

TWEED VALLEY HOSPITAL NSW

SSD2 LANDSCAPE REPORT

23RD SEPTEMBER 2019



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Note: All area calculations are advisory only and all figures should be checked and verified by a licensed surveyor.

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1. EXECUTIVE SUMMARY

1.1 OVERVIEW

Tweed Valley Hospital is an opportunity to create a significant new community facility that supports the health and well-being needs of the region well into the future. The site, surrounding landscape, and architectural design calls for a landscape response that is connected with its context and seamlessly integrated into the life of the hospital.

At a strategic level, the guidelines of GANSW's 'Better Placed' and 'Greener Places' documents have informed the guiding principles for this project.

Key principles for the landscape design include:

- Biophilic design
- Celebrate Site History
- Uniquely of the place
- Legible and accessible
- Diversity of experiences; and
- Low maintenance

1.1.1 LANDSCAPE DESIGN CONSIDERATIONS

Fundamental existing site considerations in the landscape design include neighbouring land uses, existing vegetation and landscape character, existing topography, views, and heritage.

Conceptual development of the landscape language is directly connected with the architectural narrative – 'patchwork' – inspired by the dynamic matrix of farming plots when viewed from above.

Existing fields on the site inspire delineation of contrasting lawn species for visual diversity in the broader landscape, whilst a finer grain patchwork of new elements connects this language to and through the building.

Visual diversity in the patchwork narrative is created in the landscape using a range of techniques, including strong edge definition, hierarchy and repetition of line, and planting contrast.

A series of places are designed appropriate to scale and program, whilst broadly reading as a cohesive and legible patchwork of related elements. The key places are:

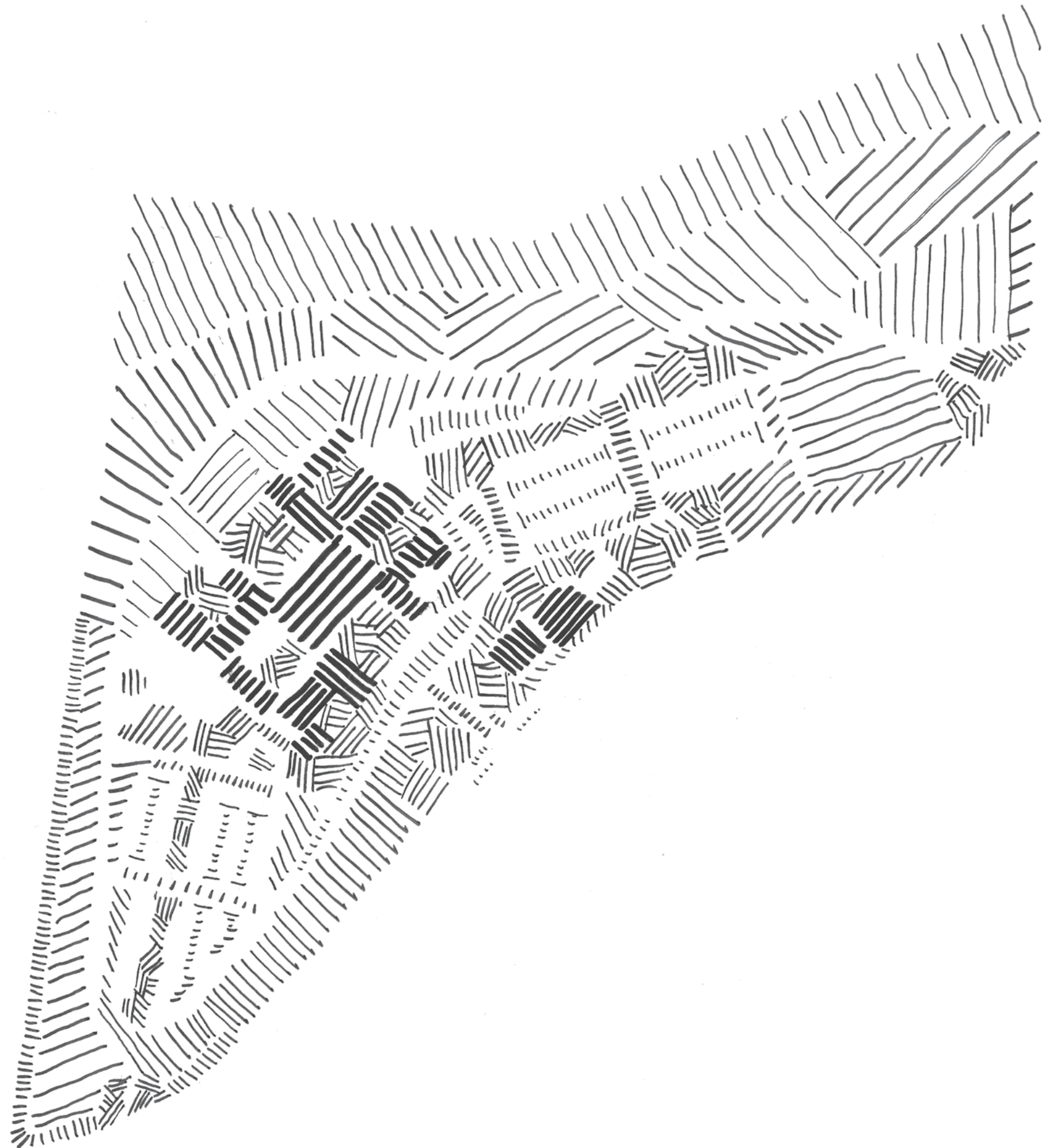
- Health Hub
- South Entry Plaza
- Viewing terrace
- Green Spine (including West Entry and East Entry)
- Courtyards
- Open lawns with clusters of trees within the APZ
- Bioretention Areas
- Vegetated Buffers

Key to health and well-being of the Hospital users is a considered approach to CPTED. Key issues considered include legibility of key movement paths, active building edges to maximise passive surveillance of external areas, and consideration of the experience both day and night.

1.1.2 MATERIAL AND PLANTING CONSIDERATIONS

Proposed landscape materials reference existing site materials and the history of the site; including the use of natural materials where appropriate, and materials that are durable, cost effective and low maintenance.

The site-wide planting palette and design has been developed to reference the many layers of site history; from the naturally occurring species that once covered the site and were important to Indigenous culture, to the more recent agricultural uses and character. Plantings are both in linear 'paddock lines', and informal to reference the natural landscape. The contrast of these planting characters creates the desired patchwork in the landscape at a range of scales. Large solitary feature trees are strategically placed to assist with wayfinding and reference the 'tree in a paddock' narrative. The species selected are typical of the farm homestead feature trees and paddock trees in the local area. There are also the 'new' layers of planting that respond to the new hospital context. This planting incorporates species with sensory values, and culinary and medicinal uses to encourage meaningful engagement with the landscape. Particular consideration is given to species that do not attract pests and cause allergies.



2. STRATEGIC CONTEXT

2.1 BETTER PLACED (GA NSW)

‘Better Placed’ outlines the Government Architect NSW (GANSW) position on the objectives and expectations when creating and designing good places. The following principles found in the Better Placed document apply directly to the Landscape Principles developed for the Tweed Valley Hospital.

CONTEXTUAL, LOCAL AND OF ITS PLACE

Local character, heritage, and community aspirations have been considered in the design development, from planning and spatial design through to materiality and planting.

SUSTAINABLE, EFFICIENT AND DURABLE

Key to the sustainable ongoing operation of the hospital is design to minimise ongoing maintenance, water sensitive design, and use of robust materials sourced locally wherever possible. Encouraging active transport modes through design is also considered key to achieving sustainable outcomes.

EQUITABLE, INCLUSIVE AND DIVERSE

A range of spatial types and experiences to meet the diverse needs of the community. High legibility and equal access throughout is key to this principle, to create a welcoming and safe place for all.

DISTINCTIVE, VISUALLY INTERESTING & APPEALING

Creating a series of distinctive places throughout the site is achieved through development of planting and material palettes that respond to their immediate context, and marker species (such as Hoop Pines and Poinciana trees) that connect with the indigenous landscape character and cultural heritage.

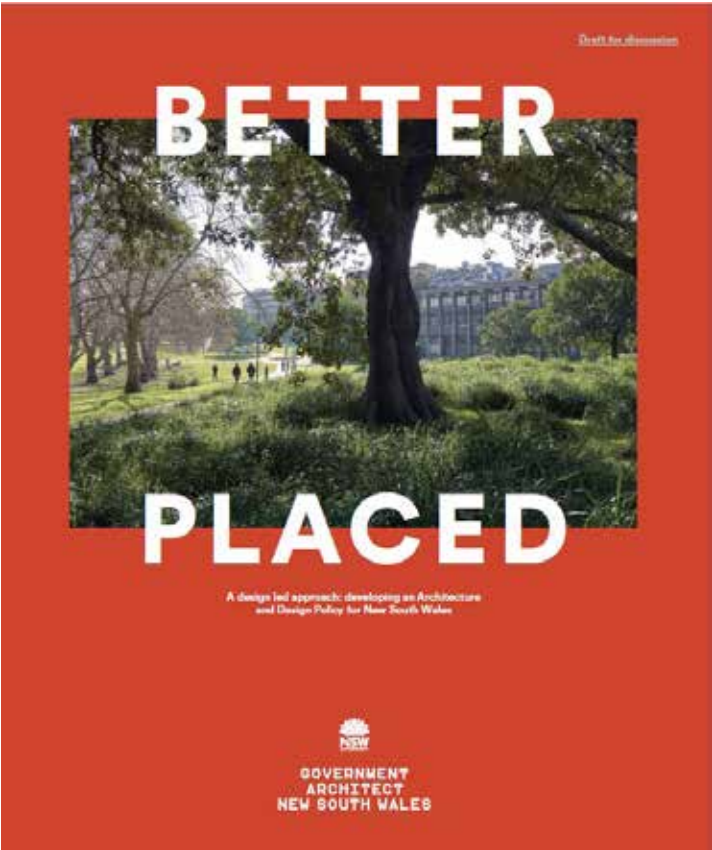


Fig 1 ‘Better Placed ’ document cover

2.2 GREENER PLACES (GA NSW)

The following principles found in the Greener Places document apply to the Landscape Principles developed for the Tweed Valley Hospital.

CONNECTIVITY

Urban connectivity has been improved with the provision of more direct active transport connections. Planting design augments existing native vegetation, and bioreflection basins / rain gardens establish stepping stone habitat connectivity across the site.

MULTIFUNCTIONALITY

The range of spaces are designed to accommodate a range of programmatic requirements and user groups. The landscape serves to provide health and well-being to the hospital population, whilst also bolstering local flora and fauna biodiversity.

PARTICIPATION

Consultation of key user groups for the hospital during the design process - including the elderly, children, the Indigenous community, and people with mental health issues - has informed design development.

ADDITIONAL NOTES

The document highlights the fact that green infrastructure can reduce stress and improve healing times – particularly relevant to this project. It also notes that Green infrastructure can reduce symptoms of depression and cardiovascular disease, foster creative play among children and walkability improves public transport inequity.

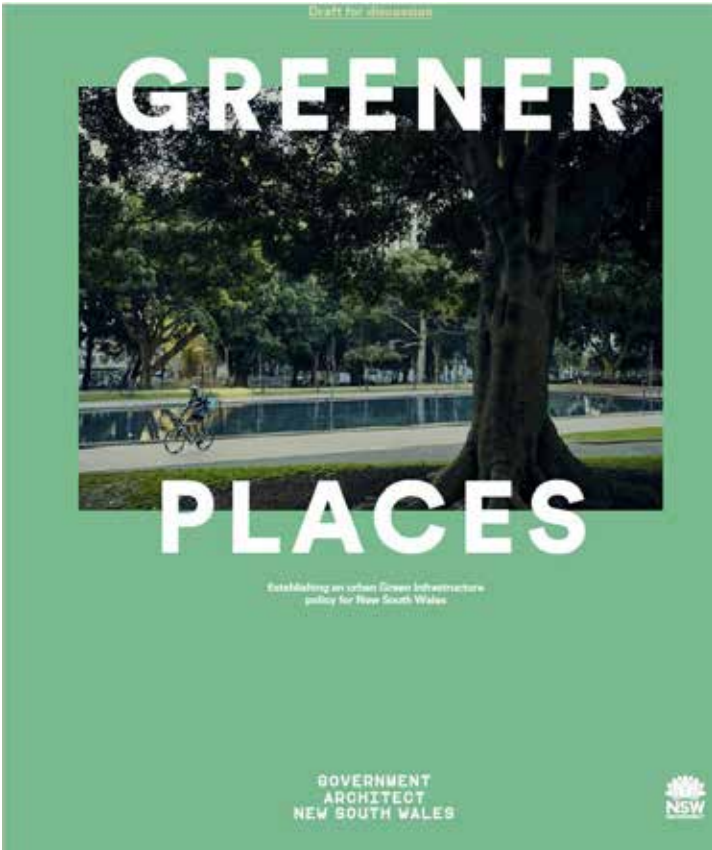


Fig 1.1 ‘Greener Places’ document cover

3. SITE CONTEXT

The site’s location on the rural-urban fringe sees the coming together of two distinctly different landscapes, and presents the opportunity for the landscape design to celebrate this diversity.

Elevated views from the site enjoy a regional catchment of mountain ranges (including Mount Warning) to the west, and coastal beaches to the east.

The immediate surrounding environment of the hospital includes dense coastal wetland forest to the north, and planting buffers to the remaining boundaries. The west boundary of the site interfaces with open rural land, and farmland is also present on the opposite side of the road in the south west corner. The remaining primary interfaces to the south and east are Kingscliff TAFE and Kingscliff Swimming Centre, respectively.

FARMLAND CONTEXT

The surrounding farmland has a strong landscape character; one of clearly defined lines and strong contrasts. The farming lots are divided by both natural features (e.g. forests, creeklines), and man-made elements (e.g. roadways, vegetated buffers). The expanse of irregularly-shaped farming lots creates a ‘patchwork’ of contrasting landscapes.



Fig 2 Landscape Patchwork Conceptual Sketch



Fig 3 Site Aerial

4. SITE ANALYSIS



Fig 3.1 Site Aerial

4.1 PATCHWORK LANDSCAPE

The site is divided up into a matrix of smaller farming plots, with characteristics in their form and definition that are typical of the wider form landscape context. In particular it is noted that the plots:

- Range in scale,
- Have strong colour contrasts (due to different crops, fallow land, etc.)
- Have predominantly linear geometry
- Both follow contour and run perpendicular to it
- Plots spatially defined by trees/vegetation, boulders, and swales



Fig 3.2 Existing treeline along Cudgen Road

4.2 ROADSIDE TREELINE

The vegetation buffer to street edge has very limited ecological value, with the presence of many exotic and weed species.

Clearing of areas where required for access is not considered to be an issue from ecological perspective. However, this vegetation has the potential to provide valuable visual screening, agricultural buffer and visual amenity in certain areas.



Fig 3.3 Heritage Stone Walls

4.3 STONE WALLS

Significance of existing stone walls has been assessed by a Heritage specialist. Refer to the 'Historic Heritage Assessment Tweed Valley Hospital Stage SSD2' by Niche Environment and Heritage



Fig 3.4 Stone Boulders on site

4.4 STONE BOULDERS

A large amount of loose rock is present throughout the site. It is assumed that these boulders have been cleared from the fields to prevent damage to farming machinery. These boulders have been recognised for their potential reuse in the landscape, e.g. in bioretention gardens to mitigate flow velocity.



Fig 3.5 Existing Fig on Cudgen Road

4.5 LARGE FIG

A large Fig (*Ficus benjamina*) at the existing site entry on Cudgen Rd is classified as being of high retention value. It is recognised for its potential to become a feature of the Hospital arrival experience. Refer to Arborist Report for additional information.



Fig 3.6 Existing Poinciana

4.6 LARGE POINCIANA

Moderate value Poinciana tree noted for its exemplary form and recognised for its potential to be transplanted and used as an iconic feature of the hospital.



Fig 3.7 Custard Apple Orchard

4.7 CUSTARD APPLE ORCHARD

Opportunity for retention of custard apple orchard was identified early in the design process.

5. EXISTING VEGETATION

Trees with moderate to high retention value have been retained wherever possible. Two trees of moderate retention value will likely be removed due to the new internal road alignment. Salvage and relocation of the existing Poinciana (Tree 3 – refer arborist report) is being considered. It has an exemplary form and would bring immediate shade and sense of place to the entry plaza. It also brings with it a story of site history and memory that can be celebrated.

The current landscape proposal will see a significant net increase in total trees on the site, which will include a diverse mix of native tree species at densities appropriate to landscaping requirements (including APZ, agricultural buffers, sight lines).

Refer to Arborist Report and Biodiversity Management Plan for further information.



Fig 4 Site Imagery: Existing Vegetation

6. LANDSCAPE PRINCIPLES



DIVERSITY OF EXPERIENCES
A landscape that responds to a diversity spaces and microclimates throughout the site to create an overall journey of unique destinations rich in experience.



BIOPHILIC DESIGN
Creation of a landscape that will reduce stress, improve well-being and expedite healing



CELEBRATE SITE HISTORY
A landscape that recognises the versatility of site history and works to integrate this diversity into the design.



LOW MAINTENANCE
A landscape that minimises ongoing maintenance inputs to ensure sustainability of the facility.



UNIQUELY OF THE PLACE
A landscape that resonates with the local community and connects with its landscape context.



LEGIBLE AND ACCESSIBLE
Key to a hospital environment, a landscape that guides people with clarity and ease.

7. DESIGN NARRATIVE

The landscape design takes inspiration from the rural 'patchwork' of farming plots, creating a series of well-defined spaces, distinctly different in character and experience, yet stitched together to create a strong sense of place.

The various places created respond to their context and have a reducing grain size depending on their proximity to the hospital building and spatial definition.

A range of techniques are used to develop a patchwork language for the finer scale, including:

- Contrasting planting,
- Arrangement of planting/paving/furniture as rhythmic series of elements with complementary forms



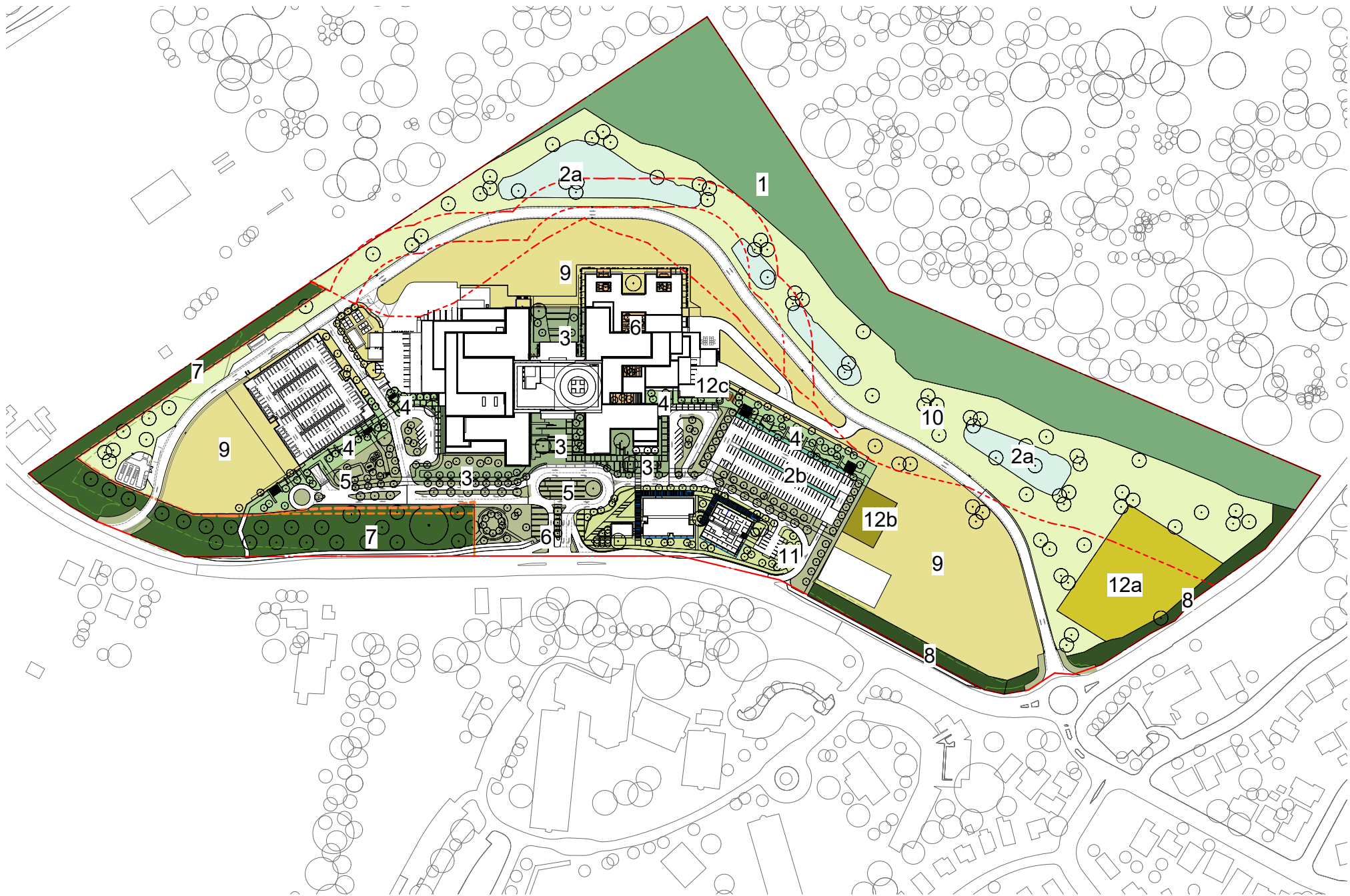
Fig 5.1 Patchwork conceptual sketch



Fig 5.2- 5.4 Precedent Imagery



8. LANDSCAPE MASTERPLAN



LEGEND
















	1. Retained forest - Restored and enhanced in accordance with Biodiversity Management Plan		4. Green Spine		8. Embellished Buffer - Embellished in accordance with Biodiversity Management Plan		12a. Existing Orchard
	2a. Bioretention planting		5. Feature Entries/Hospital landscape fringe		9. Hydromulched/drill seeded lawn (Exotic grass-mowing maintenance eg. couch, buffalo)		12b. Community Garden Opportunity
	2b. Rain Gardens		6. Landscaped courtyards within hospital envelope		10. Lawn with clusters of native planting		12c. Therapy garden Opportunity
	3. Hospital landscape		7. Vegetated buffer		11. Health Hub / Support Building		

Fig 6.1 Landscape Zonal Plan

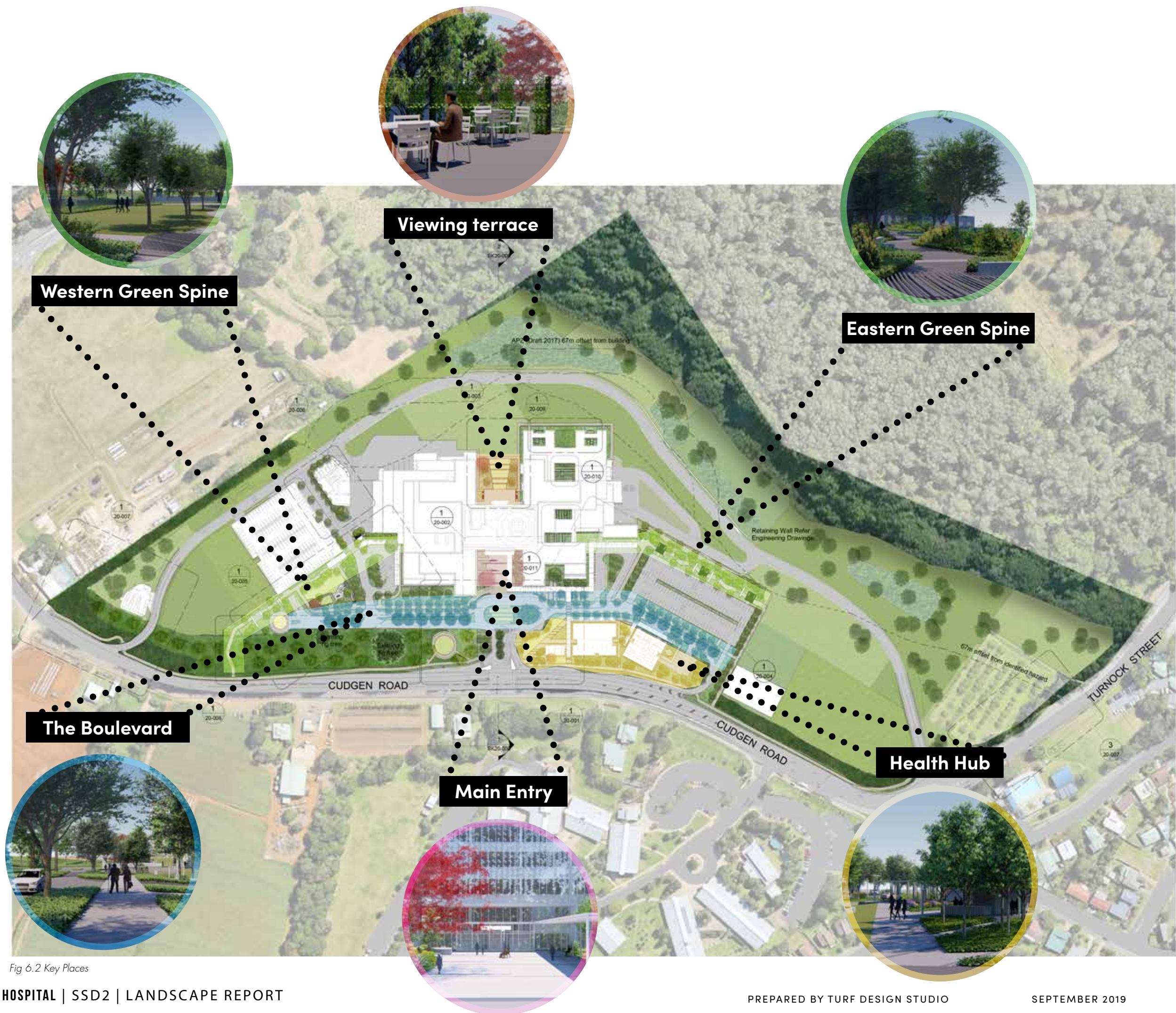


Fig 6.2 Key Places

9. KEY PLACES

9.1 HEALTH HUB

The Health Hub landscape importantly welcomes people arriving by bus or active transport to the hospital. Clear and direct pathways draw people through the space to the pedestrian crossing, and then on to the main building entry.

The hub is accompanied by open lawns and low planting, ensuring a clear line of site between arrival and destination. Gentle grades from the main hospital entry to the health hub ensure that there is equal access for all.

Design of the Indigenous Courtyard is being undertaken in close collaboration with representatives of the local indigenous community (Design TBA). This area will be specifically considered as a focus for Indigenous cultural interpretation, which may be represented through the landscape materials, detailing, and planting. The design and concept are indicative only, pending further consultation and confirmation with community groups.



Fig 7 Health Hub Lumion Imagery (planting indicative of 5+ year growth)



Fig 7.1 Rendered Plan 1:400@A3

LEGEND

	Lawn		In-situ Concrete Paving		Seating with Backrest (50% of the total length)
	Roadway		Planting		Lighting (TBC)
	Concrete unit paving		Proposed Trees		Pergola / Shelter Above

9.2 THE BOULEVARD

A boulevard connects the length of the site in parallel to the Green Spine and Cudgen Road, providing a landscaped pedestrian and public vehicle access route through the site. The east-west axis is strengthened by central median of Hoop Pines. Smaller shade trees and lush understorey planting combine to frame generously proportioned, shaded pedestrian walks.

Future development to the east will see a continuation of the Boulevard, including parallel parking in 'urban' conditions for convenience and to create genuine street conditions.

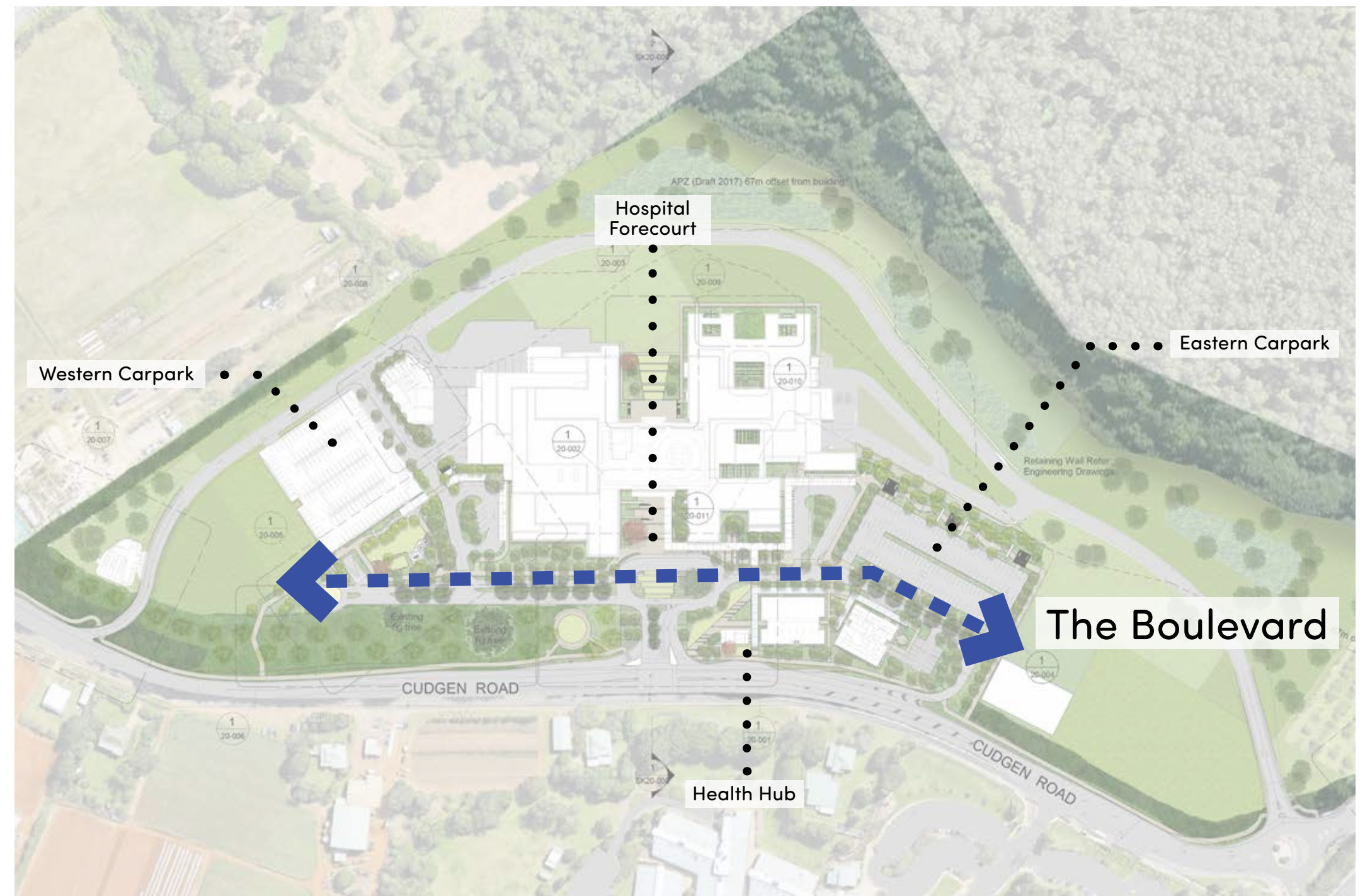
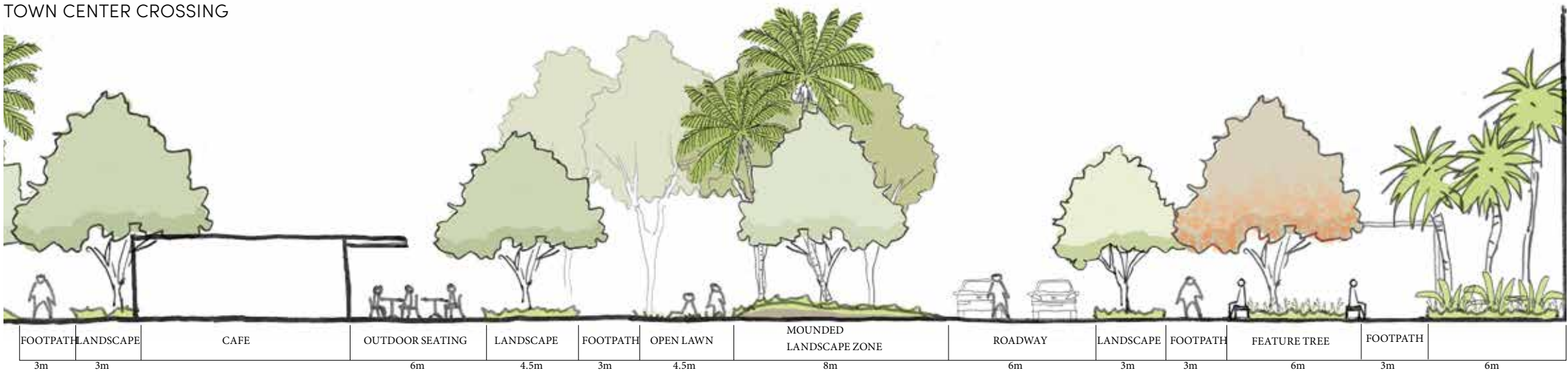
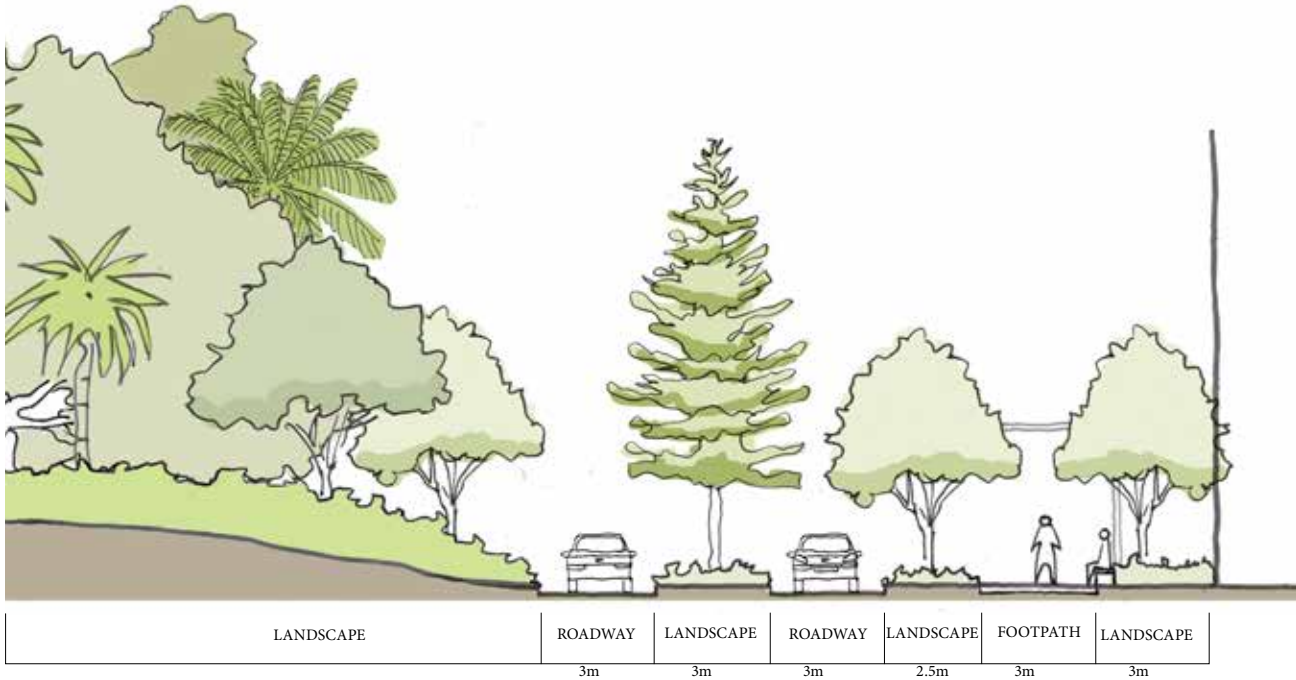


Fig 8 The Boulevard diagram (not to scale)

TOWN CENTER CROSSING



FOREST EDGE CONDITION



URBAN CONDITION - (FUTURE STAGES)

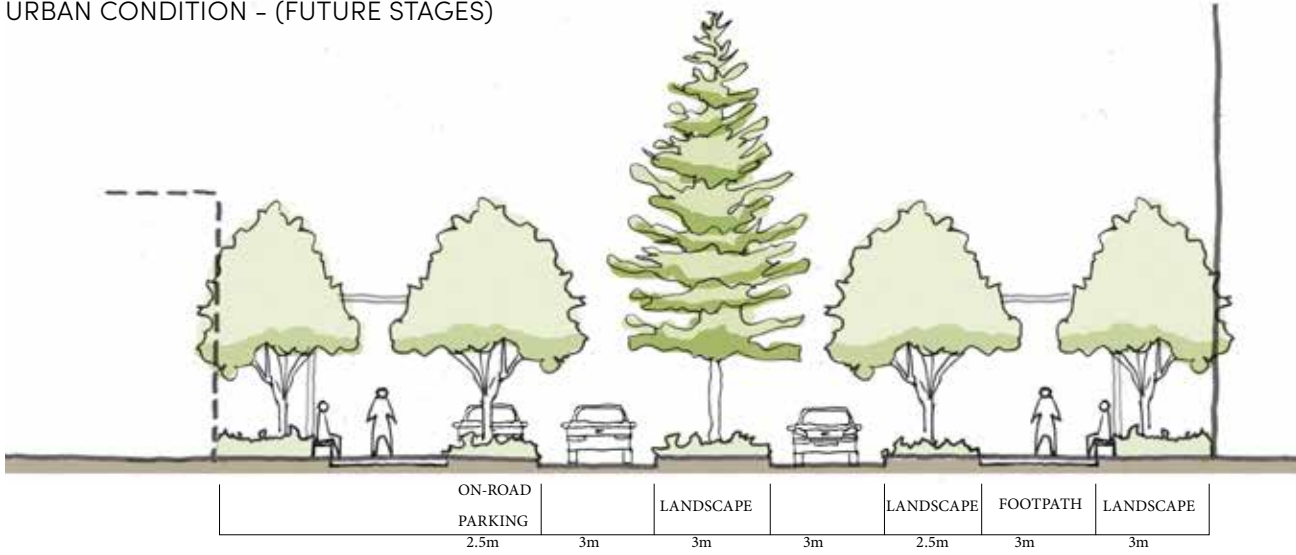


Fig 8.1 Walkway shaded and framed by trees



Fig 8.2 Walkway with places to pause

9.3 SOUTH ENTRY PLAZA

The main building entry, this plaza provides a highly legible connection to the internal lobby.

Landscape frames a direct connection to the central entry, exhibiting the contrasting landscapes of natural forest (on the eastern edge) and structured landscape of the surrounding farmlands (on the western edge). The two landscapes combine to give the space visual interest and diversity. A Poinciana tree features in the SW corner of the space – visible on approach via both the road and pedestrian routes, contributing to wayfinding, and collocated with seating to offer shaded respite at the street edge. Location of this feature tree (and others throughout the proposed design) also pays homage to the typical use of an exotic feature tree within the front yard of a rural homestead to bring a human scale, colour and a sense of care to the large scale open fields beyond.

Banded paving continues the patchwork design narrative characteristic of key pathways through the site – increased in scale appropriate to the proportions of the space.

Seating is provided to the edges of the space, immersed within the planting for environmental comfort and to heighten connections with the landscape. Clutter is minimised within the central plaza space for efficient movement through the space and to allow for flexible programming (such as market/information stalls, gathering of larger groups for bus pickup, etc.)

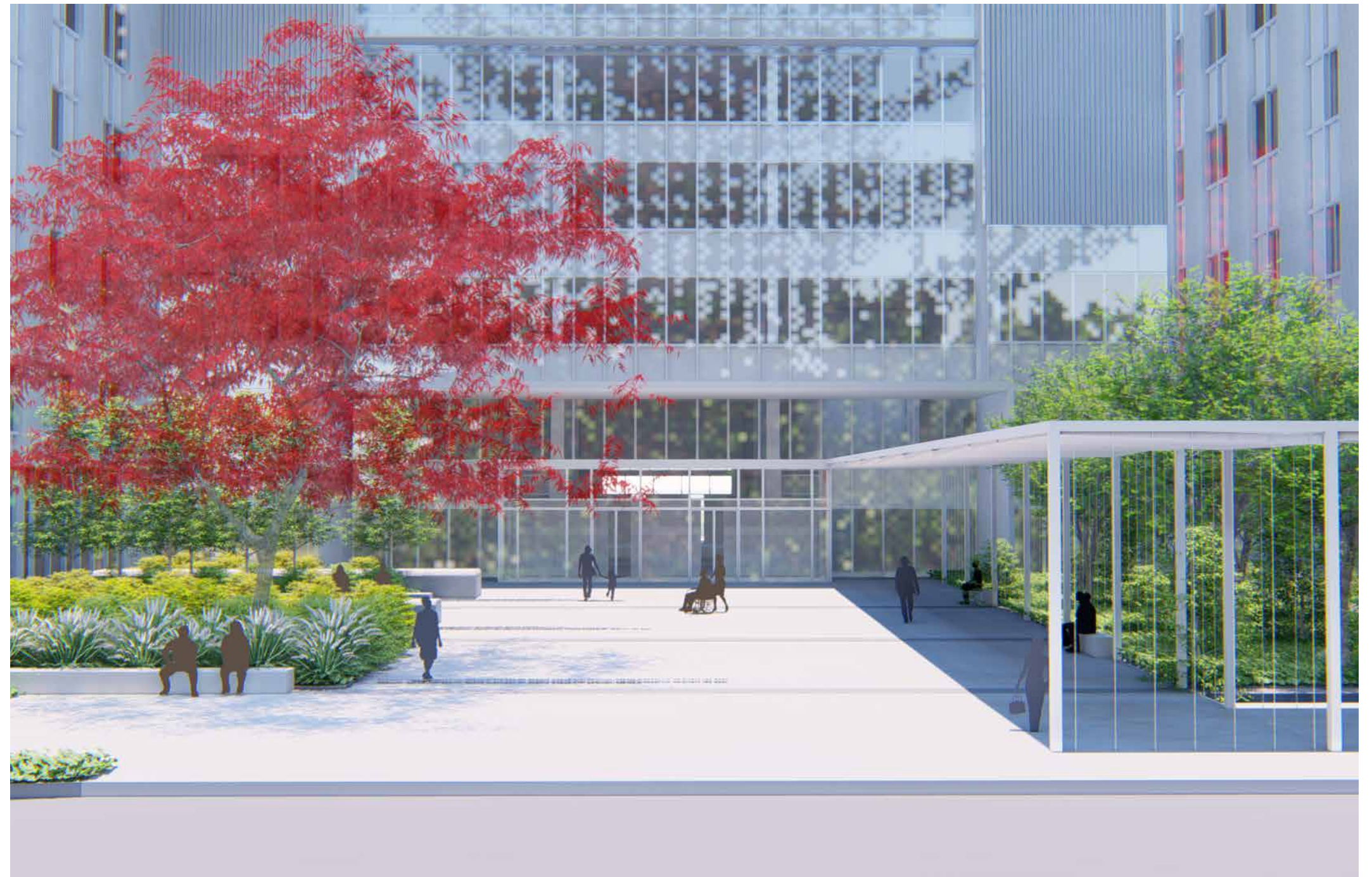


Fig 9. South Entry Plaza Lumion Imagery (planting indicative of 5+ year growth)



LEGEND

	Lawn		In-situ Concrete Paving		Seating with Backrest (50% of the total length)
	Roadway		Planting		Lighting (TBC)
	Concrete unit paving		Proposed Trees		Pergola / Shelter Above



Fig 9.2 Rendered Section 1:400@a3

9.4 VIEWING TERRACE

The Viewing terrace captures the idealic views of the Tweed Valley Landscape, offering grand visual amenity for staff, visitors and patients.

The Viewing terrace offers visitors a comfortable space within an accessible distance of the hospital. A screening structure frames the edges of a paved seating space. The screening defines the outdoor seating area, which provides a space for visitors to sit and enjoy the panoramic views outward. The screen also serves a balustrade between the terrace and adjacent hospital windows, ensuring privacy and safety for those inside and out. The screen will be greened by climbing plants, delivering contrast to the urban hospital facade behind, whilst complimenting the landscaped areas nearby.

A sloped lawn leads outwards to the green pastures beyond and is buffered by sloped low-level planting on the eastern and western edges. Light canopy coverage compliments the bushland beyond and adheres to the standards required for landscaping within an APZ.

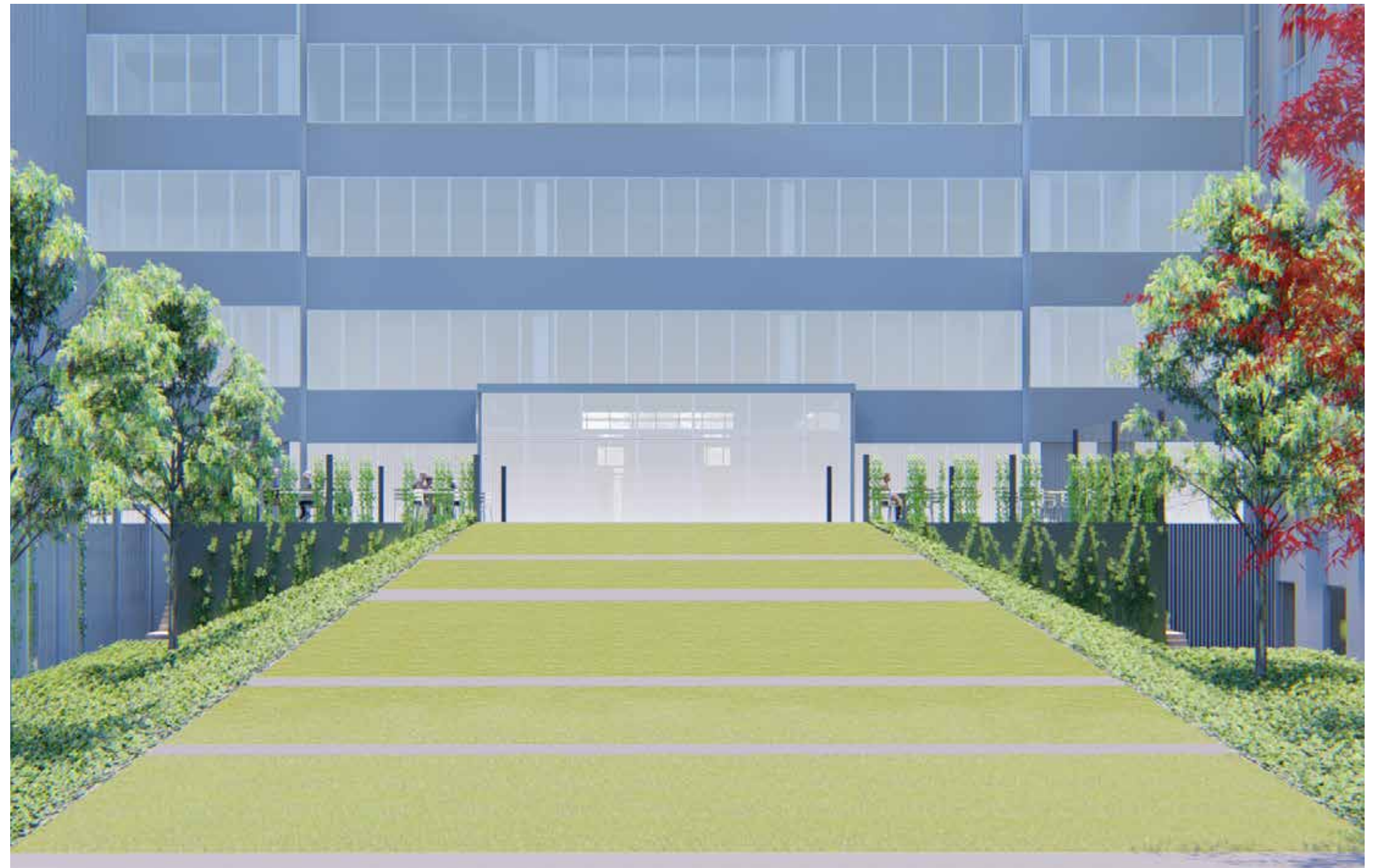


Fig 10. Viewing terrace Lumion Imagery (planting indicative of 5+ year growth)

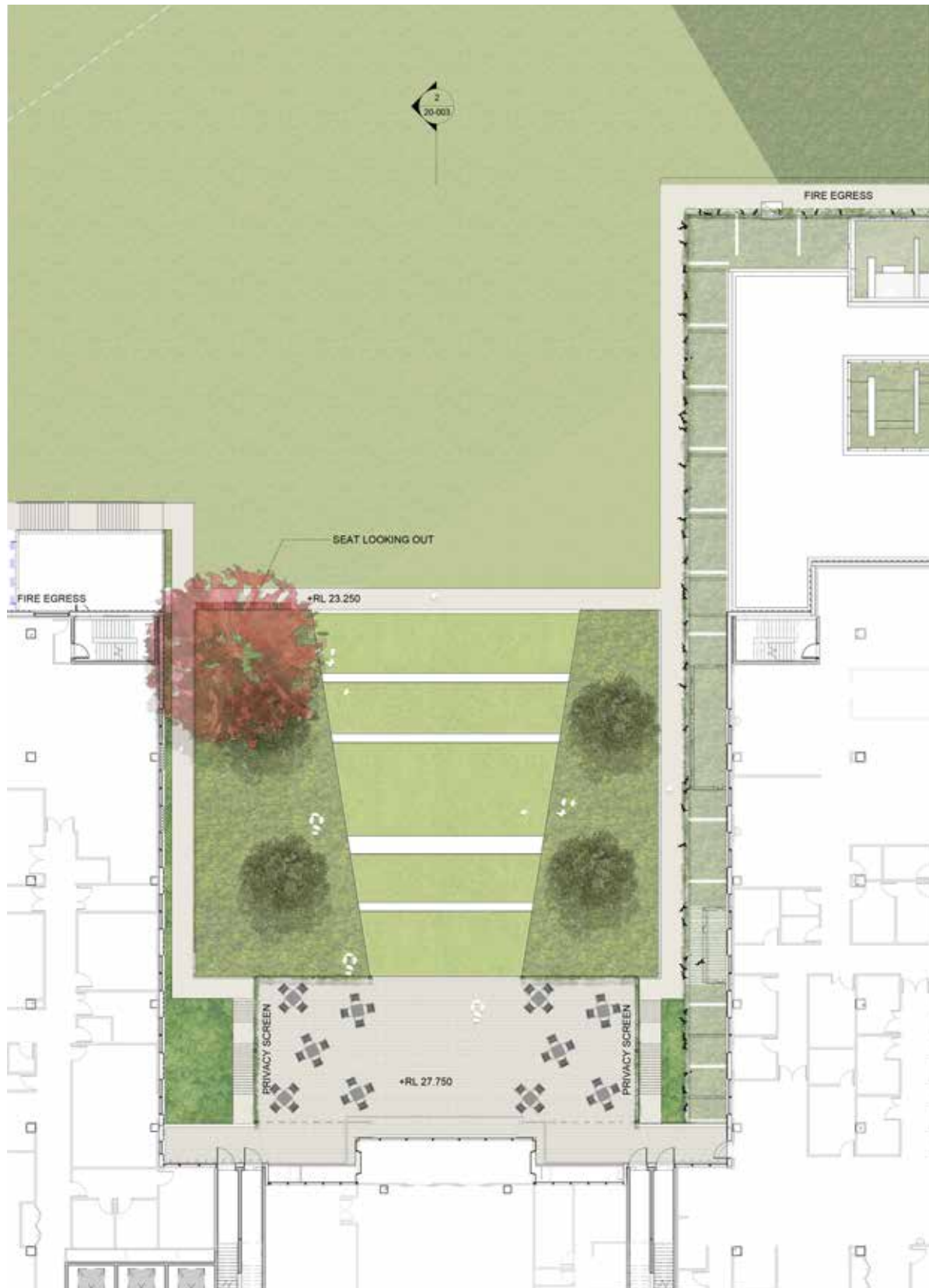


Fig 10.1 Rendered Plan 1:400@a3

LEGEND

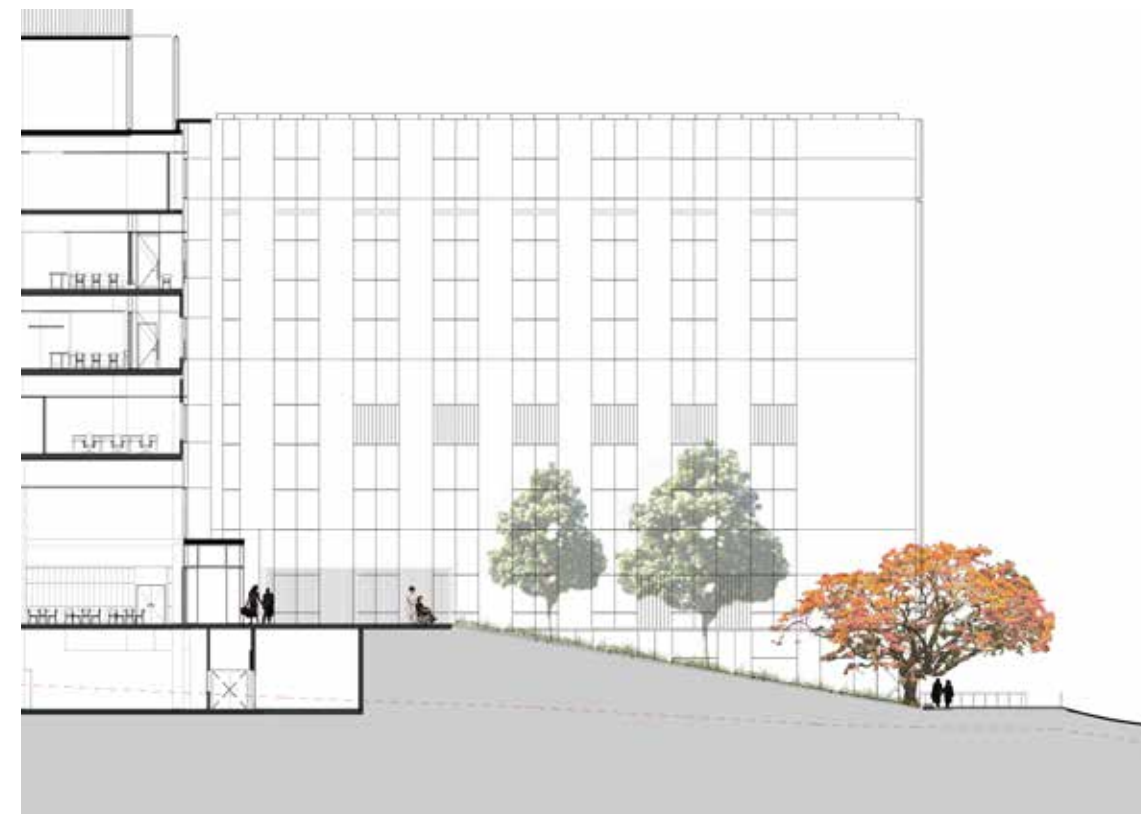


Fig 10.2 Rendered Section 1:400@a3

9.5 WEST ENTRY AND GREEN SPINE

The west entry is designed to create a sense landscape connectivity between inside and out. The green spine connection from the multi-deck car park to the hospital entry frames the approach with greenery, before opening out to a more generous plaza space at the doorstep. Views of greenery from the internal courtyard draws people into the building, and continues the sense of landscape immersion.

A weather protected structure extends from the entry to frame views and guide movement toward the car park. The West Entry also leads to the Village Green- a flexible open lawn space for active recreation. The Green will contain an open lawn for recreation, seating for viewing and respite, as well as a modified sports court for basketball. The West Entry also includes the Pet Visitation area, a safe space where patients can interact with their pets.












Fig 12. West Entry Lumion Imagery (planting indicative of 5+ year growth)



Fig 12.1 Rendered Plan 1:400 @A3

LEGEND

	Lawn		In-situ Concrete Paving
	Roadway		Planting
	Concrete unit paving		Proposed Trees
	Seating with Backrest (50% of the total length)		
	Lighting (TBC)		
	Pergola / Shelter Above		

9.6 EAST ENTRY AND GREEN SPINE

The East Entry reflects the design of the West Entry, connecting people from the eastern car park and drop-off.

An eastern green spine connection delivers a comfortable pedestrian journey from car park to hospital entry. Raised thresholds define pedestrian crossings and encourage circulation towards the weather protected structure.

The Eastern Green Spine serves a similar function to the Western, offering pedestrian connections between the single story car park and the hospital. In the east a wide planted area buffers the pathway, deterring movement down the adjacent embankment towards the roads designated for emergency vehicles. Along the length of the eastern spine, seating will be provided. This amenity is useful for those who may need to take intermittent breaks when moving between the hospital and other spaces.

Future development of the eastern portion will see an extension of the Green Spine to connect with new landscape spaces and buildings.



Fig 11.1 Eastern Green Spine Lumion Imagery (planting indicative of 5+ year growth)



Fig 12.1 Rendered Plan 1:400@a3

LEGEND



Fig 12.2 Rendered Section 1:400@a3

9.9 COURTYARDS

Internal courtyards have been designed to bring light and greenery into the building, supporting the overarching objective to connect people (physically and visually) with landscape to improve health and well-being and assist with recovery. This diversity of orientation, wind conditions and solar access brings climate resilience to the landscape by establishing varying microclimates at any given time.

The courtyards are designed to maximise greenery and access to natural light, whilst providing equal access pathways and seating to encourage habitation of the spaces where appropriate. Planting is arranged to create filtered views between the inside/outside interface where possible, to assist with the sense of privacy for people both inside and out. The various courtyard spaces have a range of microclimates, which influences plant species selection. The proposed species selection creates a predominantly green aesthetic, with diversity achieved through shades and textures to create a patchwork of gully rainforest species, connecting with the broader patchwork design narrative.

Where appropriate (e.g. mental health courtyards) species selection includes plants that provide opportunities for engagement with care and maintenance.

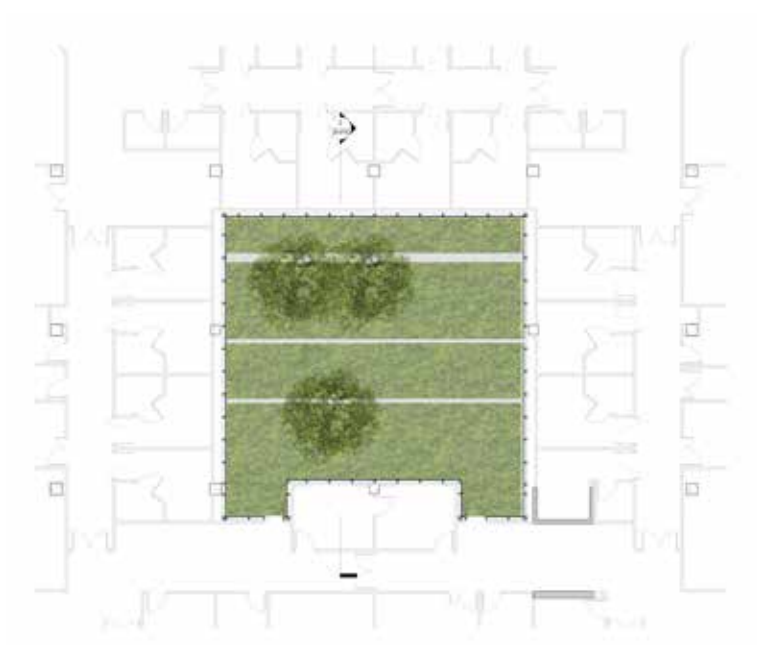


Fig 13.1 Ground Level Terraces Plan (not to scale)



Fig 13.2 Ground Level Terraces Plan (not to scale)

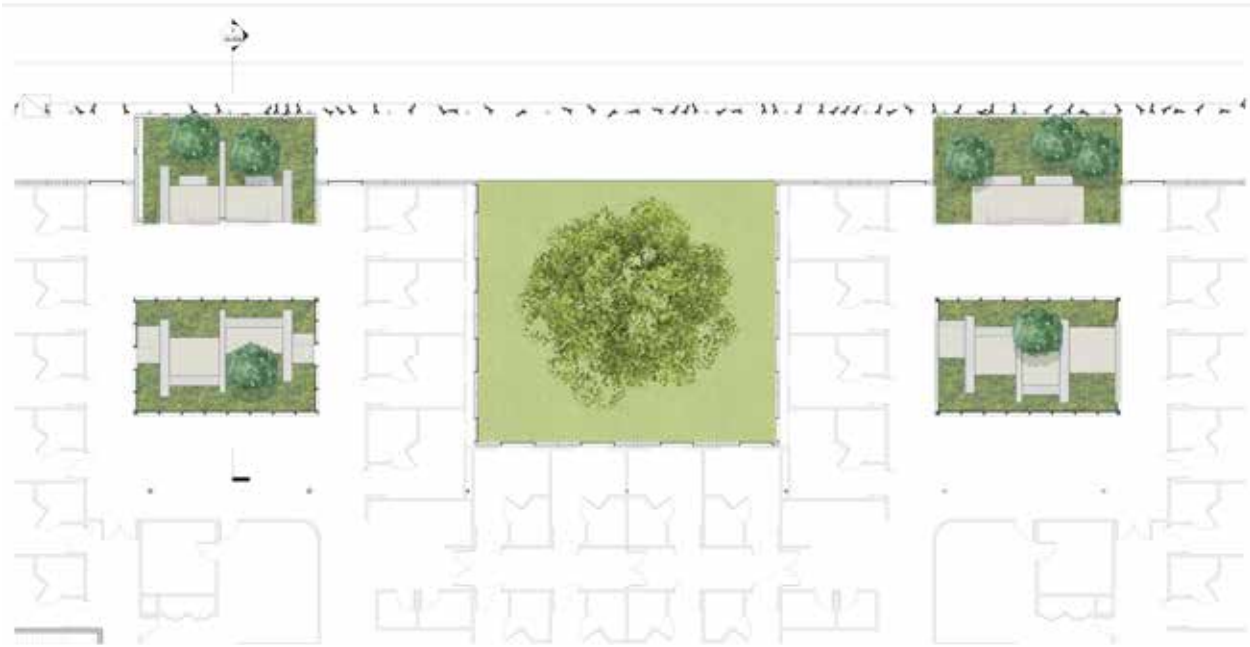


Fig 13.3 Lower Ground Courtyards Rendered Plan (not to scale)

LEGEND

Lawn

Roadway

Concrete unit paving

Seating with Backrest (50% of the total length)

Lighting (TBC)

Pergola / Shelter Above

In-situ Concrete Paving

Planting

Proposed Trees



Fig 13.4 Lower Ground Terraces & Courtyards Plan 1:400@a3



Fig 13.5 Southern Courtyards Lower Ground Plan 1:400@a3



Fig 13.6 Southern Courtyard Lower Ground Section 1:400@a3

9.10 OPEN LAWNS WITH CLUSTERS OF TREES (WITHIN APZ)

The landscape area north of the building is subject to an Asset Protection Zone (APZ) of 67m; comprised of an Inner Protection Area (IPA) of 47m and an Outer Protection Area (OPA) of 20m. The APZ extends from the north-east, north and north-west facades.

Landscape design within these areas must be in accordance with the APZ standards provided in “Planning For Bush Fire Protection” by NSW Rural Fire Service, Aug 2018, p116-117, as follows:

INNER PROTECTION AREA (IPA) – 47M

The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the dwelling, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees:

- Canopy cover should be less than 15% (at maturity)
- Trees (at maturity) should not touch or overhang the building
- Lower limbs should be removed up to a height of 2m above ground
- Canopies should be separated by 2 to 5m
- Preference should be given to smooth barked and evergreen trees.

Shrubs:

- Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings
- Shrubs should not be located under trees
- Shrubs should not form more than 10% ground cover
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass:

- Should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- Leaves and vegetation debris should be removed.

OUTER PROTECTION AREA (OPA) – 20M

An OPA is located between the IPA and the unmanaged vegetation. Vegetation within the OPA can be managed to a more moderate level. The reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathways to crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

In practical terms the OPA is an area where there is maintenance of the understorey and some separation in the canopy.

When establishing and maintaining an OPA the following requirements apply:

Trees:

- Tree canopy cover should be less than 30%
- Trees should have canopy separation
- Canopies should be separated by 2 to 5m

Shrubs:

- Shrubs should not form a continuous canopy
- Shrubs should form no more than 20% of ground cover

Grass:

- Should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- Leaf and other debris should be mown, slashed or mulched.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA to the standards given above should be undertaken on an annual basis, in advance of the fire season, as a minimum.

9.10.1 LANDSCAPE RESPONSE TO APZ

The landscape design for these areas acknowledges the need to minimise ongoing maintenance inputs, and responds with the proposal for predominantly open lawns, with sporadic planting of a mix of appropriate trees species that connect with the landscape character of adjacent forest. Planting of individual trees with generous spacing enables efficient mowing maintenance. To connect with the patchwork design narrative and landscape context, the existing delineation of different paddocks across the site is defined by a change in lawn species, providing a subtle contrast of textures and green hues across the site. These different lawn species require delineation with another element to prevent migration of the lawns together, and loss of strong edge definition over time. A combination of stone boulders (salvaged from within the site in existing swales) and discontinuous shrub lines will define this edge.

It is noted that future expansion of the hospital may occur both west and east of the current proposed building footprint. To ensure future-proofing of the landscape, the above APZ requirements have been adhered to for the entire landscape interface with existing forest to the north (i.e. within a 67m offset from the existing tree trunk line).

9.11 BIORETENTION AREAS

Existing sediment basins (constructed to capture and treat stormwater on site during construction) will be converted into bioretention basins that will capture and treat stormwater on the Site for the operational life of the project.

Bioretention planting will manage and filter site stormwater through a diverse mix of species adaptable to wet and dry conditions. Species selection is in accordance with recommendations of the project ecologist and bushfire consultant. Maximising species diversity will optimise resilience.

The batters and outlet areas will be planted out with a hard edge of Lomandra longifolia planted in three rows 0.5 m apart with staggered spacings at 1.0 m to discourage breeding of cane toads, in accordance with the Biodiversity Management Plan. Refer BMP for further details, including temporary cane toad fencing requirements.

CODE	BOTANICAL NAME	COMMON NAME	APPROX. HEIGHT AT INSTALLATION	SIZE AT MATURITY (HxS)
Bioretention Planting				
	Baloskion tetraphyllum subsp. Meiostachyum	Plume Rush	0.2m (tubestock)	0.5-1.6m x 0.6m
	Carex appressa	Tall Sedge	0.2m (tubestock)	0.8m
	Cyperus exaltatus	Tall Flatsedge	0.2m (tubestock)	1-1.8m
	Cyperus polystachyos	Sedge	0.2m (tubestock)	0.8m
	Ficinia nodosa	Knobby Club-rush	0.2m (tubestock)	1mx1m
	Juncus continuus	Rush	0.2m (tubestock)	1m
	Juncus prismatocarpus	Branching Rush	0.2m (tubestock)	0.6mx1m
	Juncus usitatus	Common Rush	0.2m (tubestock)	1m
	Lepironia articulata	Rush	0.2m (tubestock)	2m
	Leptospermum polygalifolium subsp. polygalifolium	Teatree	0.2m (tubestock)	3mx3m
	Lomandra longifolia	Spiny-head Mat Rush	0.2m (tubestock)	1mx0.6m
	Schoenoplectiella mucronata	Rush	0.2m (tubestock)	1m

9.12 VEGETATED BUFFERS

Vegetated buffers are designed in accordance with the requirements outlined in the Land Use Conflict Risk Assessment, as follows:

Criteria for all buffers:

- Include species with long, thin and rough foliage which facilitates the more efficient capture of spray droplets;
- Provide a permeable barrier which allows air to pass through the buffer. A
- Porosity of 0.5 is acceptable (approximately 50% of the screen should be air space);
- Foliage is from the base to the crown;
- Include species which are fast growing and hardy; and
- Have a mature tree height at least 3m;

Specific requirement for the 30m buffer along southern boundary:

- Contain random plantings of a variety of tree and shrub species of differing growth habits, at spacings of 4–5 m for a minimum width of 30 m.

Specific requirement for the 10m buffer along southern boundary:

- To be installed between the existing row of mixed trees and shrubs on the western and south-western boundary of the Project Site to form an improved vegetative screen
- Contain random plantings of a variety of tree and shrub species of differing growth habits, at spacings of 2–3 m for a minimum width of 10 m

Species selection for the buffer is comprised of a diverse mix of large shrubs/small trees from the project ecologist’s species list to achieve the above criteria whilst also making a contribution to habitat and biodiversity.

A mix of tall eucalypt canopy trees are included in these areas to provide vegetation in the upper stratum and achieve visual diversity. Generous spacing of these larger canopy trees ensures views to the hospital building and associated wayfinding elements is retained in perpetuity, and solar access to buffer vegetation below for healthy growth.

Where movement through the buffer is required for road / pathway access to the site, the alignment has been designed to ensure adequate buffering with vegetation is achieved.

CODE	BOTANICAL NAME	COMMON NAME	APPROX. HEIGHT AT INSTALLATION	SIZE AT MATURITY (HxS)
Vegetated Buffers				
	Eucalyptus microcorys	Tallowwood	1.5m high (45ltr)	20m+ x 8m
	Eucalyptus propinqua	Small-fruited Grey Gum	1.5m high (45ltr)	20m+ x 8m
	Cryptocarya laevigata	Red-fruited Laurel	1.5m high (45ltr)	2m
	Eupomatia laurina	Bolwarra	1.5m high (45ltr)	2.5m
	Hibiscus tiliaceus	Cottonwood Hibiscus	1.5m high (45ltr)	8m x 6m
	Notelaea longifolia	Large Mock-olive	1.5m high (45ltr)	6m
	Polyscias sambucifolia subsp. Short leaflets	Elderberry Panax	1.5m high (45ltr)	5m x 2m
	Stenocarpus salignus	Scrub Beefwood	1.5m high (45ltr)	10m+ x 7m+
	Syzygium australe	Brush Cherry	1.5m high (45ltr)	8mx6m

10. CONNECTIVITY AND PATH NETWORK

The abovementioned places are connected via a series of paths that combine to create a legible movement network throughout the hospital. All pathway connections provide efficient connections between buildings, and are equal access. The pathways offer a range of variable-length circuits that have been designed to promote health and well-being through engagement with the landscape.



LEGEND
















-  Existing On-road Shared Path
 Existing Off-road Shared Path
 Proposed Off-road Shared Path
 Existing Crossing
 Proposed Crossing
-  Cycle Route
 Main Pedestrian Route: Drop-off + Bus Stop to Entry
 Secondary Pedestrian Route: Car Parking to Entry
 Pedestrian Route: Street to Entry
-  Connector Pedestrian Route: Connections between paths to form circuits
 Access from Car Parking
 Bus Stop
-  Gathering & Social Spaces
 Civic Spaces
 Cycle End of Trip: Bike Storage

Fig 15.2 Walking Routes - 5 min

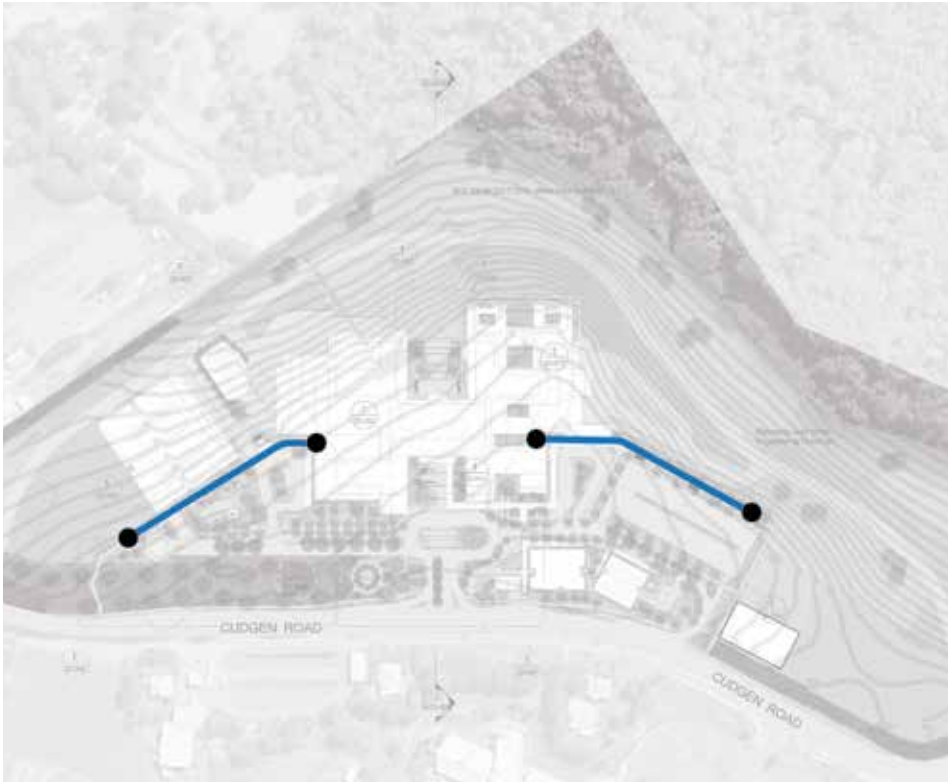


Fig 15.3 Walking Routes - 10 min

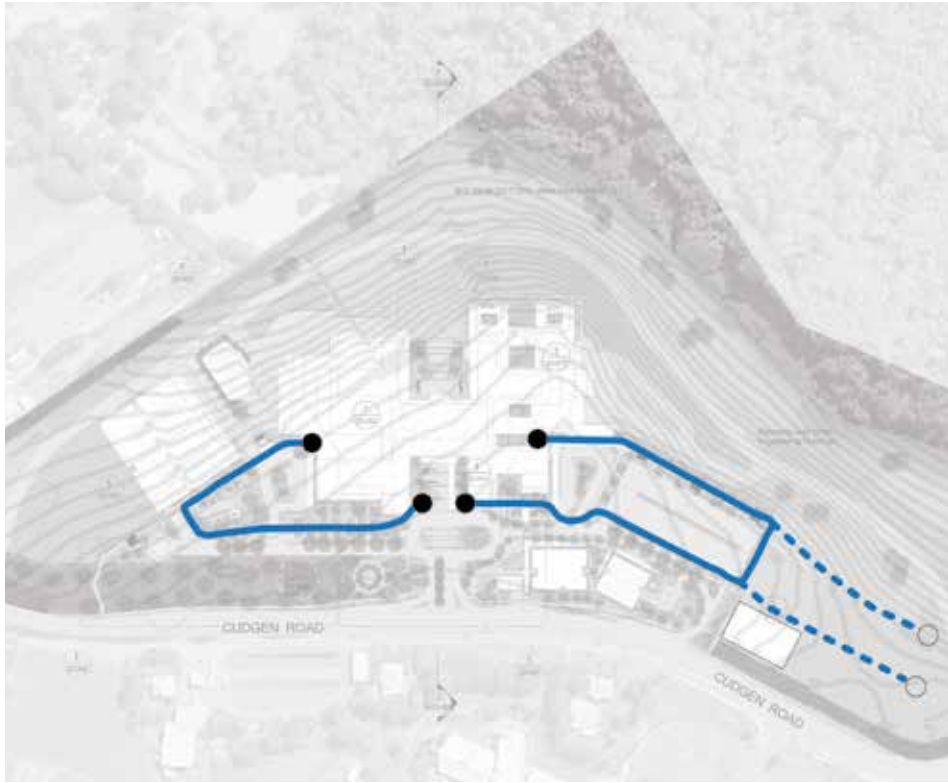


Fig 15.4 Walking Routes - 15 min



11. MATERIALS, FURNITURE AND FIXTURES

11.1 PAVING

The ratio of paving to planting has been considered throughout the design to maximise greenery and permeable surfaces wherever possible to optimise the sense of immersion in landscape, and minimise heat gain and water runoff. Appropriate path widths are provided throughout, specific to their program requirements and pedestrian volumes. Detailing of the paving reflects the overarching patchwork' design narrative.

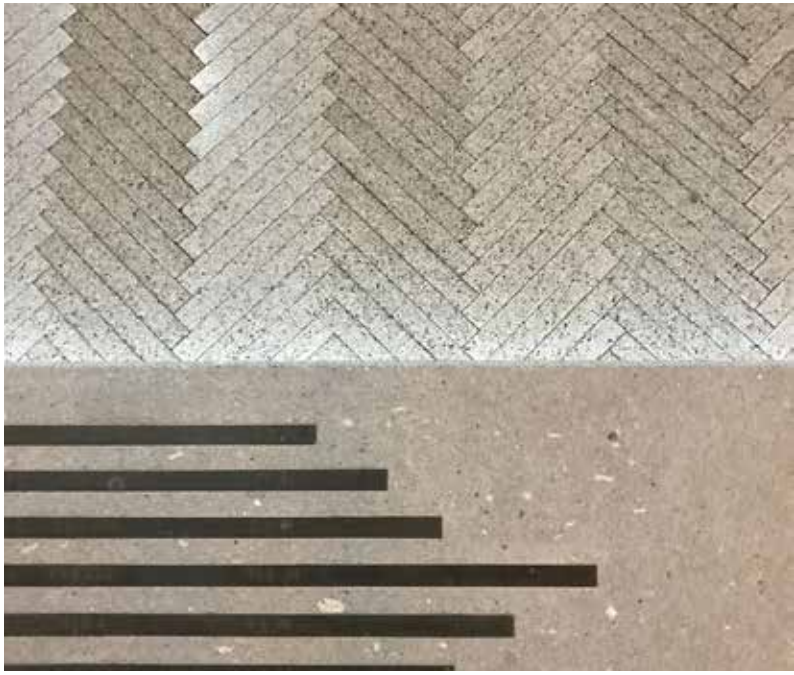


Fig 16.1 - 16.3 Precedent Imagery: material and pavement condition

11.2 SEATING

Seating is designed to provide comfort for all users. Backrests and armrests are provided to at least 50% of formal seating in every space, to encourage longer periods of use.

11.3 LIGHTING

Lighting is designed to ensure safe use of the hospital at all times of the day. A hierarchy of lighting levels assists with wayfinding along primary movement paths at night. Energy efficient lighting assists with minimising ongoing operational costs and ESD.

Pole mounted lighting is located to minimise conflict with key desire lines through external spaces, and light spill to adjacent areas is minimised with the use of directional fittings and shielding to direct light to appropriate locations.

Refer External Lighting Strategy Report for further information on lighting classifications for each area.



Fig 16.4 Backrest Seating with shade amenity

11.5 RETAINING WALLS

The visual impact of retaining walls on the surrounding properties will be mitigated using a combination of techniques. Banking of landscape areas to the top and toe of walls (at appropriate maximum grades), minimises total wall heights. Walls are terraced where possible to further reduce bulk and scale.

The materiality and texture of walling has been considered to mitigate visual impact. Gabion walling is currently proposed, using local natural stone with hues that complement the natural landscape. Within the Asset Protection Zones, planting will remain an important technique to mitigate visual impacts, albeit the species mix and distribution in these areas will be designed in accordance with APZ requirements, including planting in clusters (rather than rows), maintaining gaps in canopies, and low flammability plants. Incorporation of tree species of a height to visually mask the building is proposed.



Fig 17.2 Gabion wall precedent imagery

12. PLANTING

12.1 DAY 1 PLANTING STRATEGY

The day one planting strategy focuses on maximising the success of site planting long term.

The initial planting scheme will use a variety of pot sizes to ensure long term plant health and day one amenity. In particular feature trees that are key to providing day one amenity will have larger pot sizes than the remainder of plant species.

12.2 PLANTING PALETTE

A native plant palette that is specific to the local climate forms the majority species selection for the site. Inspiration has been taken from the environmental area species where appropriate. This will reduce the maintenance of planting areas and help to reflect the local character of the area through planting.

In specific areas surrounding the hospital this palette becomes more diverse to include some exotic species that contribute to shade, diversity, amenity, and celebrate the seasons.

The planting palette also incorporates species with sensory values, and culinary uses to encourage meaningful engagement with the landscape.

Edible plant varieties are proposed for inclusion in various areas of the hospital. Their integration ranges from designated areas for productive community gardening (which will be a diverse mix of seasonal species), to native bush tucker plantings focused around key outdoor Aboriginal meeting places (species palettes are currently being developed in consultation with the Indigenous community). Edible plants will also be integrated into the courtyards where appropriate.

Particular consideration has been given to species that do not attract pests and cause allergies.



Fig 18 Vegetation character

13. WATER

The landscape planting design is comprised of local native species and species that are adapted to the local environment. Selection of species naturally adapted to the site's environmental characteristics significantly reduces water demand for irrigation. Subsurface drip irrigation will be specified to further improve water efficiency.

Site stormwater management includes large bioretention basins along the lower northern boundary of the site, retrofitting the sediment basins that were established as part of the early works. Refer to Civil Engineers report for further details.

Raingardens are incorporated into the east car park for local infiltration of stormwater runoff.

14. SOIL MANAGEMENT

Consistent with the Agricultural Offset Plan, the intent is for the existing site soils to be utilised / managed on site.

If (following additional testing) the topsoil is deemed suitable for use as growing media, it will be utilised for the top 300mm (Horizon A) in all new garden areas.

If (following additional testing) site soils are found to be low in organic matter, they may be utilised for the Horizon B (depths >300mm) of new garden areas, or as engineering fill.

15. MAINTENANCE

The hardworks and softworks design has given particular consideration to minimising ongoing maintenance, with use of hardwearing, robust materials and plants.

The proposed species palette of predominantly native species and plants commonly grown in the local area ensures appropriateness to site context, resilience, and minimises ongoing irrigation requirements. Workshops with maintenance staff will be held in detailed design phase to ensure species selection and hardworks design optimises ongoing maintenance outcomes.

16. CPTED

The following text has been developed with reference to the CPTED Guidelines by DUAP 2001.

It is important that this new public facility, that services the full spectrum of the community, is designed to cater for their varying needs and is a safe place to be. A range of considerations in the landscape design contribute to creating an environment where people feel safe and comfortable.

16.1 SURVEILLANCE

On approach to the hospital, generous path widths combine with low planting the path edges to channel movement and maximise the sense of space and surveillance of one’s immediate surroundings.

Path networks follow key desire lines, with wayfinding signage and feature elements in the landscape used to create unobstructed views to a series of legible destinations. Path networks that connect buildings are designed to follow active edges of built form wherever possible, to maximise passive surveillance and sense of orientation to the building entries.

Hospitals are in operation 24/7, with movement of staff, patients, and visitors between buildings and car parks at all times of the day and night. The landscape design addresses CPTED at night by providing a clear hierarchy of lighting levels throughout the site, with the highest external lighting levels guiding movement along key movement paths (green spine, the boulevard) and primary open space destinations (such as main entry plaza, east and west entries).

Planting throughout balances the desire for privacy with filtered views to public areas, to optimise passive surveillance.

16.2 ACCESS CONTROL

Access control to various areas has been considered to ensure no ‘dead-ends’ are created, and gates / fencing are permeable where appropriate to maintain views in/ out. Fencing design considers the need for detailing that is not hostile and institutional in nature.

16.3 TERRITORIAL REINFORCEMENT

Territorial reinforcement of places throughout the landscape is achieved passively with ‘soft’ solutions such as planting edges/buffers wherever possible to minimise the need for walls and fences, which can create adverse CPTED outcomes.

For internal courtyards, large windows to the internal space reinforce territory whilst maintaining passive surveillance.

Providing a range of seating areas in each space encourages gathering and activation of the space by more than one group simultaneously, to encourage social interaction further reduce the likelihood of anti-social behaviour.

16.4 SPACE MANAGEMENT

Landscaped courtyards are designed to interface specifically with adjacent buildings, creating a sense of ownership/belonging for these external places, and assigning responsibility for ongoing monitoring and maintenance (e.g. litter, graffiti, lighting)



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