Protection Policies* (SEPPs) identify 'beneficial uses' (i.e. environmental values) of the water environment at any particular location and establish environmental quality objectives to ensure their protection.

The *SEPP (Waters of Victoria)* policy contains catchment-specific schedules, including 'F7 Waters of the Yarra Catchment', which is relevant to Council. This recognises the cumulative effects of different activities on water quality and the need to coordinate the planning and management of land, water and waterways.

Water quality in urban waterways largely depends on the control of pollutants carried by stormwater. The *SEPP (Waters of Victoria)* requires that urban runoff does not compromise identified beneficial uses of receiving waters. It refers to stormwater pollution and requires measures be undertaken to control the environmental impact of stormwater.

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) *Urban Stormwater: Best Practice Environmental Management Guidelines* identifies the following principles for managing stormwater runoff:

- **Preservation:** preserve valuable elements of the stormwater system, such as natural channels, wetlands and vegetation
- **Source control:** limit changes to the quantity and quality of stormwater near the source
- **Structural control:** use structural measures, treatment or detention basins to improve water quality and control discharge rates.

Suitable measures to control stormwater runoff from any site are required to manage the quality of water draining into waterways. This involves structures to reduce or delay stormwater flow or to intercept or remove pollutants after they have entered the stormwater system. Treatment measures must be installed for all discharges to receiving waters as appropriate to ensure compliance with:

- *Melbourne Docklands Environmental Management Plan*
- *Stormwater Quality Management Guidelines for Wharf Areas in Victoria Harbour*
- *Urban Stormwater: Best Practice Environmental Management Guidelines*
- *Environment Protection Act 1970, Variation of the State Environment Protection Policy (Waters of Victoria) – Schedule F7, Waters of the Yarra Catchment.*

B3.2 DESIGN METHODOLOGY AND LEVELS

Design must be carried out using methods described in *Australian Rainfall and Runoff, a Guide to Flood Estimation*, by Engineers Australia (AR&R). Attention should be focused on Volume 1, Book 8 'Urban Stormwater Management'. Where AR&R does not specify applicable criteria, one of the following documents may be used and their reference included in the computations:

- *Melbourne Water Land Development Manual*, Volume 2, Part 3 – Technical Guidelines and Requirements
- *VicRoads Road Design Guidelines*, Part 7 – Drainage.

In calculating runoff from catchments, it must be assumed that all areas including pervious areas are fully developed and a coefficient of runoff of 0.9 is applicable. This allows for drainage to cope with future development.

Effects on upstream and downstream catchment areas must be allowed for and these must not be adversely affected by new works. This may require information from Council's Engineering Services Branch regarding designated flood paths.

B3.2.1 Major and Minor Flow

Design must be based on the **Major and Minor Flow Principle**. Major and Minor Flows are generated through rainfall directly on the local catchment area (floods caused through king tides are treated separately).

Major Flow used in calculations must be that resulting from an Average Recurrence Interval (ARI) 100 Year Storm. Major Flows may drain overland along streets, through parks or through private property where floodway easements are created.

Major Flow depth and velocity must be in accordance with AR&R Section 1.10.4 'Safety', which states that the product of velocity and depth should not exceed 0.4m²/sec. Flow depths on streets should not exceed 200mm above channel invert. Flow is to be contained within the road reserve.

Minor Flow is to be the ARI 10 Year Storm or as per the *VicRoads Road Design Guidelines*, whichever is greater.

The Minor Flow is to be fully contained in an underground piped system. This applies to all areas including roads, public spaces, residential, commercial, retail and industrial development.

Downpipes from buildings and drainage from paved or landscaped areas must connect to the underground system, except where runoff into a bioretention system or other WSUD measure is approved. Under no circumstances will Minor Flow be permitted to sheet flow over public reservations including roads.

B3. STORMWATER MANAGEMENT

B3.2.2 Discharge into trunk drains and receiving waters

The Manager Engineering Services will stipulate the point of stormwater discharge into trunk drains or receiving waters. The piped system will discharge to the Yarra River, Moonee Ponds Creek or a trunk drain.

All receiving waters must be protected at each outlet by means of an approved gross pollutant trap. The piped system must be designed for the Hydraulic Grade Line at the discharge point.

The design flow for pollutant capture/containment (the treatable flow rate) shall be the ARI 3 month storm.

No discharge is allowed into Victoria Harbour except for rainfall events greater than the Minor Storm event. If it is demonstrated to be impractical to avoid flow into Victoria Harbour, the matter must be referred to the Manager Engineering Services for approval and stipulation of any applicable conditions. Where the Manager Engineering Services approves discharge into Victoria Harbour, the design must be in accordance with the *Stormwater Quality Management Guidelines for Wharf Areas in Victoria Harbour*.

B3.2.3 Receiving water level

The receiving water level of the Yarra River and Moonee Ponds Creek for both the Minor Flow and the Major Flow must be the Mean Higher High Water of 0.42m AHD, as per the Victorian Regional Channels Authority's Victorian Tide Tables for Williamstown.

B3.2.4 Flood levels

Melbourne Water has advised that Docklands is subject to Port Phillip Bay's 1% tidal flooding and the applicable flood level is RL 1.6m AHD.

It is estimated that the 1 in 100 year ARI flood level is also 1.6m AHD for the Yarra River and Moonee Ponds Creek.

New building developments must respond to existing drainage conditions, with habitable floors set above anticipated flood levels, as per Melbourne Water's Planning for Sea Level Rise guidelines:

- Habitable building floor levels must be set with 600mm freeboard above the current 1 in 100 year ARI flood levels (i.e. at a minimum of 2.4m AHD)
- Habitable building floor levels are to have freeboard above the major flow predicted for the local catchment area
- Residential buildings are to have a minimum floor level of 3m AHD.

B3.3 PITS, COVERS AND GRATES

The following pipe design and construction standards apply:

- Locate pits clear of pedestrian crossings and on the uphill side of crossings, where possible
- All pit covers in the road reserve including those in footpaths, nature strips and medians must be Class D, capable of taking highway-type loadings and must provide skid resistance equivalent to the adjacent pavement
- Pit dimensions must allow for mechanical and manual cleaning methods and satisfy Occupational Health and Safety (OHS) rules regarding access. Refer to VicRoads standards and Council's [Engineering Standard Drawings](#)
- Pit covers with infills located in bluestone or asphalt paved areas must be filled in with charcoal-coloured concrete. Concrete surrounds to pits must be charcoal-coloured
- All steel parts must be hot dipped galvanised and must conform to *AS 3996-2006 Access covers and grates*.

B3.4 PIPE DESIGN AND CONSTRUCTION

The following pipe design and construction standards apply:

- All pipes in road reserves must be VicRoads-approved pipe material and rubber ring jointed (RRJ)
- Pipes must be 300mm diameter minimum and backfilled in accordance with Council's specification
- Pit, pipe bedding, pipe cover etc. must be to the standards stipulated by Council or VicRoads, if not stated. Cement stabilised backfill around pipes will not be accepted
- Minimum drop through pits is to be 50mm. Pit bases to be shaped. No sump pits are allowed without the approval of the Manager Engineering Services
- Minimum pipe cover 400mm in easements not subject to vehicular loads, and 600mm in roads
- Stormwater drains must incorporate a method to prevent siltation from upstream catchment areas, and from the receiving water (Yarra River or Moonee Ponds Creek) resulting from tidal flows back up the pipe, which may deposit silt
- A minimum pipe flow velocity of 0.6m/s is to be achieved for ARI 1 year for self-cleansing maintenance. Check for partial flow velocity
- Maximum pipe flow velocity to be 6m/s and maximum velocity into receiving water 3m/s
- Minimum pipe slope determined by meeting minimum pipe flow velocity and construction tolerance. Roughness coefficient of $n = 0.013$ applies
- Pumped stormwater discharge will not be approved unless it can be demonstrated that alternatives are not feasible and requires the approval of the Manager Engineering Services.

B3. STORMWATER MANAGEMENT

DESIGN STANDARDS



Bluestone overflow kerb

↗ Design Standard 301.03



Drainage pit side entry with standard steel grate

↗ Design Standard 304.01

B3.5 MELBOURNE WATER MAIN DRAINS

The Yarra's Edge precinct is traversed by three Melbourne Water drains:

- Johnson Street Main Drain – 2.3m x 1.2m RC Box Culvert
- Gittus Street Main Drain – twin 1.4m diameter RC pipes
- Gittus Street Main Drain Diversion – 1.5m diameter RC pipe.

These approximately cater for flow volumes up to those generated by a 1 in 5 year ARI storm. They have no spare capacity to accept discharge from the Yarra's Edge precinct.

Melbourne Water requires:

- No buildings may be located over or immediately adjacent to main drains
- Sufficient lateral space adjacent to main drains must be provided to enable ongoing maintenance and future refurbishment of main drains
- Alteration of Melbourne Water drains may be approved by Melbourne Water if plans are prepared in accordance with Melbourne Water Land Development Manual.

CHAPTER REFERENCES

'Water Sensitive Urban Design Guidelines' (2009), City of Melbourne

'Environmental Protection Act 1970', State Government of Victoria

'Environmental Protection Act 1970', Variation of the State Environment Protection Policy (Waters of Victoria) Schedule F7, Waters of the Yarra Catchment (1999), State Government of Victoria

'Urban Stormwater: Best Practice Environmental Management Guidelines' (2006), CSIRO

'Melbourne Docklands Environmental Management Plan' (2008), Places Victoria

'Stormwater Quality Management Guidelines for Wharf Areas in Victoria Harbour' (2012), Places Victoria

'Australian Rainfall and Runoff - A Guide to Flood Estimation', Volume 1, Book 8 'Urban Stormwater Management' (1987), Institution of Engineers Australia

'Melbourne Water Land Development Manual' (2013), Melbourne Water

'VicRoads Road Design Guidelines', Part 7, Drainage (2003), VicRoads

'Victorian Tide Tables', Williamstown (2012), Victorian Regional Channels Authority

'Planning for Sea Level Rise' (2012), Melbourne Water

Australian Standard: *AS 3996-2006 Access covers and grates*

Other useful references

'Adoption Guidelines for Stormwater Biofiltration Systems' (2009), Facility for advancing Water Biofiltration, Monash University

'Constructed Wetlands Manual, Volume 1 and 2' (1998), Department of Land and Water Conservation, New South Wales

'Managing Urban Stormwater using Constructed Wetlands-Industry Report 98/7' (1999), Cooperative Research Centre for Catchment Hydrology

'Total Watermark - City as a Catchment' (2008), City of Melbourne

'WSUD Engineering Procedures: Stormwater' (2005), CSIRO

B4. STREETS AND ROUTES

This section of the *Docklands D&C Standards* provides design guidelines for street, traffic management and road design, including the design of walking and cycling routes where these extend through parks and other public spaces. The focus of this section is on the functional layout of circulation spaces. Materials and details are dealt with separately in Chapter B5: 'Paving and surface materials'.

Consideration of all transport modes in relation to the uses of public spaces and private development is required to ensure an integrated design of the movement network as a whole. Designs must be in accordance with predicted volumes and must provide for connectivity between precincts and major destinations.

Designs must respond to the hierarchy of streets and lanes that define Docklands, respecting their varied priorities in relation to transport functions and interfaces with development sites (e.g. key public frontages or service access areas). Developers should contact Council's City Design Division and refer to Council's Typical Street Standards for guidance (e.g. provided in Figure 4.1).

Walking and cycling should be the primary means of local transport via safe, generous and attractive routes that interlink the city. Particular regard must be given to the needs of the disabled and for non-ambulant modes of movement (prams, wheelchairs). The use of public transport must also be prioritised.

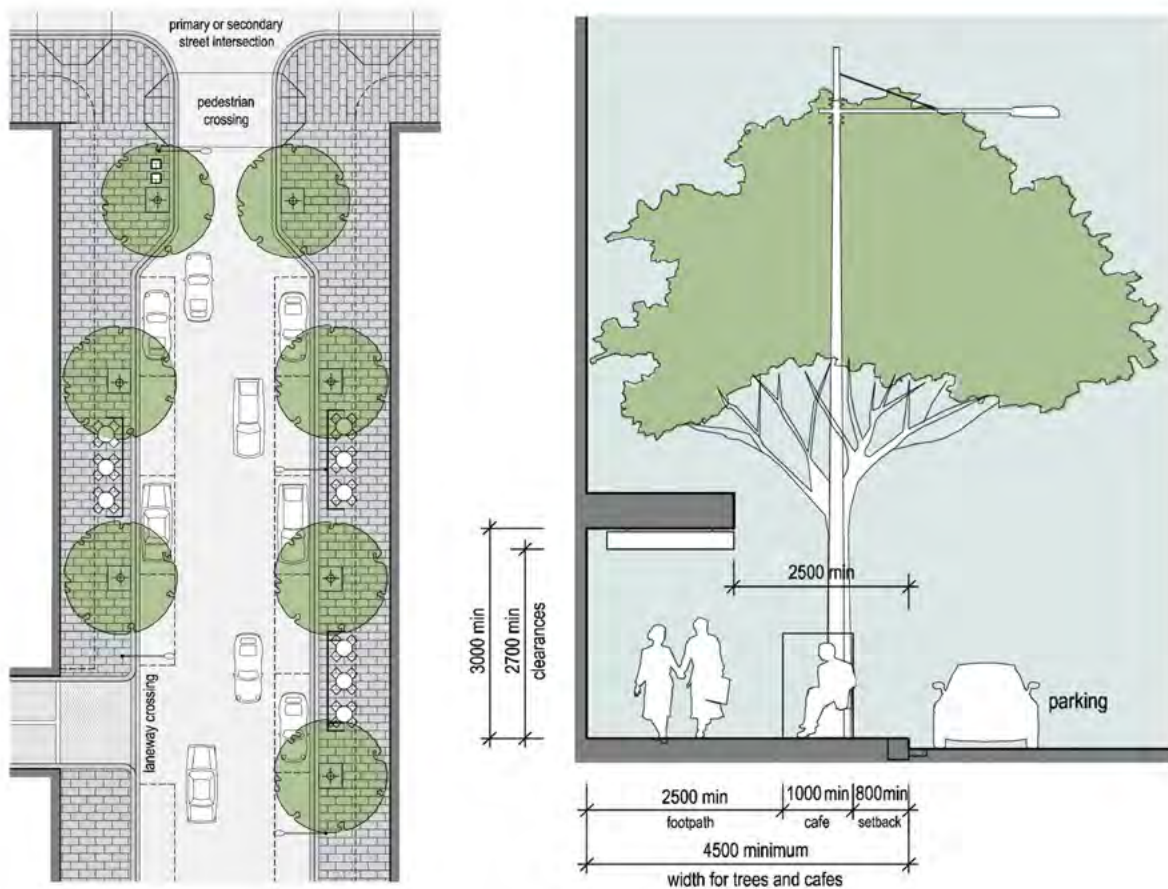


Figure 4.1 Illustrative snapshot of Council's Typical Street Standards

Consistency in design is often as important to the safety and functionality of city streets as is the consistent use of materials and details. Plans and cross-sections illustrating a range of typical situations found in Melbourne are available from Council. These show how particular features fit into the streetscape and provide cross-references to Design Standards for use in these situations.

Public access (on foot and by bicycle) to waterfront areas is a key feature of Docklands and must be prioritised. Vehicle traffic near waterfronts should be limited, except for emergency, maintenance and delivery access.

Provisions for vehicular traffic must allow for:

- Expected present and future traffic volumes and staged construction issues as the precinct develops over time
- Connection to trunk roads and between precincts such that traffic flow is not unduly impeded and future development is not stifled
- Discouragement of unnecessary through traffic 'rat running'
- Use of public transport, cycling and walking
- Emergency vehicle access
- Future construction vehicle activity
- Access for delivery trucks, couriers, taxis and garbage trucks *NOTE: All waste storage and collection for private properties must be accommodated within the site. Placement of bins in streets for rubbish collection will not be permitted.*

Designers must consult with Council's Engineering Services Branch (Traffic Engineering) during the design phase of all projects that propose new or revised traffic management arrangements. The Engineering Services Branch can provide advice on parking layouts, sign locations, time restrictions and requirements for fee parking including the type and location of meters/ticket machines.

References providing further guidance are available in the chapter references.

B4.1 FOOTPATHS AND WALKING ROUTES

B4.1.1 Path widths

The appropriate footpath width in any location depends on anticipated pedestrian volumes and must also allow for street furniture, and for outside eating areas, street vendors etc. where appropriate. Provision of space should be as generous as possible to support access and to accommodate associated pedestrian activities.

As a rule of thumb for new and redesigned streets, the proportion of the total road reserve width allocated to pedestrian uses (excluding medians) should be:

- *at least* one third, throughout Docklands, and
- *at least* one half, in pedestrian priority areas (refer B4.1.3 Shared Zones for definition).

The absolute minimum footpath width measured from face of kerb to building/property line must be 1.5m. Significantly greater widths are appropriate in most streets.

If an adequate footpath cannot be provided (e.g. in a laneway) the entire space must be treated as a Shared Zone (more information and definition of a Shared Zone is provided below).

B4.1.2 Slopes and cross-falls

Footpath cross-falls:

- 1.25% (1 in 80) minimum
- 2.5% (1 in 40) maximum.

Minimise cross-falls for user comfort and to support kerbside cafes and other areas of outdoor seating. However, absolute minimum slopes are only appropriate with paving materials that can be laid in smooth, even slopes.

B4. STREETS AND ROUTES

B4.1.3 Shared Zones

Pedestrian priority areas typically include waterfront promenades and Shared Zones. Shared Zones are streets and laneways with either part or full closure to vehicle traffic, and/or low vehicle speed restrictions as part of a dedicated shared traffic zone arrangement. Shared Zones remove the presumption that the vehicle has the right of way. Shared Zones are designed to prioritise pedestrians and public life through the paving palette and landscape treatments that create a strong differentiation from traditional vehicle priority streets. This serves to remind drivers they should proceed cautiously and slowly. Shared Zones may be temporary for peak usage times, such as lunchtime or special events.

Shared Zones should be designed to indicate that traffic conditions differ from those in typical streets, by using level changes, distinct paving materials and/or other treatments.

Buffer kerbs are often required to prevent vehicles from bumping into buildings or other features along a Shared Zone, even if the resulting footpath is too narrow to use for walking.

B4.2 PLACEMENT OF PUBLIC REALM ELEMENTS ON FOOTPATHS

B4.2.1 Minimum clear circulation space

An absolute minimum 1.5m wide unobstructed pedestrian pathway must be maintained on all footpaths, adjoining the building/property line. Greater widths are appropriate in most streets.

No public realm elements, including steps, street furniture, signs, poles, service cabinets or plantings are to be installed along the building line that would obstruct pedestrian movement or visibility along this path.

Where footpath widths are minimal, any impediments on the path should be minimised such as:

- Mounting street lights on buildings
- Placing furniture in localised kerb extensions
- Planting trees in the parking lane.

B4.2.2 Setback from kerbs of public realm elements

Set elements back from the kerb for traffic safety and to allow access to parked vehicles.

Minimum acceptable setbacks, measured from the face of the kerb to the edge of the relevant item closest to the kerb, are:

- Furniture: 500mm absolute minimum
- Parking meters, light poles and small services cabinets: 750mm minimum
- Items more than 1000mm wide: 800mm minimum (e.g. seats, cafe screens, rows of bike parking hoops)
- At loading zones: 700mm minimum for all objects except light poles and parking signs
- At disabled parking bays: 1500mm minimum for all objects except light poles and parking signs.

The above minimum setbacks should be increased in locations where there is an unusually steep cross-fall on the street, so that trucks tilting sideways do not strike sign and light poles or other furniture.



Centre Place, Melbourne – Example of a pedestrian priority area



In narrow streets and laneways, wall-mounted lights should be used to keep limited footpath space clear for circulation. Light poles in these situations are also liable to damage since space for manoeuvring vehicles is tight.



Trees planted in the parking lane maximise pedestrian circulation space in narrow footpaths. The trees are ideally located to collect rainwater runoff for passive irrigation. Relatively few larger trees in the parking lane can also add more greenery and shade to the street than many small trees in the footpath.

B4. STREETS AND ROUTES

B4.3 PROVISION FOR UNIVERSAL ACCESS

The *Federal Disability Discrimination Act 1992* (DDA) provides protection for everyone in Australia against discrimination based on disability. It encourages everyone to be involved in implementing the Act and to share in the overall benefits to the community and the economy that flow from participation by the widest range of people.

The DDA makes it illegal for public places to be inaccessible to people with a disability. This applies to existing places as well as places under construction. Existing places must be modified and be accessible (except where this would involve 'unjustifiable hardship').

Every area open to the public should be open to and usable by people with a disability:

- Places used by the public must be accessible at the entrance and inside
- Facilities within these places must be accessible (wheelchair-accessible toilets, lift buttons within reach, tactile and audible lift signals for people with vision impairments)
- Rather than being confined to a segregated space or the worst seats, all areas within places used by the public should be accessible to people with a disability
- Location of on-street disabled parking spaces should take into account access arrangements to and along the adjacent footpath
- Signalised pedestrian crossings must have 'automatic call-up' and all traffic signals must include 'audio tactile' features. All pedestrian crossings must have audio tactile devices.

Complying with the *Building Code of Australia*, or the Melbourne Planning Scheme, does not necessarily mean the public realm will comply with the requirements of the DDA. Developers should make themselves aware of all the issues relating to the DDA and incorporate the appropriate provisions to comply.

B4.3.1 Kerb access ramps

Kerb access ramps enable access for all people by providing ramped access from the footpath at a road crossing.

Where conventional kerb ramps are required, the following principles apply:

- Ramps should align with the direction of travel to cross the street and with a path of travel along the building line
- Minimise slopes. A 1:20 (5%) maximum slope is preferred, with the absolute maximum being 1:8 (12.5%). Create gentle transitions between surfaces at different angles to avoid trip hazards
- If necessary to achieve recommended slopes, the entire width of the footpath may be used if the resulting slope is less than 5% (1 in 20)
- If recommended slopes cannot be achieved by manipulating the footpath surface, raising the road level will be necessary
- Side slopes must be no steeper than the ramp itself, so these are set out at 45° angles
- The absolute minimum width is 1200mm, and the preferred minimum 1500mm. However, even the preferred minimum width should generally be exceeded unless a wider ramp is impossible
- Do not provide ramps if they do not link with accessible crossings, unless for access to disabled parking or for delivery trolleys
- The ramp pavement, kerb, and channel should match adjoining details
- Where unit pavers are used, the ramp size should be rounded up to fit the paver module. Align the paving pattern with the ramp edges to minimise cutting of tiles.

DESIGN STANDARDS



Access ramp typical corner bluestone footpath

[↖ Design Standard 401.01](#)



Access ramp typical corner asphalt footpath

[↖ Design Standard 401.03](#)



Access ramp joined narrow bluestone footpath

[↖ Design Standard 401.02](#)



Access ramp for median/island

[↖ Design Standard 401.04](#)

B4. STREETS AND ROUTES

B4.3.2 Tactile paving

Tactile ground surface indicators (TGSIs) are used to inform vision-impaired people as they move through a place. Not all vision-impaired people are totally blind, so TGSIs also use luminance contrast with surrounding pavements for their effect. DDA compliance requires their installation where appropriate in new or upgraded works. However, while TGSIs are useful for the vision-impaired, they can hinder access for people with other disabilities and can trip anybody, so their use requires very careful consideration.

General principles for the use of TGSIs include:

- Provide TGSIs as per the relevant Australian Standard (*AS/NZ 1428.4.1:2009 Design for access and mobility*) to comply with DDA requirements at all pedestrian ramps, crossings and wide vehicle crossovers
- TGSIs should be installed in areas of greatest need. They are important to mark unusual hazards such as stairs, in areas where crowds create confusion, or where noise levels mask sounds that people usually use to navigate (e.g. at busy public transport facilities)
- Use of TGSIs should be minimised through careful site design. A site that needs many TGSIs probably has basic design faults that should be addressed first. Footpaths and other spaces should be designed so they are intrinsically easy to navigate, and intersections and crossings should be designed with simple alignments and direct lines of travel. Remove hazards, if possible, rather than mark them with TGSIs
- Be consistent in the use of TGSIs within a given area
- Use TGSIs only to indicate safe routes and street crossings. Do not mark street crossings with TGSIs if they duplicate or are close to existing signalised crossings or zebra crossings
- Use the minimum necessary quantity of TGSIs
- TGSIs at door entries and ramps should be located within the property line, not on the public footpath. New stairs and ramps at entries must be designed with a landing and TGSIs located within the property boundary
- TGSIs on costly stone pavements should be of a high quality material commensurate with the paving. They must be an integral part of paving projects and may therefore be a factor limiting the use of special pavements.

B4.4 BIKE PATHS AND ON-STREET BIKE LANES

Bike paths should be provided in accordance with Council's *Bicycle Plan 2012-2016*, the *Austrroads Guide to Road Design* and any other applicable plans that identify priority routes. In addition, dedicated on-street bike lanes should be provided wherever space is available.

Shared bicycle/pedestrian paths are typical in parks and along the waterfront. Separate cycling and walking paths may be desirable for greater capacity and safety along cycling routes.

General principles include:

- Create continuity and consistency in width and paving treatment along each route
- Provide physical separation from vehicular traffic if there is space
- Provide a buffer between bike paths and car parking if possible to avoid conflict between cyclists and car doors/alighting passengers
- Provide a buffer between pedestrians and cyclists along commuter routes
- Provide smooth, well-draining surfaces, safe setbacks of hazards, and clear views at intersections and curves
- Provide advanced stop lines and 'head start storage areas' for cyclists at signalised intersections
- Use green-coloured bike lanes to increase driver and cyclist awareness where traffic movements are unusually busy or complex.

B4.4.1 Shared bicycle/pedestrian path widths

The preferred minimum width on major routes is 6m for two-way traffic (3m for one way).

The absolute minimum width for two-way traffic is 4m (2m for one way). The minimum of 2m for two-way cycling, set by Austrroads, is inadequate in most parts of the Melbourne City Council municipality due to high pedestrian and cyclist volume.

B4.4.2 On-street bicycle lane widths

Kerbside bicycle lanes should be 1.5m to 2m wide. Avoid on-street lanes wider than 2m as they encourage motorists to drive along them. Where cycling volumes are not high, it may be more practical to install 'Clarendon style' bicycle lanes.

Bicycle lanes next to kerbside parking should be 2m and the parking bays marked at 2m. Narrow parking lanes encourage parking against the kerb. Adjoining traffic lane widths should also be minimised to ensure the bike lane can't be used to pass on the left (specific widths depend on traffic conditions).

'Copenhagen style' or other dedicated bike paths should provide 2m minimum clear width for each direction of bicycle traffic.

Wide kerbside lanes or clearway bicycle lanes should be 4m to 4.8m wide.

Kerbside bike lane dimensions exclude any pitcher channels.

B4. STREETS AND ROUTES

B4.5 VEHICULAR TRAFFIC LANES

B4.5.1 Lane widths

Appropriate traffic lane widths vary depending on context.

Minimising the number and width of traffic and parking lanes is desirable to leave more space for other road users (e.g. pedestrians, cyclists, public transport) and to encourage slower driving speeds.

However, traffic lane widths must be adequate to cater for all anticipated vehicular movements, including buses, garbage trucks and removalist vans as appropriate to each location. Lane widths must allow adequate vehicle access to properties taking into consideration all on-street parking requirements.

B4.5.2 Kerb radials at corners and intersections

Kerb radials at corners must be adequate to cater for all anticipated vehicular movements. At a minimum, all intersections should cater for:

- Garbage truck (minimum 8.8m long)
- Fire truck (minimum 8.8m to 12.5m long)
- Removalist van (minimum 12.5m long).

Provision for larger vehicles (e.g. long rigid buses, semi-trailers etc.) is required in some streets throughout Melbourne, including Docklands. Advice from Council's Engineering Services Branch (Traffic Engineering) should be obtained to confirm requirements.

Designs must be checked to confirm accommodation for swept paths to Austroads standards.

B4.5.3 Levels, slopes and cross-falls

Minimise cross-falls to reduce risks of trucks striking projecting signs and building canopies.

Channel grade:

- 0.5% (1 in 200) desirable minimum
- 0.33% (1 in 300) absolute minimum.

Cross-fall – running lanes and parking lanes:

- 1.67% (1 in 60) minimum
- 5.0% (1 in 20) maximum.

In areas subject to potential inundation, road levels must be above the Designated Flood Level of 1.6m AHD unless approved by the Manager Engineering Services.

B4.6 VEHICULAR CROSSINGS OF FOOTPATHS

Locations where vehicles drive across footpaths create potential conflicts with pedestrians and are also subject to much more serious structural loads than other footpath areas. Standard footpath paving materials must not be used in these areas and site-specific details need to be taken into account.

A visible indication that there may be conflicts between pedestrians, cyclists and vehicles should be provided by a change in paving material. Typical crossover details return the kerb to the building line to demarcate the crossover.

Extreme durability is required for paving on crossovers as stopping/turning vehicles exert lateral and twisting pressures. Paving tiles (e.g. bluestone) are NOT durable on crossovers and are not acceptable. Crossovers must be paved with asphalt even if a higher-quality pavement like bluestone is used for the rest of the footpath.

Standard widths for driveways and crossovers are:

- Single residence: 2.75m minimum width
- Other land uses: 3m minimum width
- 7.6m maximum width.

Kerbs and channels at crossovers are to match adjoining details.

Similar details are used for entries to minor laneways as for entries to private driveways and car parks.

4. STREETS AND ROUTES

DESIGN STANDARDS



Crossing asphalt paving with bluestone edge

↖ Design Standard 402.01



Crossing asphalt paving with no edging

↖ Design Standard 402.05



Crossing asphalt paving for laneway with side pits

↖ Design Standard 402.02

B4.7 ON-STREET VEHICLE PARKING

Short-term on-street parking, loading zones and taxi ranks can be important for the functioning of streets to support local land uses. Kerbside parking can also provide a buffer between traffic and pedestrians by creating a 'friction' that slows down traffic. On-street resident priority parking schemes are not provided in Docklands.

On-street parking space in an area should relate to local uses and consider the following, as appropriate:

- Short-term customer parking
- Patron drop-off areas
- Disabled persons
- Taxi ranks and bus zones
- Loading zones, postal service
- Clearways to facilitate traffic flow
- Motorbike and bicycle parking
- Visitor parking
- Special uses such as work zones.

Appropriate parking lane widths vary depending on context, but typical ranges include:

- To accommodate cars only: 2.2m to 2.3m
- To accommodate bus stops: 2.6m.

It is expected that long-term parking will be catered for in off-street car parks. Parking is to be in accordance with AS 2890.5 *Parking facilities Part 5: On-street parking*.

B4.7.1 Parking locations and arrangements

Loading zones, 5 minute parking zones, etc. should be located at the downstream side of intersections to allow ease of access and sight distance for the intersecting street.

Substantial loading facilities should be located off-street and should not compromise other street uses.

Separate bike paths from parking bays, if possible, to avoid conflicts between cyclists, car doors and alighting passengers.

B4.7.2 Motorcycle parking

Motorcycle parking on footpaths and pedestrian areas is legal in Victoria. Therefore, controlling motorcycle parking to avoid conflicts with other uses is difficult and should be considered as part of the public realm design. Motorcycle parking facilities should be placed conveniently at most entries to pedestrian zones and promenades without blocking pedestrian desire lines and to help discourage inappropriate biking along them. Street design should consider motorcycle parking. Furniture location can be used to limit the intrusion of motorcycle parking into footpath areas that should only be used by pedestrians.

B4. STREETS AND ROUTES

B4.8 WATERFRONT PROMENADES

In addition to streets, Melbourne's parks and waterfront promenades are integral to the walking and cycling network. These are valued as recreation spaces. Vehicle traffic should be discouraged or prevented from accessing waterfronts and parks, except for emergencies, maintenance or deliveries. Where vehicle access is required, these areas should be designed as Shared Zones.

Local street networks around parks and waterfront spaces should be designed to minimise conflicts between vehicles, pedestrians and cyclists.

Safety principles must be included to effectively manage risks associated with activities along the waterfront. A water safety risk assessment should be undertaken and recommendations implemented in accordance with the *Guidelines for Water Safety in the Melbourne Docklands*.

B4.8.1 Circulation space

Provision for pedestrian traffic along waterfront promenades should consider two zones:

- **Passive zones**
These are areas along the water's edge designed to provide a passive seating area and discourage pedestrian and bicycle traffic flow from the water's edge. Strategies to create a passive zone include wharf edge kickers, seating areas, bollards, lighting and other furniture. This infrastructure is both a physical and a visual deterrent to pedestrians walking at the water's edge reducing the need for safety fencing.
- **Active zones**
These are large, open promenade areas designed to encourage the main pedestrian traffic flow away from the edge of the promenade. Active zones include clear pathways and direction.

For waterfront promenades lined by buildings, provide a continuous clear walking path along the building line. Outdoor cafes must not be located in this path. Frontage activation should be achieved primarily through uses of internal building spaces facing onto the promenades, or by activities located centrally in the promenade.

Provide vehicle access for emergencies, rubbish collection, other services and events. Maintain generous clearances around features that may be damaged by vehicles and/or provide protection using bollards or kerbs.

Prioritise waterfront spaces for recreational uses including walking and cycling. If separate paths are required, set bikes away from the water.

As per B4.2.1 above, waterfront promenades must provide a minimum 1.5m unobstructed pedestrian pathway.

B4.8.2 Levels

Where feasible, create an overall fall towards the water to maximise water views.

Do not create raised spaces or features that visually isolate parts of the promenade from the water. Avoid abrupt level changes high enough to block views. This includes consideration of balustrades and other features that exaggerate the visual impacts of surface level changes.

Minimise cross-falls in most areas for ease of walking. However, steeper slopes may be appropriate in places to enhance water views and for activities such as sitting on grass.

B4.9 UTILITIES PROVISION

Road reserve widths and levels must be designed to allow for existing and future services.

The streetscape design must allow for proposed future services through the installation of extra conduits to eliminate the need to excavate paving in future years. This is especially important if an intricate paving design is proposed.

Note that due to the National Competition Policy some services may be laid in multiples, as each service provider (e.g. Telstra and Optus) may wish to lay its own complete network. When dealing with these telecommunications companies ensure the needs of all authorities are catered for in the works.

Locations of utilities must be in accordance with industry standards.

Cement-stabilised backfill around underground service conduits is not approved.

Pit covers in the road reserve (including the footpath, nature strip and medians) must be capable of taking highway type loadings.

Pit covers with infills in bluestone or asphalt paved areas must be filled in with charcoal-coloured concrete. Any concrete surrounds to pits must be constructed with charcoal-coloured concrete.

Various pits and pit covers for the assets of service authorities are subject to the design standards of those organisations. Alteration of these pits is subject to approval of the relevant Responsible Authority, including:

- VicRoads approval for traffic signals (N.B. On completion of installation of traffic signals and handover to VicRoads, maintenance of signals will be undertaken by VicRoads at its cost)
- Yarra Trams approval for tram alignment
- CitiPower/Powercor approval for public lighting.

B4. STREETS AND ROUTES

CHAPTER REFERENCES

'Typical Street Standards', City of Melbourne

'Disability Discrimination Act 1992', Australian Government

'Building Code of Australia' (2012), Australian Building Codes Board

'Melbourne Planning Scheme' (2012), Department of Planning and Community Development, State Government of Victoria

Australian Standard: *AS/NZ 1428.4.1:2009 Design for access and mobility*

'Bicycle Plan 2012 - 2016', City of Melbourne

'AustRoads Guide to Road Design', Part 6A: Pedestrian and cyclist paths (2010), Austroads

Australian Standard: *AS 2890.5 Parking facilities Part 5: On-street parking*

'Guidelines for Water Safety at the Melbourne Docklands' (version 2.0 draft), Places Victoria

Other useful references

'Docklands Waterways Strategic Plan 2009 - 2018' (2009), City of Melbourne

'Road Encroachment Operational Guidelines' (2003), City of Melbourne

'Transport Strategy Planning for Future Growth' (2012), City of Melbourne

'Access Docklands: A Plan for the Docklands Transport Network' (2012), Places Victoria, City of Melbourne

'Cycle Notes and Extended Guidelines' (various dates), VicRoads

'Road Safety Road Rules 2009', Department of Transport

'Traffic Engineering Manual Volume 1 - Traffic Management' (2010), Chapter 4, Pedestrian Facilities, VicRoads

B5. PAVING AND SURFACE MATERIALS

This chapter provides design guidelines for paving and surface materials for the Docklands public realm. It details the use of sawn bluestone and asphalt as the primary paving and surface material. It should be read in conjunction with Chapter B4: 'Streets and routes' which details a variety of bluestone crossing and edge details.

This chapter does not address paving and surface materials for wharves and waterfront promenades. When selecting paving and surface materials for these areas guidance should be taken from Chapter B10: 'Maritime works', the [Docklands Public Realm Plan](#) and relevant waterfront master plans.

B5.1 ROAD PAVEMENT DESIGN

The following is a list of construction standards that must be adhered to in order of legal requirement:

- *VicRoads Traffic Engineering Manual*, the *Austrroads Guide to Road Design*, and the *VicRoads Supplements to the Austrroads Guide to Road Design*
- Relevant Australian Standards.

In addition, developers should take note of the following:

- Road pavement design life must be 30 years
- Designers must submit assumptions on vehicle loadings to allow for growth in traffic volumes and vehicle types
- Pavement must be designed taking into account the strength and stiffness of the foundation material
- A geotechnical report by a NATA-approved laboratory is required as a basis for pavement design
- Asphalt must be a minimum depth of 100mm and must have a minimum 10-year design life with no maintenance during that time while the subsequent maintenance cycles are to be within the normal maintenance regime acceptable to VicRoads
- Road and bridge construction, including material supply, must be in accordance with VicRoads specifications
- Refer to VicRoads for roads under its control.

DESIGN STANDARDS



Asphalt road pavement

👉 Design Standard 201.08

5. PAVING AND SURFACE MATERIALS

B5.2 PAVING MATERIALS

The extent of paving in urban spaces means that slight maintenance complications or modestly increased material costs can have huge impacts. Paving affects the character of spaces but is less important than buildings and vegetation, which dominate in most views. Simple paving is therefore preferred in most places. Principles for the selection and use of paving include:

- Compliant with Council standards
- Ensure the footpath paving suits likely vehicle loadings
- Extreme durability is required where stopping and turning vehicles exert lateral and twisting pressures; crossovers must therefore be asphalt even if a higher-quality pavement like bluestone is used for the rest of the footpath
- Minimise the variety of materials and details in a given area
- Relate changes in paving to changes in functions and clearly delineate boundaries (e.g. at kerbs, drainage channels and vehicular crossovers)
- All paving must be easy to repair, replace and replicate when damaged
- Adopt a consistent modular system with 995mm X 495mm (nominal) dimensions
- Consider ways to reduce the prominence of paving rather than using costly materials. For example, if flat areas are paved and slopes planted, greenery will tend to dominate in most views. Trees can break up views of paving, while shaded surfaces are less obvious than those in sun, and dappled shade can make plain surfaces more attractive.

Spare conduits for future services or service repairs must be installed where necessary to avoid opening up the paving in future. Typically these conduits are for the use of telecommunication services. Provide a 90mm PVC conduit at nominal 400mm depth located centrally along pavement.

B5.2.1 Standard paving

Two main paving treatments are to be used in Docklands. Refer to the [Docklands Public Realm Plan](#) (Chapter 4 'Public streets and routes') for information on the standard materials palette.

Sawn bluestone is the standard footpath paving used throughout the Capital City Zone and must be used for selected high use areas including primary streets, pedestrian-only streets, arcades and lanes and shared streets in Docklands. (Refer to the *Docklands Public Realm Plan* for a guide on where to use bluestone paving in Docklands.)

Asphalt is the standard paving for all other areas, all road and laneway surfaces, and all driveway crossovers.

DESIGN STANDARDS



Sawn bluestone paving standard size

For pedestrian areas with priority given to primary streets, promenades, and plazas

↖ Design Standard 201.01



Asphalt footpath paving

↖ Design Standard 201.03

B5.2.2 Flexible and special paving

Almost all paving in road reserves and most paving of paths in other spaces should be one of the two standard materials – asphalt or bluestone. However, other materials may be appropriate in particular situations, particularly where:

- A flexible material is needed around the base of trees
- Permeable materials that increase infiltration of air and rainwater into the soil are available
- Paving is likely to be damaged as a matter of routine by structures for events
- Lawn is unable to withstand intensive use but a hard paved finish is inappropriate.

Permeable asphalt may be appropriate in footpaths and in parking lanes with light vehicular traffic loads.

5. PAVING AND SURFACE MATERIALS

Gravel may be appropriate in large level spaces subject to intensive use and wear, where lawn is not sustainable. However, gravel requires regular maintenance. If laid on slopes it is liable to erosion and it can track onto surrounding pavements. Care is required in its use, with close attention needed to drainage and erosion control, and to the interface between gravel and any adjoining rigid pavements. It is generally desirable to avoid mixtures of rigid paving (concrete or stone) and flexible paving (gravel or asphalt), to minimise the risk of trip hazards as the surfaces wear and move over time.

Large expanses of granitic gravel may require constructed drainage channels or spoon drains across them to minimise sheet erosion and gullyng.

Granitic gravel is often used to finish tree pits. However, in busy areas (i.e. throughout much of the central city and Docklands) people walk across tree pits and track gravel onto surrounding pavements and into shops. On slopes, it is also liable to erosion. In these situations, tree pits should be finished with a layer of permeable pebble mix paving. As with any rigid tree grate, the surface is often relatively short-lived due to the expansion of roots near the base of the tree. As it requires more complicated maintenance than the simple topping up of granitic gravel, it should not be used where granitic gravel is adequate.

Bluestone pitcher paving is a traditional detail in Melbourne and creates an attractive texture. However, its uneven surface creates trip hazards and limits access for people with disabilities, so it should be used only for vehicular areas. Pitchers must not be used on footpaths, bike paths or as a surface for pedestrian crossings.

Council does not encourage the use of an exposed aggregate concrete finish on paved or vertical surfaces. The exposed aggregate finish is difficult to clean and costly to apply sealant coatings to protect the treatment.

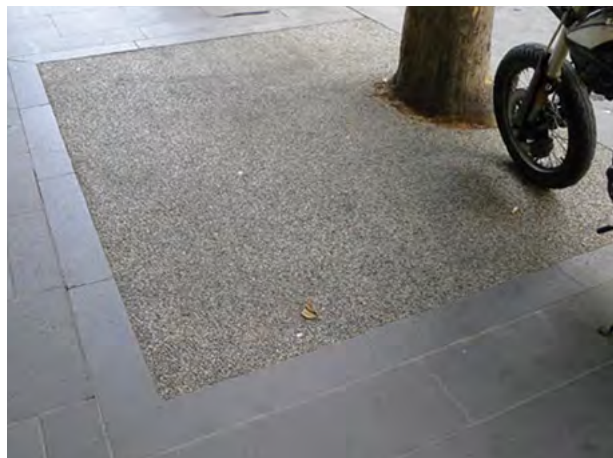
DESIGN STANDARDS



Granitic gravel paving

For tree pits and flat areas in parks only; do NOT use on slopes

↗ **Design Standard 201.04**



Permeable pebble mix paving

For use as a fixed but permeable surface for tree pits

↗ **Design Standard 201.06**

B5.3 KERB AND CHANNEL

Kerbs block vehicles but create only minor impediments for pedestrians and can withstand vehicle impacts, so they are usually preferred over other barriers such as bollards.

Bluestone kerbs are traditional and preferred throughout Melbourne. They must be used for all new streets and for the upgrade of existing streets adjacent to new developments in Docklands.

Concrete kerbs are not accepted for use within Docklands.

Gutter stones are typically used in combination with kerbs to define the drainage channel, although they are not necessary where surfaces drain away from the kerb.

Principles for use of kerb and channels are:

- Minimise kerb heights to provide easy access onto the footpaths at any location, and to minimise the size of ramped kerb crossings
- Re-use old bluestone kerbstones but avoid mixing recycled and new stonework
- Do not mix bluestone pitchers with dressed stonework (e.g. to form segmented curves)
- Where unit pavers are planned for a footpath, do not use recycled kerbstones due to the difficulty of making a neat joint between the pavers and irregular kerbstones
- Where bike lanes are located adjacent to the kerb, use a channel of minimal width
- Pitchers should be tightly butt-jointed, without using mortar except as necessary at pedestrian crossings to ensure an even surface.

Wide bluestone pitcher channels (i.e. more than three rows of pitchers) exist in some parts of Melbourne. If considered of heritage significance, these should be retained and repaired if damaged. However, they are not acceptable for new work.

DESIGN STANDARDS



Sawn bluestone kerb and gutterstone

↖ **Design Standard 301.01**

B5.3.1 Standard kerb and radial dimensions

The standard bluestone kerb width is 300mm. Narrower kerbs (200mm) have been used in some areas in the past, and must only be used for repairs or minor modifications where they already exist.

Lengths should average at least 1m, with the minimum length 450mm.

Radial kerb sections must be used in roadways for exposed corners as well as internal angles. Sharp square corners and mitred joints are not acceptable.

B5. PAVING AND SURFACE MATERIALS

Streets should be designed to use standard kerb radial dimensions and curves should be simple arcs rather than compound curves, in order to facilitate replacement of damaged sections and recycling if works are altered. This applies at all locations including intersections, driveway crossovers and kerb outstands.

For curves, use standard radii:

- 610mm, 1220mm, 1830mm, 2440mm, 3660mm and 4270mm
- 5m, 6m, 7m, 8m etc. through to 18m
- Make curves greater than 18m radius out of straight segments
- With 300mm wide kerbs, the ends of each stone should be trimmed to create tight butt joints in curves between 18m and 30m radius
- With 200mm kerbs, ends should be trimmed for curves between 18m and 20m radius
- Larger radii can be formed using untrimmed butt jointed straight segments.

B5.4 CHANNELS AND SPOON DRAINS

Gutters, channels or spoon drains without kerbs are used at path edges where no barrier is needed and to define drainage lines across paved surfaces.

General principles for use of channel details are:

- Use sawn bluestone for all channels.
- If drainage lines are required over pedestrian areas, integrate these with any ornamental paving pattern
- Ensure surface drains do not create trip hazards or interfere with universal access
- Do not use bluestone pitchers to construct channels.

DESIGN STANDARDS



Sawn bluestone channel

↖ Design Standard 303.01

B5.5 FLUSH EDGES

Edging materials are often required for paths in parks, between garden beds and lawns, and between different pavement materials. These stabilise flexible materials such as asphalt and gravel, as well as containing loose mulch in play areas and garden beds.

General principles for the selection and use of edging materials include:

- Edging should typically be used at junctions between garden beds and lawn areas or lawn and gravel path interfaces
- Rather than being decorative only, edge details should serve as drainage channels or have a practical relationship to construction of the pavement (e.g. serving as formwork for laying concrete or asphalt, or as a permanent retaining edge for loose materials)
- Lawn edging should have a smooth face along the grass side to facilitate maintenance, and materials should resist damage by trimming tools (i.e. the difficulty of keeping neat turf edges along irregular materials or where grass grows into joints encourages maintenance staff to resort to herbicides, which is undesirable)
- For lawns of kikuyu or similar invasive species, the edging should have tight joints and be deep enough to prevent the grass from spreading through it
- Edging details should generally be in proportion to the width of the surface. Avoid using wide borders on narrow paths.

DESIGN STANDARD



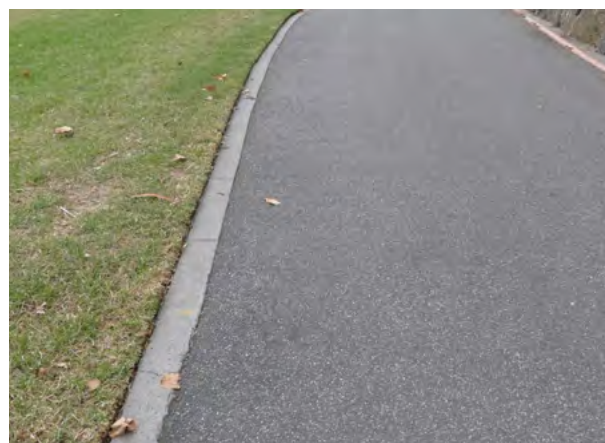
Timber edge *For use in parks only*

↖ Design Standard 305.01



Steel edge *For use in parks only*

↖ Design Standard 305.02



Cast in situ concrete edge *For use in parks only*

↖ Design Standard 305.03

B5. PAVING AND SURFACE MATERIALS

CHAPTER REFERENCES

[*'Docklands Public Realm Plan'*](#) (2012), City of Melbourne

'Traffic Engineering Manual' (2010), VicRoads

'Austroads Guide to Road Design' (2010), Austroads

'VicRoads Supplement to the Austroads Guide to Road Design' (2010), VicRoads

B6. STREET, PARK AND WATERFRONT FURNITURE

Street, park and waterfront public realm spaces provide significant opportunities to contribute to sustainable, economically viable and healthy communities. The use of a standard furniture palette within the public realm ensures long-term functionality and supports these outcomes.

Provision of street, park and waterfront furniture enables visitors to Docklands to spend more time using the public realm. Seating, drinking fountains, toilets, bike hoops and other public realm elements combine to enhance the visitor experience.

This chapter contains design guidelines and standards for furniture in the Docklands public realm.

B6.1 SUPPLY AND MANUFACTURE OF FURNITURE

All new street and park furniture must be manufactured in accordance with the requirements of Council's Engineering Services Branch. Only furniture approved by the Manager Engineering Services may be used.

B6.2 FOOTINGS AND INSTALLATION OF FURNITURE

All new furniture must be installed in accordance with the requirements of Council.

Where possible, install gib key sockets, bollards, bike hoops, sign posts etc. by coring a neat hole in the finished pavement rather than using other means of excavation. On structures (e.g. most waterfront promenades), or where there are shallow underground services, furniture is installed using base plates and chem-set bolts.

DESIGN STANDARDS



Gib key and socket

↖ Design Standard 705.05

B6.3 SEATS

Seating is one of the most important public realm elements for encouraging the use of public spaces. The location and type of seating should be physically and socially comfortable.

The slatted seat (with back and arm rests) is preferred where there is space, as it provides a better service for the elderly and people with disabilities, and for where people are expected to sit for longer periods of time.

The slatted bench is likely to be a trip hazard to people with vision impairments or in crowded conditions and is not suitable for use on narrow footpaths.

All seats are fabricated from 316 stainless steel.

B6. STREET, PARK AND WATERFRONT FURNITURE

B6.3.1 Quantities and locations of seating

The slatted bench should be used only where people are expected to sit for periods shorter than 15 minutes. For areas where people are expected to sit for longer periods, the slatted seat with back is recommended.

Provide a seat or bench at regular intervals along important pedestrian routes to provide resting places. Provide more seats on hills, with increasing frequency as the slope increases.

In plazas, provide at least 100mm of seating (measured along the front edge of seats and sitting ledges) per square metre of open space (in addition to any seating in outdoor cafes).

Provide seating along waterfront promenades to define passive and active pedestrian zones and to provide a place for people to sit and enjoy the water's edge.

B6.3.2 Built-in seating

In most streets standard seats and benches are the only appropriate type of seating. However, in plazas, along the waterfront promenade and other places where space permits, some seating should be built into the design. A variety of ledges, steps and custom-designed seats (especially long ones) may be appropriate.

In these situations:

- Seating should be nominally 420mm above pavement level
- Where seat heights vary due to sloping sites, surfaces between 300mm and 900mm above pavement level may be usable but at least 50% should be between 350mm and 600mm

- Bench seating should be at least 400mm deep. Seating with a back should be at least 350mm deep, and the backrest at least 300mm high
- Benches and ledges to accommodate back-to-back seating should be no less than 750mm deep and preferably at least 1000mm deep
- Seating surfaces should be level, smooth and well-draining
- At least 10% of seating should have back rests
- At least 5% of seating should have arm rests
- A variety of seating arrangements provides greater flexibility and choice for individuals, groups, strangers or friends. Avoid fixed single seats
- Council does not encourage the use of an exposed aggregate concrete finish on custom-designed seats. The exposed aggregate finish is difficult to clean and costly to apply sealant coatings to protect the treatment
- All timber surfaces are to be treated with natural oils and included within a regular maintenance program to protect and improve the presentation of the timber.

DESIGN STANDARDS



Stainless steel slatted seat

Use in streets. May be used in very small parks

[↖ Design Standard 701.01](#)



Stainless steel slatted bench

Use in streets

↖ Design Standard 701.02



City swivel seat

Use in plazas where other furniture relates to the typical street-style palette (i.e. all stainless).

↖ Design Standard 701.04



Park seat (with stainless steel frame)

Use in parks, waterfront promenades and in footpaths of streets adjacent to a park

↖ Design Standard 701.03



Park swivel seat

Use in parks and waterfront promenades

↖ Design Standard 701.05

B6. STREET, PARK AND WATERFRONT FURNITURE

B6.4 LITTER BINS

B6.4.1 Litter, recycling and dog waste bins

Standard litter bins

The standard litter bin holds a wheeled plastic liner designed for a mechanical lifter attached to garbage collection trucks. The metal surround secures the liner and improves its appearance.

All bins are fabricated from 316 stainless steel.

Bins should be placed at regular intervals along footpaths with high pedestrian traffic, at intersections, and at mid-block pedestrian crossings. They should be convenient to seating areas, especially where people are likely to sit and consume food and drinks, but placed so they do not detract from the amenity of the seats.

The siting of litter bins is often contentious, especially near retail or residential premises, and should be undertaken with care and consultation with traders or residents.

General principles for placing bins include:

- When redesigning existing streets, bins should be kept in their existing locations if feasible
- Any proposed relocation should be supported by consultation with nearby traders
- Do not align bins with doorways to buildings
- Bins should be near a road or path that is traversable by garbage trucks. Preferred positions are near street corners where there are No Standing Zones to ensure easy access
- Do not place bins in defined pedestrian paths

- Bins should not be placed on street corners where they block drivers' views
- Designers should consider the impact of pest populations when placing bins near seats, picnic furniture or playgrounds
- Bins should not be placed within 1m of a seat when located in the street.

Recycling bins

Recycling bins and standard litter bins should typically be installed together in pairs. Although recycling bins may not be installed with every litter bin, they should be provided:

- Along major pedestrian thoroughfares
- In parks near barbecues
- Near sporting clubs in parks.

B6.4.2 Bin corrals

Bin corrals are used near picnic and barbecue areas where very large volumes of litter are generated. They should be placed adjacent to a path for easy access for garbage disposal.

DESIGN STANDARDS



City litter bin

↖ Design Standard 702.01



City recycling bin

↖ Design Standard 702.02

B6. STREET, PARK AND WATERFRONT FURNITURE

B6.5 FOUNTAINS, BARBECUES AND TABLES

B6.5.1 Drinking fountains

All drinking fountains should provide access for users of mobility aids (e.g. wheelchairs).

Drinking fountains are high maintenance. Ease of maintenance using standard parts is vital. Non-standard fountains will not be approved.

Given the limited number of drinking fountains installed in Melbourne, they should be placed consistently in similar types of locations so people can find them.

Appropriate sites for drinking fountains include positions near or within clear view of:

- Tram and bus stops and railway station entries
- Entries to public or 'civic' buildings
- Public toilets
- Sports facilities and picnic sites in parks.

Drinking fountains should be installed parallel to the kerb when installed on footpaths. They must be installed so that a person on a wheelchair can use them with ease.

B6.5.2 Barbecues and picnic tables

Council's standard barbecues are electrical and operate with timer-controlled switches. The single, double and extended 'Yarra type' barbecues are all of similar design but offer a range of sizes to suit different contexts. Consider access around double barbecues to allow for two groups to use at once.

The barbecue and picnic set(s) are placed adjacent to each other.

If possible, picnic tables should be placed where they receive shade from midday through to early afternoon during summer, yet receive some sun in winter. Tables should also be installed to provide access for users of mobility aids.

In addition to their visual impact, installing picnic facilities in new locations can significantly change the ways in which that space is used. New installations should therefore be supported by an appropriate consultative process, or fit with an approved master plan for the site. When replacing existing barbecues and tables, use the current standard design. If there is more than one barbecue at a site and they are of an older style, replace all at one time.

DESIGN STANDARDS



Drinking fountain

[Design Standard 703.01](#)



Drinking fountain with dog bowl

↖ Design Standard 703.02



Barbecue - single

↖ Design Standard 707.02



Picnic table

↖ Design Standard 707.01



Barbecue - double

↖ Design Standard 707.03

B6. STREET, PARK AND WATERFRONT FURNITURE

B6.6 BOLLARDS

Bollards restrict vehicle access without impeding pedestrian and bicycle access or rainwater drainage, so they may be desirable instead of kerbs in some situations. They are a simple way to protect individual trees or other features, or protect paved areas that may be accessible to vehicles.

Bollards are often used where they are likely to be struck by vehicles and damaged, in order to protect other features. This demands bollards that can be replaced simply and without great expense.

Bollards should not be used as a barrier instead of kerbs where vehicles are likely to strike the barrier regularly, unless:

- The bollard is placed as a sacrificial protector of a more valuable feature
- Kerbs would create unworkable problems with drainage, disabled access or trip hazards
- Retention of existing kerbs is important for some reason (e.g. heritage) but a barrier is needed beyond the existing kerb line.

All removable bollards throughout Docklands are on a key system. Refer to the relevant Design Standard for details. Developers must provide all keys at Practical Completion to the satisfaction of the Manager Engineering Services.

General principles relating to the design and use of bollards include:

- Finishes should be easy to restore when scratched or marked
- Bollards must incorporate a reflective panel to ensure visibility for vehicular traffic
- In rows of bollards there should be clear gaps of at least 1m, but gaps should be no greater than 1.5m to prevent vehicular access
- If a mixture of removable and fixed bollards is needed at a site, all should be the same style.

Waterfronts along the Yarra and in Docklands also feature mooring bollards, which serve a specific function for specific places and are not appropriate elsewhere.

DESIGN STANDARDS



Fin bollard - fixed

[Design Standard 704.03](#)



Fin bollard - removable

↖ Design Standard 704.04



Timber bollard - fixed

For use in parks only

↖ Design Standard 704.06



Cattle rail bollard

For use with WSUD tree pits only Design

↖ Design Standard 704.05



Timber bollard - removable

For use in parks only

↖ Design Standard 704.07

B6. STREET, PARK AND WATERFRONT FURNITURE

B6.7 FENCES

B6.7.1 Fences in streets

Fences and other pedestrian barriers should only be used in unusual situations where they are absolutely necessary, since:

- Freedom of pedestrian movement in streets is generally desirable
- Barriers can create hazards as well as preventing them by trapping people in dangerous situations on the roadway
- Fences are often subject to accidental damage and are therefore relatively maintenance-intensive
- People often resent gratuitous barriers making fences targets for vandalism
- There is little data proving that fences in streets enhance pedestrian safety.

An apparent need for fences in streets usually indicates inadequate footpath widths, a lack of convenient crossings or excessive distances between safe crossings, traffic signal cycles that inadequately cater to pedestrian needs, or other problems. These should be rectified where possible rather than installing a fence.

B6.7.2 Park fences

Many of the problems with fences in streets also apply in other public spaces, so they should only be used when there is clear reason to do so. Fences around play spaces are not supported by Council.

All Council standard park fences use 150mm x 150mm Cypress Pine posts with a pyramidal top (30° slopes) and chamfered detail to define a 'cap'. This applies to:

- Timber post and pipe fence
- Timber bollards (fixed and removable).

Timber fence posts located within 3m of a roadway (with a 50kph or greater speed limit) must be made frangible with a 35mm diameter hole, 50mm above the finished surface level drilled perpendicular to the direction of traffic.

Park designs should minimise the need for any fencing. Custom-designed fences may be appropriate in exceptional situations where there is little or no risk of vehicular damage.

DESIGN STANDARDS



Post and rail fence

For use in parks only. Do not use along roads with speed limits greater than 40kph

↖ Design Standard 706.01



Steel hoop fence

For use in parks only, to protect ornamental garden beds

↖ Design Standard 706.02



Steel safety rail fence

For use in streets

↖ Design Standard 706.07

B6.8 BICYCLE PARKING

The standard bicycle parking hoop can be used singly or (more commonly) with two or more set parallel to each other, depending on the demand and available space. They can be placed perpendicular or parallel to the kerb or at another angle appropriate to the space to maintain required setbacks.

The demand for bicycle parking in a given area can sometimes be assessed by observing where people lock their bicycles to fences, poles and other street furniture. The use of existing furniture for bicycle parking is not undesirable unless it interferes with other activities or damages the furniture involved. Therefore, providing bicycle parking hoops to meet all of the parking demand is not always necessary.

Placement criteria for bicycle hoops include:

- Bicycle hoops are generally located along cycling routes, destination points or public attractions
- They should be placed where they are clearly visible, not hidden where bikes are more vulnerable to vandalism or theft
- Minimum offsets of bicycle hoops from kerbs and building lines should allow for a 2000mm x 600mm zone, centred on the hoop, to keep bikes as well as the hoops themselves clear of traffic, car doors and pedestrian travel paths
- When placing multiple bicycle hoops in a group, parallel hoops should be spaced 1000mm apart (measure perpendicular to the centre-lines of the hoops)
- They should be offset a minimum of 800mm from the face of kerb
- The absolute minimum footpath width for placing bicycle hoops is 2000mm. The preferred minimum is 3500mm and hoops must be set parallel to the kerb when such minima apply
- Try to place bicycle hoops so that more can be added in the future if demand increases.

Bicycle hoops should be fixed securely to footings rather than installed with gib key sockets, due to the risk of theft.

When adding or replacing existing bike non-standard bike hoops use the current standard design. If there is more than one at a site and they are of an older style, replace all at one time.

6. STREET, PARK AND WATERFRONT FURNITURE

DESIGN STANDARDS



Bicycle hoop

↖ Design Standard 706.08



Spiral bicycle hoop

↖ Design Standard 706.09

B6.9 SKATEBOARDING DETERRENENTS

Skateboarding is supported in appropriate areas. However, in places where there is no specific provision for skateboarding, it frequently causes damage to stonework and furniture. In addition, the risk of skateboarders colliding with pedestrians or unexpectedly entering pedestrian areas or roadways are safety concerns, and a source of intimidation that can deter other public activity.

Some exposed edges can be reinforced (e.g. with continuous steel angles) to protect them from damage. This does not prevent the skateboards marking the surface, nor does it protect other members of the public. It is therefore often necessary to use construction details to deter skateboarding altogether.

Protruding fins and buttons are often used to retrofit existing masonry, if necessary, and are commonly used throughout Melbourne.

As these details can create tripping hazards it is preferable to consider the likely need for skateboarding deterrent measures and design these in from the start, for example with:

- Textured or heavily jointed masonry
- Broadly rounded or angled edges rather than square edges, small bevels or bullnoses
- Steel detailing integrated with masonry jointing patterns.

Techniques to reduce the need for skateboarding deterrent measures should also be considered in the overall design of spaces, including:

- Use heavily textured pavements along or near low walls and steps
- Place furniture and other features to impede clear runs up to edges and slopes that may be used for skateboarding jumps
- Consider the need for tactile ground surface indicators (TGSIs) and their likely impact as skateboarding deterrents before installing other deterrents (but never use TGSIs as skateboarding deterrents if they are not needed to assist people with vision impairments).

Any installation of projecting fins or buttons must be subject to a risk assessment.

When replacing damaged or missing skateboarding deterrents, match the surrounding detail.

DESIGN STANDARDS



Skate deterrent long fin
↖ Design Standard 705.01



Skate deterrent stainless steel button
↖ Design Standard 705.03



Skate deterrent short fin
↖ Design Standard 705.02



Skate deterrent bronze button
↖ Design Standard 705.04

B6. STREET, PARK AND WATERFRONT FURNITURE

B6.10 PUBLIC AMENITIES

B6.10.1 Passenger shelters

Passenger shelters are provided at tram and bus stops by the public transport authority. Site designs must allow space for appropriate shelters including clearances for access around them, and provide for service connections.

DESIGN STANDARDS



Tourist bus shelter

↖ Design Standard 710.03



Tram shelter

↖ Design Standard 710.04

B6.10.2 Public toilets

As the Docklands waterfront and other spaces/facilities are intended to attract a wide range of visitors, provision of public toilets is important. Projected population growth in Docklands will also increase the need for public toilets.

Establishing new sites for public toilets is important. Public toilets allow visitors to stay for extended time periods. Factors that should be considered in siting toilets include:

- Close proximity to pedestrian paths and other facilities or areas where they are likely to be needed
- Distances to underground service connections
- High visibility
- A location where there is strong natural surveillance (e.g. at park edges and in streets)
- High levels of natural light
- Attractive surroundings
- Principles of gender accessibility, to ensure that all people can access toilets safely and without fear of discrimination or harassment.

Council has adopted standard automated public toilet designs that aim to provide a well-presented interior design that is robust and easy to clean, an external shell that blends with the streetscape, and has provisions for people with special needs.

The City of Melbourne Public Toilet Plan recommends all public toilets be provided in buildings. In some cases a custom shell with the standard automated toilet within parks and public spaces can be provided. This can allow for other park storage to be integrated in the one building. Council standard toilets (silver bullets) should be used in streets.

DESIGN STANDARDS



Park toilet

↖ Design Standard 710.08



Self-cleaning toilet

↖ Design Standard 710.09

B6.11 STREET TRADING FACILITIES

The operation of outdoor cafes on footpaths and all other public spaces is guided by Council's *Activities Local Law 2009*, section 1.13 and Outdoor Cafe Guide and requires a permit from Council. A variety of other Federal, State and Municipal laws and policies also apply. The Outdoor Cafe Guide provides details of these controls, along with requirements for:

- Access, location and layout of outdoor cafes
- Design and installation of furniture
- Operation and management
- Education and compliance
- Application procedures.

Similar controls apply for all other street trading including news kiosks, fruit stands and commercial tour operations. Street trading applications are typically approved by Council after Practical Completion has been provided.

Council is currently retiring existing street trading licences approved by Places Victoria. All street trading permits are issued by Council.

Further street trading information and an application form is available on Council's website.

B6. STREET, PARK AND WATERFRONT FURNITURE

DESIGN STANDARDS



Outdoor cafe screen

↖ Design Standard 710.05



News pillar

↖ Design Standard 710.11



Outdoor waiter station

↖ Design Standard 710.06



News kiosk

↖ Design Standard 710.12

B6.12 WIND ABATEMENT

Wind should be mitigated through building design, where possible, to avoid wind abatement structures in the public realm. However, sometimes wind abatement structures may be required to reduce the impact of wind in public spaces.

The design and location of these structures must be approved by the Manager Engineering Services in accordance with planning requirements. Any location must not obstruct pedestrian desire lines or key views.

Typically, section 173 agreements are in place for the ongoing maintenance and care of wind abatement structures and remain the responsibility of building owners.

Requests for outdoor dining wind abatement must refer to the *Outdoor Café Guide*.

Challenging conditions for vegetation growth have meant trees have been unreliable for wind abatement in Docklands.

CHAPTER REFERENCES

'The City of Melbourne Public Toilet Plan' (2008 – 2013), City of Melbourne

'Melbourne City Council Activities Local Law 2009', section 1.13, City of Melbourne

'City of Melbourne Outdoor Cafe Guide' (2008), City of Melbourne

Other useful references

'Melbourne Docklands Wind Mitigation Guidelines' (2008), VicUrban

B7. SIGNS

Signs must be provided in public streets and spaces to provide regulatory, safety, directional and interpretive information. While various types of signs are subject to different guidelines, there are some general principles that should be addressed with all sign types:

- Provide information where it is most required
- Place directional signs where people make decisions about their route of travel (e.g. at intersections and railway station entries)
- Provide signs to complement existing signage systems (e.g. Public Transport Victoria (PTV) signs at tram stops and Southern Cross Station)
- Ensure sign type, size and content suit viewing conditions
- Keep signs addressed to motorists simple, especially in complex traffic situations, and avoid unnecessary signs at busy intersections
- Minimise the number of signs and only include information appropriate to a site
- If existing signs are inadequate, replace them rather than add new ones
- All directional signs should use a consistent design and graphic style to ensure legibility of the system as a whole
- Sign graphics - including text size, style, colour and its contrast with the background - should maximise legibility for all people (refer to *AS/NZ 1428.4.1:2009 Design for access and mobility*)
- International standard pictograms should be used to provide concise and universally recognisable information.

B7.1 TRAFFIC, STREET AND PROPERTY SIGNS

Traffic/parking signs and line markings must be in accordance with VicRoads standards.

Parking signs should be placed on buildings, where possible, or on a footpath adjacent to the car parking space.

Every intersection must have street name signs.

Where a street is to remain privately-owned, the words 'Private Road' must be displayed on the street nameplate.

B7.1.1 Naming geographical places and roads

The State Government Department of Sustainability and Environment (DSE) sets out procedures and principles for naming, renaming and adjusting the boundaries of geographic features, localities and roads in Victoria in its *Guidelines for Geographic Names*.

These guidelines, provided under the aegis of the *Geographic Place Names Act 1998*, are mandatory for naming authorities in Victoria. They have been developed through detailed consultation with municipal councils, government departments and emergency response and public service providers.

The policy for naming geographical places, including roads within the Melbourne City Council municipality is set out in Council's *Activities Local Law 2009 - Policy Operating Statement, Naming of Geographical Places (Including Roads)*. DSE guidelines and processes underpin this policy.

A list of names with pre-approval for use in the Docklands area is available in the *Docklands Place Naming and Storylines* manual and the *Docklands Place Naming Register* database. A name chosen from this list must be checked for compliance with the DSE guidelines, and if satisfactory, can be adopted without further consultation.

If another proposed name is selected, the *Guidelines for Geographic Names Victoria* must be used in accordance with Council's Policy Operating Statement.

The naming of roads is handled by Council's Planning and Building Branch (Land Survey).

B7.1.2 Property address numbers

Every building must clearly display its street address at the main entrance (at a minimum). Use of Council's standard signs makes these easier for people to find and is strongly recommended.

When not done as part of the Subdivision approval process, allocation of street address numbers to properties is handled by Council's Property Services Branch (Valuations).

B7.2 WAYFINDING (PEDESTRIAN) SIGNS

The Docklands wayfinding signage system includes signs for circulation, identification, public facility information and street names, which have been designed to:

- Enhance the sense of place and a cohesive character of the public domain
- Provide clear, unambiguous public information
- Serve as a modular kit of parts that are interchangeable, cost effective and allow for change of information and the evolution of the site over the development period
- Distinguish between information types through consistent hierarchy of scale, and placement.

Signs must be selected and applied according to Council's *Signage Manual*, and must:

- Be the most appropriate sign type
- Be placed in a logical, prominent location
- Have clear and unimpaired sightlines
- Be located within 5m of an existing light pole where possible (for non-illuminated signs)
- Display a limited number of clear messages
- Consider access needs of visitors.

The *Signage Manual* includes a plan with indicative sign locations. Signs must be provided according to this plan, although each position needs to be refined in relation to the design for its site.

Specifications are supplied in the Signage Manual for sign composition, graphics, colours, finishes, fabrication and installation.

When final sign locations and types are approved, Council will supply graphic contents for all directional signs, including three-dimensional/two-dimensional maps and naming for directional information. Maps will be printed on transparent material, which allows for illumination.

B7. SIGNS

B7.3 WATERWAYS SIGNS

A range of signs are used on land and on berthing infrastructure to indicate navigational hazards, mark locations of safety equipment, identify berths, and direct boat traffic and pedestrians accessing marine facilities. This includes signs installed on land that match the wider wayfinding signage system, and signs installed on piles and buoys in the water, as below:

- Ferry signage pylon (pedestrian-oriented, on land)
- Waterfront regulatory and information pylon (pedestrian-oriented, on land)
- Waterway regulatory signs (water-oriented, mounted on wharf faces)
- Life buoy marker signs (on land)
- Pile caps (colour coded to indicate commercial, public and reserved/private berths)
- Pile-mounted marina signs.

Recommendations for waterways signs are provided in Council's *Signage Manual*. Water-based navigation requirements are the responsibility of Parks Victoria acting as Waterways Manager under the *Marine Act 1988*.

B7.4 INTERPRETIVE AND COMMEMORATIVE SIGNS

This section concerns signage commemorating a person or event or to provide information of general interest about a place (as distinct from directional, safety or regulatory information).

Interpretive and commemorative signage should only be installed if directly relevant to the place and if consistent with an approved master plan. It should avoid providing information that can be provided more effectively through other media.

The number of existing nearby plaques, artworks and other objects may be a reason not to install more, even if another sign seems relevant.

This type of signage is usually fixed to a building or pavement, rather than freestanding. Proposals for plaques that incorporate sculptural relief, are three-dimensional sculptures or are artistic works in other respects should be considered through procedures relating to public art acquisition rather than design standards.

B7.4.1 Memorial plaques

All memorial plaques must be referred to Council's Plaques and Memorials Committee.

Subjects for memorials should be limited to:

- A person or association that has contributed significantly to the cultural, political or social aspects of the locality's development
- A significant anniversary of an event unique to the locality's history and development
- Information directly relevant to the site.

No new plaque should be installed that commemorates a person, event or occasion already memorialised within the Melbourne City Council municipality.

B7.4.2 Interpretive signs

Interpretive signs differ from directional signs. They can suggest, evoke and arouse curiosity, not just state facts. Convenient walking routes do not determine the best locations. Things other than conventional signs can also be used to interpret a place. Interpretive signs should avoid stating the obvious and encourage people to develop their own personal understanding of a place.

Interpretive signage is an expression of the cultural dimensions of a place. Public places are valued for the opportunities they provide for people to interact in public, thereby making their own contributions to the significance of the place. Official statements of meaning may undermine this value. Any interpretive signage should unobtrusively enhance the experience of a place, so that the space itself and the public activity in it remain the focus of people's attention.

Avoid using signs to provide information that can be communicated more effectively using other media such as brochures or a website.

B7.5 TEMPORARY AND EVENTS SIGNS

Information about events should be provided using separate temporary signs rather than by complicating permanent directional signs. For example:

- It is usually inappropriate to mix information about temporary or short-term events with permanent directional or identification signs
- It is important to keep directional signs simple and focused on essential information
- The simple graphics appropriate for directional signs are likely to constrain promotional material for events, which may be more flamboyant and need to display sponsor logos.

Guidelines for temporary signs (e.g. to provide information during the construction of projects) are provided in Council's *Signage Manual*.

B7.5.1 Banner poles

Banners are used within the Melbourne City Council municipality to promote events and major civic occasions. In Docklands, the aim is to:

- Add vitality to the cityscape
- Promote events and activities occurring in the city and Docklands.

The banner program is not a medium for:

- Advertising commercial sponsors
- Promoting events the public can't attend
- Marketing activities such as product launches, venue openings or media announcements.

Council's Docklands Banner Guidelines provide detailed information about how banner poles in various locations are booked for set periods. These guidelines are framed around existing banner locations.

B7. SIGNS

For any project that involves potential changes to existing banner poles, or the addition of new banner poles, consultation must be undertaken with Council.

Locations of banners should be determined in relation to the following factors:

- Banners must be in highly visible locations
- Banners have the best visual impact if placed in groups, which require significant space for clearances between and around the poles
- Banners must not conflict with existing trees and must not limit tree planting opportunities
- Banners should not be placed near activities that are sensitive to the noise of halyards banging against the poles.

DESIGN STANDARDS



Banner pole

↖ Design Standard 710.10

CHAPTER REFERENCES

Australian Standard: *AS 1428 Design for access and mobility*

'*Guidelines for Geographic Names*' (2010), Department of Sustainability and Environment, State Government of Victoria <http://www.dse.vic.gov.au/property-titles-and-maps/naming-places>

'*Geographic Place Names Act 1998*', Department of Sustainability and Environment, State Government of Victoria

'*Melbourne City Council Activities Local Law 2009*', City of Melbourne

'*Docklands Place Naming and Storylines*' (2010), VicUrban

'*Docklands Place Naming Register Database*' (2010), VicUrban

'*City of Melbourne Signage Guidelines*' (2012), City of Melbourne

'*Marine Act 1988*', State Government of Victoria

'*Docklands Banner Guidelines*' (2010), City of Melbourne

Other useful references

'*City of Melbourne Plaques and Memorials Policy*' (1997), City of Melbourne

'*Policy for Memorials and Monuments in City of Melbourne Parklands*' (2003), City of Melbourne

B8. LIGHTING

Good public lighting makes responsible use of energy to enhance people's experience of the city. It improves amenity, wayfinding, visual comfort, road safety and personal security. Illumination and light fittings contribute to the city's identity and reveal or exaggerate other features.

The *City of Melbourne Lighting Strategy* sets out principles for public lighting, including:

- Use a limited range of light types to add cohesion to the urban landscape and to articulate hierarchies of major and minor routes. Each type should be matched to a specific situation and used consistently wherever that situation occurs
- Use lamps that emit 'white' light. In contrast to yellowish high pressure sodium lamps, this increases visual comfort and enhances people's sense of safety by allowing more accurate perception of colour, size and shape
- Minimise intrusive illumination and stray light. Use full cut-off lanterns to avoid glare, reduce waste and minimise sky glow
- Adopt responsible management, efficient technology and other forms of best practice energy conservation.

In practice, public lighting involves coordination between Council and the power distribution company (CitiPower/Powercor) charged with operating functional public lighting systems in the area. Given this context, public lighting falls into two distinct categories:

- Functional lighting to achieve the standards of *AS/NZS 1158 Lighting for roads and public spaces* in the illumination of roads, laneways, parks, promenades and other public spaces
- Decorative lighting, e.g. to highlight features such as art works, trees etc.

B8.1 PUBLIC LIGHTING

B8.1.1 Functional lighting

All poles, luminaires, conduits and wiring for functional lighting is owned and operated by the distribution company once commissioned. Only approved poles and luminaires may be used and must be either 'CitiPower/Powercor standard' or 'CitiPower/Powercor-approved non-standard'. Functional lighting is connected to CitiPower/Powercor's circuits and is unmetered.

Functional lighting must be designed to **exceed** the minimum illumination standards required by Council's Engineering Services Branch and *AS/NZS 1158 Lighting for roads and public spaces* and at no instance should it be less than P3 sub category.

In areas of staged development, supplementary lighting may be appropriate to compensate for the absence of lighting that is usually provided from adjoining buildings in the central city.

B8.1.2 Decorative lighting

CitiPower/Powercor carry no responsibility for decorative lighting, which must be on separate metered circuits and all maintenance must be organised through separate contracts by Council.

The use of decorative lighting, and all aspects of its design, is subject to the approval of the Manager Engineering Services, and must take into account:

- Performance of the light fittings, including quality of light and glare control
- Fittings already in the area – the number of different fittings in use should be minimised)
- Vulnerability to vandalism
- Ease of maintenance and replacement
- Operating costs
- Energy use
- Durability – all lamps and fittings must have a verifiable minimum life of 3 years with manufacturer guarantees to this effect
- Decorative lighting should be integrated into the design of the space but must be designed to enable future decommissioning without reconstruction of other assets.

Decorative lighting must be designed in accordance with relevant Australian Standards, the *Victorian Service and Installation Rules* and the requirements of the relevant distribution company.

All control gear and switches for decorative lighting must be located in public spaces that are easily accessible by Council contractors. Electrical industry standard locking devices must be used.

The following lighting elements will not be approved:

- In-ground up-lights that shine on trees
- Light fittings attached to trees
- Control gear under wharve structures.

B8.1.3 Cabinets, conduits and wiring

Cabinets for electrical switchboards and/or meters must be as per Council standard. They must be fitted with a power industry standard lock with key number 811A unless written approval has been obtained from Council to use another type.

A photoelectric (PE) cell should be mounted on the exterior of the cabinet to control operation of lighting.

Cabinets should be located carefully to avoid limiting potential use of a space and to minimise visual impacts. In streets and small parks, cabinets should be installed parallel to the kerb.

Overhead wiring is not permitted except where part of an approved catenary-supported lighting system.

Use CitiPower/Powercor-approved orange colour standard conduits of minimum 40mm diameter for underground cabling.

All electrical cabling for metered circuits should comply with the current version of *AS/NZS 3000 Electrical installations* (known as the *Australian/New Zealand wiring rules*) and the *Electricity Safety Act 1998*. For unmetered lighting CitiPower/Powercor and Victorian Electricity Supply Industry (VESI) standards should be followed.

B8.1.4 Metered and unmetered public lighting

Refer to Chapter A7: 'Construction' for information relevant to hold points during construction of works.

Refer to Chapter A8: 'Practical Completion' for metered and unmetered public lighting requirements.

B8. LIGHTING

DESIGN STANDARDS



Elliptical pillar

↗ Design Standard 710.07

B8.2 STREET LIGHT FITTINGS

B8.2.1 Pole-mounted lights

The most common street light fitting used in Docklands is the King Street Light with tall pole. The version on a shorter pole is also used in selected narrower streets.

The Neighbourhood Light is used for selected narrow streets.

The St Kilda Road Light is a combined light and tram wire support pole. The pole height, diameter and wall thickness can vary to suit site conditions and catenary loading. It can be fitted with a second luminaire with arm length to suit local requirements.

The Docklands Light is to be used within pedestrian areas on the waterfront and is also appropriate for other locations.

B8.2.2 Wall-mounted and catenary lights

Wall-mounted and suspended lights should be used where footpath widths are minimal, in narrow laneways where poles are vulnerable to damage by manoeuvring trucks, and where space for poles is problematic or a clear ground area is important for other reasons.

The wall-mounted light is available in two bracket lengths to suit the laneway width and the requirement for overhanging. It is generally mounted 5m to 5.5m above ground level.

Catenary lighting allows the luminaire to be centred over a roadway, or the illumination of wider spaces without the use of poles. The lights are fixed to a system of catenary wires, which are fixed via brackets to adjoining buildings where possible, and in some cases to poles.

B8.2.3 Pole locations and spacing

The location and spacing of lights should be carried out in consultation with a specialist lighting engineer to meet the appropriate lighting standard. Indicative, typical spacing for different light and pole types are as follows:

- King Street Light (tall): 20m approximately
- King Street Light (short): 20m approximately
- Neighbourhood Light: 15m approximately
- St Kilda Road Light: 12m approximately
- Wall-mounted light: 12m approximately
- Docklands Light: 12m to 15m approximately.

Light poles must not obstruct paths of travel or passenger access to on-street parked vehicles.

B8.2.4 Drawings, specifications and warranties

Drawings and specifications of poles, luminaires, lamps and all other equipment or components, and the contact details of the suppliers should be provided to Council.

Warranty documents for poles, brackets, luminaires, lamps, control gear, cabinets, switchboards and all fittings in metered circuits should be submitted to Council at Practical Completion.

DESIGN STANDARDS



King Street light - tall pole

↖ Design Standard 601.01



Laneway wall-mounted light

↖ Design Standard 601.05



King Street light - short pole

↖ Design Standard 601.02



Neighbourhood light

↖ Design Standard 601.06



Docklands light

↖ Design Standard 601.03



St Kilda Road light

↖ Design Standard 601.07

B8. LIGHTING

B8.3 PARK AND WATERFRONT LIGHT FITTINGS

In most Docklands parks, lighting will be provided by street lights around the park perimeter. In these situations it is recommended to use light fittings that match those in the street if one or only a few additional lights are required within the space.

Lighting may present an impediment to on-water navigation. This occurs when lighting is directed outward towards approaching vessels. In practice, a higher mounted, lower intensity light should be adopted to control spill.

Where a special 'pedestrian' light is desired, use the Docklands Light. This is available as a single or double luminaire and is normally positioned at 12m to 15m centres. The placement of lights should be carried out in consultation with a specialist lighting engineer.

The Docklands Light can be mounted flush with the pavement or on a pedestal. The simpler flush option is preferred, unless matching existing details within a space. Mounting details should be determined in consultation with a structural engineer.

Where a large space needs to be lit while remaining relatively clear of poles, use the 12m pole-mounted floodlights. The luminaire details, lamp wattage and set-out of poles should be resolved in consultation with a specialist lighting engineer to suit the site conditions and the appropriate lighting standard.

The placement of poles should be carefully considered to avoid interfering with circulation and other activities, and to minimise the risk of damage to the poles by vehicles.

Power supply to items such as garden sprinkler pumps, water storage tanks and associated switchboards that are part of the public realm must be on a metered supply.

DESIGN STANDARDS



Park light

[↖ Design Standard 601.09](#)

CHAPTER REFERENCES

'City of Melbourne Lighting Strategy' (2002), City of Melbourne

Australian Standard: *AS/NZS 1158 Lighting for roads and public spaces*

'Victorian Service and Installation Rules' (2005), Victorian Electricity Distributors

Australian Standard: *AS/NZS 3000 Electrical installations* (known as the *Australian/New Zealand wiring rules*)

'Electricity Safety Act 1998', State Government of Victoria

Other useful references

'Melbourne's Parks and Gardens Lighting Strategy' (1995), City of Melbourne

B9. LANDSCAPE ELEMENTS: PLANTINGS AND IRRIGATION

Strategic guidance in parks is provided through the following documents:

- [Docklands Public Realm Plan](#) – guidelines for the use and character of each major Docklands public space
- *Open Space Strategy* – an overarching framework and strategic direction for public open space planning in the Melbourne City Council municipality for the next 15 years
- *Urban Forest Strategy* – principles, strategies and targets to create a healthy, resilient and diverse urban forest that contributes to the health and wellbeing of our communities.

Larger spaces and diverse possible uses allow more flexibility in park design than in streets. This allows varied recreational opportunities for each park. To achieve diversity, there is a need to understand each park's role in relation to other spaces.

Within streets, strategic guidance is provided by the following:

- *Melbourne Docklands Tree Strategy* – guidance on species selection and site conditions
- *Urban Forest Strategy*
- *Docklands Precinct Plan* (available in 2013/14) – guides street tree planting to implement the *Urban Forest Strategy* and respond to community needs.

B9.1 GENERAL ISSUES REGARDING LANDSCAPE ELEMENTS AND PLANTING

B9.1.1 Water sensitive urban design

Developers should contact Council to discuss the incorporation of water sensitive urban design (WSUD) into public realm works (tree pits and water collection tanks). The application of WSUD principles, materials and products is in its infancy and continually being improved. Liaison with Council will help ensure the most appropriate materials and/or products are applied at the time. Guidelines regarding the above can be found in Council's *Water Sensitive Urban Design Guidelines*.

B9.1.2 Design character and function

Landscape elements and plantings should:

- Contribute to the legibility of Melbourne's grid of main streets, with continuous avenue plantings, yet balance this with diverse plantings in lanes, parks and other spaces
- Use trees to increase canopy cover in order to provide amenity and ameliorate urban heat island effects.

B9.1.3 Sustainability and maintenance

Landscape elements and plantings should:

- Consider adaptation to typical conditions including local climate extremes (e.g. drought, extreme heat and sun-scorch)
- Consider specific locational requirements (e.g. WSUD planters that may flood at times)
- Be designed to be well-maintained without unreasonable expense for the site.

B9.2 PLANTING CONDITIONS IN DOCKLANDS

B9.2.1 Issues and strategic design approach

Planting conditions in Docklands are more limited than in other parts of Melbourne. Low-lying soils, exposure to saline water and high winds are prevalent due to a large proportion of public streets and spaces being on wharves, bridges and other structures. While planted landscapes can be created in these situations, they often create design issues or require solutions that run counter to a number of Council's broad strategic directions:

- Containerised trees rarely grow to a large size, so they are ineffective at providing shade or a human scale in relation to large buildings
 - Containerised plants need to be replaced when they grow too large for the given area (i.e. their effective life is often 10 years or less)
 - Replacement planting is often difficult without damaging structures, waterproofing membranes and drainage systems
 - It may be impossible to redesign or rearrange plantings to respond to new expectations
 - Containerised plants are sensitive to drought. Although their roots may only require a soil volume as provided in a container, the additional soil mass in natural ground conditions acts as a reserve that stabilises moisture and temperatures in the root zone
 - Irrigation is critical for containerised plants, and failure of irrigation systems is often catastrophic
 - Soil weight and loads associated with tree maintenance vehicles require stronger and more costly construction.
- These issues call for a strategic approach to planting throughout Docklands to maximise the impact of planting where it is feasible and to ensure its healthy long-term growth:
- Minimise planting in containers
 - Where a large proportion of public space is on structure (e.g. the waterfront promenades), maximise plantings anywhere there is natural ground with space for root growth
 - Use spaces on structures for activities and facilities that suit open, treeless sites
 - Where containerised plantings are the only option, consolidate into fewer, larger planters to provide flexibility in replanting over time. Use lawns, ground covers or shrubs in containerised situations rather than trees, as these can be reinstated more easily
 - If trees are required, select robust species. In most cases, species will need to have a high tolerance of drought, extreme temperatures and high winds
 - Where effective soil volumes on 'natural ground' are limited by a high water table, contamination of subsoils or other factors, build up the level if possible to increase the available soil depth
 - Ensure soil media meets Australian Standards for containerised soils, and that drainage and irrigation systems are robust and proven in other instances. Soil media, irrigation and drainage systems need to be approved by Council's Urban Landscapes and Parks Services branches
 - Ensure a well-planned maintenance program is developed and adhered to. Critical items to consider are the frequent monitoring of the vegetation and the irrigation and drainage systems.

B9. LANDSCAPE ELEMENTS: PLANTINGS AND IRRIGATION

B9.2.2 Planting over structures and in containers

Structures below planted areas must have the capacity to support at least 1.5m depth of saturated soil and associated live loadings including maintenance vehicle access. Structural design must be independently certified.

Design details must be documented and approved by Council, including:

- Soil profile
- Irrigation system
- Plant species
- Waterproofing and drainage systems, including protection from backflows of saline water
- Demonstration that all containerised plantings allow for easy removal and replanting
- Demonstration of access for cleaning drains and irrigation pipes from top surface through an inspection pits or pipes.

A Management Plan must be provided to, and approved by, the Manager Engineering Services, addressing:

- Maintenance requirements for all aspects of the containerised planting including irrigation systems
- Maintenance practices to prevent potential damage to any underlying structure, waterproofing, drainage system or other service
- Predicted lifespans of all plants used and replacement strategy
- Predicted lifespan of waterproofing membranes and replacement strategy
- Predicted lifespan of irrigation system, and replacement strategy.

B9.3 TREE LOCATIONS AND PLANTING DETAILS

Canopy cover

Increase tree canopy cover to provide amenity and ameliorate urban heat island effects:

- 40+ % of paved areas should be shaded within any given precinct
- Use fewer large-growing trees in streets rather than many small ones, as broad canopies are needed to span roadways
- Species selection and diversity needs to align with *Urban Forest Strategy* principles to ensure greater diversity and less exposure to future pest and diseases.

Locations

Locations of trees in streets should:

- Minimise interference with pedestrian and vehicular access
- Maintain adequate clearance from overhead services and canopies
- Maintain adequate clearance from services (i.e. do not plant trees over gas and water services or under awnings)
- Locate trees towards the centre of roadways (i.e. in parking lanes or medians if possible, in order to maximise shading of pavements).

Tree quality

Tree quality should meet NATSPEC *Specifying trees: A guide to assessment of tree quality*.

Tree planting pit details

Tree planting pits and surrounds should be designed to support tree health and protect surrounding assets, and should not cause pedestrian hazards:

- Minimise trip hazards, including those from dislocation of pavement, grates etc. due to tree growth
- Prevent soil, mulch or gravel from washing onto surrounding pavements and creating slip hazards or a nuisance to property owners
- Planting pit designs should be in accordance with Council's Design Standards and [Engineering Standard Drawings](#).

Tree size at planting

Semi-advanced and advanced tree stock, (nominally trees from 1m to 2.5m high), should be planted in most locations including parks, footpaths, median strips in main roads, and nature strips.

Typical planting sizes should be as follows:

- 1.5m high, 25 litre container
- 2-3m high, 50 litre container.

Support for tree establishment

Facilitate hand watering to the root zone during the establishment period after planting.

Provide temporary staking to stabilise trees and protect them from vandalism.

Ensure stakes, ties and other temporary protective measures are fully removable at the appropriate time.

Do not use unnecessary permanent tree guards.

Trees should be planted, maintained and of quality in accordance with Council's Design Standards and [Engineering Standard Drawings](#).

B9.3.1 Trees in footpaths

Ensure clear sightlines at intersections and pedestrian crossings. Trees near the back of the kerb should be:

- 10m set back from face of kerb of intersecting street
- 20m set back from face of kerb of intersecting street at approach-side of traffic lights
- 10m set back from departure side of traffic lights
- 2.4m from driveways
- 3m from power and light poles
- 2m from fire hydrants.

Trees should be spaced to maximise canopy cover along streets while allowing for healthy long-term growth of the trees, for example:

- Large canopy trees at 10m-12m centres
- Small and medium trees at 6m-10m centres.

Trees planted in footpaths must be tall enough to ensure that branches are well clear of pedestrians. Species with pendulous branches must not be used.

Allow generous openings in pavements and flexible surfaces near trees to allow for the growth of roots.

Provide permeable pebble-epoxy paving as a finish to tree pits in areas where:

- The volume of pedestrian traffic is high and/or the footpath is relatively narrow and people will therefore tend to walk over the tree pits
- Steep slopes mean a granitic gravel finish to a tree pit will erode onto the surrounding pavement.

B9. LANDSCAPE ELEMENTS: PLANTINGS AND IRRIGATION

DESIGN STANDARDS



Tree pit in asphalt paved area

↖ Design Standard 501.02



Tree pit bio-retention type in bluestone paving

↖ Design Standard 501.08



Tree pit standard size in bluestone paved area

↖ Design Standard 501.04



Tree grate for pedestrian areas

B9.3.2 Trees in roadways

Ensure clear sightlines at intersections and pedestrian crossings. Trees in parking lanes and medians should be:

- 10m set back from face of kerb of intersecting street
- 20m set back from face of kerb of intersecting street at approach-side of traffic lights
- 10m set back from departure side of traffic lights
- 2.4m from driveways
- 3m from power and light poles
- 2m from fire hydrants.

Trees planted in parking lanes should be spaced to maximise canopy cover along streets while allowing for efficient kerbside parking layouts (e.g. with clear parking bay lengths of two or three cars).

Trees planted in parking lanes and medians must be large canopy trees, with all branches high enough to be clear of vehicles. Species with pendulous branches must not be used.

Protect trees in parking lanes and centre of road medians from vehicle impact by using, in order of preference:

- 1st kerbs
- 2nd bollards or tree guards.

Locate trees in low points where runoff can be used for passive irrigation.

Maximise the extent of permeable surfaces to let air and water into the soil, especially within trees' anticipated drip zone, and in low-lying parts of the street (e.g. along the kerbside parking lane) where water collects.

Use subsoil drains in combination with bioretention type tree pits and permeable surfaces to avoid potential waterlogging of soils, and consequent damage to trees and weakening of pavements.

Allow generous openings in pavements and flexible surfaces near trees to allow for growth of roots.

DESIGN STANDARDS



Tree island in centre of road parking area

↖ **Design Standard 501.07**

B9. LANDSCAPE ELEMENTS: PLANTINGS AND IRRIGATION

B9.3.3 Use of structural soil for tree planting

Developers should contact Council to discuss the incorporation of structural soils when trees are planted in footpaths and between parking bays in the road (i.e. areas subject to significant compaction). Liaison with Council's Engineering Services Branch will help ensure the most appropriate Design Standard and structural soil specifications are applied.

DESIGN STANDARDS



Tree pit in combination with structural soil

↖ Design Standard 501.11

B9.3.4 Trees in lawn or garden areas

Integrate large-scale WSUD features into the landscape if possible. For example:

- Locate trees in low points and swales where runoff can be used for passive irrigation
- Use bioretention basins where appropriate to filter rainwater runoff
- Install subsoil drains to avoid water-logging or use plants (e.g. trees, shrubs and/or ground covers) suited to periodic wet conditions.

Protect trees from damage by mowers and string trimmers:

- In areas of closely spaced trees or copses, use a mulch surface or ground cover planting other than lawn.

DESIGN STANDARDS



Tree pit in lawn or mulched planter bed

↖ Design Standard 501.01

B9.4 OTHER PLANTINGS

B9.4.1 Garden beds

All planted areas must be adequately mulched.

Ensure vegetation will not create places of concealment.

Plan for simple maintenance regimes that apply throughout the city:

- Limit any high-maintenance features to areas that have an agreed strategic importance
- Avoid labour-intensive planting in places that may be dangerous to work in
- Plant in locations with optimal conditions for growth and that protect plants from damage.

B9.4.2 Drainage swales and bio-filtration beds

For guidelines, refer to Council's *Water Sensitive Urban Design Guidelines*.

B9.4.3 Lawn

All turfing areas must be warm season kikuyu.

As kikuyu can spread invasively, careful attention must be given to the delineation of the edge of the lawn where it adjoins other planting areas. Ideally, paved pathways will be used to separate grassed areas from garden beds to ensure a complete barrier. The appropriate detail for other types of barriers depends on the context, including maintenance regimes and soil type (i.e. kikuyu runners spread at greater depth in sandy soil than in clay).

B9.4.4 Movable planters

Movable planter boxes or potted plants are inappropriate in most public landscapes.

Movable planter boxes may be permitted as part of the furniture and screening provided by a kerbside cafe operator. These cafe planters are supplied, installed and maintained at the expense of the

cafe operator. The design, placement and maintenance of such planters must conform to requirements as detailed in the *City of Melbourne Outdoor Café Guide*.

B9.5 IRRIGATION

Council aims to balance the use of finite water resources against community expectations of public spaces. In Melbourne's climate, this requires the use of landscape irrigation to make spaces more usable for recreation, to provide effective shading during hot weather, and to meet aesthetic ideals connected with historically significant parks and gardens.

Consideration should be given to the use of rainwater collection tanks and other WSUD water collection systems. These systems are non-standard and not defined within this document (refer Chapter B1, B1.5 'Approval for non-standard materials and elements'). Developers should contact Council to discuss the incorporation of these systems into public realm works.

Where possible:

- Landscapes should be designed to be irrigated efficiently with access to both potable and stormwater where practicable
- 'Passive irrigation' should be used using rainwater runoff into planting areas, and supported by maximising the extent of permeable ground surfaces
- Spaces should be designed to incorporate (or to contribute to precinct-wide) stormwater collection and re-use systems.

All design and documentation, materials supplied and work carried out should be in accordance with relevant Australian Standards as well as the criteria set out below.

As outlined in Chapter A9, A9.1.3: 'Landscape Defects Liability Period', the minimum defects liability period for landscape works is 12 months, including accompanying irrigation systems.

B9. LANDSCAPE ELEMENTS: PLANTINGS AND IRRIGATION

B9.5.1 Irrigation zones and system types

Irrigation zones should be classified in the following vegetation types

- Turf grass
- Tree
- Garden bed.

No single irrigation valve should water more than one irrigation zone.

High profile turf areas should be irrigated with pop-up sprinklers.

High profile garden areas should be watered with subsurface irrigation except in the following situations, where pop-up sprinkler should be used:

- Areas containing plants or trees with vigorous root systems
- Ornamental plantings, annual and perennial plants.

B9.5.2 Irrigation control systems

All irrigation controllers must be compatible with Council's 'Irrinet' control system, which allows for remote operation through a central computer.

All irrigation control infrastructure must be operated by the developer's maintenance representative until final handover is given. At final handover the developer will arrange for the new controller/s to be connected to Council's system.

Power supply to items that are part of the public realm must be on a metered supply, such as irrigation controllers, garden and lawn sprinkler pumps, water storage tanks and associated switchboards.

To ensure compliance with Council's standard irrigation specifications, developers must confirm irrigation system design with the Parks Services Branch prior to the Municipal Design Approval.

CHAPTER REFERENCES

'Docklands Public Realm Plan' (2012), City of Melbourne

'Open Space Strategy - Planning for Future Growth' (2012), City of Melbourne

'Urban Forest Strategy - Making a Great City Greener 2012-2032', City of Melbourne

'Melbourne Docklands Tree Strategy' (2008), VicUrban

'Water Sensitive Urban Design Guidelines' (2009), City of Melbourne

'Specifying trees: A guide to assessment of tree quality' (2003), Ross Clark (published by NATSPEC)

'City of Melbourne Outdoor Café Guide' (2008), City of Melbourne

Other useful references

'City of Melbourne Soft Landscape Specification', City of Melbourne

Australian Standard: AS 4970-2009 *Protection of trees on development sites*

B10. MARITIME WORKS

This chapter describes standards for wharves and floating infrastructure intended to become public assets. It pertains to works in or adjacent to the Yarra River, Victoria Harbour and Moonee Ponds Creek, which in Docklands are tidal zones.

Docklands waterways and waterfront spaces are of outstanding quality and contain facilities to support diverse uses, equity and ease of access. The vision set out in the *Docklands Waterways Strategic Plan* is for an integrated working harbour that is accessible to all Melburnians and visitors, with commercial and leisure boating opportunities and a vibrant and active events space. To realise this vision, the priorities are:

- Support the development of water transport
- Increase the frequency and diversity of water-based public activity
- Maximise the use and viability of facilities with multi-purpose assets that are designed and operated to best practice standards
- Increase awareness of Docklands waterways, and encourage repeat visits to use them.

The *Docklands Waterways Strategic Plan* includes recommendations for:

- Water traffic: commuter ferry services, shuttle services, commercial vessels
- Public berths, private berths, super-yachts
- Public activities, events, recreational boating
- Land access and car parking
- Wayfinding and visitor services, public toilets, marine precinct, waterways regulatory centre
- Planning and management
- Proposed development areas in context to adjacent areas

- Indicative vessel uses
- Indicative vessel sizes
- Channel and fairway widths
- Water depths
- Layout of the berth sizes
- Construction material and finishes.

Specific recommendations are also provided on a precinct-by-precinct basis. All works in waterfront areas should support these aims.

Places Victoria and Council have commissioned a Conservation Management Plan for the State Heritage-listed component of Victoria Harbour, including the water and Sheds 19-21 (New Quay West), Sheds 9 and 14 (Central Pier) and Sheds 8 and 15 (formerly on Harbour Esplanade). This includes:

- An audit of heritage elements, documentation of existing materials, and conclusions about the significance of the place and its fabric
- A chronological and thematic history
- A statement about current development status
- A policy for conservation and adaptive re-use of heritage elements and recommended actions including guidance for reinstatement of removed elements as appropriate.

Heritage Victoria will refer to the Conservation Management Plan when considering any future heritage permit applications on Victoria Harbour.

B10. MARITIME WORKS

B10.1 FUNCTIONAL CRITERIA

B10.1.1 Public access

Wharves and marinas must provide universal access. Gangways should typically be provided for vessel access. Where gangways are not provided the vessel/landing gap should not exceed 100mm. All surfaces must be non-slip.

B10.1.2 Emergency access

Emergency vehicle access and any other emergency service authority requirements must be provided to all wharves and marinas. Developers will be required to provide evidence in the form of a letter from emergency service agencies that the design meets their operational requirements.

B10.1.3 Safety equipment

Lifebuoys and ladders must be installed as per the *Guidelines to Water Safety at the Melbourne Docklands*. Generally, lifebuoys should be installed at 150m intervals and ladders at 50m intervals.

Ladders are required when freeboard exceeds 0.5m, such as a wharf or commercial pontoon, and should be:

- In line of sight from water's surface
- Located to allow clear access to the ladder when shipping berths are occupied
- Edge protection should be removed at ladders
- Provide safety chains between ladders.

B10.1.4 Servicing functions

Servicing functions at wharves (e.g. boat refuelling, waste disposal etc.) should be kept as far away from pedestrian activities as feasible.

During the planning process, consider locating servicing functions adjacent to the buildings and land-based functions they are associated with. For example, an arrangement could be made to share compactor bins for waste disposal in an adjacent building.

B10.1.5 Utilities provision

Where a maritime structure is to provide support for services or utilities, the developer must obtain written approval from the relevant authorities and certification of the design. The design must consider the following elements:

- Mooring points
- Firefighting equipment
- Service pedestal equipment detail
- Waste management (e.g. sewer, hard rubbish, recycling and general waste)
- Lighting
- Electricity
- Signage
- Timber fenders.

Maritime structures must include timber fenders to stop debris from collecting under structures adequate for the purpose of berth rating. Timber fenders are to include access gates and fittings for the attachment of safety chains.

B10.1.6 Flood debris

Structures must be designed to minimise debris and litter mat formation.

B10.1.7 Navigation

The navigation requirements of Parks Victoria, as Waterways Manager under the *Marine Act 1988*, must be met.

B10.1.8 Maintenance

All maritime components should be designed for minimum maintenance or for ease of maintenance in areas prone to deterioration or damage.

The design should allow for access to all structural members for inspection, repair or replacement.

DESIGN STANDARDS



Life buoy holder

👉 Design Standard 708.01



Marine ladder

👉 Design Standard 708.02

B10.2 STRUCTURAL CRITERIA

B10.2.1 Structural loads

The maximum tonnage limit for vessels mooring adjacent to a public maritime structure must be defined, having regard to the proposed use.

Structures must be able to withstand current, log strike, debris and litter mat forces associated with flood velocities up to and including those associated with a 1 in 100 year flood.

B10.2.2 Design loads - wharves

Wharves shall be designed for a minimum superimposed live load of 12kpa (trafficable) or T44/W7 wheel loads.

B10.2.3 Structural isolation

Maritime structures must be designed to act as independent structures:

- If ownership of the structure is to be transferred to Council, the developer must demonstrate structural support is not required for adjacent structures, and the developer must provide evidence to the satisfaction of Council's Engineering Services Branch as to how this has been achieved
- If complete structural independence cannot be economically achieved, the developer will retain ownership of the structure and transfer the area above the structure to Council for ongoing care and maintenance
- The public realm maritime structure, if structurally independent, must not compromise the integrity of adjacent structures (i.e. it must be designed to withstand lateral impact from marine vessels without affecting adjacent owned structures).

B10. MARITIME WORKS

B10.2.4 Design life

The minimum design life for all structural maritime elements must be 50 years. The infrastructure in total, including all piles, decking, pontoons and associated elements, must be designed to last a minimum of 25 years with minimal maintenance.

Design life requirements will be fulfilled if all structural, functional and safety requirements are met throughout and at the end of the stated period, although there may be a need for major maintenance to prolong the service life beyond this. For design purposes it must be assumed that only preventative and isolated maintenance will be necessary during the design life.

For concrete elements, it will be assumed that the end of the service life will be reached after a maximum of 8 years from corrosion initiation.

The condition of any existing member that is to be re-used must be investigated by means of a thorough condition and material testing survey. It is expected that condition surveys and inspections will continue to be an important part of the lifetime maintenance regime.

B10.3 DURABILITY DESIGNER AND PLAN

B10.3.1 Durability designer

A durability designer who is an expert in the field of durability planning of structures, with exposure to marine environments, must be retained over the duration of a project to ensure all durability issues are addressed.

During the design process the durability designer must be involved in the following:

- Development of a Durability Plan
- Durability Review of preliminary design
- Review of 50% Complete detailed design
- Review of the final design.

The durability designer must undertake a detailed review of design documentation at the conclusion of each of the above phases. Until the durability designer has reviewed and provided input at each of these project phases, a hold point must be in place.

For the Final Design this hold point will only be released once the durability designer provides evidence that all requested modifications have been fully incorporated into the design documentation.

The durability designer must have an ongoing role during the construction phase of the project to ensure all site works are constructed in a durable manner. This role must encompass the development of a comprehensive range of trial mixes and supervision of all durability aspects of a project to be included in a Durability Plan.

B10.3.2 The Durability Plan

A Durability Plan considering the design and construction process of a marine structure is required for all maritime works to ensure the required service life is achieved. The plan must detail maintenance requirements during the first 25 years, and an extended period from 25 to 50 years. The plan must address all structural elements (e.g. piles, wharf deck etc.) and fixtures (e.g. fenders, bollards, ladders, safety equipment etc.). Details of modelling assumptions must be stated (e.g. chloride diffusion coefficients for concrete elements and assumed reinforcement construction tolerances).

Environment

Environmental conditions have a significant impact on deterioration of marine structures. The assumed environment of each element must be defined in enough detail for all elements to be identified together with the suggested deterioration control mechanisms.

Environmental conditions must be taken from site investigations and test data wherever possible. Assumptions must be clearly identified and supported via current literature. Possible environmental changes such as sea level rises or increased water body aeration must be outlined and must include wave studies.

Structural elements

The Durability Plan must subdivide structures into element types, and must define:

- Proposed uses and assumed design loadings, berthing characteristics and maximum berthing reaction allowed into the wharf
- Details of the components of each element (e.g. concrete mix design, grade of steel or stainless steel)
- The proposed construction method and measures to address durability concerns
- Contamination risks during construction, from storage of materials, containment during fabrication, contamination during construction, and at early ages post construction
- Accessibility of each structural member for inspection, repair or replacement
- The results of condition surveys for any existing structural member to be re-used.

Maintenance and lifecycle costs

Provide costs and scheduling for all planned maintenance activities during the minimal maintenance period.

Provide details of projected maintenance works beyond the first 25 years to maintain integrity of the structure.

Provide details of lifecycle ownership, maintenance regimes and responsibilities and minimum standards of asset condition.

B10. MARITIME WORKS

B10.3.3 Construction management

Prior to commencing construction of any element a Durability Plan must be submitted. This must identify risks and hazards to achieving durability, including but limited to:

- Action (e.g. cover to reinforcement)
- Responsibility (e.g. site representative responsible for construction of this element)
- Methodology/timing (e.g. inspection and measurements to cover reinforcement prior to concrete pour)
- Records produced (e.g. listing steps taken to mitigate risks and hazards that can be audited by the durability designer)
- Possible remedial measures in case of deficiencies.

The durability designer must assess any non-conformances that reduce the durability of the structure. Proposed remediation actions must be supported by durability modelling and must be made to achieve the required service life without increased maintenance, when compared with the maintenance requirements of the original design.

At the completion of construction, a Durability Completion Report must be compiled by the durability designer, detailing the outcomes of the design, construction and post construction phases. This must include:

- The Durability Plan/Modelling Details
- Design Review Reports
- Construction Durability Plans
- Trial Mix results
- Construction Test Results and Measurements of Concrete Properties
- Site Measurements (e.g. cover to reinforcement)
- Non Conformance Reports (NCRs) affecting durability and associated correspondence/recommendations
- Any other relevant testing or correspondence.

CHAPTER REFERENCES

'Docklands Waterways Strategic Plan 2009 - 2018' (2009), City of Melbourne

'Victoria Harbour Conservation Management Plan' (draft 2012), Lovell Chen

'Guidelines for Water Safety at the Melbourne Docklands' (version 2.0 draft), Places Victoria

'Marine Act 1988', State Government of Victoria

Other useful references

'Loading Information for Wharves and Marinas' (2011), City of Melbourne

'Cleaner Marinas - EPA Guidelines for Protecting Victoria's Marinas' (1998), Environment Protection Authority

'Public Safety on Wharves' (no date), P.D Cummings and J.A. Imrie of Kinhill Pty Ltd.

'Design Guideline for Floating Assets Including Marinas and Walkways' (2011), City of Melbourne

'Docklands Vessel Traffic Study - Vessel Traffic Management Plan' (2011), Parks Victoria, City of Melbourne, Places Victoria

'Docklands Vessel Traffic Study - Review of MAB New Quay Marina at Victoria Harbour' (2011), City of Melbourne

'Docklands Waterways Marine Infrastructure and Facilities Recommendations' (2010), Parks Victoria, Places Victoria, City of Melbourne

Australian and British Standards including, but not limited to: AS 1170 SAA loading code, AS 1720 Timber structures, AS 2159 Piling - design and installation, AS 3600 Concrete structures, AS 3962 Guidelines for design of marinas, AS 4100 Steel structures, AS 4997 Guidelines for the design of maritime structures, BS 5400 Steel, concrete and composite bridges, BS 6349 Maritime structures, BS 8110 Structural use of concrete - crack control and AS 5100 SAA bridge design code.

GLOSSARY OF TERMS

AHD	Australian Height Datum
AS	Australian Standard
CAD	Computer Aided Design
Capital City Zone	The Capital City Zone covers the whole Central Business District and also includes the Queen Victoria Market and parts of Southbank, as defined by the Melbourne Planning Scheme.
Council	Melbourne City Council
Docklands D&C Standards	Docklands Design and Construction Standards Public Infrastructure Works (this document)
DDA	<i>Disability Discrimination Act 1992</i>
Design Standards	One-page PDF documents, available on Council's website which provide details and illustrations of how public realm elements must be constructed
Developer	The entity responsible for building the public realm, be they a public or private agency
Docklands Zone	The Docklands Zone, as legislated in the <i>Docklands Act 1997</i> , includes all Docklands precincts from Yarra's Edge in the South, Stadium precinct to the East, Waterfront City in the North and Moonee Ponds Creek to the West, and is also defined in the Melbourne Planning Scheme.
DPCD	Department of Planning and Community Development (State Government of Victoria)
DSE	Department of Sustainability and Environment (State Government of Victoria)
Engineering Standard Drawing	A standard drawing developed by Council providing details and specifications for the construction of public realm works
EPA Victoria	Environment Protection Authority Victoria
Final Completion	Formal acknowledgement from Council that Defects Liability Period is complete and all outstanding works have been rectified to Council's satisfaction. At this point, Council accepts all responsibility for the site.

GDA	Geocentric Datum of Australia
GIS	Geographic Information System
Handover	Refer to 'Practical Completion'
Head start storage areas	Areas on-road provided for cyclists at signalled intersections
NATA	National Association of Testing Authorities
PDF	Portable Document Format
Places Victoria	The State Government's Urban Renewal Authority (successor to VicUrban)
Practical Completion	Practical Completion is commonly referred to as 'handover'. It is formal acknowledgement from Council that works are complete and the Defects Liability Period may commence. The site is typically open to public access, even though minor finishing works and rectification of defects of omissions may occur. At this point, Council accepts day-to-day responsibility for maintenance.
Public realm	All publically accessible areas including public spaces, streets and routes
Public space	A component of the public realm – includes waterways, public marinas, parks, squares, forecourts, promenades and creek corridors
Public streets and routes	A component of the public realm – includes roads, lanes, arcades, bridges and overpasses
Section 173 agreements	A legal contract between the Responsible Authority and the owner of land setting out conditions or restrictions on the use or development of the land, or to achieve other planning objectives in relation to the land, registered over the title to the land so that the owner's obligations under the agreement bind future owners and occupiers of the land. ²
TGSIs	Tactile Ground Surface Indicators, used to inform vision-impaired people as they move through a place
WSUD	Water sensitive urban design

² 'Using Victoria's Planning System' Department of Planning and Community Development

HOW TO CONTACT US

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