3.4 STORMWATER AND WSUD

Stormwater Drainage and WSUD - Site wide

The total catchment area for the entire SICEEP development is approx. 190 ha. Of this approx. 120 ha is to the south of the precinct and will drain through The Haymarket either from the south east at the junction of Hay and Harbour Streets or south west at the corner of Hay Street and Darling Drive. Ultimately this enters the harbour at Cockle Bay.

In order to facilitate the modelled 1 in 100 year flows, the Boulevard will accommodate a continuous overland flow path that can direct high velocity stormwater away from Haymarket and toward Cockle Bay. Stormwater will be directed toward the Boulevard from the east and west along Hay Street, with some flow diverted along the east of Darling Drive.

WSUD principles within the Public Domain

The expected velocity of the stormwater in high rainfall events means that infiltration into porous surfaces will not occur during these events. Low flows, however will be mostly absorbed through porous surfaces or soft landscape areas. As such, the Public Domain will be designed to facilitate bio filtration within the Boulevard and the Darling Drive road reserve, absorbing runoff from low flow rain events and capturing stormwater through permeable paving and suitable filter soil media.

SSDA 5

Bio filtration of low stormwater flows will occur within the Boulevard tree avenue through the use of permeable paving (paving laid with open joints and permeable sand based infill) to allow water to infiltrate the filter media/soil mix in which the proposed trees are to be planted. Treated water will re join the stormwater system and can potentially be captured and re used to irrigate parkland and soft landscape areas within the precinct.

In the Darling Drive road reserve, the infiltration of low flows will occur through proposed permeable surface (decomposed granite) and filter media/soil base south of Dickson's Lane and a planted bioswale to the north. The proposed planting of the swale with sedges and grasses will aid filtration and polishing of the stormwater before re entering the system

Figure 3.4.1 Water Management in the South West Plot

3.5 THE BOULEVARD

The 20m wide Boulevard will provide the primary circulatory axis throughout the entire SICEEP precinct. It will be the principal ordering feature of the Public Domain, connecting all the proposed spaces, parks and attractions. Commencing at Hay Street in The Haymarket precinct, the Boulevard will retain a consistent visual character throughout The Haymarket and through to the Darling Harbour precinct.

Taking the line of Quay Street as its axis and effectively extending the pedestrian connection to Central Station through Quay Street, the Boulevard starts at Hay Street and extends along the western edge of Haymarket Square, where the square 'breaks out' into the Boulevard and breaks the formality of its arrangement. This allows activity from the Haymarket Square to extend into the Boulevard to facilitate larger events. It also helps connect the two public spaces.

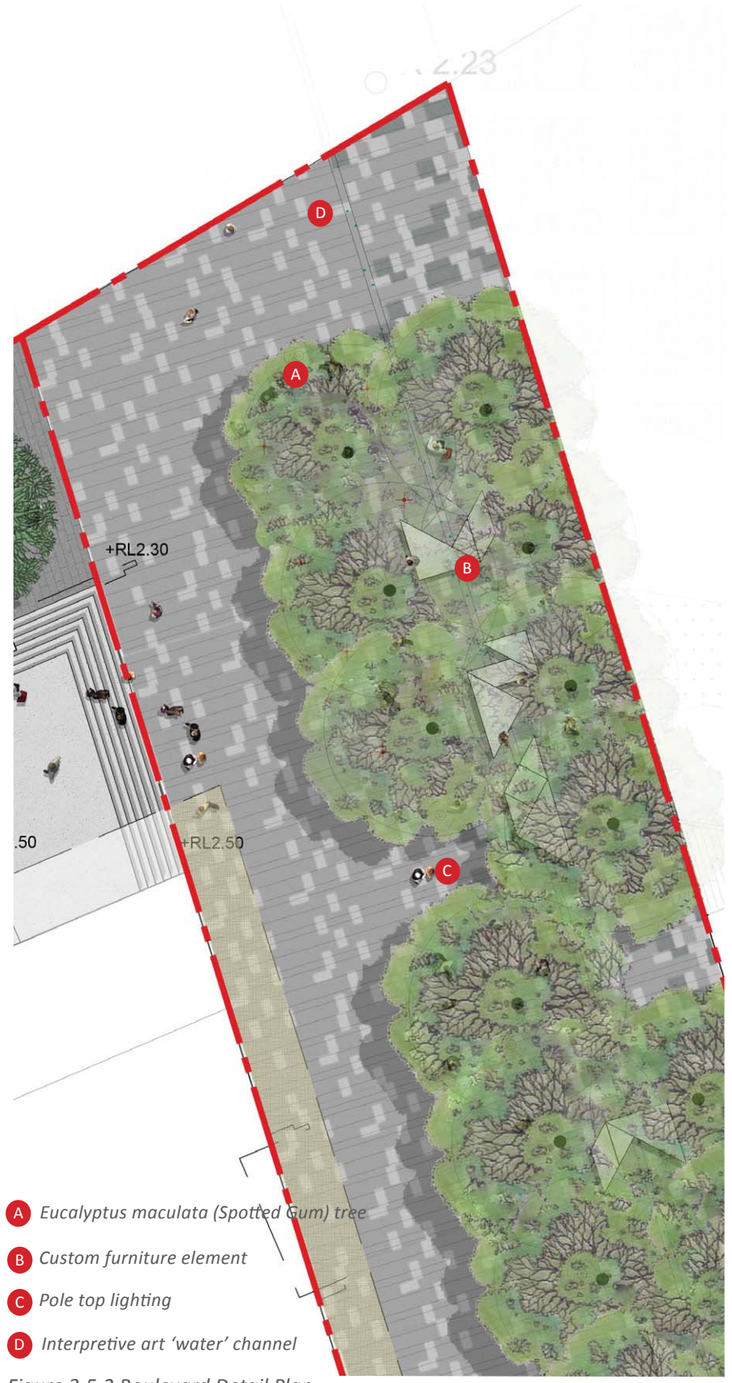
The Boulevard will be the focus of pedestrian movement and activation within this application, providing a space to promenade, interact and dwell, as well as providing the capacity to facilitate large movements of people for events and functions.

The walking experience will be enhanced by details such as an interpretive art feature, connecting to the water feature within the square. These features will help to tell the stories of the site's history. The Boulevard also features seating areas with custom designed furniture that is unique to the Boulevard and high quality stone paving with tonal and textural interest. This composition establishes the character of the Boulevard which is consistent along its length.

SICEEP precinct wide, the Boulevard will allow level access to all areas. It will be paved across its full 20m width, allowing for large crowds and comfortable flow of pedestrian traffic. The Boulevard is a pedestrian priority zone facilitating passive cycle use.

Whilst the Boulevard will be a pedestrian priority zone it will allow for access for service and emergency vehicles only, within the non planted zone.

Figure 3.5.1 Boulevard Plan



A *Eucalyptus maculata (Spotted Gum) tree*

B *Custom furniture element*

C *Pole top lighting*

D *Interpretive art 'water' channel*

Figure 3.5.2 Boulevard Detail Plan

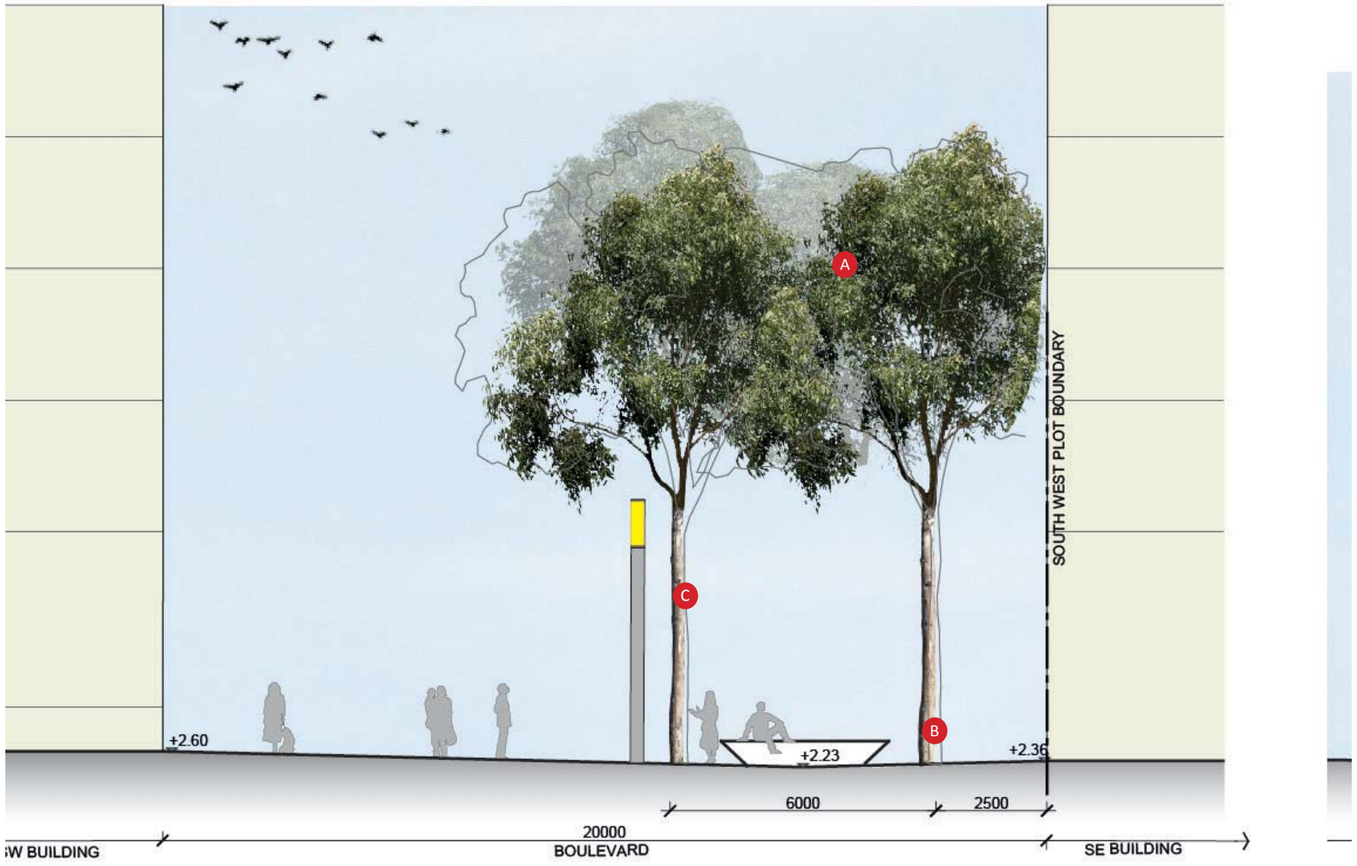


Figure 3.5.3 Boulevard Typical Section

A *Eucalyptus maculata (Spotted Gum) tree*

B *Custom furniture element*

C *Pole top lighting*

D *Interpretive art 'water' channel*

Paving

The paving of the Boulevard will respond to the predominant city paving type of the adjacent areas – dark grey granite, with a greater degree of detail in tone, colour and size variation. This will help to link it visually as a key Civic space, much like Martin Place, Circular Quay and Pitt Street Mall but with its own visual character.

Trees

A grand double avenue of *Eucalyptus maculata* will provide a tall colonnade of Australian species that will run the length of the site, shading the walkway and the seating to one side of the pedestrian street. A local Sydney Gum species has been selected to help define the Boulevard as a distinctly Sydney space, with reference back to the site's natural history as a valley floor leading to the Sydney Harbour.

Furniture

The Boulevard will be lined with custom designed bespoke seating elements, positioned beneath the shade of the trees. The number and form of these elements will vary, relating to key activity spaces and amenity of adjacent areas along the north-south spine. These seating platforms , composed of cast concrete and timber can vary in composition and allow a variety of use (sitting, laying, working, eating).

Lighting

The Boulevard will be lit through a simple row of pole top lighting with multi- directional fittings which will serve to provide safe and comfortable levels of light whilst also highlighting features such as tree canopies, seating and other elements.

Figure 3.5.4 Boulevard Montage

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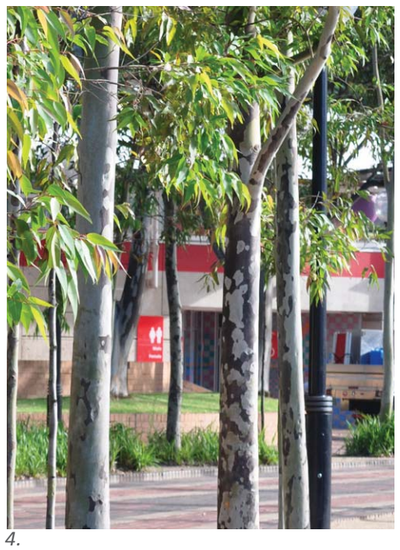

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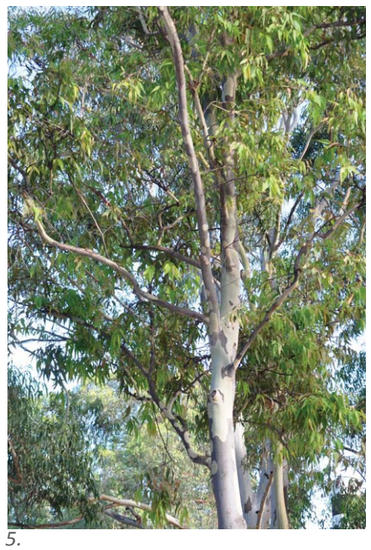

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Figure 3.5.5 Boulevard character images: 1, 2, 3 -Tonal variation in granite paving. 4 ,5 - Local Eucalyptus species, 6 - Pitt St Mall paving, 7 - Shell imprints as part of the Interpretive art channel in the Boulevard, connecting to the water elements in Haymarket Square

3.6 DICKSON'S LANE

Dickson's Lane is an 8m wide lane that provides pedestrian access from Darling Drive to the Boulevard and is a key east west connection, increasing permeability into The Haymarket site. The connection to Darling Drive is a secondary circulatory pathway, and as such the laneway will be used mainly by locals, residents and students who can utilise the central crossing at Darling Drive. The public car park entrance from the NW Plot , and the SW Plot entrance lobby, both located on Dickson's Lane will activate the lane, improve passive surveillance and generate passing pedestrian trade for a number of small scale retail and food tenancies. The narrow width of the lane and the small scale tenancies reinforce the feel of a local street space in contrast to the larger civic spaces in the precinct.

The level change between the Boulevard and the lane is addressed at the Boulevard entry with a split step/wide shallow ramp arrangement which allows the majority of the lane to be at the floor level of adjacent retail outlets or lobby entry. The south east corner of the lane at the edge of the SW Plot provides the ideal area for a terrace, potentially associated with a food and beverage tenancy, taking advantage of northerly aspect and location with views along the Boulevard.

The design intends to encourage people to linger in the space rather than cut through; seat walls offset at different angles provide diverse seating options to cater for a variety of groups within a sheltered environment. Canopies from the building will provide weather protection whilst allowing daylight penetration. Controlled compression of the space is achieved through the placement of the seating and trees which maximises the feeling of activity and intimacy.

There is the potential for a public art or focal urban element to be located at the Darling Drive end of Dickson's Lane to draw the eye and encourage exploration of the lane as an alternative route into the precinct.

Lighting will be important in activating the lane at night and in ensuring that it is a safe and comfortable environment. A variety of overhead 'lantern' style catenary lighting hung at different heights, teamed with uplighting will provide visual interest and work in with proposed eclectic awning arrangements.

The surface will be paved in light-mid grey granite pavers in a combination of exfoliated and hammered finishes for textural interest. A small number of deciduous trees (*Acer palmatum* or similar) will provide seasonal interest.

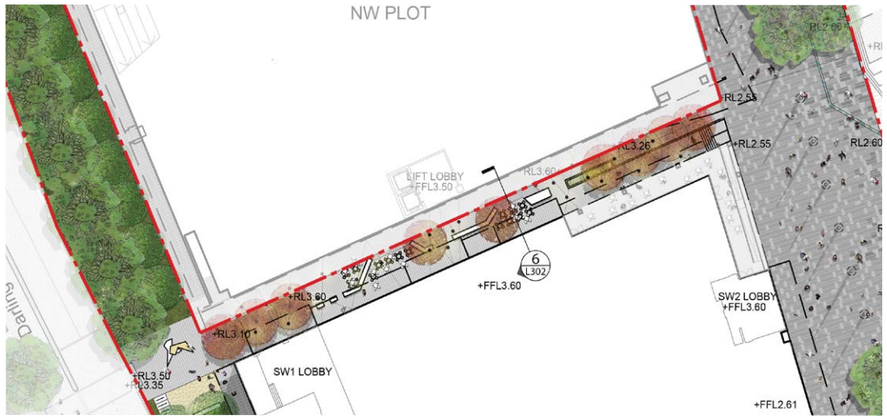
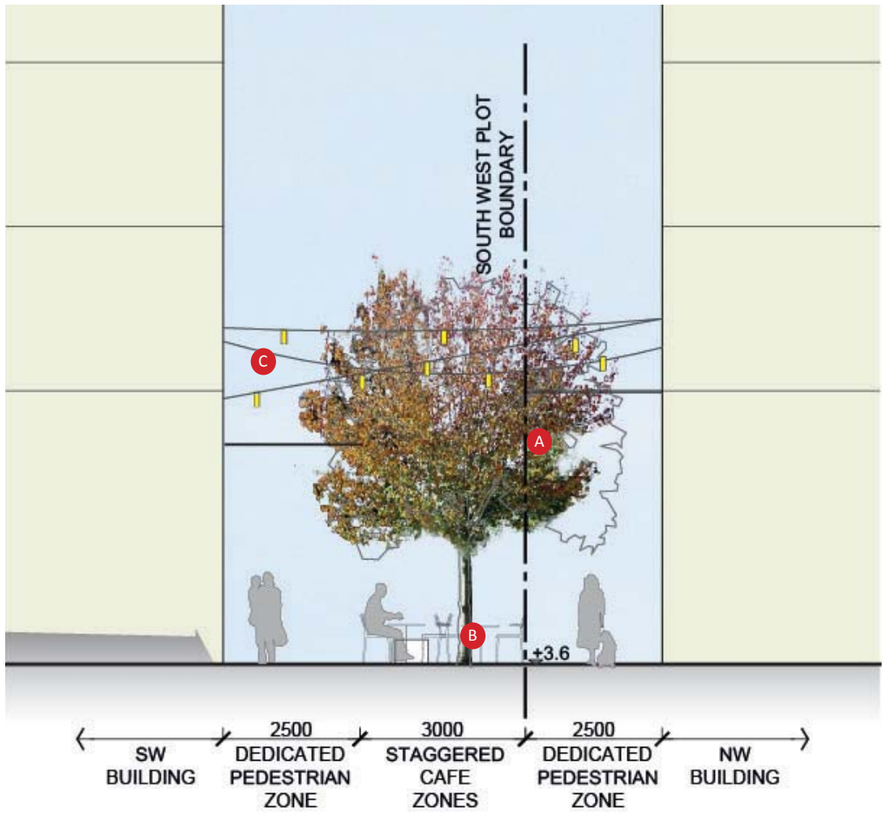


Figure 3.6.1 Dickson's Lane plan



A *Deciduous trees*
B *Cafe seating*
C *Catenary lighting*

Figure 3.6.2 Section 1-- Dickson's Lane

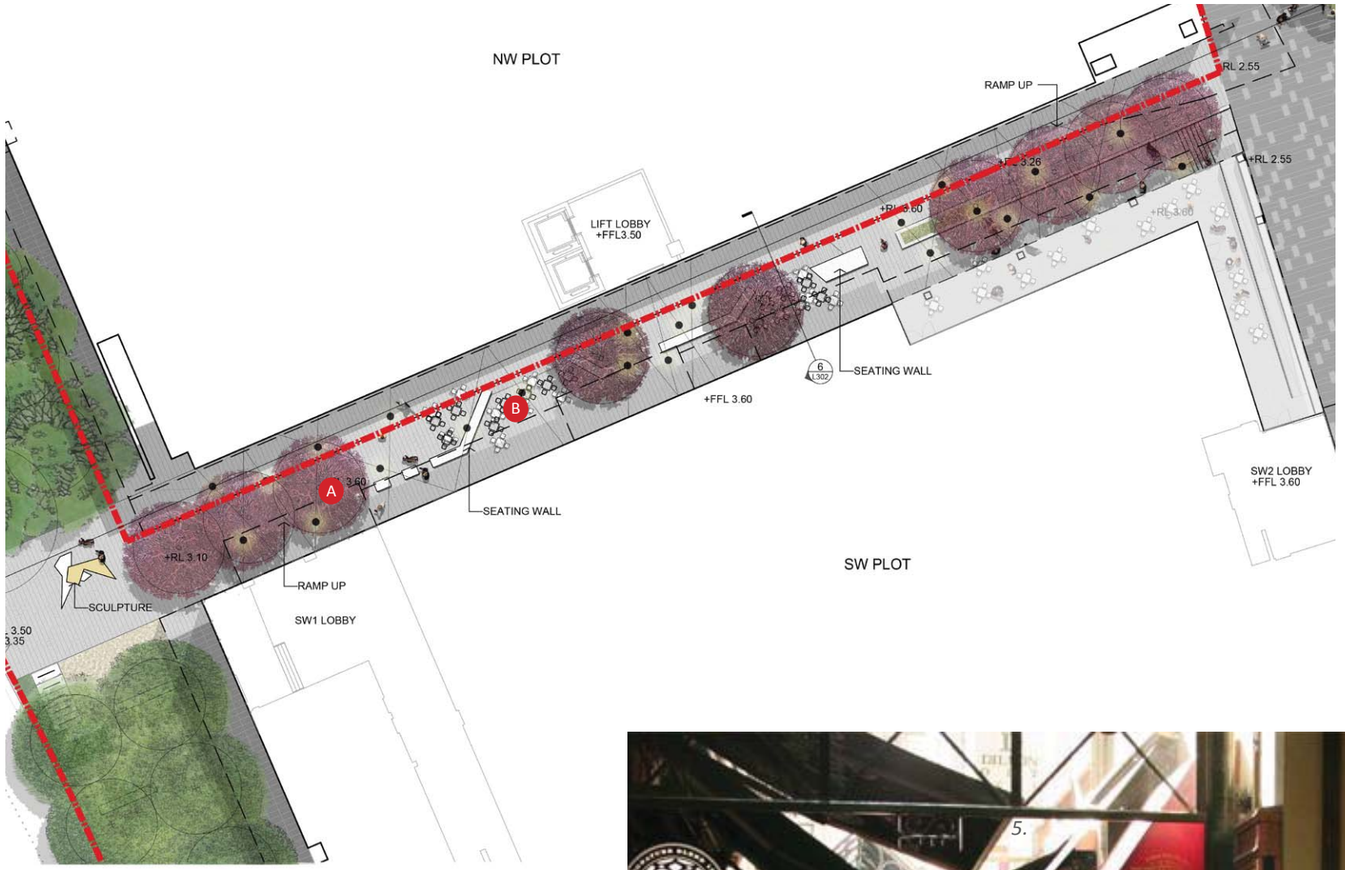


Figure 3.6.3 Dickson's Lane detail plan

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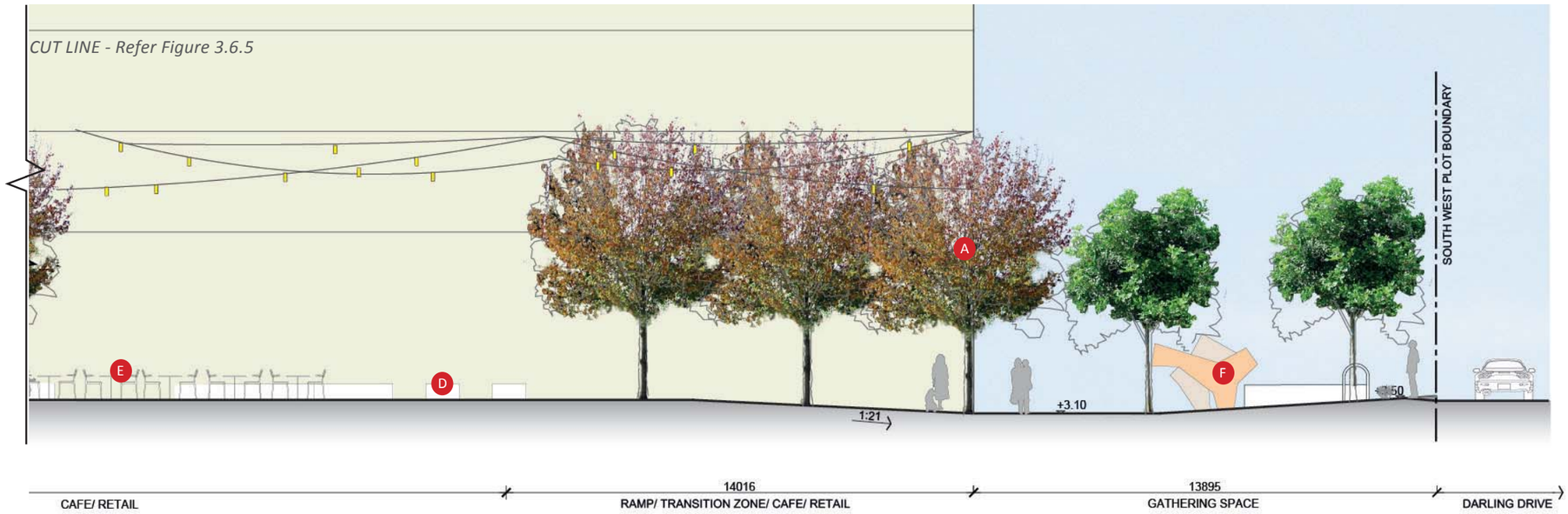
Figure 3.6.4 Dickson's Lane character images: 1.- Catenary lighting, 2.- Eclectic awnings and signage, Melbourne, 3. Deciduous street trees with seasonal interest

Figure 3.6.5 Section 2. Dickson's Lane Sectional Elevation (east)



A *Deciduous trees*
B *Cafe/ bar terrace*
C *Raised planter edge*
D *Concrete benches*
E *Cafe/ bar seating*
F *Public art*

Figure 3.6.6 Section 2. Dickson's Lane Sectional Elevation (west)

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Figure 3.6.7 Dickson's Lane character images: 1.- Precast concrete bench 2.- Foliage of Japanese Maple 3.- Granite paving, 4.- Public art, 5.- Textural paving 6. -Cast concrete blade walls at step/ramps

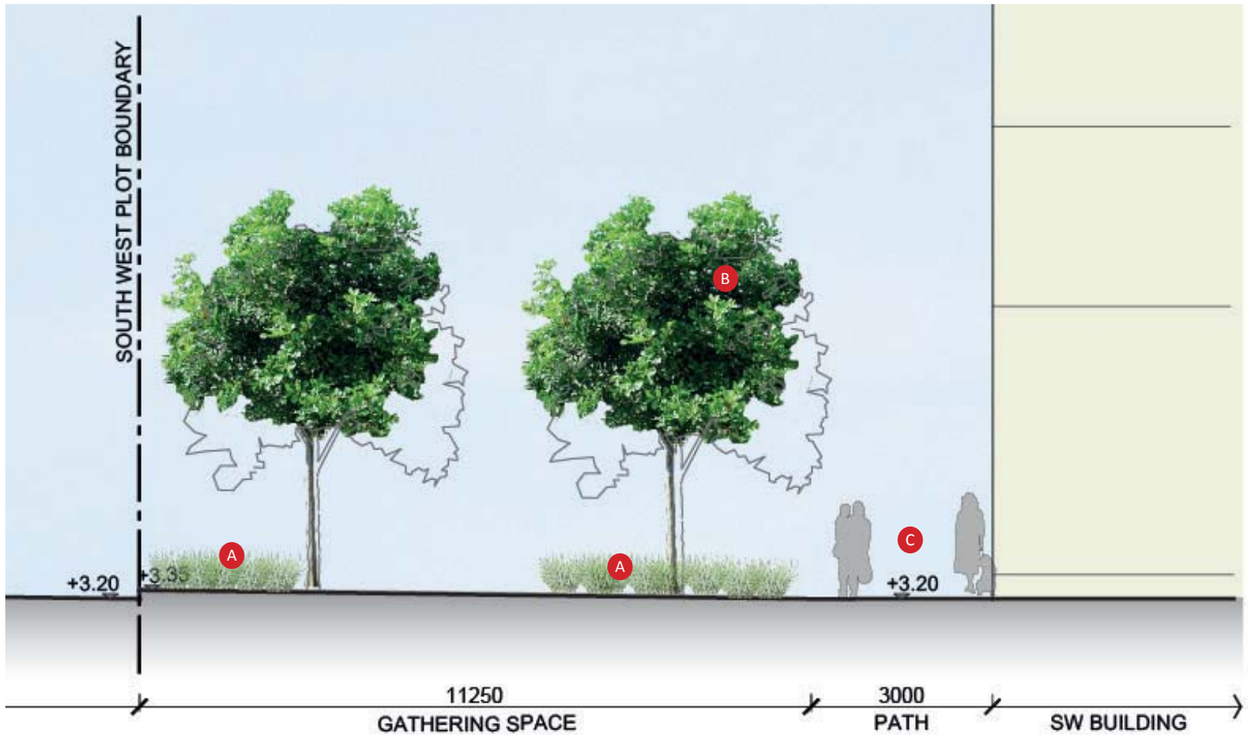
Figure 3.6.8 Dickson's Lane character Montage- Day

Figure 3.6.9 Dickson's Lane character Montage - Night

3.7 DARLING DRIVE

Darling Drive provides vehicular access to all proposed new exhibition, convention and entertainment buildings within the SICEEP precinct, allowing the inner core of Public Domain to remain pedestrian focussed. Similarly, within The Haymarket precinct, Darling Drive provides access to the above ground car parking within the NW and SW buildings, accessed via Hay Street and Exhibition Place.

A generous width of road reserve forms the associated Public Domain alongside Darling Drive to the west of the SW building facing Darling Drive which allows access to Dickson's Lane, and the residential lobby located on the north west corner of the building. This lobby location is emphasised within the Public Domain through a formal arrangement of trees within a decomposed granite surface, terminating in a small square in line with the end of Dickson's Lane and a proposed pedestrian crossing which provides access from the student accommodation. An appropriately scaled urban element will serve as a marker, a visual focal point, highlighting Dickson's Lane and the vista through to Haymarket Square. The trees - a native Water Gum, *Tristaniopsis laurina* will form the double avenue within decomposed granite, with a small number of cast concrete benches located beneath them, with beds of native grasses. This permeable area will serve as a bio filtration zone for the low flow stormwater along the Darling Drive Public Domain. Paved pedestrian access is provided in a 3m wide footpath adjacent to the building, paved in the Sydney grey granite to tie in with Hay Street.



A *Native grasses*

B *Amenity tree planting*

C *Pedestrian pathway through to Dickson's Lane and Hay Street*

Figure 3.7.1 Section 2: Darling Drive

Figure 3.7.2 Darling Drive Plan

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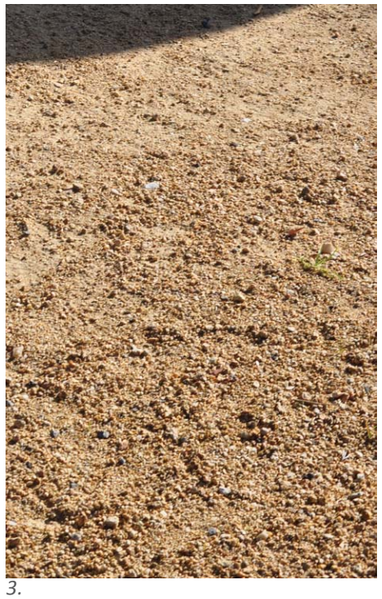

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Figure 3.7.3 Darling Drive character images: 1.- Cast concrete bench 2.- trees in decomposed granite 3.- Decomposed granite surface, 4.- Native grasses, 5.- Tristaniopsis laurina as street tree' 6. - Public Art

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The northern section of Darling Drive is essentially soft landscape, being a swale of native grasses and sedges planted in formalised swathes. This will act as bio filtration for the low stormwater flows diverted along Darling Drive.

The low grasses and soft landscape will be planted with a combination of *Tristaniopsis* (Water Gum) and *Flindersia* (Crows Ash) trees, the Flindersia acting as street avenue tree to the edge of Darling Drive.

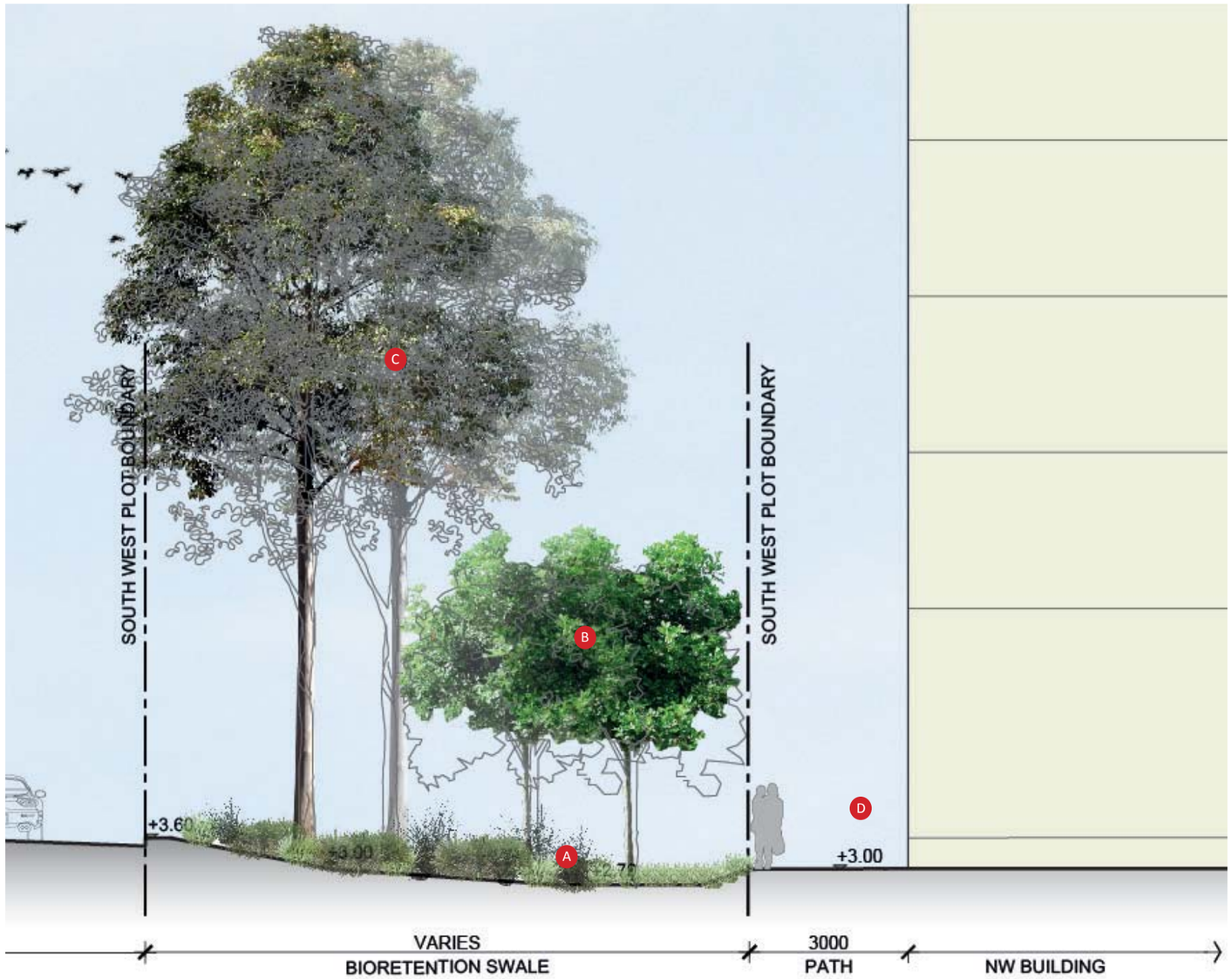

Figure 3.7.4 Section 3: Darling Drive Typical Section

A *Biofiltration basin*

B *Amenity planting*

C *Darling Drive tree planting*

D *Pedestrian pathway through to Dickson's Lane and Hay Street*

Figure 3.7.5 Darling Drive (North) Plan

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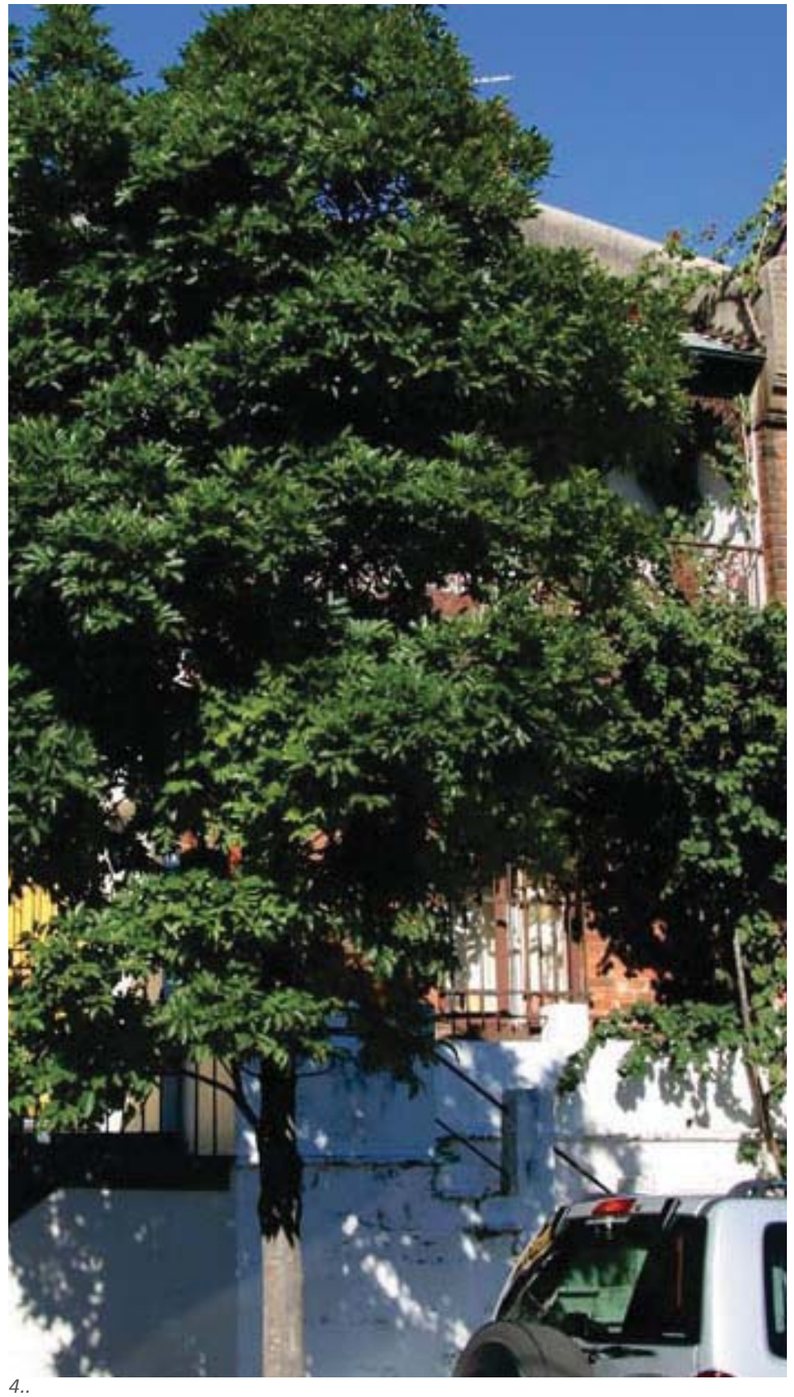
Figure 3.7.6 Darling Drive character images: - 1,2,3 -Native grasses, bio filtration swale planting, 4 - Flindersia australis (Crows Ash) as street tree



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3.8 HAY STREET

Hay Street which runs from Elizabeth Street to Darling Drive is a pedestrian/ light rail shareway between Parker Street and George Street to the east, and from Harbour Street to Darling Drive within The Haymarket DA site. The proposed upgrades to the Sydney Light Rail and the Chinatown district create the opportunity to strengthen this street as a key pedestrian link within the Sydney network.

The light rail runs along the southern edge of Hay Street, with an existing stop at Paddy's Markets. It is proposed that the light rail tracks remain as existing, whilst the 'street' treatment is defined through the use of the Sydney stone pavement - dark grey granite and flush stone kerb. The car park entry for the South West residential building is located on the corner of Hay Street, accessed off Darling Drive. This section of the street will be treated as roadway, whereas the remainder of Hay Street will be a pedestrian environment containing landscape elements such as trees, seating and bollards.

The Public Domain of Hay Street will be visually uncluttered and restrained, allowing the finer grain of the Haymarket Square and the laneways to be distinct and more definitively "Haymarket". Pole top lighting will provide safe lighting levels for pedestrians and cyclists. Plane trees provide the appropriate scale and softening to the built form, and provides a visual link to the trees in adjacent Quay Street.

Figure 3.8.1 Hay Street Plan

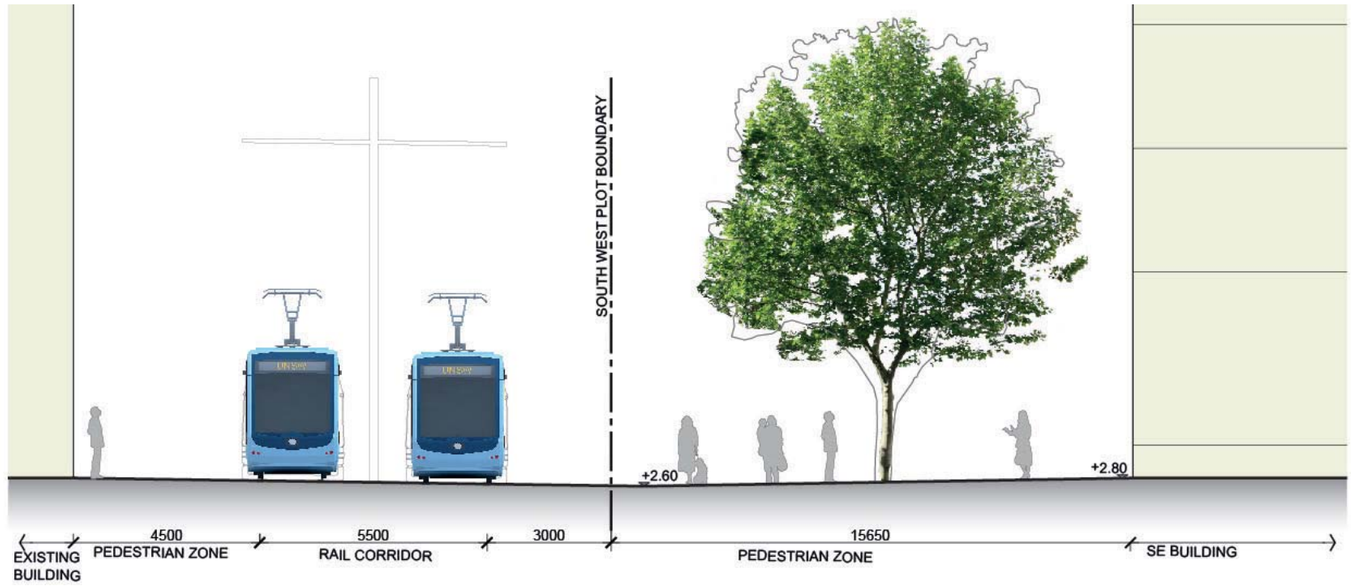

Figure 3.8.2 Section 3: Hay Street

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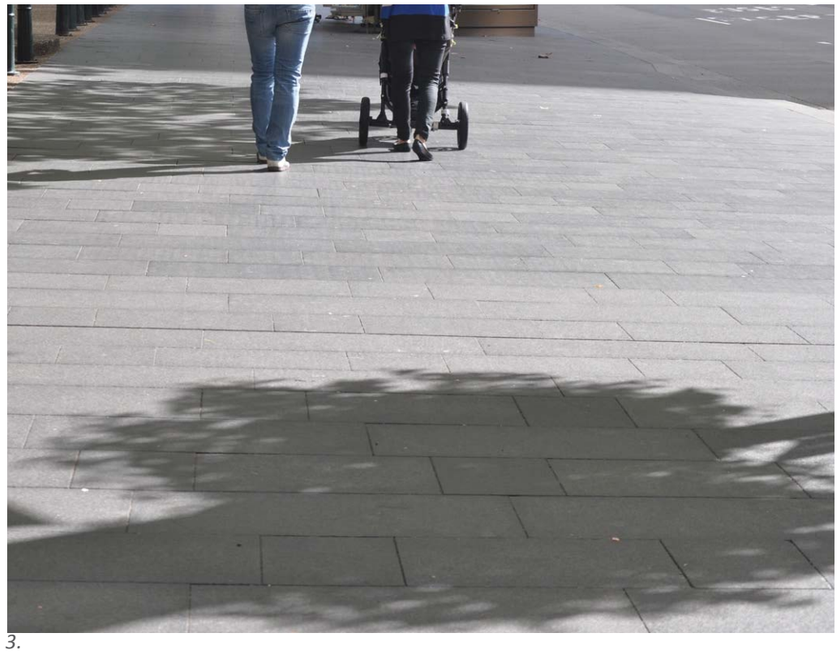

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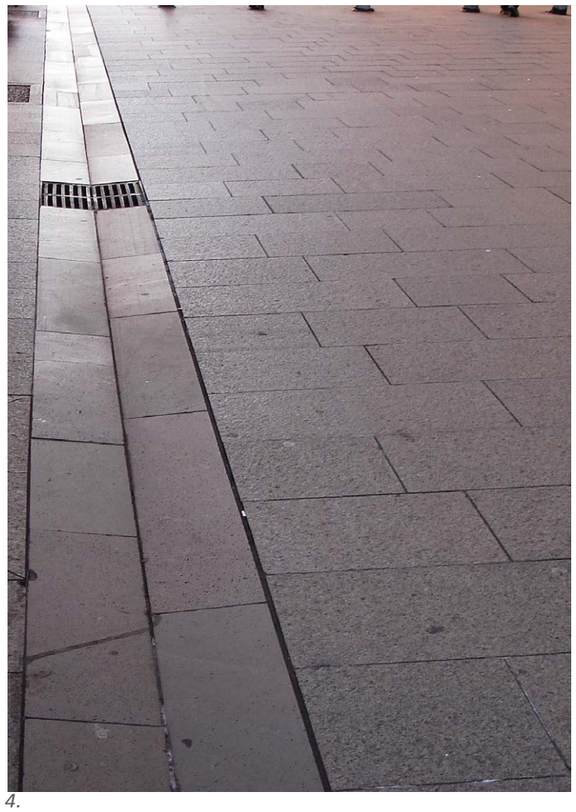

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Figure 3.8.3 Hay Street character images: 1.- Platanus acerifolia, 2.- paved tree pit surface, 3. - Sydney street granite paving, 4 - double flush kerb as definition

Figure 3.8.4 Hay Street Montage

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4.1 MATERIALS

Materials across the site will reflect the hierarchy of Public Domain space within The Haymarket precinct. The palette of materials will be restrained, robust and of high quality. The Sydney standard palette of 'Austral black' granite street paving sets the baseline material at the streets of Hay Street and Darling Drive. It is proposed that the Boulevard utilise the same stone paving as a common element but introduce variety in size, colour and texture to produce a cohesive yet visually interesting pattern that will run the length of the Boulevard, precinct wide.

This is in keeping with other Sydney civic spaces of this nature such as Martin Place and Pitt Street Mall. The Boulevard will be paved across the width of the site, with open jointed paving used as the permeable paving element around the base of trees.

Dickson's Lane will be paved in natural granite in lighter tonal colours, utilising a greater variety of textures and smaller unit sizes in order to generate a more intimate and local character to the lane.

The standard Sydney paving stone will be used within the main peripheral areas of the SW Plot as a consistent material forming the 'external' streetscape and of The Haymarket precinct including Hay Street. This dark grey granite will demarcate the pedestrian flows around the periphery of the precinct - a 3m width of pavement to the east of the SW Plot for secondary access, with a more extensive width of paving in Hay Street which will be a primary circulation space. The use of the standard Sydney paving stone will tie The Haymarket precinct in with other civic spaces and streets within the city and will form the 'base' material for the inner core of the precinct, where granite will be used in a more detailed and varied fashion.

The bio filtration tree planting zone to the west of the pavement in the Darling Drive reserve will be decomposed granite to allow infiltration. The gold colour of the deco granite will pick up the reds and golds of the heritage brick buildings surrounding the site.

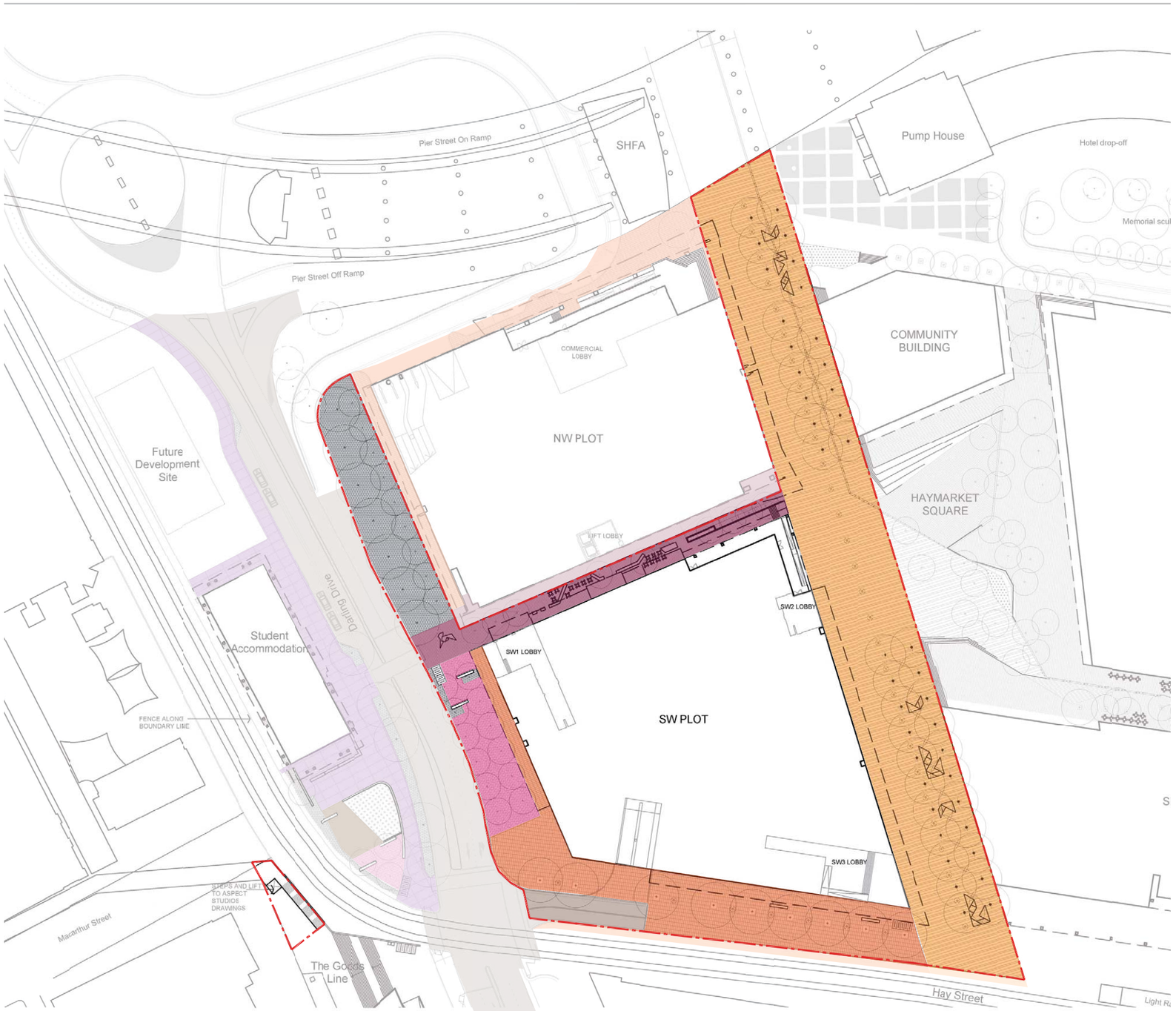
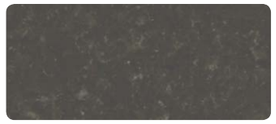


Figure 4.1.1 Materials Plan

THE BOULEVARD



Material	Granite (body)
Finish	Exfoliated to AS
Colour	Austral Black
Thickness	60mm vehicular/ 50mm non vehicular

Material	Granite (highlight)
Finish	Exfoliated to AS
Colour	Austral Verde
Thickness	60mm vehicular/ 50mm non vehicular

Material	Granite (highlight)
Finish	Exfoliated to AS
Colour	Austral Grey
Thickness	60mm vehicular/ 50mm non vehicular

DICKSON'S LANE

Material	Granite
Finish	Exfoliated to AS/ Hammered
Colour	Austral Grey
Thickness	50mm

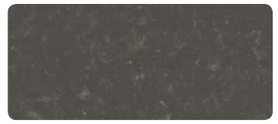
Material	Granite (highlight)
Finish	Exfoliated to AS
Colour	Austral Verde
Thickness	50mm

Material	Insitu concrete
Finish	Class 2 finish
Colour	Grey/ Exposed aggregate
Thickness	To engineer's specification

HAY STREET

Material	Granite
Finish	Shot to AS
Colour	Austral Black
Thickness	60mm vehicular/ 50mm non vehicular

DARLING DRIVE



Material	Granite
Finish	Exfoliated to AS
Colour	Austral Black
Thickness	50mm

Material	Asphalt
Finish	AC 10 or AC 5
Colour	Black
Thickness	To engineer's specification

Material	Decomposed granite
Colour	Gold
Thickness	To supplier's specification

Figure 4.1.2 Materials Schedule