

# Public Realm

## Master Specification

### PR-LS-D1 Landscape and Urban Design

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1	Transfer from Part D37 Design – Urban and Landscape Design	
2	Additional content regarding design requirements	23/09/19
3	Inclusion of cross reference to PR-AC-D1	August 2020
4	Additional content regarding design requirements	August 2021
5	Additional references, early design works, landscaping above structures, and Green Infrastructure content added	July 2022

## Document Management

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## PR-LS-D1 Landscape and Urban Design

### 1 General

- 1.1 This Part specifies the requirements for the urban and landscape design. It provides design criteria which serve to encourage design excellence for infrastructure in the built environment and public realm. It includes the design of elements such as hard and soft landscaping treatments, the architecture of structures (e.g. bridges, buildings, noise barriers, retaining walls, road furniture and fences), the design of public spaces and cultural and creative elements.
- 1.2 The Urban Designer(s), Landscape Architect(s) and Irrigation Designer(s) shall be on the current Department Professional and Technical Services Prequalification Contract for Urban Design, Landscape Design and Irrigation Design.
- 1.3 In developing the urban and landscape design, the Designers shall:
  - a) ensure compliance with all safety requirements;
  - b) ensure the interrelationship of individual design elements and consider their relationship to the whole, including their appropriateness within the project and beyond the project boundaries;
  - c) ensure any public realm infrastructure strengthens the local character of the area by responding to the social, cultural and environmental characteristics of that area;
  - d) ensure safe, efficient and legible circulation routes for pedestrians, cyclists and people with disabilities;
  - e) ensure a high standard of design to achieve quality infrastructure that is visually attractive and interesting, sophisticated, contemporary and robust;
  - f) ensure that design features and the selection of materials minimise whole-of-life and maintenance costs;
  - g) incorporate sustainable design principles such as water management, energy efficiency, biodiversity and healthy lifestyles into the public realm;
  - h) ensure the urban and landscape design is fully coordinated and integrated with road, rail and other infrastructure and utility services so as to compliment without compromising structural integrity, functionality or access;
  - i) ensure the landscape design incorporates offsets for impacted native, amenity, regulated and significant vegetation in accordance with the Department's Vegetation Removal Policy, Native Vegetation Act 1991 and Development Act 1993, where relevant; and
  - j) comply with the design requirements stated for each of the following sections of Part PR-LS-D1.

### 2 References

- 2.1 Unless specified otherwise, all design will be undertaken in accordance with the following:
  - a) Department Green Infrastructure Commitment 2021
  - b) South Australian State Planning Policies.
  - c) Disability Inclusion Act 2018
  - d) Disability Standards for Accessible Public Transport 2002  
<https://www.legislation.gov.au/Details/F2011C00213>.
  - e) Disability Standards for Accessible Public Transport Guidelines 2004 (No.3)  
<https://www.legislation.gov.au/Details/F2005B01059/0d42e6f5-72ea-406a-a9ac-b311077b840c>.
  - f) AS 1158 Lighting for roads and public spaces.
  - g) Department Environment and Heritage Technical Manual, Attachment 4B - Vegetation Impact Assessment Guideline.
  - h) Department Guidelines for Disability Access in the Pedestrian Environment.

- i) Statutory requirements for clearances of trees to Utility Services.
- j) Department Rail Electrification: Vegetation Planting Guidelines.
- k) Department Technical Standards and Guidelines. <http://www.dit.sa.gov.au/standards>.
- l) Department Operational Instruction 19.8: Trees in Medians and Roadsides in the Urban Environment  
[https://www.dit.sa.gov.au/\\_data/assets/pdf\\_file/0005/396104/Trees\\_in\\_Medians\\_in\\_Urban\\_Environments\\_-\\_Operational\\_Instruction\\_19\\_8\\_V9.pdf](https://www.dit.sa.gov.au/_data/assets/pdf_file/0005/396104/Trees_in_Medians_in_Urban_Environments_-_Operational_Instruction_19_8_V9.pdf)

2.2 The design will comply with the principles contained in the following:

- a) Project-specific Urban Design Frameworks, Principles or Guidelines, if supplied by the Principal.
- b) The 30 Year Plan for Greater Adelaide (Government of South Australia, 2016)  
<http://livingadelaide.sa.gov.au>.
- c) Office for Design and Architecture SA: Principles of Good Design  
[https://www.odasa.sa.gov.au/wp-content/uploads/ODASA-Principles-of-Good-Design\\_WEB-FINAL.pdf](https://www.odasa.sa.gov.au/wp-content/uploads/ODASA-Principles-of-Good-Design_WEB-FINAL.pdf).
- d) Creating Places for People – An Urban Design Protocol for Australian Cities  
<http://urbandesign.org.au>.
- e) QLD Government, Crime Prevention Through Environmental Design, Guidelines for Queensland 2007 <http://www.police.qld.gov.au/programs/cscp/safetyPublic>.
- f) Australian Institute of Landscape Architects (SA Chapter) “Creating Greener Places for Healthy and Sustainable Communities”. .
- g) The Department for Environment, Water and Natural Resources “Water Sensitive Urban Design Policy” available from [www.environment.sa.gov.au](http://www.environment.sa.gov.au).
- h) Planning SA: Transport Choice and Urban Design – Design Issues for Accessible Neighbourhoods.
- i) The Department for Environment and Water “Planting Indigenous Species Policy”  
<https://www.environment.sa.gov.au/about-us/our-reports>
- j) Government of New South Wales, Centre for Urban Design “Bridge Aesthetics: Design Guideline to Improve the Appearance of Bridges in NSW”  
<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/centre-for-urban-design/bridge-aesthetics-guidelines.pdf>
- k) Government of New South Wales, Centre for Urban Design “Noise Wall Design Guideline”  
<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/centre-for-urban-design/noise-wall-design-guideline.pdf>
- l) Government of New South Wales, Centre for Urban Design “Shotcrete Design Guideline”  
<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/centre-for-urban-design/shotcrete-design-guidelines.pdf>
- m) Government of New South Wales, Centre for Urban Design “Tunnel Urban Design Guideline”  
<https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/documents/centre-for-urban-design/tunnel-urban-design-guideline.pdf>
- n) The Department for Infrastructure and Transport “2021-2031 Cycling Strategy for South Australia”.
- o) Heart Foundation “Healthy by Design SA”.
- p) Government of South Australia “Healthy Parks Healthy People South Australia”.
- q) FEMA Site and Urban Design for Security: Guidance Against Potential Terrorist Attacks  
<https://www.fema.gov/sites/default/files/2020-08/fema430.pdf>

### 3 Early Design and Construction Works

3.1 Early design and construction works may be required well before the commencement of civil works on site. Works to be considered at this early stage include:

- a) stakeholder or asset owner consultation for urban design requirements, landscaping and maintenance requirements, and supply and management of water for irrigation;
  - b) liaison and coordination with the Department and utility services (e.g. electricity, gas, water, telecommunications) to ensure services and related infrastructure are fully integrated with the design of the public realm;
  - c) established tree and palm relocation;
  - d) seed supply, including the collection of native plant seed and propagules prior to vegetation removal;
  - e) reuse of site-won mulch from vegetation removals;
  - f) plant and advanced tree supply, nursery establishment;
  - g) plant rescue;
  - h) topsoil stripping and stockpiling for later reuse; and
  - i) weed control and associated soil preparation for landscaping.
- 3.2 Early design and construction works identified should be included in the Urban and Landscape Design Report.

## 4 Urban Design and Architectural Character

- 4.1 The Designer shall develop an Urban and Landscape Design Report that explains the design philosophy and principles that have been used to develop the overall public realm response for the project.
- 4.2 The architectural character of the project should be contemporary and innovative, improve the urban character of the local precinct and be sensitive to context.
- 4.3 The design will:
- a) attain a high design standard for the public realm, architectural built form and detailing;
  - b) respond to the immediate site context and the character of adjoining streets and open spaces and create a unique sense of place and identity;
  - c) adopt appropriate materials, colours and textures to visually connect the project to the urban character of the local precinct;
  - d) mitigate unfavourable impacts from structures such as overshadowing, wind acceleration and turbulence on adjacent open space and private land; and
  - e) provide free-draining finishes and joint detailing which minimises water retention, litter traps and potential chemical, mould and dirt staining.
- 4.4 The Urban and Landscape Design Report will:
- a) clearly explain the overall design philosophy and design principles;
  - b) describe the desired and expected outcomes from environmental, local community, pedestrian, cyclist, motorist and / or rail user viewpoints; and
  - c) describe how the urban design philosophy will be integrated into the design of all relevant project elements including but not limited to bridge superstructures (parapets and girders), bridge substructures (headstocks, piers, pile caps, piles, abutments), noise barriers, road and rail furniture (gantries and major signage structures, light poles, safety barriers and screens, field cabinets), materials, colours, surface treatments / finishes, landscaping (species palette, identifying irrigated and non-irrigated areas), architectural lighting, fencing and railing, street furniture, staircases and ramps, reinforced earth walls, retaining walls, batter slopes, buildings (e.g. computer equipment rooms, lifts, toilets, bike storage areas), wayfinding signage and cultural and creative elements.

### Bridge Form and Detailing

- 4.5 The design will:

- a) ensure bridges present an elegant design solution with smooth, clean lines. They will have a minimal structural depth to minimise visual bulk and maximise natural light to the environment beneath;
- b) ensure the width of pedestrian and cyclist facilities provided on bridges is sufficient to accommodate the expected volume and type of users;
- c) integrate utilities and services within the structural profile to eliminate visible clutter;
- d) consider form and detailing of urban elements for the pedestrian experience;
- e) integrate any lighting that is required with the bridge design and provide a coordinated approach that considers any other elements (e.g. safety barriers, anti-throw screens and cameras);
- f) ensure safety screens are integrated with the overall bridge architecture;
- g) eliminate opportunities for bird roosting on and beneath structures;
- h) provide detailed and neat, clean finishes to outer exposed edges;
- i) provide chamfered surface finishes to all exposed concrete edges and surfaces;
- j) provide detailing to eliminate footholds and climbing opportunities on or beneath structures;
- k) angle the top of structure parapets / barriers inwards towards the roadside to direct rainwater onto the bridge to avoid staining on the outside face;
- l) extend the parapet below the bridge deck to hide any complex details;
- m) provide a neat and integrated connection between the parapet (including ends) and the bridge structure;
- n) provide a neat and integrated connection between the safety barrier system and the parapet; and
- o) articulate the lines and flat planes of the façades (for example, joints between panels) with other sub- and super-structure elements, including columns, embankment walls and minor elements such as barriers, noise walls and light poles.

## Headstocks, Piers, Piles and Pile Caps

- 4.6 Headstocks should be integrated with piers rather than being designed as a separate, visually unrelated element to avoid visual complexity.
- 4.7 Headstocks should not extend up and across the outer face of the girder.
- 4.8 Pier composition, proportion, spacing, detailing and material selection should provide a light, elegant and contemporary character for the project.
- 4.9 Piles and pile caps should be concealed from view. Where piles are integrated into a bridge abutment, the abutment surface treatments will be considered and integrated into the overall urban design of the project.

## Facades, Parapets, Barriers, and Screens

- 4.10 The bridge elevation should be carefully considered as part of the public realm design.
- 4.11 The design will:
  - a) provide an articulated architectural and structural design outcome that is visually “light” within the surrounding public realm and integrated with the other infrastructure elements;
  - b) ensure design elements that contribute to the appearance of bridges when viewed in elevation are considered holistically (e.g. facades, parapets, screens, barriers, railing, fencing, lighting, gantries and signage);
  - c) ensure passive surveillance is provided for pedestrians and cyclists using bridges including stairs, ramps and lifts; and
  - d) ensure infrastructure elements designed to prevent unauthorised access are integrated with the public realm and the overall urban design of the project.

4.12 A Bridge Aesthetic Report is to be provided in the Urban and Landscape Design Report.

## Minor Infrastructure Elements

4.13 The design and placement of all minor infrastructure elements including road furniture, barriers, w-beam, wire rope safety fence, bollards, gantries, light poles, signage, ITS equipment, cameras, field cabinets and service pits should be integrated into the overall urban design of the project.

4.14 The design will:

- a) provide an integrated architectural and structural design for all minor infrastructure elements;
- b) use materials and techniques that require low maintenance and are robust and durable; and
- c) accurately show all minor infrastructure elements on all relevant urban and landscape design drawings.

## Reinforced Earth Walls, Retaining Walls, Noise Barriers and Tree Planting Above Structures

4.15 The design will:

- a) integrate reinforced earth walls, retaining walls and noise barriers with the urban and landscape design of the project;
- b) provide appropriate retaining structures and waterproofing to facilitate irrigated tree and shrub plantings where planting is proposed above or adjacent to the structure;
- c) consider the visibility and exposure of vertical faces and opportunities to incorporate cultural and creative elements in place making;
- d) provide wall surfaces and detailing that are consistent with the design intent and detailing of other architectural elements;
- e) prioritise integrated finishes to avoid supplementary cladding;
- f) not use “off gun” shotcrete finishes in highly visible areas; and
- g) prioritise finishes that are less attractive to graffiti vandalism (e.g. textured) or are easily cleaned.

## Fencing

4.16 The design will:

- a) consider the design, colour, material, and scale of all fencing at the pedestrian level;
- b) ensure fencing selection is integrated with the urban design and contributes to a positive urban design outcome for the community;
- c) consider maintenance activities when determining fence alignments and access gate locations; and
- d) ensure maintenance access gates are suitably sized for the required maintenance activities.

## Architectural Lighting

4.17 Lighting proposed to enhance the urban design outcome is subject to the approval of the Principal. Any proposed lighting will consider whole-of-life costs, durability, ease of replacement, and maintenance access.

4.18 The design will:

- a) consider inclusion of feature lighting that can contribute to functional requirements;
- b) minimise glare and light spill, and provide a fully integrated lighting design;
- c) use lighting to provide safety and security for pedestrians and cyclists;
- d) consider feature lighting to reinforce entry points and key features to assist wayfinding;



- e) integrate light poles with urban design outcomes;
  - f) use robust, vandal resistant and low maintenance fittings;
  - g) ensure consistency in architectural expression by consideration of form, materials and colours of light poles and fittings;
  - h) design for ease of luminaire replacement; and
  - i) utilise LEDs where possible for energy efficiency.
- 4.19 A Lighting Strategy will be provided in the Urban and Landscape Design Report. The Lighting Strategy will include:
- a) expected hours of operation;
  - b) an estimate of the annual power consumption;
  - c) integration with statutory lighting requirements;
  - d) graphic representations of the strategy in operation; and
  - e) durability and maintenance requirements including maintenance intervals and accessibility requirements.

## Street, Station and Public Space Furniture

- 4.20 Furniture includes seating, rest areas, signage and wayfinding elements, bins, fountains, bike racks, bike service stations, shelters, and other amenities that will be considered in developing the urban design outcome of the project.
- 4.21 The Designer shall specify furniture that contributes towards the successful functioning of the precinct at pedestrian scale, and increases amenity and supports recreational use.
- 4.22 Any furniture proposed will be in accordance with the relevant Department and Council standards and / or guidelines.
- 4.23 The Designer shall ensure the following minimum design requirements are achieved:
- a) Place furniture to service the community and to avoid creating unnecessary obstacles to pedestrian movement or restrict pedestrian access.
  - b) Ensure relevant stakeholders are consulted in the design, selection and placement of furniture.
  - c) Ensure robust construction to reduce unnecessary maintenance costs.
  - d) Furniture will be constructed of materials that are complimentary to the project architecture and have low whole-of-life costs.
  - e) Consider integrating cultural and creative elements into the furniture and / or the provision of project specific bespoke items at key locations.
  - f) Furniture will be compliant with The National Construction Code and Disability Discrimination Act 1992 requirements.

## Field Cabinets

- 4.24 The Contractor shall integrate field cabinets, service kiosks, junction boxes, etc., and other services buildings / cabinets with the overall urban design layout, furniture and landscape design.
- 4.25 Field cabinets will be carefully situated in areas to be landscaped to minimise visual intrusion whilst maintaining required accessibility.
- 4.26 The design, colour and form of field cabinets will be in accordance with relevant Department standards and be a consistent colour across a suite of cabinets which may require coordination across utility authorities.

## Cultural and Creative Elements

- 4.27 Opportunities to introduce cultural and / or creative elements to tell individual stories of place and respond to local conditions should be considered and integrated with the architecture and urban design of the project.
- 4.28 In particular, the design will consider requirements of Master Specification Part PR-AC-D1 “Aboriginal Cultural Expression in Infrastructure Design”.
- 4.29 Elements to be considered may include:
- a) screens;
  - b) noise walls / noise barriers;
  - c) reinforced earth walls and retaining walls;
  - d) bridge abutments, particularly those accessible to pedestrians;
  - e) street furniture;
  - f) balustrades;
  - g) fencing;
  - h) signage; and
  - i) paving.
- 4.30 Cultural and creative elements may be stand-alone installations.
- 4.31 The design of cultural and creative elements will:
- a) ensure only robust and durable materials and finishes are used and that, overall, the cultural and creative elements have low maintenance requirements; and
  - b) ensure landscape and urban design treatments involving cultural and creative elements are well coordinated to avoid inconsistency of themes / messages and should be consistent or compliment the overall urban design vision. A Creative Strategy outlining the theme and context of all the various cultural and creative elements will be provided in the Urban and Landscape Design Report.

## 5 Crime Prevention Through Environmental Design

- 5.1 The Principal places high importance on safety. The Designer shall ensure that safety principles are considered throughout the design, construction and implementation process.
- 5.2 The Designer shall develop a site-specific Crime Prevention Through Environmental Design (CPTED) Strategy to guide and evaluate the proposed design.
- 5.3 The Designer shall utilise their CPTED Strategy to evaluate the proposed design.
- 5.4 The site-specific CPTED Strategy and the evaluation of the design based on this Strategy will both be included in the Urban and Landscape Design Report at each of the design review stages.
- 5.5 The Principal may engage SAPOL’s Crime Prevention Unit or other independent specialist to undertake an independent review of how well the design assists in the prevention of crime.

### Prevention of Vandalism

- 5.6 The Designer shall undertake a risk assessment to identify all visible and exposed areas, items and surfaces throughout the project works that may be vulnerable to graffiti and other forms of vandalism. The outcome of the risk assessment will demonstrate solutions to prevent vandalism including, but not limited to, the following:
- a) selecting materials and textures that discourage graffiti;
  - b) minimising flat surface areas available for graffiti;
  - c) preventing access to areas that may be vulnerable to graffiti and / or vandalism; and

- d) identifying opportunities for landscaping and cultural and creative element installations to deter graffiti and vandalism.

## 6 Access and Movement

- 6.1 Accessibility requirements will be integrated into the overall design.
- 6.2 The project should enhance and improve the connectivity and safety of pedestrian and cyclist routes both within the project scope and to broader strategic links beyond the project boundaries.
- 6.3 Where safe and practical, zones directly beneath overpasses and bridge structures should be activated through the inclusion of pedestrian and cycle paths and connectivity, seating, plaza areas, cultural and creative elements and other urban design considerations.
- 6.4 The design will:
  - a) be accessible and inclusive;
  - b) provide clear and legible connections to adjacent facilities and destinations, local pedestrian and cycle networks and local / arterial roads;
  - c) select materials, proportion spaces and design public realm areas to allow for flexible use while still maintaining continuity of access and movement through them;
  - d) provide clear and legible entries and exits;
  - e) ensure landscape and urban design treatments and elements do not compromise clear zones for pathways, roads and railways;
  - f) utilise landscape and urban design treatments to increase driver awareness of pedestrian and bicycle facilities and promote safe access;
  - g) design for intuitive wayfinding to minimise reliance on signage;
  - h) consider the anticipated volume of users when determining pathway widths;
  - i) ensure infrastructure elements such as light poles and signage do not obstruct pedestrian and cyclist paths; and
  - j) comply with principles of universal design and Disability Discrimination Act 1992 requirements.

## 7 View Corridors and Wayfinding

- 7.1 Develop a comprehensive Wayfinding Strategy that aids navigation and orientation for all users in a simple and effective manner. The Wayfinding Strategy should consider existing and new urban design elements and signage requirements holistically to assist with understanding of journey and place.
- 7.2 View corridors should be utilised to assist in wayfinding and orientation, and be included in the Wayfinding Strategy. View corridors may also highlight desirable views and be utilised to enhance a journey.
- 7.3 The design will:
  - a) provide adequate wayfinding signage within the project, safely directing people into and out of the project precinct;
  - b) ensure signage is clear and legible at key decision-making points; and,
  - c) consider opportunities for integration of smart technologies into the signage and wayfinding strategy.
- 7.4 The Wayfinding Strategy will be included in the Urban and Landscape Design Report.

## 8 Materials, Colours and Finishes

- 8.1 The Designer shall select a palette of materials, colours and finishes for all infrastructure elements across the project.

- 8.2 The design will:
- a) utilise low sheen, non-reflective urban design finishes to minimise headlight and sun glare;
  - b) achieve consistency of materials, finishes and colours supporting the overall design philosophy and design principles;
  - c) utilise only low maintenance materials and avoid external finishes that require frequent on-going maintenance; and
  - d) prioritise sustainable, low whole-of-life cost materials.
- 8.3 Deviance from a considered palette for unique elements that may assist with identifying key locations or iconic elements may be appropriate.
- 8.4 The Palette of Materials, Colours and Finishes will be included in the Urban and Landscape Design Report.

## 9 Water Sensitive Urban Design

- 9.1 Water Sensitive Urban Design (WSUD) solutions should be integrated with the overall design of the project.
- 9.2 The design will:
- a) integrate stormwater management into the urban design realm to maximise useable public open space;
  - b) utilise WSUD solutions to minimise peak stormwater flows and improve water quality;
  - c) ensure basins, wetlands and swales have batter gradients no steeper than 1V:4h and permit the establishment and maintenance of vegetation;
  - d) ensure basin design eliminates the need for safety fencing;
  - e) utilise rainwater to passively irrigate landscape plantings and grassed areas through natural filtration and infiltration;
  - f) permeable paving will be used where hard surfaces are required adjacent to existing mature trees; and
  - g) provide simple WSUD solutions to minimise maintenance requirements.
- 9.3 The WSUD Strategy will be included in the Urban and Landscape Design Report.

## 10 Landscape Design and Green Infrastructure

- 10.1 The landscape planting design will contribute towards the character and sense of place, provide improved visual amenity, liveability and biodiversity to assist with meeting targets set out in the 30 Year Plan for Greater Adelaide and the South Australian State Planning Policies.
- 10.2 The design will respond to the green infrastructure objectives and desired characteristics defined in the Green Infrastructure assessment and Green Infrastructure concept plan, prepared in accordance with Master Specification Part PC-PL2 and/or PC-ST1.
- 10.3 Where a canopy cover target has been established for the project, the design will incorporate sufficient canopy trees to ensure achievement of the canopy cover target (measured at maturity).
- 10.4 Shade trees will be incorporated into the design where this will improve amenity for pedestrians, cyclist and public transport customers. The Designer shall seek to achieve a target of  $\geq 50\%$  canopy cover over footpaths and cycle paths (measured at maturity).
- 10.5 The design will:
- a) integrate the landscape design early in the project's design phase to enable the landscape to maximise the positive contribution to the whole, not just landscaping for "leftover" spaces (e.g. consider median widths to allow for the inclusion of trees);

- b) allow adequate space above and below ground for tree planting early in the design, with consideration of offset requirements for road, rail and other infrastructure;
- c) provide desirable, usable and accessible spaces for people;
- d) compliment the new infrastructure and assist in its visual integration with the surrounding urban context;
- e) integrate stormwater design requirements including those from Part RD-DK-D1 “Road Drainage Design” with landscape and urban realm requirements to create safe, engaging and easily maintainable assets;
- f) consider CPTED principles in the selection and location of plants;
- g) utilise trees in the public realm for shade and to minimise urban heat island effects;
- h) consider deciduous trees where winter sun will benefit the microclimate of an area;
- i) consider innovative approaches to green infrastructure;
- j) contribute to the rehabilitation and enhancement of the landscape and to improve areas adjacent to the project;
- k) give preference to the use of local native plants and species that are suited to local conditions;
- l) select tree and plant species for their ultimate height and growth habits, longevity, shade and solar access, low irrigation and maintenance requirements;
- m) specify and install trees and other plantings that eliminate weed infestation, stabilise soil, provide habitat, capture contaminants and improve amenity;
- n) specify planting offset distances from all adjacent infrastructure;
- o) utilise low maintenance techniques such as mulch and automatic drip irrigation;
- p) provide concrete edging to all grassed areas, gravel mulched areas, and garden beds in urban and township locations and
- q) ensure infrastructure for landscape irrigation (e.g. conduits, controllers, water meters, etc.) is considered early in the design process and integrated with civil works.

## Plant Species Palette

- 10.6 The Contractor shall provide a Plant Species Palette which will include the species selection proposed for each planting area, plant spacings, quantities of each species, and planting offset distances.
- 10.7 A minimum of 50% of new landscape plantings will be native species that are suited to local conditions, having regard to future impacts of climate change.
- 10.8 The Plant Species Palette will be included in the Urban and Landscape Design Report.

## Vegetation Management for Train Operations

- 10.9 The Contractor shall undertake a risk assessment of existing vegetation and proposed landscape treatments, to identify elements that have the potential to foul train operations.
- 10.10 This risk assessment will be included in the Landscape and Urban Design Report.
- 10.11 Vegetation that has the potential to foul train operations will be approved by the Manager Rail Infrastructure Management prior to planting.

## Batters

- 10.12 The design will:
- a) ensure batters are integrated with the drainage, urban and landscape design;
  - b) provide smooth, tapered transitions between cuttings, fill embankments, and existing landforms;
  - c) include appropriate erosion control solutions and landscape treatments to maintain slope mass and surface stability;

- d) ensure surface treatments and gradients of batters are compatible with access and maintenance requirements;
- e) ensure that grass requiring mowing or slashing is not included on batters steeper than 1V:4H;
- f) consider the use of retaining structures and terracing to reduce the gradients of batter slopes; and
- g) ensure the design and maintenance of batters will comply with the requirements of PC-EDM2 "Safety Management in Design".

## Irrigation

10.13 An Irrigation Strategy will be developed to identify watering requirements for plant establishment and maintenance and will identify:

- a) stakeholder requirements;
- b) sources of water including the use of recycled water;
- c) water connection points;
- d) irrigation conduit locations;
- e) scheduling of watering requirements; and
- f) maintenance requirements and responsibilities.

10.14 The Irrigation Strategy will be included in the Urban and Landscape Design Report.

10.15 A detailed irrigation design will be developed based on the agreed Irrigation Strategy.

## 11 Maintenance Provisions

11.1 The Contractor shall provide information to demonstrate the durability and proposed maintenance requirements of all plantings, products, coatings, finishes and fixtures specified in the design.

11.2 The design will ensure maintenance access is incorporated as a fundamental element of the design and the following minimum requirements are achieved:

- a) soft landscape treatments should not have high maintenance costs;
- b) urban design materials and components will be weatherproof and UV resistant with a minimum 20-year design life; and
- c) paint finishes will have a minimum 10-year design life.

11.3 The following information will be included in the Urban and Landscape Design Report:

- a) a Maintenance and Durability Report demonstrating that durability and maintenance requirements have been achieved;
- b) a Landscape Maintenance Plan containing:
  - i) the maintenance activities that will be required of a landscape contractor during the establishment and 1-3 year maintenance period; and
  - ii) details of the ongoing / routine maintenance that will be required of the Department or Council, or other asset managers, including frequency of operations, replacement planting and other activities required to maintain the asset to the design intent.
- c) a Maintenance Access Strategy identifying maintenance accessibility requirements for all design components.

## 12 Cost Estimates

12.1 Cost estimates for all urban and landscape design components will be provided as a Schedule of Rates for construction and maintenance in the Urban and Landscape Design Report at each of the design review stages.

## 13 Records

13.1 Design reports and drawings will be updated for each of the design review stages.

13.2 At each of the design review stages the following records will be provided to the Principal:

a) Drawings will include the following information:

- i) Existing vegetation which is to remain after completion of the works clearly differentiated from proposed new landscaping, including offset plantings for vegetation removed;
- ii) Sufficient detail to fully communicate the intent of the proposed Final Urban and Landscape Design, including location and form of all urban and landscape design features;
- iii) Areas to be landscaped including planting schedules with species, quantities, spacings and planting offset distances;
- iv) A continuous longitudinal elevation to include all bridges and infrastructure, typical cross sections, perspective drawings, detailed cross sections and construction details to clearly communicate the design intent; and
- v) Will be clear and easily interpretable.

b) The Urban and Landscape Design Report will include the following information:

- i) Early Design and Construction Works;
- ii) Design Philosophy and Principles, including Green Infrastructure Assessment and Green Infrastructure Concept Plan;
- iii) Bridge Aesthetic Report;
- iv) Lighting Strategy;
- v) Creative Strategy;
- vi) Site Specific CPTED Strategy;
- vii) Evaluation of the design based on the CPTED Strategy;
- viii) Wayfinding Strategy;
- ix) Palette of Materials, Colours and Finishes;
- x) WSUD Strategy;
- xi) Plant Species Palette including quantities of plants;
- xii) Estimated tree canopy cover at maturity following planting, measured in square metres and as a percentage of the total project to confirm that tree canopy cover targets will be achieved;
- xiii) Vegetation Management for Train Operations Risk Assessment;
- xiv) Irrigation Strategy;
- xv) Maintenance and Durability Report;
- xvi) Landscape Maintenance Plan;
- xvii) Maintenance Access Strategy;
- xviii) Cost Estimates for landscape construction and maintenance; and
- xix) Cross references to other relevant discipline packages as necessary.

## 14 Hold Points

14.1 There are no Hold Points referenced in this part.

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