

# Master Specification Part PR-LS-D1

## Landscape and Urban Design

September 2024



**Government of South Australia**  
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and Transport

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## Document Management

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## Contents

Contents	3
PR-LS-D1 Landscape and Urban Design	4
1 General	4
2 Documentation	7
3 Early design and construction activities	8
4 Urban design and architectural character	9
5 Crime prevention through environmental design (CPTED)	16
6 Access and movement	17
7 View corridors and wayfinding	17
8 Materials, colours and finishes	18
9 Water sensitive urban design (WSUD)	18
10 Landscape design and Green Infrastructure	18
11 Maintenance provisions	21
12 Cost estimates	21
13 Hold Points	22

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## PR-LS-D1 Landscape and Urban Design

### 1 General

- a) This Master Specification Part specifies the requirements for the landscape and urban design, including:
  - i) the documentation requirements, as set out in section 2;
  - ii) the early design and construction activity requirements, as set out in section 3;
  - iii) the urban design and architectural character requirements, as set out in section 4;
  - iv) the crime prevention through environmental design requirements, as set out in section 5;
  - v) the access and movement requirements, as set out in section 6;
  - vi) the view corridors and wayfinding requirements, as set out in section 7;
  - vii) the materials, colours and finishes requirements, as set out in section 8;
  - viii) the water sensitive urban design (WSUD) requirements, as set out in section 9;
  - ix) the landscape design and Green Infrastructure requirements, as set out in section 10;
  - x) the maintenance provision requirements, as set out in section 11;
  - xi) the cost estimate requirements, as set out in section 12; and
  - xii) the Hold Point requirements, as set out in section 13.
- b) This Master Specification Part:
  - i) provides design criteria which serve to encourage design excellence for infrastructure in the built environment and public realm; and
  - ii) includes the design of elements such as hard and soft landscaping treatments, the architecture of structures (such as bridges, buildings, noise barriers, retaining walls, road furniture, and fences), the design of public spaces and cultural and creative elements.
- c) The Contractor must ensure that the urban and landscape design is carried out by designers that are prequalified on the current Department Application Guidelines: Professional and Technical Services Framework (Pre-qualification No. 17C811) (available from [https://www.dit.sa.gov.au/contractor\\_documents/prequalification](https://www.dit.sa.gov.au/contractor_documents/prequalification)), including the following categories (as applicable):
  - i) urban design;
  - ii) landscape design; and
  - iii) irrigation system design.
- d) In developing the urban and landscape design, the Contractor must:
  - i) ensure the Project responds to all of the ODASA Principles of Good Design: context, inclusivity, durability, value, performance and sustainability;
  - ii) ensure compliance with all safety requirements set out in the Contract Documents;
  - iii) consider the interrelationship of individual design elements and their relationship to the whole, including their appropriateness within the Project and beyond the Project boundaries;
  - iv) ensure any public realm infrastructure strengthens the local character of the area by responding to the social, cultural and environmental characteristics of that area;

- v) ensure safe, efficient and legible circulation routes for pedestrians, cyclists and people with disabilities;
  - vi) ensure a high standard of design to achieve quality infrastructure that is visually attractive and interesting, sophisticated, contemporary and robust;
  - vii) ensure that design features and the selection of materials minimise whole-of-life and maintenance costs;
  - viii) incorporate sustainable design principles such as water management, energy efficiency, biodiversity and healthy lifestyles into the public realm;
  - ix) 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;
  - x) ensure the landscape design incorporates offsets for impacted native, amenity, regulated and significant vegetation in accordance with:
    - A. Department EHTM Attachment 4B - Vegetation Impact Assessment Guideline;
    - B. *Native Vegetation Act 1991* (SA); and
    - C. *Planning, Development and Infrastructure Act 2016* (SA); and
  - xi) comply with the design requirements set out in this Master Specification Part.
- e) The urban and landscape design must comply with:
- i) the Reference Documents, including:
    - A. AS/NZS 1158 Lighting for roads and public spaces;
    - B. Department EHTM Attachment 4B - Vegetation Impact Assessment Guideline (available from: <https://dit.sa.gov.au/standards/manuals#EHTM>);
    - C. Green Infrastructure Commitment (available from: [https://dit.sa.gov.au/standards/standards\\_and\\_guidelines](https://dit.sa.gov.au/standards/standards_and_guidelines));
    - D. Department Operational Instruction 19.8: Trees in Medians and Roadsides in the Urban Environment (available from: [https://dit.sa.gov.au/standards/standards\\_and\\_guidelines](https://dit.sa.gov.au/standards/standards_and_guidelines));
    - E. Department Sustainability Manual (available from: <https://dit.sa.gov.au/standards/manuals>);
    - F. ODASA publication Principals of Good Batter Design (available from: <https://www.odasa.sa.gov.au/>);
    - G. ODASA publication Principals of Good Design (available from: <https://www.odasa.sa.gov.au/>);
    - H. State Planning Policies for South Australia (available from <https://plan.sa.gov.au/>); and
    - I. all relevant statutory requirements and Reference Documents related to the clearances of trees to Utility Services;
  - ii) all relevant Laws, including:
    - A. *Disability Discrimination Act 1992* (Cth), and its subordinate instruments, including:
      - I. Disability Standards for Accessible Public Transport 2002; and
      - II. Disability Standards for Accessible Public Transport Guidelines 2004 (No. 3);
    - B. *Disability Inclusion Act 2018* (SA);

- C. *Native Vegetation Act 1991* (SA); and
  - D. *Planning, Development and Infrastructure Act 2016* (SA); and
- iii) the principles contained in the following documents:
- A. all project-specific urban design frameworks, principles, strategies or guidelines, if supplied by the Principal;
  - B. Australian Institute of Landscape Architects (SA Chapter), *Creating Greener Places for Healthy and Sustainable Communities* (available from: <https://www.odasa.sa.gov.au/resources/documents/>);
  - C. *Creating Places for People - An Urban Design Protocol for Australian Cities* (available from: <http://urbandesign.org.au>);
  - D. Department 2022-2032 *Cycling Strategy for South Australia* (available from <https://www.dit.sa.gov.au/cycling>);
  - E. South Australian *Walking Strategy 2022-2023* (available from <https://www.wellbeingsa.sa.gov.au/our-work/healthy-places-people/physical-activity/walking-strategy>);
  - F. Department for Environment and Water, *Planting Indigenous Species Policy* (available from: [www.environment.sa.gov.au](http://www.environment.sa.gov.au));
  - G. Department for Environment and Water publication, “Water Sensitive Urban Design Creating more liveable and water sensitive cities in South Australia” (available from: [www.environment.sa.gov.au](http://www.environment.sa.gov.au));
  - H. FEMA 430 *Site and Urban Design for Security: Guidance Against Potential Terrorist Attacks* (available from: <https://www.fema.gov/>);
  - I. Government of New South Wales, Centre for Urban Design, “Bridge Aesthetics: Design Guideline to Improve the Appearance of Bridges in NSW” (available from: <https://roads-waterways.transport.nsw.gov.au/>);
  - J. Government of New South Wales, Centre for Urban Design “Noise Wall Design Guideline: Design guideline to improve the appearance of noise walls in NSW” (available from: <https://roads-waterways.transport.nsw.gov.au/>);
  - K. Government of New South Wales, Centre for Urban Design “Shotcrete Design Guideline: Design guideline to improve the appearance of shotcrete in NSW” (available from: <https://roads-waterways.transport.nsw.gov.au/>);
  - L. Government of New South Wales, Centre for Urban Design “Tunnel Urban Design Guideline: Design guideline to improve the customer and community experience of road tunnels” (available from: <https://roads-waterways.transport.nsw.gov.au/>);
  - M. Government of South Australia, *Healthy Parks Healthy People South Australia* (available from: [www.environment.sa.gov.au](http://www.environment.sa.gov.au));
  - N. Heart Foundation, *Healthy by Design SA* (available from: <https://www.healthyactivebydesign.com.au/resources/publications>);
  - O. ODASA, *Principles of Good Design* (available from: <https://www.odasa.sa.gov.au/>);
  - P. ODASA, *Principles of Good Better Design* (available from: <https://www.odasa.sa.gov.au/>);
  - Q. Queensland Government, *Crime Prevention Through Environmental Design, Guidelines for Queensland* (available from: <https://www.police.qld.gov.au>); and
  - R. *The 30 Year Plan for Greater Adelaide* (Government of South Australia) (available from: <http://livingadelaide.sa.gov.au>).

- f) The urban and landscape design must comply with the requirements set out in PR-PF-D1 “Designing for Accessibility”.

## 2 Documentation

### 2.1 Design Basis

In addition to the requirements of PC-EDM1 “Design Management”, the urban and landscape Design Basis must include details of the early design and construction activities, as required by section 3.

### 2.2 Design Drawings

In addition to the requirements of PC-EDM1 “Design Management”, the Design Drawings must:

- a) identify existing vegetation which is to remain after completion of the Works or Temporary Works clearly differentiated from proposed new landscaping, including offset plantings for vegetation removed;
- b) include 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;
- c) identify areas to be landscaped including planting schedules with species, total quantities, spacings and planting offset distances, and plant species quantities per planting bed on each sheet;
- d) accurately show all infrastructure elements on all relevant drawings;
- e) include a continuous longitudinal elevation to clearly communicate the design intent of all bridges, infrastructure and public realm elements, which must include:
  - i) typical cross sections;
  - ii) perspective drawings; and
  - iii) detailed cross sections and construction details; and
- f) be clear and easily interpretable.

### 2.3 Design Report

In addition to the requirements of PC-EDM1 “Design Management”, the urban and landscape Design Report submitted as part of the Preliminary Design Documentation must include:

- a) the landscape and urban design philosophy and principles, as required by section 4.1;
- b) the Green Infrastructure Assessment and green infrastructure concept plan where prepared during the planning phase of the Project (refer to PC-ST1 “Sustainability in Design”);
- c) a copy of the bridge aesthetic report developed in accordance with ST-SD-D1 “Design of Structures”;
- d) a lighting strategy as required by section 4.10c);
- e) a creative strategy as required by section 4.13f), including the Contractor’s proposal regarding the ongoing maintenance responsibilities for cultural and creative elements;
- f) a site specific CPTED strategy as required by section 5.1b);
- g) the evaluation of the design based on the CPTED strategy, as required by section 5.1c);
- h) the graffiti and vandalism risk assessment required by section 5.2a);
- i) a wayfinding strategy as required by section 7;
- j) a palette of materials, colours and finishes; as required by section 8;
- k) a WSUD strategy as required by section 9;

- l) a plant species palette including total quantities of plants, as required by section 10.2;
- m) where applicable, a vegetation management for train operations risk assessment, as required by section 10.3;
- n) an irrigation strategy as required by section 10.5;
- o) the following in relation to maintenance and durability, as required by section 11:
  - i) a maintenance and durability report;
  - ii) a landscape maintenance plan; and
  - iii) a maintenance access strategy;
- p) cost estimates for landscape construction and maintenance as required by section 12; and
- q) all necessary cross references to other relevant discipline packages, documents, drawings, or reports.

## 2.4 Maintenance Plan

In addition to the requirements of PC-CN2 “Asset Handover”, the urban and landscape Maintenance Plan must include:

- a) the maintenance activities that will be required of a contractor during the establishment and 1-3 year maintenance period;
- b) 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; and
- c) a maintenance access strategy identifying maintenance accessibility requirements for all design components.

## 3 Early design and construction activities

- a) The Contractor must carry out early design and construction activities before the commencement of civil permanent Works on Site. Early design and construction activities to be considered at this early stage include:
  - i) stakeholder or asset owner consultation for urban design requirements, landscaping and maintenance requirements, and supply and management of water for irrigation;
  - ii) liaison and coordination with the Principal and Utility Service Authorities (e.g. electricity, gas, water, telecommunications) to ensure Utility Services and related infrastructure are fully integrated with the design of the public realm, including landscaping and tree planting;
  - iii) established tree and palm relocation;
  - iv) plant rescue;
  - v) seed supply, including the collection of native plant seed and propagules prior to vegetation removal;
  - vi) reuse of site-won mulch and timber from vegetation removals;
  - vii) plant and advanced tree supply, nursery establishment;
  - viii) topsoil stripping and stockpiling for later reuse;
  - ix) weed control and associated soil preparation for landscaping; and
  - x) establishment of Tree Protection Zones for existing trees to be retained and protected within the Site in accordance with PC-ENV2 “Environmental Protection Requirements”.



- b) Any early design and construction activities identified and proposed must be included in the relevant planning study submission or the urban and landscape Design Basis (as applicable).

## 4 Urban design and architectural character

### 4.1 General

- a) The Contractor must 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.
- b) The architectural character of the Project should be contemporary and innovative, improve the urban character of the local precinct and be sensitive to context.
- c) The design must:
  - i) attain a high design standard for the public realm, architectural built form and detailing;
  - ii) respond to the immediate site context and the character of adjoining streets and open spaces and create a unique sense of place and identity;
  - iii) adopt appropriate materials, colours and textures to visually connect the Project to the urban character of the local precinct;
  - iv) mitigate unfavourable impacts from structures such as overshadowing, wind acceleration and turbulence on adjacent open space and private land; and
  - v) provide free-draining finishes and joint detailing which minimises water retention, litter traps and potential chemical, mould, and dirt staining.
- d) The urban and landscape Design Report must:
  - i) clearly explain the overall design philosophy and design principles;
  - ii) describe the desired and expected outcomes from environmental, local community, pedestrian, cyclist, motorist or rail user viewpoints; and
  - iii) describe how the urban design philosophy will be integrated into the design of all relevant Project elements including:
    - A. bridge superstructures (parapets and girders);
    - B. bridge substructures (headstocks, piers, pile caps, piles, abutments);
    - C. noise barriers;
    - D. Tunnels (including portals and approach structures, Tunnel interiors, and Tunnel ventilation compounds);
    - E. road and rail furniture (gantries and major signage structures, light poles, safety barriers and screens, field cabinets);
    - F. materials;
    - G. colours;
    - H. surface treatments and finishes;
    - I. landscaping (species palette, identifying irrigated and non-irrigated areas);
    - J. architectural lighting;
    - K. fencing and railing;
    - L. street furniture;
    - M. staircases and ramps;

- N. reinforced earth walls;
- O. retaining walls;
- P. batter slopes;
- Q. WSUD;
- R. buildings (e.g. computer equipment rooms, lifts, toilets, bike storage areas);
- S. wayfinding signage; and
- T. cultural and creative elements.

## 4.2 Bridge form and detailing

In relation to bridge form and detailing, the design must:

- a) ensure bridges present an elegant design solution with smooth, clean lines. They must 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 Utility Services and other 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 and architectural design;
- 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 and 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-structure and super-structure elements, including columns, embankment walls and minor elements such as barriers, noise walls, anti-throw screens and light poles.

## 4.3 Headstocks, piers, piles and pile caps

- a) Headstocks should be integrated with piers rather than being designed as a separate, visually unrelated element.
- b) Headstocks should not extend up and across the outer face of the girder.
- c) Pier composition, proportion, spacing, detailing and material selection should provide a light, elegant and contemporary character for the Project.

- d) 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.

#### 4.4 Facades, parapets, barriers and screens

- a) The bridge elevation should be carefully considered as part of the public realm design.
- b) In relation to bridge design, the design must:
  - i) provide an articulated architectural and structural design outcome that is visually “light” within the surrounding public realm and integrated with the other infrastructure elements;
  - ii) 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);
  - iii) ensure passive surveillance is provided for pedestrians and cyclists using bridges including stairs, ramps, and lifts; and
  - iv) ensure infrastructure elements designed to prevent unauthorised access are integrated with the public realm and the overall urban design of the Project.
- c) A bridge aesthetic report must be provided in accordance with ST-SD-D1 “Design of Structures”, and a copy included in the urban and landscape Design Report.

#### 4.5 Tunnel infrastructure

- a) All Tunnel infrastructure must be integrated to create a unified and considered design, including approach structures, portals, ventilation facilities, safety barriers, screens, lighting, intelligent transport system (ITS) infrastructure, signage, and all services.
- b) In relation to Tunnel portal and approach structure design, the design must:
  - i) consider the prevailing local sense of place, character, landscape, and views to minimise visual and physical impacts on surrounding land uses, open spaces, and connectivity;
  - ii) consider the form and placement of all gantries, walls, barriers, screens, lighting, ITS infrastructure, signage, and services to provide an uncluttered, unified, and considered design response;
  - iii) maximise opportunities for landscaping around and above portal areas by designing structures that are capable of supporting deep soil zones and irrigation for vegetation;
  - iv) consider the height, scale, form, and location of all portal structures to maximise views, minimise impacts to local communities and meet acoustic requirements for noise attenuation; and
  - v) ensure Tunnel approaches are generously proportioned to provide a welcoming, reassuring, and memorable experience for motorists and focus on driver safety and comfort.
- c) In relation to Tunnel interior design, the design must:
  - i) use robust, durable materials that can withstand the harsh Tunnel environment and required maintenance regime;
  - ii) achieve visual variety within the Tunnels by providing a creative design response on the cladding at Tunnel entrances, exits, vehicle safety bays, pedestrian emergency access passages, or other areas of interest;
  - iii) align architectural panels to avoid gaps and stepping to create a consistent visual outcome in accordance with TUN-CIV-DC1 “Tunnel Civil Requirements”;
  - iv) design walls, ceilings, and cladding to conceal sub-structures and services;

- v) provide a calming and reassuring experience for motorists within the Tunnel, with appropriate levels of visual stimulation to avoid monotony and support driver attentiveness and safety;
  - vi) use colour, graphics, or text to indicate, at various points, the location of the Tunnel in relation to the surface environment;
  - vii) use light colours for interior cladding to reflect light and provide a sense of spaciousness;
  - viii) use ambient lighting to improve the visual experience within the Tunnel and to reduce or remove any potentially oppressive feeling of being underground; and
  - ix) where appropriate, use feature lighting to contribute to the identity, safety, and visual amenity of the Tunnel interior.
- d) In relation to Tunnel ventilation compounds, the design must:
- i) ensure Tunnel ventilation compounds are of high architectural quality and use design treatments that visually minimise mass and bulk of the compounds and are sensitive to local conditions, architectural forms, materiality, and heritage;
  - ii) integrate compounds and their curtilages with streets and footpaths to contribute to local streetscape character;
  - iii) ensure ventilation outlets and compounds are recessive, elegant, and integrated sculptural forms that sit respectfully in the landscape;
  - iv) ensure ventilation outlets and compounds are designed to be 'building' scale rather than 'industrial' scale;
  - v) ensure ventilation structures are contextually sensitive and focus on sculptural form and materiality;
  - vi) locate ancillary elements to be sensitively integrated and concealed from public view as part of the design approach and use landscape elements such as mounding and planting to reduce the perceived height, bulk, scale, and form;
  - vii) consider the height, scale, form, and location of all structures to maximise views, minimise impacts to local communities and valued places, and meet acoustic requirements for noise attenuation;
  - viii) locate compounds behind planted or treed landscape buffer zones to minimise visual and physical impacts and ensure they are integrated with the surrounding environment; and
  - ix) consider maintenance access and safe vehicle, pedestrian, and cyclist circulation requirements.

## 4.6 Minor infrastructure elements

- a) 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 must be integrated into the overall urban and landscape design of the Project.
- b) For the minor infrastructure elements referred to in section 4.6a), the design must:
  - i) provide an integrated architectural and structural design for all minor infrastructure elements;
  - ii) use materials and techniques that require low maintenance and are robust and durable; and
  - iii) accurately show all minor infrastructure elements on all relevant urban and landscape Design Drawings.

## 4.7 Noise barriers

In relation to noise barriers, the design must:

- a) be high-quality, elegant, 3-dimensional sculptural elements, with consistency of form, texture, colour and pattern;
- b) have a form that follows the vertical alignment of the road at the macro scale and considers the surrounding landform to work with changes in levels and grades;
- c) avoid irregular height changes and steps in the top edge of the barrier. Where stepping is unavoidable, steps must be small and regular or organised in equal or controlled rhythms;
- d) ensure ends of noise barriers on bridges or where there are breaks in the wall are tapered so that the termination is not abrupt;
- e) ensure the location and alignment of noise barriers within the road reserve and on structures is carefully considered;
- f) ensure the height, placement, and design, balances acoustic benefits with provision of safe, usable community open space and landscaping;
- g) consider views from both sides, with equal consideration given to drivers travelling at high speeds, pedestrians and cyclists travelling at lower speeds, and outlook from adjacent properties;
- h) consider transparent panels if solar access to properties is compromised and to reduce the visual bulk of noise barriers on structures;
- i) consider noise barrier location and alignment adjacent to pedestrian and shared paths and eliminate spaces that may be a security issue;
- j) integrate noise barriers with the urban and landscape design of the Project;
- k) provide appropriate footings, retaining structures and waterproofing to facilitate irrigated tree and shrub plantings where planting is proposed adjacent to the structure;
- l) consider the visibility and exposure of vertical faces and opportunities to incorporate cultural and creative elements in place making;
- m) provide wall surfaces and detailing that are consistent with the design intent and detailing of other architectural elements;
- n) prioritise integrated finishes to avoid supplementary cladding;
- o) not use “off gun” shotcrete finishes in highly visible areas; and
- p) prioritise finishes that are less attractive to graffiti vandalism (e.g. textured) or are easily cleaned.

## 4.8 Reinforced earth walls, retaining walls, and tree planting above structures

In relation to reinforced earth walls, retaining walls, noise barriers and planting of vegetation above structures, the design must:

- a) integrate reinforced earth walls and retaining walls 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) integrate permanent support structures with concrete retaining walls to allow vegetation to grow over and cover wall surfaces;
- d) consider the visibility and exposure of vertical faces and opportunities to incorporate cultural and creative elements in place making;

- e) provide wall surfaces and detailing that are consistent with the design intent and detailing of other architectural elements;
- f) prioritise integrated finishes to avoid supplementary cladding;
- g) not use “off gun” shotcrete finishes in highly visible areas; and
- h) prioritise finishes that are less attractive to graffiti vandalism (e.g. textured) or are easily cleaned.

## 4.9 Fencing

In relation to fencing, the design must:

- 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.

## 4.10 Architectural lighting

- a) Lighting proposed to enhance the urban design outcome is subject to the approval of the Principal. Any proposed lighting must consider whole-of-life costs, durability, ease of replacement, and maintenance access.
- b) In relation to architectural lighting, the design must:
  - i) for locations not on bridges, consider inclusion of feature lighting that can contribute to functional requirements;
  - ii) minimise glare and light spill, and provide a fully integrated lighting design;
  - iii) use lighting to provide safety and security for pedestrians and cyclists;
  - iv) consider feature lighting to reinforce entry points and key features to assist wayfinding;
  - v) integrate light poles with urban design outcomes;
  - vi) use robust, vandal resistant and low maintenance fittings;
  - vii) ensure consistency in architectural expression by consideration of form, materials and colours of light poles and fittings;
  - viii) design for ease of luminaire replacement; and
  - ix) utilise LEDs for energy efficiency.
- c) A lighting strategy must be provided in the urban and landscape Design Report which must include:
  - i) expected hours of operation;
  - ii) an estimate of the annual power consumption;
  - iii) integration with statutory lighting requirements;
  - iv) graphic representations of the strategy in operation; and
  - v) durability and maintenance requirements including maintenance intervals and accessibility requirements.

#### 4.11 Street, station and public space furniture

- a) For the purposes of this section 4.11, “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.
- b) The Contractor must specify and utilise furniture that contributes towards the successful functioning of the precinct at pedestrian scale and increases amenity and supports recreational use.
- c) Any furniture proposed must be in accordance with the relevant Reference Documents.
- d) The Contractor must ensure the following minimum design requirements are achieved in relation to furniture:
  - i) furniture must be placed to service the community and to avoid creating unnecessary obstacles to pedestrian movement or restrict pedestrian access;
  - ii) all relevant stakeholders must be consulted in the design, selection, and placement of furniture;
  - iii) construction must be robust to reduce unnecessary maintenance costs;
  - iv) furniture must be constructed of materials that are complimentary to the Project architecture and have low whole-of-life costs;
  - v) consider integrating cultural and creative elements into the furniture or the provision of project-specific bespoke items at key locations;
  - vi) furniture must be compliant with the National Construction Code and *Disability Discrimination Act 1992* (Cth); and
  - vii) furniture for rail stations must be in accordance with RW-STS-D1 “Stations”.

#### 4.12 Field cabinets

- a) The Contractor must integrate field cabinets, service kiosks, junction boxes, etc., and other services buildings and cabinets with the overall urban design layout, furniture, and landscape design.
- b) Field cabinets must be carefully situated in areas to be landscaped to minimise visual and physical intrusion whilst maintaining required accessibility.
- c) The design, colour, and form of field cabinets must be in accordance with relevant Reference Documents and be a consistent colour across a suite of cabinets which may require coordination across Utility Service Authorities.

#### 4.13 Cultural and creative elements

- a) Opportunities to introduce cultural 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.
- b) The design must consider requirements of PR-AC-D1 “Aboriginal Cultural Expression and Engagement in Infrastructure Design”.
- c) Elements to be considered may include:
  - i) screens;
  - ii) noise walls and noise barriers;
  - iii) reinforced earth walls and retaining walls;
  - iv) bridge abutments, particularly those accessible to pedestrians;
  - v) street furniture;

- vi) balustrades;
  - vii) fencing;
  - viii) signage; and
  - ix) paving.
- d) Cultural and creative elements may be stand-alone installations.
  - e) The design of cultural and creative elements must:
    - i) ensure only robust and durable materials and finishes are used which , overall, have low maintenance requirements; and
    - ii) ensure landscape and urban design treatments involving cultural and creative elements are well coordinated to avoid inconsistency of themes and messages and are otherwise consistent with or compliment the overall urban design vision.
  - f) A creative strategy outlining the theme and context of all the various cultural and creative elements must be provided in the urban and landscape Design Report, including the Contractor's proposal regarding the ongoing maintenance responsibilities for those cultural and creative elements.
  - g) The Contractor must obtain the Principals' agreement to the ongoing maintenance responsibilities for the cultural and creative elements, such agreement will constitute a **Hold Point**. The relevant cultural and creative elements must not be commissioned or installed until this Hold Point is released.

## 5 Crime prevention through environmental design (CPTED)

### 5.1 General

- a) The Principal places high importance on safety. The Contractor must ensure that safety principles are considered throughout the design, construction, and maintenance process.
- b) The Contractor must develop a site-specific CPTED strategy to guide and evaluate the proposed design.
- c) The Contractor must utilise the CPTED strategy to evaluate the proposed design.
- d) The site-specific CPTED strategy and the evaluation of the design based on the CPTED strategy must both be included in the urban and landscape Design Report at each of the design review stages.

### 5.2 Prevention of vandalism

- a) The Contractor must 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 must demonstrate solutions to prevent vandalism including:
  - i) selecting materials and textures that discourage graffiti;
  - ii) minimising flat surface areas available for graffiti;
  - iii) preventing access to areas that may be vulnerable to graffiti or vandalism; and
  - iv) identifying opportunities for landscaping and cultural and creative element installations to deter graffiti and vandalism.
- b) The graffiti and vandalism risk assessment required by section 5.2a) must be included as part of the urban and landscape Design Report.



## 6 Access and movement

- a) Accessibility requirements must be integrated into the overall design.
- b) 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.
- c) 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.
- d) In relation to access and movement, the design must:
  - i) be accessible and inclusive;
  - ii) provide clear, legible and direct connections to adjacent facilities and destinations, local pedestrian and cycle networks, and local and arterial roads that utilises desire lines and desirable routes;
  - iii) select materials, proportion spaces and design public realm areas to allow for flexible use while still maintaining continuity of access and movement through them;
  - iv) provide clear and legible entries and exits;
  - v) ensure landscape and urban design treatments and elements do not compromise clear zones for pathways, roads and railways;
  - vi) utilise landscape and urban design treatments to increase driver awareness of pedestrian and bicycle facilities and promote safe access;
  - vii) design for intuitive wayfinding to minimise reliance on signage;
  - viii) consider the anticipated volume of users when determining pathway widths;
  - ix) ensure infrastructure elements such as light poles and signage do not obstruct pedestrian and cyclist paths; and
  - x) comply with principles of universal design and the *Disability Discrimination Act 1992* (Cth).

## 7 View corridors and wayfinding

- a) The Contractor must develop a comprehensive wayfinding strategy that aids navigation and orientation for all users in a simple and effective manner.
- b) The wayfinding strategy should consider existing and new urban design elements and signage requirements holistically to assist with understanding of journey and place.
- c) 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.
- d) In relation to view corridors and wayfinding, the design must:
  - i) provide adequate wayfinding signage within the Project, safely directing people into and out of the Project precinct;
  - ii) ensure signage is clear and legible at key decision-making points; and
  - iii) consider opportunities for integration of smart technologies into the signage and wayfinding strategy.
- e) The wayfinding strategy required by section 7a) must be included in the urban and landscape Design Report.

## 8 Materials, colours and finishes

- a) The Contractor must select a palette of materials, colours, and finishes for all infrastructure elements across the Project.
- b) In relation to materials, colours, and finishes, the design must:
  - i) utilise low sheen, non-reflective urban design finishes to minimise headlight and sun glare;
  - ii) achieve consistency of materials, finishes and colours supporting the overall design philosophy and design principles;
  - iii) utilise only low maintenance materials and avoid external finishes that require frequent on-going maintenance; and
  - iv) prioritise sustainable, low whole-of-life cost materials.
- c) Deviance from a considered palette for unique elements that may assist with identifying key locations or iconic elements may be appropriate.
- d) The selection of a palette of materials, colours and finishes required by section 8a) must be included in the urban and landscape Design Report.

## 9 Water sensitive urban design (WSUD)

- a) Water sensitive urban design (WSUD) solutions should be integrated with the overall design of the Project.
- b) In relation to WSUD, the design must:
  - i) integrate stormwater management into the urban design realm to maximise useable public open space;
  - ii) utilise WSUD solutions to minimise peak stormwater flows and improve water quality;
  - iii) ensure basins, wetlands and swales have the flattest batter gradients possible, with batter gradients no steeper than 1V:5H and permit the establishment and maintenance of vegetation;
  - iv) ensure basin design eliminates the need for safety fencing;
  - v) utilise rainwater to passively irrigate landscape plantings and grassed areas through natural filtration and infiltration;
  - vi) use permeable paving where hard surfaces are required adjacent to existing mature trees; and
  - vii) provide simple WSUD solutions to minimise maintenance requirements.
- c) The Contractor must develop a WSUD strategy that demonstrates how the requirements of section 9b) will be met, which must be included in the urban and landscape Design Report.

## 10 Landscape design and Green Infrastructure

### 10.1 General

- a) The landscape planting design must 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 State Planning Policies for South Australia.
- b) The landscape design must incorporate sufficient shade trees and other landscaping elements as required to ensure achievement of, in order of precedence:

- i) any applicable requirements of the Contract Documents regarding Green Infrastructure, except for those listed below in sections 10.1b)ii) and 10.1b)iii);
  - ii) the Green Infrastructure targets included in the Green Infrastructure Assessment, if one has been prepared in the planning phase of the Project; and
  - iii) the standard Green Infrastructure targets set out in Table PR-LS-D2 10-1.
- c) The Contractor must ensure the landscape design process commences sufficiently early in the Project's design phase and is integrated with the road, rail and other infrastructure design process to ensure:
- i) road design parameters and constraints are informed by landscaping requirements;
  - ii) road design decisions facilitate the achievement of the Green Infrastructure objectives and targets (not just landscaping for "leftover" spaces);
  - iii) adequate space is provided above and below ground for tree planting, with consideration of applicable setback requirements for road, rail and other infrastructure (e.g. consider median and verge widths to allow for the inclusion of trees);
  - iv) suitable soil volumes are provided to enable healthy tree growth;
  - v) infrastructure for landscape irrigation (e.g. conduits, controllers, water meters, etc.) is integrated with civil works;
  - vi) provide desirable, usable and accessible spaces for people;
  - vii) compliment the new infrastructure and assist in its visual integration with the surrounding urban context;
  - viii) integrate stormwater design requirements including those from RD-DK-D1 "Road Drainage Design" with landscape and urban realm requirements to create safe, engaging and easily maintainable assets;
  - ix) consider CPTED principles in the selection and location of plants;
  - x) utilise trees in the public realm for shade and to minimise urban heat island effects;
  - xi) consider deciduous trees where winter sun will benefit the microclimate of an area;
  - xii) consider innovative approaches to Green Infrastructure;
  - xiii) contribute to the rehabilitation and enhancement of the landscape and to improve areas adjacent to the Project;
  - xiv) give preference to the use of local native plants and species that are suited to local conditions;
  - xv) select tree and plant species for their ultimate height and growth habits, longevity, shade and solar access, low irrigation and maintenance requirements;
  - xvi) specify trees and other plantings that eliminate weed infestation, stabilise soil, provide habitat, capture contaminants and improve amenity;
  - xvii) specify planting offset distances from all adjacent infrastructure;
  - xviii) utilise low maintenance techniques such as mulch and automatic drip irrigation;
  - xix) provide concrete edging to all grassed areas, gravel mulched areas, and garden beds in urban and township locations; and
  - xx) ensure infrastructure for landscape irrigation (e.g. conduits, controllers, water meters, etc.) is considered early in the design process and integrated with civil works.

**Table PR-LS-D2 10-1 Standard Green Infrastructure targets**

<b>Standard Green Infrastructure targets</b>
Provision of shade trees to achieve $\geq 20\%$ increase in existing canopy cover in the Site (measured at maturity).
Provision of shade trees to improve amenity for pedestrians, cyclists and public transport customers, targeting $\geq 50\%$ canopy cover (measured at maturity) over all footpaths and cycle paths in the Site, including those existing prior to the Commencement Date.
Where new or upgraded car parking areas are included in the Works, $\geq 50\%$ of vehicle spaces must have some degree of canopy cover (at maturity).
Incorporation of WSUD elements to achieve the WSUD performance targets for water quality, peak flow and flood risk as set out in Department of Environment, Water and Natural Resources: 'Water sensitive urban design'.
A minimum of 50% of new landscape plantings must be local native species suited to local conditions, having regard to future impacts of climate change.

## 10.2 Plant species palette

- a) The Contractor must provide a plant species palette which must include the species selection proposed for each planting area, plant spacings, quantities of each species, and planting offset distances from Utility Services and infrastructure for each plant species.
- b) A minimum of 50% of new landscape plantings must be local native species that are suited to local conditions, having regard to future impacts of climate change.
- c) The plant species palette required by section 10.2a) must be included in the urban and landscape Design Report.

## 10.3 Vegetation management for train operations

- a) Where the Works or Temporary Works are in the vicinity of railway lines, the Contractor must undertake a risk assessment of existing vegetation and proposed landscape treatments to identify elements that have the potential to foul train operations.
- b) This risk assessment required by section 10.3a) must be included in the urban and landscape Design Report.
- c) Vegetation that has the potential to foul train operations must be approved by the Principal prior to planting.

## 10.4 Batters

In relation to batters, the design must:

- a) be in accordance with ODASA publication Principals of Good Batter Design;
- b) ensure batters are integrated with the drainage, urban and landscape design;
- c) provide smooth, tapered transitions between cuttings, fill embankments, and existing landforms;
- d) include appropriate erosion control solutions and landscape treatments to maintain slope mass and surface stability;
- e) ensure surface treatments and gradients of batters are compatible with access and maintenance requirements;
- f) ensure that grass requiring mowing or slashing is not included on batters steeper than 1V:4H;
- g) consider the use of retaining structures and terracing to reduce the gradients of batter slopes; and
- h) ensure the design and maintenance of batters comply with the requirements of PC-EDM2 "Safety Management in Design".

## 10.5 Irrigation

- a) An irrigation strategy must be developed to identify watering requirements for plant establishment and maintenance and must identify:
  - i) stakeholder requirements;
  - ii) sources of water including the use of recycled water;
  - iii) water connection points;
  - iv) irrigation conduit locations;
  - v) watering requirements for each landscape typology; and
  - vi) maintenance requirements and responsibilities.
- b) The irrigation strategy required by section 10.5a) must be included in the urban and landscape Design Report.
- c) A detailed irrigation design must be developed based on the agreed irrigation strategy.

## 11 Maintenance provisions

- a) The Contractor must provide information to demonstrate the durability and proposed maintenance requirements of all plantings, products, coatings, finishes, and fixtures specified in the landscaping and urban design.
- b) The design must ensure safe maintenance access is incorporated as a fundamental element of the design and the following minimum requirements are achieved:
  - i) soft landscape treatments should not have high maintenance costs;
  - ii) urban design materials and components must be weatherproof and UV resistant with a minimum 20-year Design Life; and
  - iii) paint finishes must have a minimum 10-year Design Life.
- c) The following information must be included in the urban and landscape Design Report:
  - i) a maintenance and durability report demonstrating that durability and maintenance requirements have been achieved;
  - ii) a maintenance plan containing:
    - A. the maintenance activities that will be required of a contractor during the establishment and 1-3 year maintenance period; and
    - B. 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; and
  - iii) a maintenance access strategy identifying maintenance accessibility requirements for all design components.

## 12 Cost estimates

Cost estimates for all urban and landscape design components must 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 Hold Points

Table PR-LS-D1 13-1 details the review period or notification period, and type (documentation or construction quality) for each Hold Point referred to in this Master Specification Part.

**Table PR-LS-D1 13-1 Hold Points**

<b>Section reference</b>	<b>Hold Point</b>	<b>Documentation or construction quality</b>	<b>Review period or notification period</b>
4.13g)	Agreement to ongoing maintenance responsibilities for creative and cultural elements	Documentation	20 Business Days review