

## Schedule 6 Planning scheme policies

### SC6.1 Planning scheme policy index

The table below lists all the planning scheme policies applicable to the planning scheme area.

**Table SC6.1A Planning scheme policy index**

<b>Planning scheme policies</b>
<b>Planning scheme policies relating to Part 7 (Local plans)</b>
Planning scheme policy for Landsborough (urban design guidelines)
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<b>Planning scheme policies relating to Part 8 (Overlays)</b>
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Planning scheme policy for the biodiversity, waterways and wetlands overlay code
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Planning scheme policy for the extractive resources overlay code
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<b>Other planning scheme policies</b>
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Planning scheme policy for information that local government may require
Planning scheme policy for performance bonds

## SC6.2 Planning scheme policy for Landsborough (urban design guidelines)

### SC6.2.1 Purpose

The purpose of this planning scheme policy is to provide advice about achieving outcomes in the **Landsborough local plan code** relating to urban design.

Note—nothing in this planning scheme policy limits Council's discretion to request relevant information [under the Development Assessment Rules made under section 68\(1\) of the Act](#) in accordance with the Act.

### SC6.2.2 Application

This planning scheme policy applies to assessable development which requires assessment against the Landsborough local plan code and which is included within the following zones:-

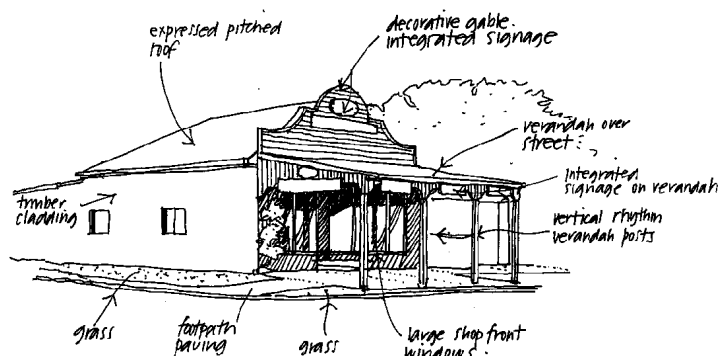
- (a) Local centre zone;
- (b) Medium impact industry zone; or
- (c) Specialised centre zone.

### SC6.2.3 Advice about achieving urban design outcomes for development in the Local centre zone

The following is advice for achieving Acceptable Outcome AO9 of **Table 7.2.16.4.1 (Criteria for assessable development Performance outcomes and acceptable outcomes for assessable development)** of the **Landsborough local plan code** relating to built form and urban design outcomes in the Local centre zone:-

- (a) Landsborough's Local centre zone has a number of 'traditional' shop buildings which exhibit good urban design 'manners' and streetscape relationships (refer **Figure SC6.2A (Design principles for development in Landsborough's Local centre zone)** below). One quality of these buildings is the interaction of vertical elements of architectural composition such as verandah posts and raking parapets extending above the roof line; and
- (b) other good urban design principles that characterise some of the older retail frontages and which are appropriate to development in Landsborough's Local centre zone include:-
  - (i) large shopfront and entry doors;
  - (ii) 'light' verandah structures over footpath areas;
  - (iii) visible pitched roof forms;
  - (iv) timber walls;
  - (v) verandah supported by posts with parapets on the gable end;
  - (vi) facing the street;
  - (vii) use of grass and simple paving materials on footpaths;
  - (viii) signage that is integrated with the building; and
  - (ix) front facade proportions are square or not too horizontal (less than a double square).

**Figure SC6.2A Design principles for development in Landsborough's Local centre zone**

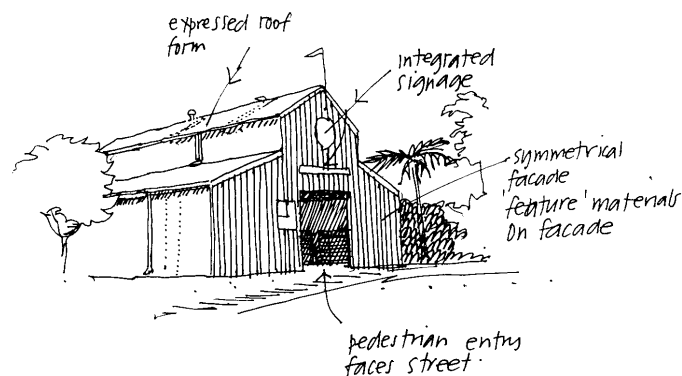


## SC6.2.4 Advice about achieving urban design outcomes for development in the Medium impact industry zone and Specialised centre zone

The following is advice for achieving Acceptable Outcomes AO4.2 and AO11.2 of **Table 7.2.16.4.1 (Criteria for assessable development Performance outcomes and acceptable outcomes for assessable development)** of the **Landsborough local plan code** relating to built form and urban design outcomes in the Medium impact industry zone and Specialised centre zone:-

- (a) the Medium impact industry zone and Specialised centre zone provide significant employment opportunities for the Landsborough area. However, most of the existing buildings in these precincts are not sympathetic to the urban character established in Landsborough's town centre;
- (b) while the functional needs of development in these zones require structures of a differing scale, some of the town centre qualities can be achieved through careful consideration of vehicle movements, pedestrian routes and facade treatment. Urban design consideration is particularly important for development fronting Caloundra Street as the main entrance to the town;
- (c) the desired qualities of the urban character of the Medium impact industry zone and Specialised centre zone are summarised below:-
  - (i) larger scale street facade treatment through the use of gables or skillion roof forms;
  - (ii) street facade designed as an active frontage with pedestrian friendly building elements such as roof overhangs;
  - (iii) signage integrated into the design of the facade and does not dominate the facade;
  - (iv) vehicle entries are located at one side of the development;
  - (v) no car parking between active frontage and the street edge;
  - (vi) car parking located at the side of the development, integrated with other vehicle movement areas; and
  - (vii) truck access roller doors are located side-on, or where facing the street, are well set back;
- (d) some of these principles are illustrated in **Figure SC6.2B (Example of an existing building illustrating some appropriate features for Landsborough's Medium impact industry zone and Specialised centre zone)** below, which shows an existing building that contributes to the establishment of an appropriate character on Caloundra Street. Good urban character features of this development are noted on the figure; and

**Figure SC6.2B Example of an existing building illustrating some appropriate features for Landsborough's Medium impact industry zone and Specialised centre zone**



- (e) built form elements which detract from the potential quality of streetscapes within the Medium impact industry zone and Specialised centre zone include:-
  - (i) car parking areas between the frontage of buildings and the street;
  - (ii) large roller doors which dominate the street elevation; and
  - (iii) poor definition of pedestrian areas and entrances.

## SC6.2.5 Advice about particular sites with architectural and heritage character

- (1) The following is advice for achieving Acceptable Outcome AO1.1 of Table 7.2.16.4.1 (~~Criteria for assessable development~~**Performance outcomes and acceptable outcomes for assessable**) of the **Landsborough local plan code** relating to the retention and adaptive re-use of buildings which have cultural heritage or character significance:-
- (a) Landsborough's town centre contains a number of buildings with heritage and architectural character. These buildings have been specifically identified in the Heritage and Character Areas Overlay Map; and
  - (b) In relation to the refurbishment of buildings with cultural heritage significance, the following principles should be followed:-
    - (i) new work should respond to the scale, rhythm, texture and functional expression of the original design, but should not try to imitate detail;
    - (ii) layers of history in a building of heritage significance, including legitimate wear and tear, should be conserved and not obscured so that buildings develop layers of age which add to their richness;
    - (iii) original building forms should be reinstated for buildings of heritage significance (e.g. verandah posts along footpaths); and
    - (iv) sensitive reinterpretation of older building forms such as dwelling house/shop combinations should be encouraged.
- (2) The following guidelines are intended to assist in the enhancement and refurbishment of the particular sites identified below:-

### Mellum Club Hotel

- (a) built for James Campbell in 1888 at the corner of Old Gympie Road and Maleny Street. In 1914 or 1915 the hotel was pulled on skids to its present location;



- (b) the building is in a prime location, being directly opposite the pedestrian route from the railway station. The original building appears relatively intact; however successive additions detract from its presentation;
- (c) refurbishment guidelines for this particular site are detailed below:-
  - (i) progressive reinstatement of verandah;
  - (ii) remove existing awnings over street;
  - (iii) open out Mill Street facade to street;
  - (iv) open out Cribb Street facade to street with doors and windows;
  - (v) widened footpath with outdoor dining and new shade structures; and
  - (vi) appropriate colour scheme for a late nineteenth century building;

### Landsborough Bakery (Former) and Landsborough Butcher (Old)

- (d) classic and intact 1920's shop architecture presently used as bakery and wedding cake shops. The original butcher's shop has an unsympathetic concrete brick front;



- (e) refurbishment guidelines for these particular sites are detailed below:-
- (i) appropriate additional development is in-filled between the buildings;
  - (ii) additional development is setback 3 metres to accentuate existing buildings;
  - (iii) additional development includes continuous verandah and active frontage along street;
  - (iv) footpath is widened and may incorporate outdoor dining;
  - (v) traditional shopfront is reinstated on the old butcher shop;
  - (vi) small extension to north of wedding cake shop is removed;
  - (vii) additional car parking areas are provided at the rear; and
  - (viii) existing colour schemes are retained;

Jewellers Shop (Former)

- (f) house and shop that makes an important contribution to town character. Strategic location on the landmark corner of Maleny Street and Old Landsborough Road is highly visible when crossing railway line. The building should be incorporated into the linkage between the School of Arts Hall and the museum;
- (g) where the traditional building frontage is retained as active frontage, there is potential to develop another active front (restaurant, cafe etc.) at the rear of the building that addresses the proposed community parkland and associated linkages. This could be achieved by extending or redesigning the rear section of the building (e.g. kitchen and dining verandah) to suit usage requirements;



- (h) refurbishment guidelines for this particular site are detailed below:-
- (i) shop retained for commercial uses appropriate for community and/or visitors e.g. backpacker centre (information centre / internet cafe / backpackers / coffee house / laundromat etc);
  - (ii) roof sheeting is reinstated in metal;
  - (iii) rear extension is enclosed or has an outdoor roofed area;
  - (iv) pitched metal roof opens to street and park; and
  - (v) appropriate colour scheme is used, for example;

Cribb Street houses

- (i) inter-war and earlier housing on Cribb Street facing the railway line and located immediately north of the old butcher shop. The preservation of these houses as a collective example of Queenslander style houses in Landsborough is sought through the identification of these houses as a character area in the Heritage and Character Areas Overlay Map;



- (j) some unsympathetic modifications and evidence of lack of maintenance, but new uses could revitalise these buildings to add life and maintain main street character; and
- (k) refurbishment guidelines for these particular sites are detailed below:-
  - (i) encourage retention of existing houses in association with residential or business uses (office, art gallery etc.);
  - (ii) extension to houses occurs towards the street (e.g. shopfront form);
  - (iii) at the rear of the building, or incorporated underneath the existing structure;
  - (iv) maximum 40% of street frontage is new building;
  - (v) active frontage is provided along the street;
  - (vi) views to existing houses from Cribb Street are maintained; and
  - (vii) car parking areas are provided at the rear of houses.

## SC6.3 Planning scheme policy for Sippy Downs Town Centre

### SC6.3.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about satisfying assessment ~~criteria~~benchmarks in relation to the Sippy Downs Town Centre;
- (b) state standards identified in the **Sippy Downs local plan code** in relation to development in the Sippy Downs Town Centre;
- (c) identify information that Council may request to allow a development application to be properly assessed; and
- (d) provide guidance on Council's policy intent in relation to development in the Sippy Downs Town Centre.

Note—nothing in this planning scheme policy limits Council's discretion to request relevant information under the Development Assessment Rules made under section 68(1) of the ~~in accordance with the~~ Act.

### SC6.3.2 Application

- (1) This planning scheme policy applies to assessable development which requires assessment against the assessment ~~criteria~~benchmarks in **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes~~criteria for assessable development~~ in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code**.
- (2) The Sippy Downs Town Centre (Precinct SID LPP-1) is identified on **Local Plan Precinct Map LPM33 in Schedule 2 (Mapping)** and comprises:-
  - (a) the Sippy Downs Town Centre Core (Sub-precinct SID LPSP-1a);
  - (b) the Sippy Downs Business and Technology Sub-precinct (Sub-precinct SID LPSP-1b); and
  - (c) the Sippy Downs West Neighbourhood Sub-precinct (Sub-precinct SID LPSP-1c).

### SC6.3.3 Development in Precinct SID LPP-1 (Sippy Downs Town Centre) generally

#### SC6.3.3.1 Town centre character (architectural and landscape character)

Guidance for achieving Performance Outcome PO2 (Town centre character)

- (1) The following is advice for achieving Performance Outcome PO2 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes~~criteria~~ for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** relating to town centre character:-

##### Architectural character

- (a) the architecture of buildings in the town centre should be reflective of location and climate and therefore take on a form that is subtropical in nature that reflects both its coastal location and connection with the University. The essential criteria to develop architectural character for the Sippy Downs Town Centre include:-
  - (i) response to the sub-tropical climate and location;
  - (ii) response to local context and neighbouring architecture (i.e. University of the Sunshine Coast);
  - (iii) variety in massing and visually engaging facades; and
  - (iv) levels of environmental sustainability; and

##### Landscape character



- (b) the landscape of the Sippy Downs Town Centre should respect the natural landscape character of the area by:-
  - (i) retaining existing vegetation;
  - (ii) maximising shade tree cover particularly along footpaths, streets and in public areas;
  - (iii) reflecting the landscape character of the Sunshine Coast; and
  - (iv) ensuring that trees are attractive, hardy and long lived.

### SC6.3.3.2 Connectivity and movement

#### Preliminary

- (1) The guidance and standards provided in this section are in addition to the **Planning scheme policy for the transport and parking code**. Where discrepancies exist between the two policies, the guidance and standards of this section take precedence.

#### General advice for connectivity and movement

- (2) The following is general advice for achieving outcomes of the **Sippy Downs local plan code** relating to connectivity and movement:-
  - (a) the Sippy Downs Town Centre should establish an interconnected and permeable movement network to allow for:-
    - (i) reduced concentration of local traffic on the major road corridors;
    - (ii) increased pedestrian and bicycle movement; and
    - (iii) increased access to public transport;
  - (b) the town centre street network comprises Principal Streets and Local Access Streets<sup>1</sup>. All streets should be designed and constructed in accordance with the relevant provisions of this planning scheme policy, the **Planning scheme policy for the transport and parking code** and the **Planning scheme policy for development works**; and
  - (c) north-south streets should have university related names. North-south streets include 'W', 'V', 'U', 'T', 'F', 'E', 'P', 'K', 'N' and 'M'. East-west streets should have local cultural heritage or environmental related names. East-west streets include 'A', 'Y', 'Z', 'X', 'C', 'B', 'R' and 'L'. 'A' street being the main street and traversing most of the town centre should be given particular consideration.

#### Guidance in relation to Performance Outcome PO4

- (3) The following is advice for achieving Performance Outcome PO4 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** relating to the town centre street network:-
  - (a) a number of Principal Streets are required to make allowance for vehicle movement into and away from the Town Centre Core (Sub-precinct SID LPSP-1a). Principal Streets are fixed in their location. All Principal Streets are designed to accommodate the efficient movement of buses as they form the basis of the public transport system for the Sippy Downs Town Centre, linking all Sub-precincts and the University of the Sunshine Coast;
  - (b) Local Access Streets are required to support the function of the Principal Streets, and facilitate movement and connectivity. Local Access Streets are not fixed in their location. Their location can be altered slightly depending on the design of individual development parcels, however all Local Access Streets should be provided. The key functions of Local Access Streets should be maintained as part of any change to their location. These functions include:-
    - (i) establishing a street block pattern with a depth of around 70-80 metres;
    - (ii) providing access to individual developments;
    - (iii) providing for additional on-street car parking; and
    - (iv) allowing for increased pedestrian and cycle movement and permeability;

<sup>1</sup> Principal Streets and Local Access Streets are identified on **Figure 7.2.25A (Sippy Downs local plan elements)** of the **Sippy Downs local plan code**.

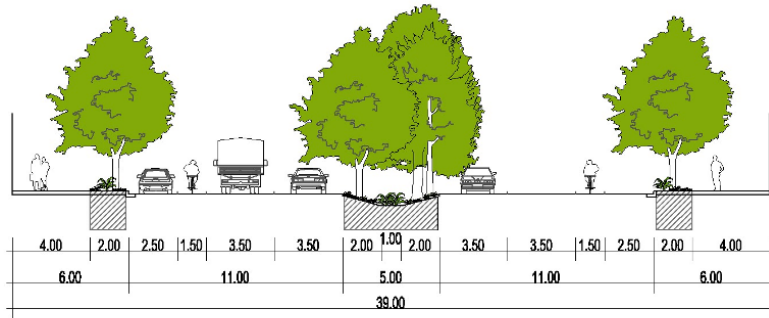


- (c) additional Local Access Streets or service lanes may be provided as necessary or as deemed appropriate for the movement network; and
- (d) all streets are crucial elements of the town centre and public realm and therefore should be dedicated as road reserve.

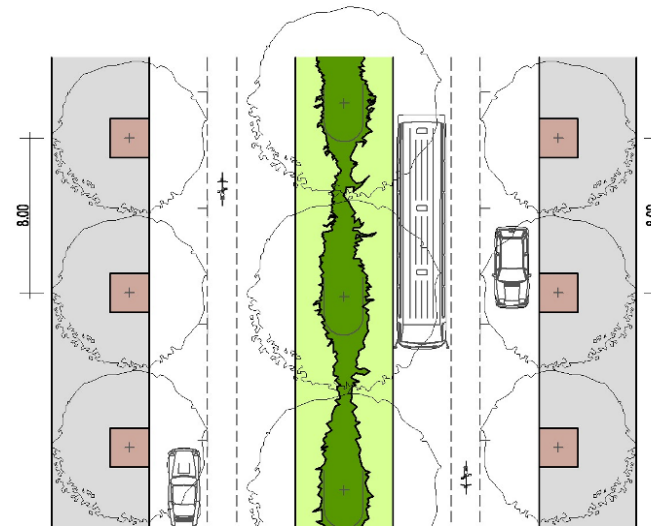
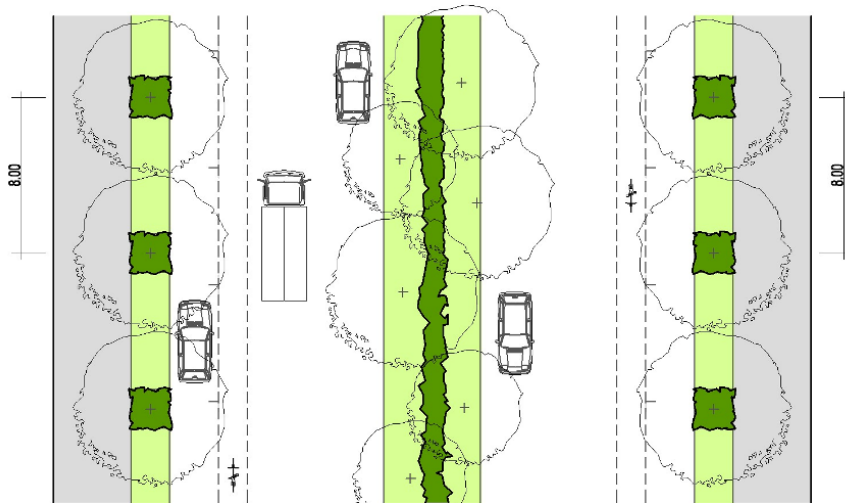
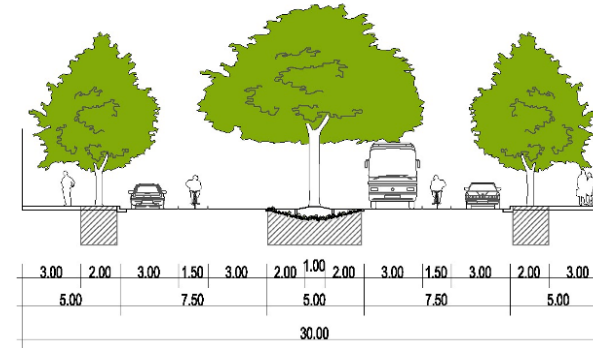
Standards in relation to street cross sections for the Sippy Downs Town Centre

- (4) All streets in the Town Centre Street Network are defined in a hierarchy of streets identified in **Figure 7.2.25D (Sippy Downs Town Centre Road / Street Designations)** of the **Sippy Downs local plan code**. The designations under this hierarchy differentiate each street for the purpose of identifying the relevant street cross section. Street cross sections are identified below in **Figures SC6.3A – SC6.3H**.
- (5) The street cross sections identified in this planning scheme policy take precedence over the relevant street cross sections provided in the **Planning scheme policy for the transport and parking code**.
- (6) For the purposes of Acceptable Outcome AO4 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following are the standards in relation to street cross sections for the Sippy Downs Town Centre:-
  - (a) the relevant cross section figure applies as indicated by **Figure 7.2.25D (Sippy Downs Town Centre Road / Street Designations)** of the **Sippy Downs local plan code**;
  - (b) cross section and reserve widths may vary to suit intersections, turning lanes, bus stops, pedestrian crossing treatments and other requirements;
  - (c) verge areas are paved in accordance with **Section SC6.3.3.5 (Landscaping)** of this planning scheme policy;
  - (d) subsurface drainage is provided and is connected to trunk stormwater;
  - (e) landscaping and drainage treatments on verge areas and medians do not inhibit direct pedestrian access to on street parking or pedestrian movement across streets;
  - (f) landscaping includes appropriate root barrier protection to kerbs and adjacent services;
  - (g) medians contain pedestrian refuge areas as necessary with refuge areas allowing for functioning of stormwater treatments (i.e. median swale); and
  - (h) additional landscaping is encouraged and is consistent with the desired landscape character.

**Figure SC6.3A Street Cross Section - Town Centre Connector**



**Figure SC6.3B Street Cross Section - Stringybark Road**



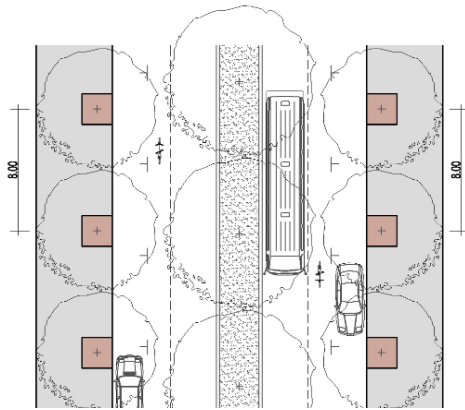
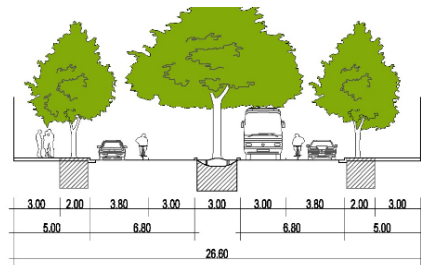
**Notes—**

1. Town Centre Connector (Sippy Downs Drive and Power Roads) are established as an informal boulevard reinforcing bushland character.
2. Verges incorporate a 2 metre wide vegetated area containing trees at 8 metre spacings with understorey planting and turf between plantings. The median may incorporate a mix of trees with understorey planting and turf.
3. The median incorporates a central swale to allow for water conveyance and initial water quality treatment.
4. Both vegetated verge areas have swales and/or biofiltration swales for the length of the carriageway.
5. Suitable tree species are provided to achieve the desired outcome.

**Notes—**

1. Stringybark Road is established as a formal boulevard reinforcing the character of the Town Centre Core Precinct.
2. Verges incorporate trees. The median incorporates trees at 10 metre spacings on raised garden beds.
3. The median incorporates a central swale to allow for water conveyance and initial water quality treatment.
4. Both verges are interspaced with biofiltration tree pits, incorporating extended detention for the length of the carriageway.
5. Suitable tree species are provided to achieve the desired outcome.

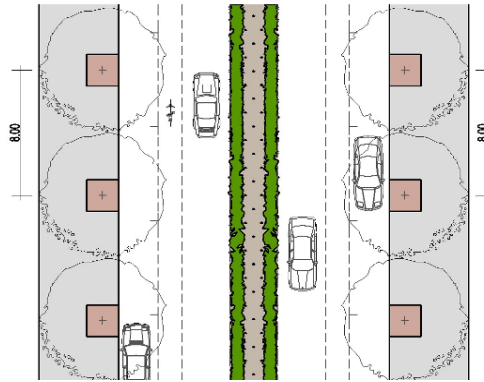
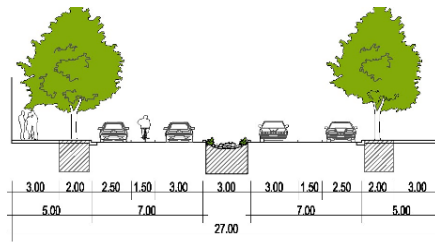
**Figure SC6.3C Street Cross Section - 'A' Street (Town Centre)**



**Notes—**

1. 'A' Street (Town Centre) is established as a major avenue reinforcing the Town Centre Core Precinct character.
2. Verges incorporate tree plantings at 8 metre spacings and the median at 10 metre spacings.
3. Both verges are interspaced with biofiltration tree pits, incorporating extended detention for the length of the carriageway.
4. 3.8 metre wide kerbside lanes are for shared use by cyclists.
5. The needs of pedestrians have priority and pedestrians are the focus of design for 'A' Street (Town Centre).
6. Pedestrian crossings are provided at consolidated locations on 'A' Street (Town Centre). Pedestrian refuge crossings and crossings at signalised intersections are sufficiently wide.
7. The kerb is built out into the parking lanes to create kerb buildouts for additional street trees and landscaping, outdoor dining, street furniture or pedestrian refuge, provided it does not conflict with intersection requirements or potential bus stop and taxi rank locations.
8. Suitable tree species are provided to achieve the desired outcome.

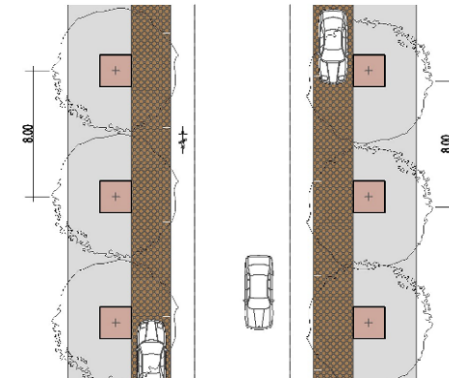
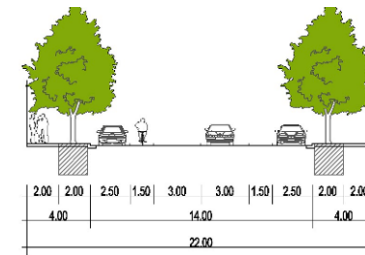
**Figure SC6.3D Street Cross Section - 'A' Street**



**Notes—**

1. 'A' Street (Sippy Downs West Neighbourhood and Business and Technology Sub-precincts) is established as a major avenue reinforcing the character of the relevant precinct.
2. Verges contain tree plantings at 8 metre spacings.
3. A 3 metre wide vegetated median with a central rock lined swale allows for stormwater conveyance and initial water quality treatment. Pedestrian refuge crossings are incorporated into the design of the median.
4. Both verges and the central median are interspaced with biofiltration tree pits, incorporating extended detention for the length of the carriageway.
5. Paving treatments vary between the Sippy Downs West Neighbourhood and Business and Technology Sub-precincts (refer to Figures 7.8(b) and (d)). Verge areas in the Sippy Downs West Neighbourhood Sub-precinct include lawn.
6. Suitable tree species are provided to achieve the desired outcome.

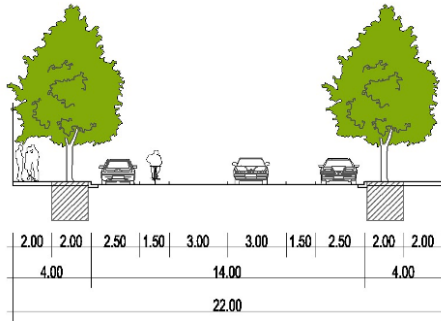
**Figure SC6.3E Street Cross Section - Town Centre Principal Street**



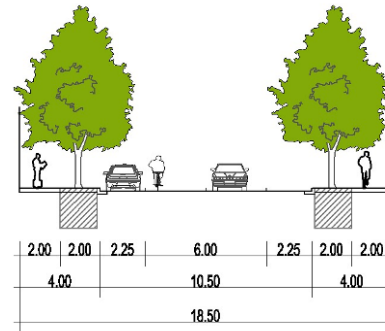
**Notes—**

1. Town Centre Principal Streets are established as major streets reinforcing the Town Centre character.
2. Verges contain tree plantings at 8 metre spacings.
3. Street trees are planted in linked linear structured soil modules with drainage and irrigation to provide a suitable growing environment.
4. Permeable paving is provided for kerbside parking areas to allow for stormwater infiltration.
5. Both verges are interspaced with biofiltration tree pods, incorporating extended detention for the length of the carriageway.
6. Suitable tree species are provided to achieve the desired outcome.

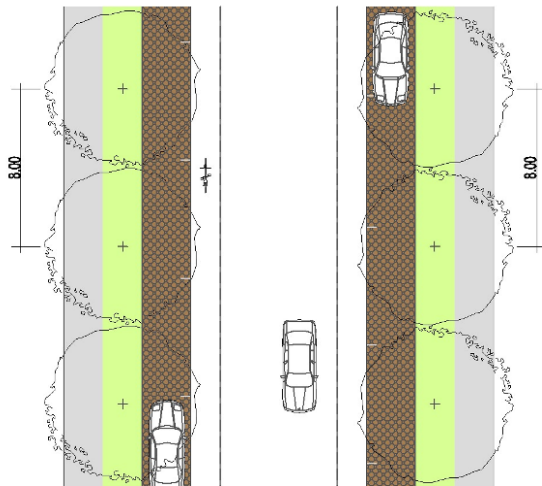
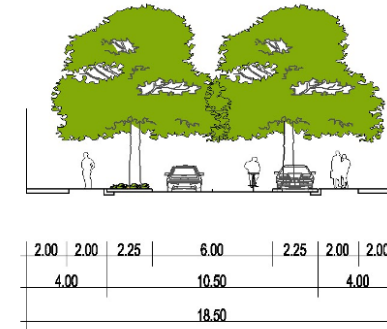
**Figure SC6.3F Street Cross Section - Residential Principal Street**



**Figure SC6.3G Street Cross Section - Town Centre Access Street**

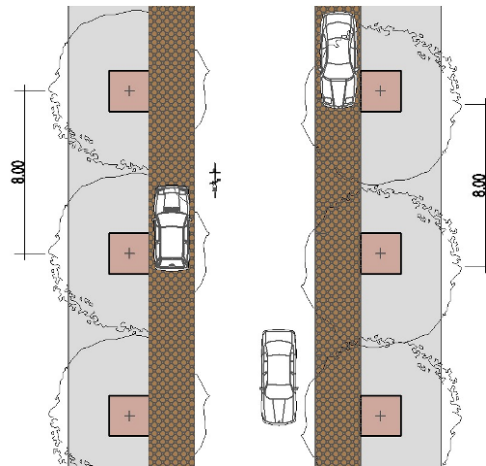


**Figure SC6.3H Street Cross Section - Residential Access Street**



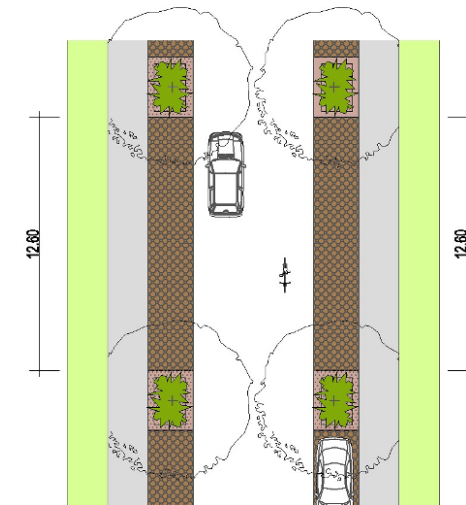
**Notes—**

1. Residential Principal Streets are established as major streets reinforcing the residential neighbourhood character.
2. Verges contain tree plantings at 8 metre spacings.
3. Permeable paving is provided for kerbside parking areas to allow for stormwater infiltration.
4. Both verges are interspaced with biofiltration tree pits, incorporating extended detention for the length of the carriageway.
5. Suitable tree species are provided to achieve the desired outcome.



**Notes—**

1. Verges contain tree plantings at 8 metre spacings.
2. Permeable paving is provided for kerbside parking areas to allow for stormwater infiltration.
3. Both verges are interspaced with biofiltration tree pits, incorporating extended detention for the length of the carriageway.
4. Suitable tree species are provided to achieve the desired outcome.



**Notes—**

1. Residential Access Streets reinforce the residential neighbourhood character.
2. Verges contain *Pongamia pinnata* and *Waterhousea floribunda* at 12.6 metre spacings in parking aisle.
3. Permeable paving is provided for kerbside parking areas to allow for stormwater infiltration.
4. Both verges are interspaced with biofiltration tree pits, incorporating extended detention for the carriageway.
5. Suitable tree species are provided to achieve the desired outcome.

#### Guidance in relation to Performance Outcome PO8 (Pedestrian through block links)

- (7) The following is advice for achieving Performance Outcome PO8 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** relating to pedestrian through block links:-
- (a) pedestrian through block links are not fixed exactly in their location (refer to **Figure 7.2.25C (Sippy Downs Town Centre Core Plan)** of the **Sippy Downs local plan code**). Their location may be altered slightly, and will depend on development design. Any relocation of the access provision should maintain the integrity of the proposed layout and the intent for permeable block configuration;
  - (b) the location of pedestrian through block links should reflect desire lines for pedestrian movement between key activity nodes. Links should be designed to ensure that they are safe alternatives to the street based pedestrian movement network. Design should consider width and access, shelter, materials, and function whilst ensuring adjacent land uses are not detrimentally impacted;
  - (c) all links, whilst they may remain in private ownership, are integral to pedestrian permeability and circulation and are to provide guaranteed 24 hour / 7 days a week public access by dedicated easement in accordance with Performance Outcome PO8 of the **Sippy Downs local plan code**; and
  - (d) where a pedestrian through block link with 'Secondary Active Street Frontage' (refer to **Figure 7.2.25C (Sippy Downs Town Centre Core Plan)** of the **Sippy Downs local plan code**) is required (i.e. east – west link between Stringybark Road and 'E' Street) development should address this link. These links may be considered suitable for the location of uses which will foster activity beyond traditional working hours (i.e. Entertainment/Catering Business uses). The design of these links should allow for the future adaptability of the street network and have the width to allow for conversion to an access street or rear service/access lane.

### **SC6.3.3.3 Built form**

#### General advice in relation to built form

- (1) The following is general advice for achieving outcomes of the **Sippy Downs local plan code** relating to built form:-
- (a) the Sippy Downs Town Centre should have a built form that:-
    - (i) can achieve high land use density without high-rise buildings;
    - (ii) is consistent with the vision for a fully integrated "University Town"; and
    - (iii) identifies Sippy Downs as distinct from other centres on the Sunshine Coast;
  - (b) accordingly, the town centre should have a built form that:-
    - (i) is a 'perimeter block' form of development (refer to **Figure SC6.3I (Perimeter block form)**);
    - (ii) generally has a four storey articulated wall of buildings;
    - (iii) provides taller six storey elements in strategic locations such as corners, along Principal Streets and at terminating vistas; and
    - (iv) has a minimum building height of 2 storeys and limits maximum building height to 6 storeys; and
  - (c) within the preferred 'perimeter block' form, the design of buildings should:-
    - (i) provide variety in building massing, street relationship and setbacks;
    - (ii) increase legibility;
    - (iii) embrace appropriate architectural themes;
    - (iv) relate buildings to public and private spaces; and
    - (v) achieve a sense of enclosure to streets and public spaces.

#### Guidance in relation to Performance Outcome PO14 (Building massing and composition)

- (2) The following is advice for achieving Performance Outcome PO14 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** relating to building massing and composition (refer to **Figure SC6.3J (Variety in building massing and composition)**):-



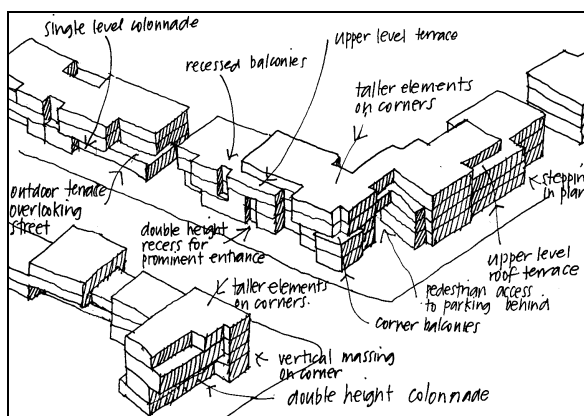
## Variety in building massing and composition

- (a) elements of the built form that help deliver variety and visual interest include (but are not limited to):-
- (i) building shape – stepped changes in height, width (large recesses) and depth (varied horizontal and vertical setbacks);
  - (ii) building location – change in the position in relation to the street (setback) as well as orientation of the building (to face a landmark);
  - (iii) articulation of building envelope – the degree of shade and shadow (articulation) of the building facades. This is achieved by the facades' components as well as the additional parts of the building (shade awnings, sunshades, eaves etc.);
  - (iv) facade texture – amount of rough and smooth textures of the facade and at a finer level the materials on the facade;
  - (v) pattern and colour; and
  - (vi) use of vegetation on, within and around buildings.

**Figure SC6.3I Perimeter block form**



**Figure SC6.3J Variety in building massing and composition**



Guidance in relation to Performance Outcomes PO17 and PO18 (Taller elements)

- (3) The following is advice for achieving Performance Outcomes PO17 and PO18 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** relating to the taller elements of buildings:-
- (a) locating taller elements within the built form assists to achieve increased variety, additional density, capitalise on views, and to assist in creating 'nodes' or minor landmarks. Taller elements are considered to be those buildings, or parts of buildings, that exceed the lower height range i.e. 5 and 6 storey elements on a Principal Street frontage or the 3 and 4 storey elements on a Local Access Street frontage; and
  - (b) rather than being the average height of development, these taller elements should be limited to corners where visibility and the built form impact have the greatest effect. A maximum footprint of 450m<sup>2</sup> and a minimum separation of 30 metres between these elements delivers an appropriate variety in built form. Location and design of taller elements should carefully consider potential shade impacts on public and private spaces.

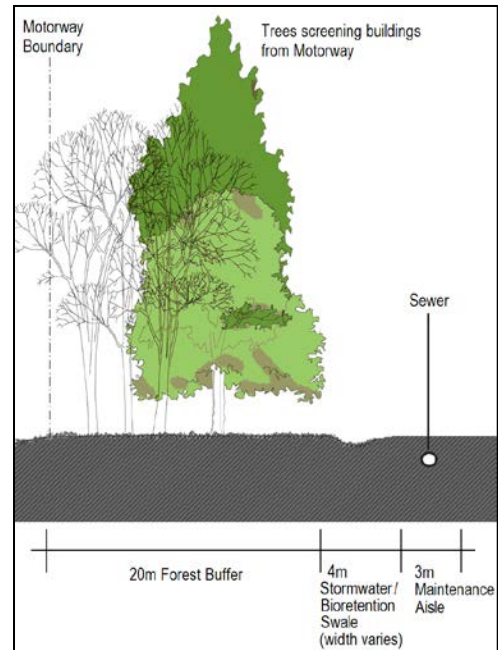
### SC6.3.3.4 Landscape buffer (Forest Buffer)

Standards in relation to the provision of the landscape buffer (Forest Buffer)

- (1) For the purposes of Acceptable Outcome AO21 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following are the standards for the design of the landscape buffer (Forest Buffer):-
- (a) the Forest Buffer is to be provided generally in accordance with **Figure SC6.3K (Indicative forest buffer cross section)**;

- (b) where located on the southern side of the Sunshine Motorway, the Forest Buffer is to be transferred to the Council in freehold tenure;
- (c) where vegetation exists within this area, all vegetation is retained in its natural state. Where no vegetation exists, the buffer area is densely planted in a manner that is floristically and structurally similar to regional ecosystems in the area;
- (d) in addition to the Forest Buffer, a 4 metre wide stormwater conveyance swale is provided and located adjacent to the buffer area in accordance with the Sippy Downs Town Centre Integrated Water Management Plan. **Section SC6.3.3.6 (Integrated water management)** of this planning scheme policy identifies the specifications of the swale;
- (e) in addition to the Forest Buffer and stormwater swale, a 3 metre maintenance aisle able to accommodate a small truck or ute with passing and turn around areas is provided. It is important that access for maintenance is provided via an abutting street or a maintenance aisle off and linked to the street network. Access easements may be required for this purpose;
- (f) the stormwater swale and maintenance aisle should be maintained by the body corporate for owners of individual developments for a period of 3 years, after which the ownership of these areas should be transferred to Council to allow for a coordinated approach to the long-term maintenance of the forest buffer and stormwater swale; and
- (g) it is not expected that acoustic fencing will be required along the Sunshine Motorway boundary.

**Figure SC6.3K Indicative forest buffer cross section**



### SC6.3.3.5 Landscaping

#### Guidance in relation to Performance Outcome PO23 (Existing vegetation)

- (1) The following is advice for achieving Performance Outcome PO23 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** relating to the retention of existing vegetation:-
  - (a) much of the town centre site will be cleared of vegetation to make way for buildings, roads and infrastructure. Wherever possible, the original landscape should be represented by retaining existing vegetation on individual development sites and supplementing this with additional native planting and transplanted understorey from the site; and
  - (b) vegetation retained on site may be included in the amount of landscaping required for a site.

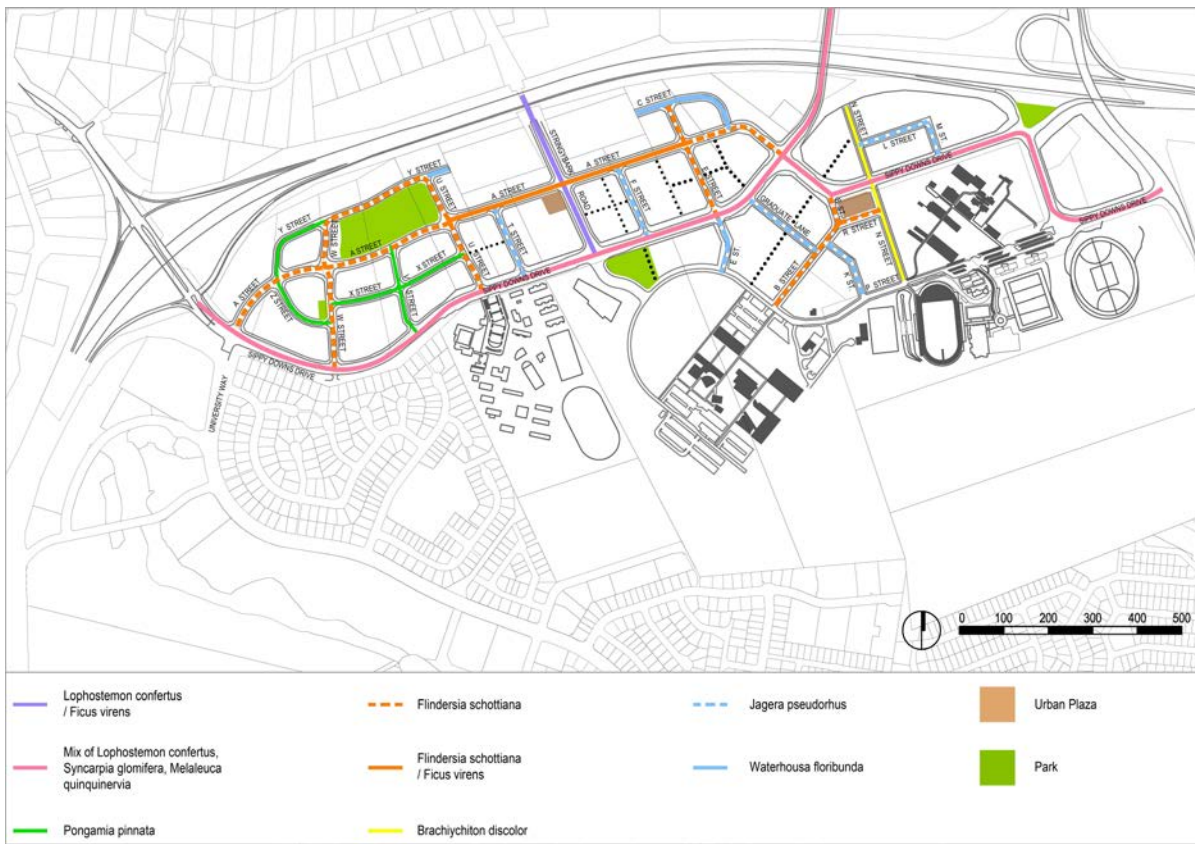
#### Standards in relation to street trees in the Sippy Downs Town Centre

- (2) For the purposes of Acceptable Outcomes AO26 and AO27 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following are the standards for street trees in the Sippy Downs Town Centre:-
  - (a) all streets are to provide a linked linear structures soil corridor free of infrastructure with drainage and irrigation capable of providing sustainable growth;
  - (b) all streets have avenue planting with large canopy trees to maximise the amount of shade;
  - (c) **Figure SC6.3L (Sippy Downs Town Centre street tree treatment)** identifies preferred tree species as a guide to desired tree form;
  - (d) spacing details for street trees are identified by the relevant cross section for each street type identified in **Section SC6.3.3.2 (Connectivity and movement)** of this planning scheme policy; and



- (e) all underground services are co-located in a single corridor adjacent to the property boundary so as not to limit the placement and growth of street trees.

**Figure SC6.3L Sippy Downs Town Centre street tree treatment**



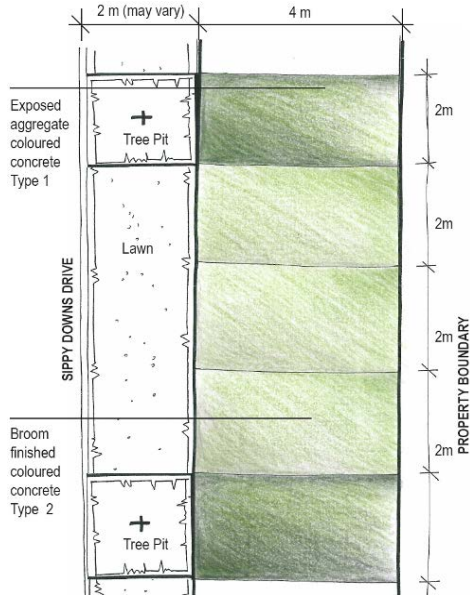
Standards in relation to footpath paving

- (3) For the purposes of Acceptable Outcome AO28 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following are the standards for footpath paving in the Sippy Downs Town Centre:-
  - (a) a consistent approach is taken to footpath paving across the Sippy Downs Town Centre;
  - (b) footpath paving is in accordance with **Figures SC6.3M - SC6.3R** and the pavement type details identified in **Table SC6.3A (Sippy Downs Town Centre streetscape treatment schedule)**; and
  - (c) footpaths in the Town Centre Core (Sub-precinct SID LPSP-1a) and Business and Technology Sub-precinct (Sub-precinct SID LPSP-1b) are to be entirely paved (except for tree pits) to cater for high pedestrian usage and outdoor dining.

Standards in relation to street furniture

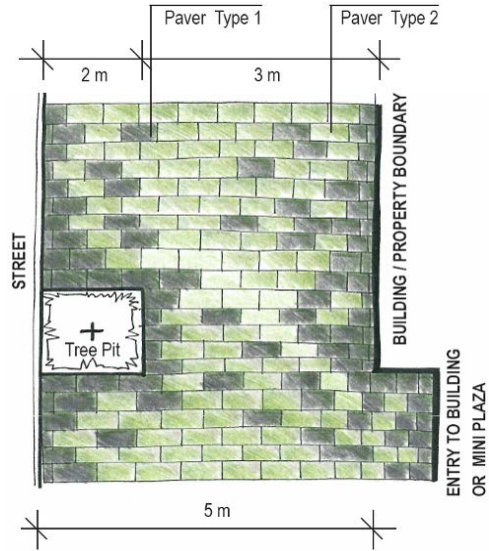
- (4) For the purposes of Acceptable Outcome AO29 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the standards for streetscape treatments are identified in the Streetscape Treatment Schedule in **Table SC6.3A (Sippy Downs Town Centre streetscape treatment schedule)**.

**Figure SC6.3M Footpath Paving – Town Centre Connector (Sippy Downs Drive and Power Road)**



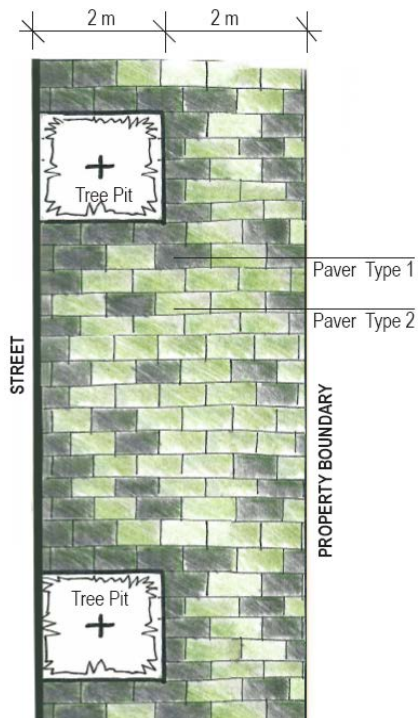
- 4m x 2.5/1.5m (typical) concrete paving, various treatments.
- Remaining paving area to be plain grey concrete, light broom finish with decorative saw cuts.

**Figure SC6.3N Footpath Paving – Stringybark Road & 'A' Street (Town Centre)**



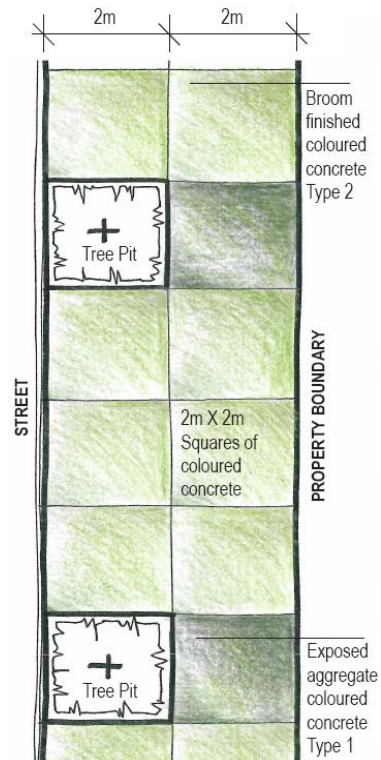
- 400mm x 400mm concrete unit pavers, laid in stretcher bond pattern, 70% main body colour, 30% accent colour, random pattern to respond to built edges.
- This footpath paving detail also applies to 'A' Street in the Sippy Downs Business and Technology Sub-precinct (A2).

**Figure SC6.3O Footpath Paving – Town Centre Principal Street**



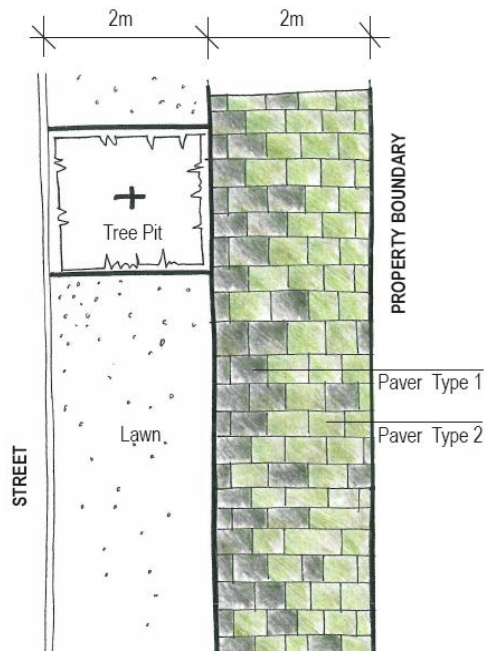
- 400mm x 400mm concrete unit pavers, laid in stretcher bond pattern, 70% main body colour, 30% accent colour, random pattern to respond to built edges.

**Figure SC6.3P Footpath Paving – Town Centre Access Street**

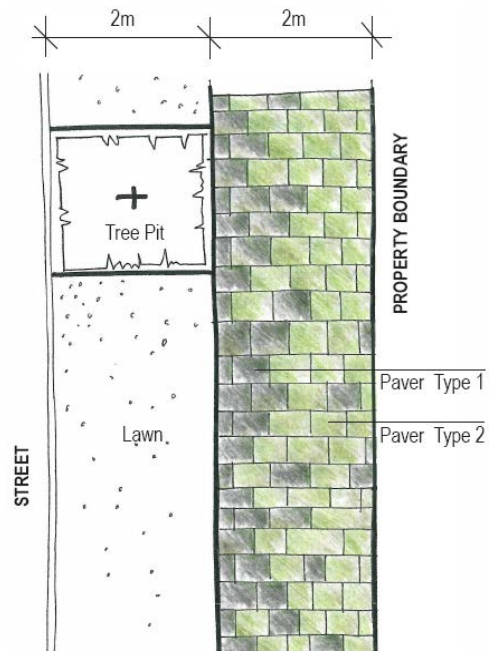


- 400mm x 400mm concrete unit pavers, laid in stretcher bond pattern, 70% main body colour, 30% accent colour, random pattern to respond to built edges.

**Figure SC6.3Q Footpath Paving Residential Principal Street**



**Figure SC6.3R Footpath Paving Residential Access Street**



- 400mm x 400mm concrete unit pavers, laid in stretcher bond pattern, 70% main body colour, 30% accent colour, random pattern to respond to built edges.
- This footpath paving detail also applies to 'A' Street in the Sippy Downs West Neighbourhood Sub-precinct (A3). Paved area is 3m in width.

**Table SC6.3A Sippy Downs Town Centre streetscape treatment schedule**

ITEM	PRINCIPAL STREETS						LOCAL ACCESS STREETS	
	Town Centre Connector	Stringybark Road	'A' Street (Town Centre)	'A' Street	Town Centre Principal Street	Residential Principal Street	Town Centre Access Street	Residential Access Street
<b>Footpath Trees</b>	Lophostemon confertus	Lophostemon confertus	Elaeocarpus obovatus	Elaeocarpus obovatus	Elaeocarpus obovatus	Elaeocarpus obovatus	Waterhoussa floribunda, Brachyichiton discolour	Pongamia pinnata, Waterhoussa floribunda
<b>Median Trees</b>	Mix of Lophostemon confertus, Syncarpia glomifera and Melaleuca quinquinovia	Ficus virens	Ficus virens or Ficus platypoda	None	N/A	N/A	N/A	N/A
<b>Understorey Planting</b>	Median and street trees	Median only	Median as appropriate	Median and street trees as appropriate	None	Lawn	None	Yes
<b>Tree Pit Mulch</b>	Composted forest mulch	Decomposed Granite	Decomposed Granite	Decomposed Granite	Decomposed Granite		Decomposed Granite	Composted forest mulch
<b>Pavement Type 1</b>	Concrete Type 1 - Light Exposed Concrete CCS Cactus with 10 - 20mm aggregate 32MPa	Paver Type 1 - Hanson 400 x 400 "Sippy Downs Brush Box" CCS Cactus (double pigment quantities) 10-12mm aggregate Padthaway Green	Paver Type 1 - Hanson 400 x 400 "Sippy Downs Brush Box" CCS Cactus (double pigment quantities) 10-12mm aggregate Padthaway Green	Paver Type 1 - Hanson 400 x 400 "Sippy Downs Brush Box" CCS Cactus (double pigment quantities) 10-12mm aggregate Padthaway Green	Paver Type 1 - Hanson 400 x 400 "Sippy Downs Brush Box" CCS Cactus (double pigment quantities) 10-12mm aggregate Padthaway Green	Paver Type 1 - Hanson 400 x 400 "Sippy Downs Brush Box" CCS Cactus (double pigment quantities) 10-12mm aggregate Padthaway Green	Concrete Type 1 - Hanson Sippy Downs Mix - Light Exposed Concrete CCS Cactus with 9 - 14mm aggregate (70% dark jade, 25% Glasshouse Blue, 5% Oyster Grey) 32MPa	Concrete Type 1 - Hanson Sippy Downs Mix - Light Exposed Concrete CCS Cactus with 9 - 14mm aggregate (70% dark jade, 25% Glasshouse Blue, 5% Oyster Grey) 32MPa
<b>Pavement Type 2</b>	Concrete Type 2 - CCS Driftwood, Light Exposed Concrete with 10-20mm 'Hytec' cream coloured crushed aggregate 25MPa	Paver Type 2 - Hanson 400 x 400 "Sippy Downs Tea Tree" CCS Driftwood, 10-12mm aggregate Padthaway Green	Paver Type 2 - Hanson 400 x 400 "Sippy Downs Tea Tree" CCS Driftwood, 10-12mm aggregate Padthaway Green	Paver Type 2 - Hanson 400 x 400 "Sippy Downs Tea Tree" CCS Driftwood, 10-12mm aggregate Padthaway Green	Paver Type 2 - Hanson 400 x 400 "Sippy Downs Tea Tree" CCS Driftwood, 10-12mm aggregate Padthaway Green	Paver Type 2 - Hanson 400 x 400 "Sippy Downs Tea Tree" CCS Driftwood, 10-12mm aggregate Padthaway Green	Concrete Type 2 - CCS Driftwood, broom finish concrete 25MPa	Concrete Type 2 - CCS Driftwood, broom finish concrete 25MPa
<b>Seats, Benches &amp; Tables</b>	SFA - Plaza CMP1/4/6 Batters Jarra	Concrete / Stone Seating Walls	SFA - Plaza CMP1/4 Powdercoat	SFA - Plaza CMP1/4 Powdercoat	SFA - Plaza CMP1/4 Powdercoat		SFA - Plaza CMP1/4 Powdercoat	
<b>Litter Bins</b>	SFA - LB6 Aluminium	SFA - LB6 Powdercoat	SFA - LB6 Powdercoat	SFA - LB6 Powdercoat	SFA - LB6 Powdercoat	SFA - LB6 Powdercoat	SFA - LB6 Powdercoat	SFA - LB6 Powdercoat
<b>Bollards</b>	SFA - Slim B5 Domehead Aluminium		SFA - Slim B5 Domehead Powdercoat	SFA - Slim B5 Domehead Powdercoat	SFA - Slim B5 Domehead Powdercoat	SFA - Slim B5 Domehead Powdercoat		
<b>Bike Stands</b>	SFA - Hoop BST02 Galvanised	SFA - Hoop BST02 Galvanised	SFA - Hoop BST02 Galvanised	SFA - Hoop BST02 Galvanised	SFA - Hoop BST02 Galvanised		SFA - Hoop BST02 Galvanised	

### SC6.3.3.6 Integrated water management

#### Preliminary

- (1) To support a holistic approach to rainwater and stormwater management, Council has prepared the Sippy Downs Town Centre Integrated Water Management Plan (IWMP). The IWMP is reflected in the provisions of this planning scheme policy and is supported by a number of design drawings and sections that are available from Council's website. Refer to Council Drawing Series 9366.
- (2) Development applications within the Sippy Downs Town Centre should fully consider the IWMP. Complying with the provisions of this planning scheme policy will ensure that the responsibility of sustainable urban water management is shared across development in the Sippy Downs Town Centre in a consistent and equitable manner.
- (3) The IWMP provides guidance and standards on the required dimensions for harvesting, detention, conveyance and treatment systems. These dimensions are reflected below. Departure from these dimensions may be considered where it can be demonstrated that an alternative proposal provides equal or greater performance to those suggested in the IWMP.
- (4) For the purposes of Acceptable Outcome AO30 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes/criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following are the standards for stormwater, water supply and wastewater infrastructure in the Sippy Downs Town Centre:-

#### Streetscape stormwater treatment

- (a) the treatment of stormwater runoff through combinations of on-site treatment, roadside swales, vegetated buffers, biofiltration and extended detention areas within the road corridor and adjacent to the 'Forest Buffer' area is supported. As part of the IWMP, the stormwater conveyance strategy assumes that:-
  - (i) a portion of runoff from roofs and site is captured and stored for use;
  - (ii) excess runoff from roofs and site is treated before discharge to the roadside conveyance;
  - (iii) conveyance within the road corridor is provided via combinations of kerb and channel flow, central swales and pipe drainage; and
  - (iv) events up to the 1%AEP storm event are conveyed within the kerb to kerb area of the road reserves where applicable;
- (b) the IWMP (refer Council Drawing Series 9366) identifies the anticipated configuration and layout of stormwater conveyance systems for the Sippy Downs Town Centre. Cross sections for each of the streets are identified in **Section SC6.3.3.2 (Connectivity and movement)** of this planning scheme policy;

#### On-site bioretention filters

- (c) on-site bioretention filters should be designed in accordance with the parameters presented in **Table SC6.3B (IWMP design parameters for bioretention filters)** and the Healthy Waterways Partnership's Water Sensitive Urban Design Technical Design Guidelines for South East Queensland;
- (d) the detention volumes of stormwater and roofwater tanks, as per **Table SC6.3E (Roofwater tank storage volumes)** and **Table SC6.2F (IWMP stormwater tank storage volumes)**, may be accounted for as equal volumes of extended detention provided by on-site bioretention filters. Further, the bioretention filter in each development could be split to a series of bioretention filters keeping the cumulative volume unchanged;

**Table SC6.3B IWMP design parameters for bioretention filters**

Design parameter	Analysis value
Bioretention filter area	3% of site area
Extended Detention Depth	0.2m
Filter Depth	1.0m
Depth below underdrain pipe as a percentage of the filter depth	10%
Saturated hydraulic conductivity	100mm/hr
Filter media to comply with FAWB <sup>2</sup> Guidelines for Soil Filter Media in Bioretention Systems	

<sup>2</sup> Facility for Advancing Water Biofiltration (FAWB) Monash University <http://www.monash.edu.au/fawb/products/obtain.html>



- (e) the detention depths and filter depths presented in **Table SC6.3B (IWMP design Parameters for Bioretention Filters)** should be maintained as the minimum values. Diversion of stormwater to the bioretention filters through a grassed swale may further improve the quality of stormwater;

#### Forest buffer swale

- (f) the 'Forest Buffer Swale' as presented in the IWMP (refer Council Drawing Series 9366) should be located outside and adjacent to the 20 metre wide 'Forest Buffer'. The function of this swale is not to enter any part of the 20 metres required for the 'Forest Buffer';
- (g) three parts of the 'Forest Buffer Swale' (tail end) should be utilised as bioretention swales. Design parameters for the forest buffer swale are given in **Table SC6.3C (IWMP design parameters for Forest Buffer swale)** and **Table SC6.3D (IWMP design parameters for bioretention filter for Forest Buffer swale)**. An indicative section of the forest buffer swale is given in Council Drawing Series 9366;
- (h) a 3 metre wide maintenance aisle should provide access to the swale. This aisle should be located adjacent to the southern edge of the swale (refer to **Section SC6.3.3.4 (Landscape buffer (Forest Buffer))** of this planning scheme policy);

**Table SC6.3C IWMP design parameters for Forest Buffer swale**

Catchment ID	Length (m)	Minimum depth (m)	Other parameters
1	118	0.50	<ul style="list-style-type: none"> <li>• Bed slope: 0.5%</li> <li>• Bed width: 2m</li> <li>• Slopes 1:4</li> <li>• Vegetation Height: 0.075m</li> </ul>
2	266	0.65	
3	431	0.65	

**Table SC6.3D IWMP design parameters for bioretention filter for Forest Buffer swale**

Catchment ID	Length (m)	Min. filter area (m <sup>2</sup> )	Other parameters
1	89	178	<ul style="list-style-type: none"> <li>• No extended detention depth</li> <li>• Filter media to comply with FAWB Guidelines for Soil Filter Media in Bioretention Systems</li> <li>• Saturated hydraulic conductivity: 100mm/hr</li> </ul>
2	133	266	
3	162	324	

#### Filling and excavation for drainage works

- (i) at some locations earthworks are anticipated to be needed prior to construction of the drainage system. Anticipated works include:-
- (i) filling of the existing ground at locations indicated on the IWMP (refer Council Drawing Series 9366) in order to provide sufficient depth to convey 1% AEP flows; and
- (ii) levelling of the existing ground (cut and fill) at some locations in order to provide continuous grade towards the end of the swale (refer Council Drawing Series 9366);
- (j) approximate filling heights at each location are given in the Council Drawing Series 9366. Details of these quantities should be confirmed during detailed design;

#### High flow bypass

- (k) the proposed IWMP drainage system is adequate for flows up to 1%AEP. However, to effectively convey flows from extreme events (greater than 1% AEP) a high flow bypass weir should be constructed to divert flows to the existing drain along the Sunshine Motorway. Refer to Council Drawing Series 9366 for high flow bypass locations and for a typical section of a proposed high flow bypass structure. The high flow bypass from the control weir should be designed to avoid disturbance of vegetation in the forest buffer from high energy flow;
- (l) easements for the proposed pipe drains and culverts are as per Council Drawing Series 9366. These easements link the precinct's drainage system to the buffer zone swales;

## Rainwater capture, storage and reuse

- (m) as part of the IWMP, the rainwater harvesting strategy should ensure:-
- (i) all building roof drainage is directed to rainwater storages;
  - (ii) systems are screened to exclude leaf litter and insects;
  - (iii) first flush devices are provided;
  - (iv) roofwater tank storage volumes are as per **Table SC6.3E (IWMP roofwater tank storage volumes)** and **Table SC6.3F (IWMP stormwater tank storage volumes)**;
  - (v) overflow from roofwater tanks is diverted to stormwater tanks;
  - (vi) storage is provided as tanks either buried under landscaped areas or car parks, or integrated into the basement designs of building;
  - (vii) harvested rainwater/roofwater is pumped throughout the building for toilet flushing, laundry and possibly also for limited garden irrigation; and
  - (viii) roofwater storages are connected to reticulated mains water supply for top up when available supply is less than or equal to 10%;

**Table SC6.3E IWMP roofwater tank storage volumes**

Precinct	Roofwater tanks	
	Retention volume m <sup>3</sup> / ha*	Detention volume m <sup>3</sup> / ha*
Sippy Downs Central	464	116
Sippy Downs West Neighbourhood	230	58
Sippy Downs Business and Technology	126	32

\* Per hectare of total site area.

**Table SC6.3F IWMP stormwater tank storage volumes**

Precinct	Stormwater tanks	
	Retention volume m <sup>3</sup> / ha*	Detention volume m <sup>3</sup> / ha*
Sippy Downs Central	99	79
Sippy Downs West Neighbourhood	628	137
Sippy Downs Business and Technology	312	214

\* Per hectare of total site area.

## Harvested water for irrigation

- (n) the IWMP requires that a harvested water supply system is implemented for supplying water for garden watering and landscape irrigation. Potable water should not be used for irrigation. The harvested water supply is supplied by either roofwater or harvested stormwater. In addition, the use of signage to indicate that drinking quality water is prohibited for use as irrigation supply should be displayed in all appropriate private and public areas.

## Stormwater capture, storage and reuse

- (o) as part of the IWMP, the stormwater harvesting strategy should ensure that:-
- (i) at least 50% of the total site area other than roofs is connected to stormwater tanks;
  - (ii) stormwater storage volumes are as per **Table SC6.3F (IWMP stormwater tank storage volumes)**;
  - (iii) the system is screened to exclude rubbish and leaf litter;
  - (iv) storage systems may use a combination of open ponds and infiltration systems or concrete tanks either buried under landscaped areas or car parking areas, or integrated into the basement designs of buildings;
  - (v) a high flow bypass is incorporated to allow high volumes of intense or extended rainfall to bypass the storage facility and bioretention area; and
  - (vi) collected stormwater intended for internal reuse is treated to appropriate standards as per the relevant State Government guidelines and requirements.

## Source reliability

- (p) the IWMP roofwater and stormwater storages have been sized to capture and store volumes of rainwater and stormwater sufficient to supply the intended connections with 85% seasonal reliability. A continuous water balance simulation, of 30 years was undertaken to determine the reliability of substitute water sources;

## Wastewater management

- (q) a 'smart sewer' system should be provided for all development. 'Smart sewers' generally use welded PE pipe and plastic access shafts in lieu of manholes and can be used to replace conventional gravity sewerage systems; and



- (r) the trunk sewer may be located within the area of the forest buffer swale only where the swale is not required for bioretention purposes. Otherwise the sewer may be located within the maintenance aisle. Refer to **Figure SC6.3K (Indicative forest buffer cross section)** for indicative location of the trunk sewer.

### SC6.3.3.7 Road traffic noise attenuation

#### General guidance in relation to road traffic noise attenuation for the Sippy Downs Town Centre

The following is general advice for achieving outcomes of the **Nuisance code** relating to road traffic noise attenuation:-

- (a) the location of the Sippy Downs Town Centre in proximity to the Sunshine Motorway results in the need to address the acoustic impact of the Motorway on development, in particular residential development. As residential development will take place in the form of multiple dwellings up to six storeys in height, the subsequent final site elevations in conjunction with any acoustic barriers will not achieve the required traffic noise attenuation. In addition, barriers would conflict with the visual amenity from the Sunshine Motorway and casual surveillance outcomes sought within the development. The applicable approach to noise attenuation may be achieved by:-
  - (i) architectural measures and building orientation to shield communal outdoor recreation areas (pool & BBQ, playground, etc.) or private courtyards from traffic noise; and
  - (ii) building design in accordance with *AS3671-1989: Acoustics-Road traffic noise intrusion-Building siting and construction*, to achieve the satisfactory noise levels as stated within *AS2107-2000: Acoustics-Recommended design sound levels and reverberation times for building interiors*, for the internal acoustic amenity.

### SC6.3.4 Development in Sub-precinct SID LPSP-1a (Sippy Downs Town Centre Core)

#### SC6.3.4.1 Land use and locations

##### Guidance in relation to Performance Outcome PO32 (Town centre core plan)

- (1) The following is advice for achieving Performance Outcome PO32 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** relating to the provision of the community facility:-

##### **Land for community facility**

- (a) Performance Outcome PO32 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** requires a minimum of 1,500m<sup>2</sup> of land to be provided for an integrated community facility to meet the needs of the Sippy Downs community. Ownership of the land is to be transferred to Council in fee simple. Infrastructure credits will apply to the value of the land;
- (b) **Figure 7.2.25C (Sippy Downs Town Centre Core Plan)** of the **Sippy Downs local plan code** identifies the preferred location of land required for this facility. Any proposal to change the location should ensure that the alternative location is on 'A' Street and has direct street frontage on a corner location; and
- (c) the facility is intended to provide for a number of functions including a branch library, multi-purpose community centre, youth facility and community information space. It is estimated that a gross floor area of 2,500m<sup>2</sup> will provide for the various components of the facility over more than one level. The Sippy Downs integrated community facility should be a free standing, significant, cultural building located with an urban plaza providing a public gathering space external to the building.

##### Guidance in relation to Performance Outcome PO35 (Large floor plate retail)

- (2) The following is advice for achieving Performance Outcome PO35 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in**

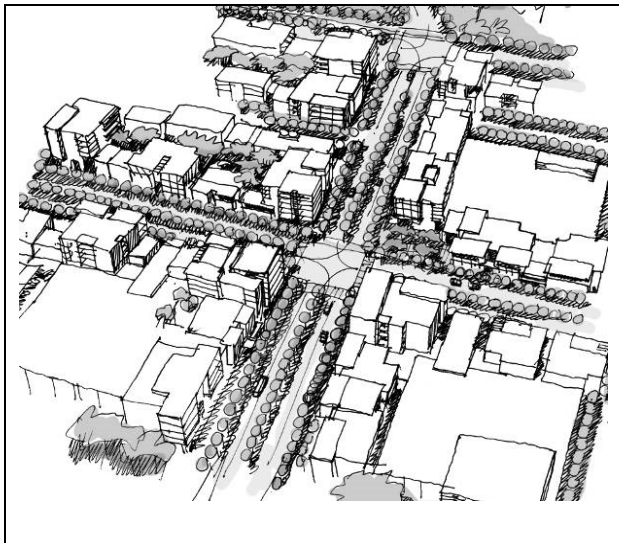
**Precinct SID LPP-1 (Sippy Downs Town Centre)** of the **Sippy Downs local plan code** relating to the location and design of large floor plate retail premises:-

- (a) the location of large floor plate retail premises (also referred to as retail 'anchor' stores) and related retail shops should ensure that they prioritise pedestrian movement on the 'Main Streets' of the town centre. Guidance on the layout and integration of large floor plate retail stores is provided below and illustrated in **Figure SC6.3S (Integration of large floor plate retail premises in the Sippy Downs Town Centre)**;

**Hybrid shopping mall / street layouts**

- (b) hybrid mall / main street retail layouts incorporate a street into the layout of a retail mall. These layouts, whilst having a street and sleeving the large floor plate components, operate on the same principles as those of a shopping mall, where the priority is on internal or off-street malls, which maximise the number of specialty retail premises and concentrate customer movement off-street between the anchor stores. This priority for off-street pedestrian movement compromises the achievement of a vibrant 'Main Street'. Whilst these retail formats may seem to create a town centre, they are based on the retail 'shopping centre' model and therefore cannot deliver a public realm based town centre. Such retail formats are inconsistent with Council's planning intent for the Sippy Downs Town Centre and should not be utilised in development design;

**Figure SC6.3S Integration of large floor plate retail premises in the Sippy Downs Town Centre**

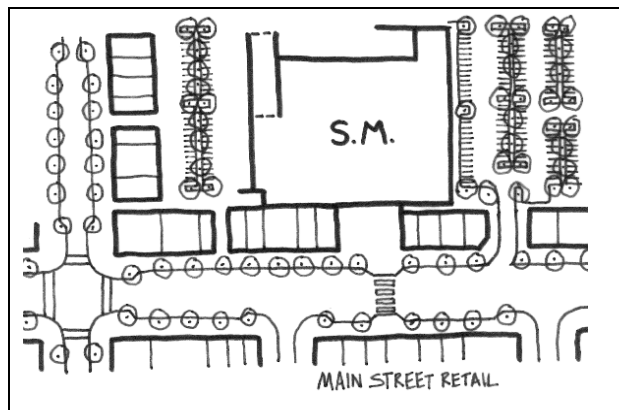


**Required retail format (Street-based)**

- (c) to ensure that the 'Main Streets' play the central role in the functioning of the Sippy Downs Town Centre Core, the 'Main Streets' should have a strong primary retail role, rather than be in competition with high rent, off-street, shops and businesses. Therefore the required retail format prioritises the street as the main retail location and pedestrian movement corridor. This arrangement seeks to ensure the attractiveness and viability of streets for retail businesses and other town centre commercial activities;

- (d) prioritisation of the 'Main Street' can be achieved when the location of large floor plate retail stores open onto, and are accessed from, the street rather than internal or off-street malls, to result in pedestrian movement along the street. A typical layout for a 'Main Street' large floor plate retail store is provided in **Figure SC6.3T (Supermarket located to front onto Main Street)**. The location and design of large floor plate retail uses should achieve the following:-

**Figure SC6.3T Supermarket located to front onto 'Main Street'**



- (i) each anchor is separated from the public realm by only one single sleeve (one tenancy) of retail floor space;

- (ii) the entrance area is designed to read as part of the town centre public space system;
  - (iii) retail uses in entrance areas should not include important retail drawcards such as chemists, post offices and newsagents. These are located on the 'Main Streets';
  - (iv) the pedestrian entrance points are accessed only from 'A' Street and lead to only one anchor retail. Pedestrian access to a retail anchor (to the front door) should be only provided from the street and not directly from a rear or side car parking area. The main movement path from the carparking area results in the movement of pedestrians along the street creating activity in the public realm; and
  - (v) the location of an anchor should not allow the opportunity for customers to move from one anchor to another without accessing the public realm ('A' Street); and
- (e) Council will seek design responses which demonstrate that the location of large floor plate retail premises, associated retail shops and other pedestrian activity generators prioritise street activity.

### SC6.3.4.2 Public open space

#### Standards in relation to the provision of the Town Square

(1) For the purposes of Acceptable Outcome AO46 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following is the advice and the standards for the development of the Town Square:-

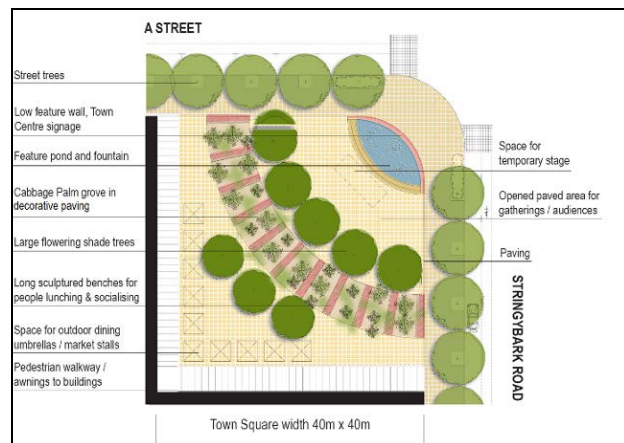
(a) the Town Square is the primary urban public space for the Sippy Downs Town Centre Core (Sub-precinct SID LPSP-1a). The Town Square should be located on the southwest corner of the intersection of 'A' Street and Stringybark Road. The Town Square should provide a community focus in the centre of town and should be highly visible from the entry into town along Stringybark Road. The area of the square should not be less than 40m x 40m, as measured from the property frontage to the building edge. An indicative Town Square concept plan is provided in **Figure SC6.3U (Town Square concept plan)**;

(b) given the importance of this public space, development should not constrain the public usability or long term flexibility of this land. Accordingly, important outcomes to be achieved are:-

- (i) the transfer of the land to Council in fee simple, including the unencumbered use of the land (including the volumetric space above and below the surface of the land); and
- (ii) that development and road design adjacent to the square maximises the usability of the space by avoiding or minimising the extent of any grade level changes; and

(c) landscaping may include clumped cabbage palms to frame the space, and provide feature planting and shade to sculptural seating. The square is hard paved to cater for the high number of users and could potentially contain some type of memorial and place for civic gathering and seating. Buildings with active frontages frame the space with space for outdoor dining and market stalls provided.

**Figure SC6.3U Town Square concept plan**

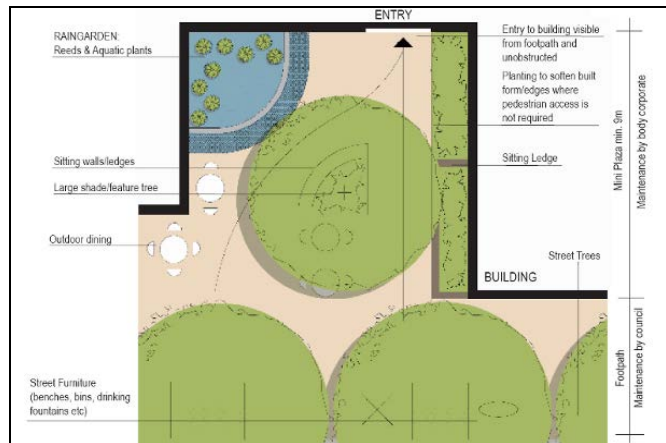


#### Standards in relation to the provision of Mini Plaza's

(2) For the purposes of Acceptable Outcome AO47 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following is the advice and the standards for the development of the Mini Plaza's:-

- (a) Mini Plaza's provide small spaces for social interaction and relaxation in an attractive, landscaped and shady setting. These spaces are created by an articulated building, have an 'urban park' character and allow for gathering sitting and eating. Whilst these spaces provide full public access and use, they are not intended to be owned or maintained by Council but rather by a body corporate or other similar arrangement;
- (b) the exact location of Mini Plaza's is determined during the detailed design process, however, their preferred locations are indicated in **Figure 7.2.25F (Sippy Downs Town Centre Open Space, Pedestrian and Cycle Linkages)** of the Sippy Downs local plan code. The minimum dimensions for a Mini Plaza should be 9 metres x 9 metres. This minimum space allows for public access and use and therefore any areas for outdoor dining are provided in addition to the minimum area required;
- (c) Mini Plaza's provide at least one shade tree and also provide a 'raingarden' to assist in stormwater treatment. The 'raingarden' intercepts and treats roofwater runoff prior to drainage to the trunk drainage system and contains reeds and aquatic plants;
- (d) Mini Plaza's contain low feature planting to encourage passive surveillance and soften built edges, contain themed artwork and provide unobstructed, easily accessible entries to buildings. Paving type and patterns ensure that the edge between the footpath and plaza is seamless; and
- (e) an indicative Mini Plaza layout is identified in **Figure SC6.3V (Concept Mini Plaza layout)**, however a range of design solutions are encouraged. Design solutions may provide flexible seating as either loose furniture, long sitting ledges or a variety of fixed benches, or a combination of these as well as various items of street furniture including a drinking fountain, litter bins and bicycle stand.

**Figure SC6.3V Concept Mini Plaza layout**



### SC6.3.5 Development in Sub-precinct SID LPSP-1b (Sippy Downs Business and Technology Sub-precinct)

#### SC6.3.5.1 Public open space

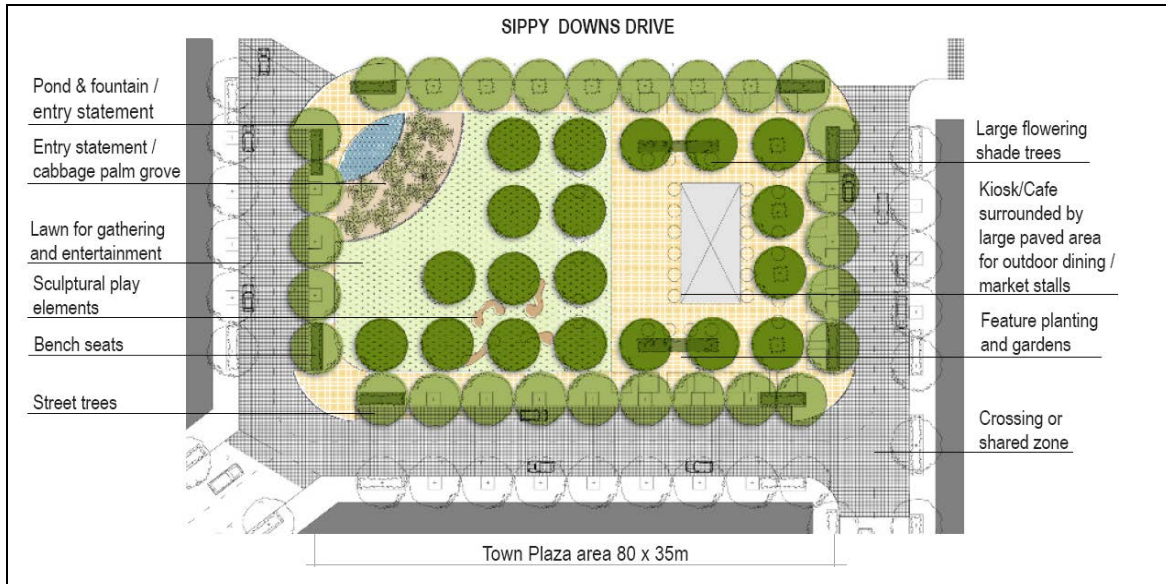
Standards in relation to the provision of the Town Plaza

- (1) For the purposes of Acceptable Outcome AO56 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes/criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following is the advice and the standards for the development of the Town Plaza:-
  - (a) the Town Plaza in the Sippy Downs Business and Technology Sub-precinct is a large space (80 metres x 35 metres) that will benefit from the 'Main Street' commercial and catering venues located on the southern side of the Town Plaza. The Town Plaza has road frontage on all sides with a number of crossing points or shared zones required between the Town Plaza and surrounding blocks. The plaza provides a variety of shady spaces with a mix of hard paving, lawn and gardens for passive recreation and community gathering and entertainment. An indicative Town Plaza concept plan is provided in **Figure SC6.3W (Town Plaza Concept Plan)**;
  - (b) given the importance of this public space, it is essential that development does not constrain the public usability or long term flexibility of this land. Accordingly, important outcomes to be achieved are:-



- (i) the transfer of land to Council in fee simple and includes the unencumbered use of the land (including the volumetric space above and below the surface of the land); and
  - (ii) that development and road design adjacent to the square maximises the usability of the space by avoiding or minimising the extent of any grade level changes.
- (c) facilities include a kiosk with outdoor dining and public toilets, a water fountain and pond and cabbage palm feature planting that is highly visible from the approach along Sippy Downs Drive. Public art and play sculptures provide cultural interest to the space.

**Figure SC6.3W Town Plaza Concept Plan**



Standards in relation to the provision of Mini Plazas

- (2) Refer to **Section SC6.3.4.2 (Public open space)** of this planning scheme policy (above) in relation to Mini Plazas.

**SC6.3.6 Development in Sub-precinct SID LPSP-1c (Sippy Downs West Neighbourhood)**

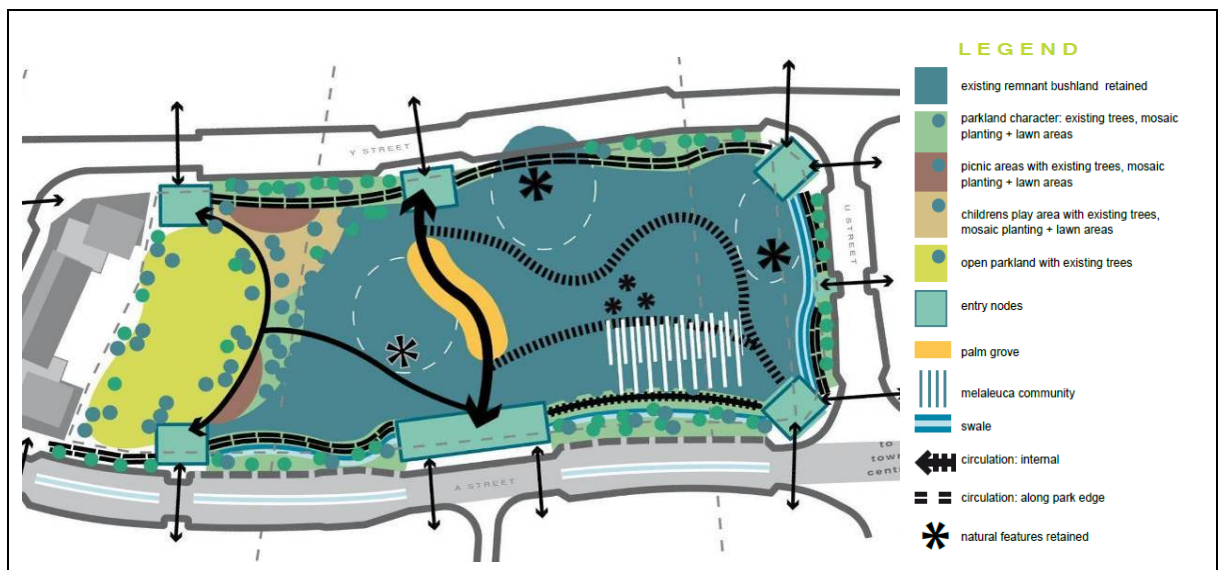
**SC6.3.6.1 Public open space**

Standards in relation to the provision of Forest Park West

- (1) For the purposes of Acceptable Outcome AO63 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following is the advice and the standards for the development of the Forest Park West:-
  - (a) the Forest Park West should be a minimum of 2 hectares in size and located generally in accordance with **Figure 7.2.25F (Sippy Downs Town Centre Open Space, Pedestrian and Cycle Linkages)** of the **Sippy Downs local plan code**;
  - (b) destined to be the last remaining remnant parcel of bushland within Precinct SID LPP-1 (Sippy Downs Town Centre), the park is intended to conserve the existing landscape features as much as possible and provide a bushland recreational experience;
  - (c) the park should not take the form of a conventional recreational park with large open areas, instead providing a balance between nature conservation and the provision of comfortable access, points of interest and recreational opportunities for users;
  - (d) the park should comprise a combination of established trees and understorey (approximately 70%), established trees and lawn (approximately 15%) and open lawn areas (approximately 15%);

- (e) paths should provide pedestrian and cycle access and circulation through the park;
- (f) facilities include public toilets, picnic shelters, BBQ's, seating areas, signage, walking tracks, kick-a-ball field and play spaces;
- (g) an additional stormwater swale (drainage reserve) is provided along the eastern edge of the park. For a typical cross section of this swale refer to Council Drawing Series 9366 (refer to **Section SC6.3.3.6 (Integrated water management)** of this planning scheme policy);
- (h) subject to site constraints, the Forest Park West is designed, in accordance with Crime Prevention Through Environmental Design (CPTED) principles so that access to and from the park is equitable with multiple exits; and
- (i) the Forest Park West is established generally in accordance with the layout indicated in **Figure SC6.3X (Forest Park West indicative concept plan)**.

**Figure SC6.3X Forest Park West indicative concept plan**



Standards in relation to the provision of the Neighbourhood Park

- (2) For the purposes of Acceptable Outcome AO64 of **Table 7.2.25.4.2 (Additional performance outcomes and acceptable outcomes criteria for assessable development in Precinct SID LPP-1 (Sippy Downs Town Centre))** of the **Sippy Downs local plan code** the following is the advice and the standards for the development of the Neighbourhood Park:-
  - (a) a Neighbourhood Park is provided on the western side of 'W' Street at the termination of 'X' Street, as identified in **Figure 7.2.25F (Sippy Downs Town Centre Open Space, Pedestrian and Cycle Linkages)** of the **Sippy Downs local plan code**;
  - (b) the Neighbourhood Park should be a minimum of 600m<sup>2</sup> in size and provide a relaxing gathering space for the residential area; and
  - (c) the Neighbourhood Park is established as a shady space with a mix of lawn and gardens, hard paved seating areas and some play elements for passive recreation and community interaction.

## SC6.4 Planning scheme policy for the acid sulfate soils overlay code

### SC6.4.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Acid sulfate soils overlay code**; and
- (b) identify and provide guidance about information that may be required to support a development application where subject to the **Acid sulfate soils overlay code**.

Note—nothing in this planning scheme policy limits Council's discretion to request relevant information under the Development Assessment Rules made under section 68(1) of the in accordance with the Act.

### SC6.4.2 Application

This planning scheme policy applies to assessable development which requires assessment against the **Acid sulfate soils overlay code**.

### SC6.4.3 Advice for acid sulfate soils overlay code outcomes

The following is advice for achieving outcomes in the Acid sulfate soils overlay code relating to the avoidance and management of acid sulfate soils:-

- (a) compliance with Performance Outcome PO1 of **Table 8.2.1.3.1 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Acid sulfate soils overlay code** may be demonstrated in part or aided by the submission of an acid sulfate soils investigation report and, if acid sulfate soils are to be disturbed by development, an acid sulfate soils management plan, prepared by a competent person in accordance with Section **SC6.4.4 (Guidance for the preparation of an acid sulfate soils investigation report and management plan)**.

Note—for the purposes of this planning scheme policy, a competent person is a Certified Professional Soil Scientist (CPSS) Stage 2 or 3, with suitable experience in acid sulfate soils.

### SC6.4.4 Guidance for the preparation of an acid sulfate soils investigation report and management plan

#### Acid sulfate soils investigation report

- (1) An acid sulfate soils investigation report is to be prepared in accordance with:-
  - (a) the *State Planning Policy December 2013* and *State Planning Policy Guideline: State interest – emissions and hazardous activities - Guidance on acid sulfate soils December 2013*; and
  - (b) the procedures described in the most up to date version of the *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland 1998* (Ahern et al, 1998).
- (2) An acid sulfate soils investigation report is to describe through detailed sampling, analysis (including groundwater analysis) and interpretation:-
  - (a) the presence, extent and intensity of any actual acid sulfate soils (AASS) and potential acid sulfate soils (PASS) present on the site; and
  - (b) the implications for design, construction and operation of the proposed development.

#### Acid sulfate soils management plan

- (3) An acid sulfate soils management plan is to be prepared in accordance with the most recent version of the Queensland Acid Sulfate Soil Technical Manual.
- (4) An acid sulfate soils management plan is to properly address, describe or include the following:-
  - (a) the mapped extent of the AASS or PASS;



- (b) a detailed description of the depth and location of all ASS identified;
- (c) the methodology used for sampling and analysis (both field and laboratory);
- (d) the ASS management practices to be implemented that will achieve any or all of the following:-
  - (i) prevention of the oxidation of pyrite (including avoiding the disturbance of ASS by excavation or changes to groundwater levels);
  - (ii) treatment or management of the ASS (which may include burial, neutralisation, and separation and treatment);
  - (iii) prevention, control or minimisation of the escape of acid sulfate leachate to the surrounding environment; and
  - (iv) neutralisation of acid leachate from AASS;
- (e) the details of any pilot project or field trial to be undertaken to prove the effectiveness of any new technology or innovative management practice being proposed;
- (f) the monitoring and reporting procedures to be established and implemented;
- (g) a contingency plan and accident emergency response procedures; and
- (h) performance criteria to be used to assess the effectiveness of the ASS management and monitoring measures.

## SC6.5 Planning scheme policy for the airport environs overlay code

### SC6.5.1 Purpose

The purpose of this planning scheme policy is to provide advice about achieving outcomes in the **Airport environs overlay code**.

Note—nothing in this planning scheme policy limits Council's discretion to request other relevant information [under the Development Assessment Rules made under section 68\(1\) of their accordence with the Act](#).

### SC6.5.2 Application

This planning scheme policy applies to assessable development which requires assessment against the **Airport environs overlay code**.

### SC6.5.3 Advice relating to obstructions and hazards outcomes

The following is advice for achieving outcomes in the **Airport environs overlay code** relating to obstructions and hazards outcomes:-

- (a) compliance with Acceptable Outcomes AO1.1 and AO1.2 of **Table 8.2.2.3.1 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Airport environs overlay code** may be achieved by observing the following process:-
  - (i) a proponent proposing to erect a permanent or temporary structure (including a construction crane) within 15 kilometres of the Sunshine Coast Airport or Caloundra Aerodrome should consult the obstacle limitation surface (OLS) diagrams included on the Airport Environs Overlay Maps;
  - (ii) where a proposed structure or any equipment necessary to construct, operate or maintain the proposed structure is likely to exceed the height plane (in metres AHD) of the OLS the proponent should consult Council's planning assessment officers;
  - (iii) where Council planning assessment officers become aware of the likelihood of permanent or temporary structures penetrating the OLS, either by notification by the proponent or by other means, the matter will be referred to the Operations Manager for Sunshine Coast Airport;
  - (iv) upon review of the proposed development the Operations Manager for Sunshine Coast Airport will either:-
    - (A) advise the Council that the proposed development is unlikely to penetrate the OLS; or
    - (B) confirm that the proposed development penetrates the OLS;
  - (v) in the case of (A) above, the proposed development may proceed without further consideration of the OLS (although any change to the project, particularly if construction cranes are involved) may require reconsideration of OLS impacts;
  - (vi) in the case of (B) above, the Operations Manager for Sunshine Coast Airport will refer the proposed structure to the Civil Aviation Safety Authority (CASA);
  - (vii) if CASA and the airport operator determines that the proposal will be a hazardous object it will give notice of its determination to the proponent and the Council as planning authority. The determination will include advice about any conditions that would reduce the risk from the proposed structure to acceptable levels, without affecting the regularity or efficiency of aerodrome operations;
  - (viii) in considering a development application Council will have regard to the advice provided by CASA; and
  - (ix) Council is unlikely to approve a development application if CASA has determined that the proposal will create an unacceptable risk to aviation safety or affect the operational efficiency of the airport as determined by the airport operator.
- (b) compliance with Acceptable Outcome AO2.5 of **Table 8.2.2.3.1 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Airport environs overlay code** may be achieved (in part) by ensuring that landscape and drainage design does not create attractive habitats for birds and flying foxes through such measures as:-

#### Wetlands, drainage areas and water body design

- (i) avoiding the creation of large water bodies and wetlands within 3 kilometres of the boundaries of an airport; and
- (ii) for development within 8 kilometres of the boundaries of an airport:-
  - (A) keeping the size of water bodies to a minimum;

- (B) avoiding the creation of islands within water bodies;
- (C) keeping water body depth at more than 500mm;
- (D) ensuring that water bodies have steep sides so as to make direct access to water difficult;
- (E) minimising the area of open water in water bodies;
- (F) minimising vegetation and overhanging rocks and logs at water body edges; and
- (G) ensuring that drainage channels provide for regular flows to be contained within steep or vertical edged concrete flow paths with any broader channels for stormwater flows grassed and graded to drain quickly and be easily mown so as to avoid pondage;

Landscape design

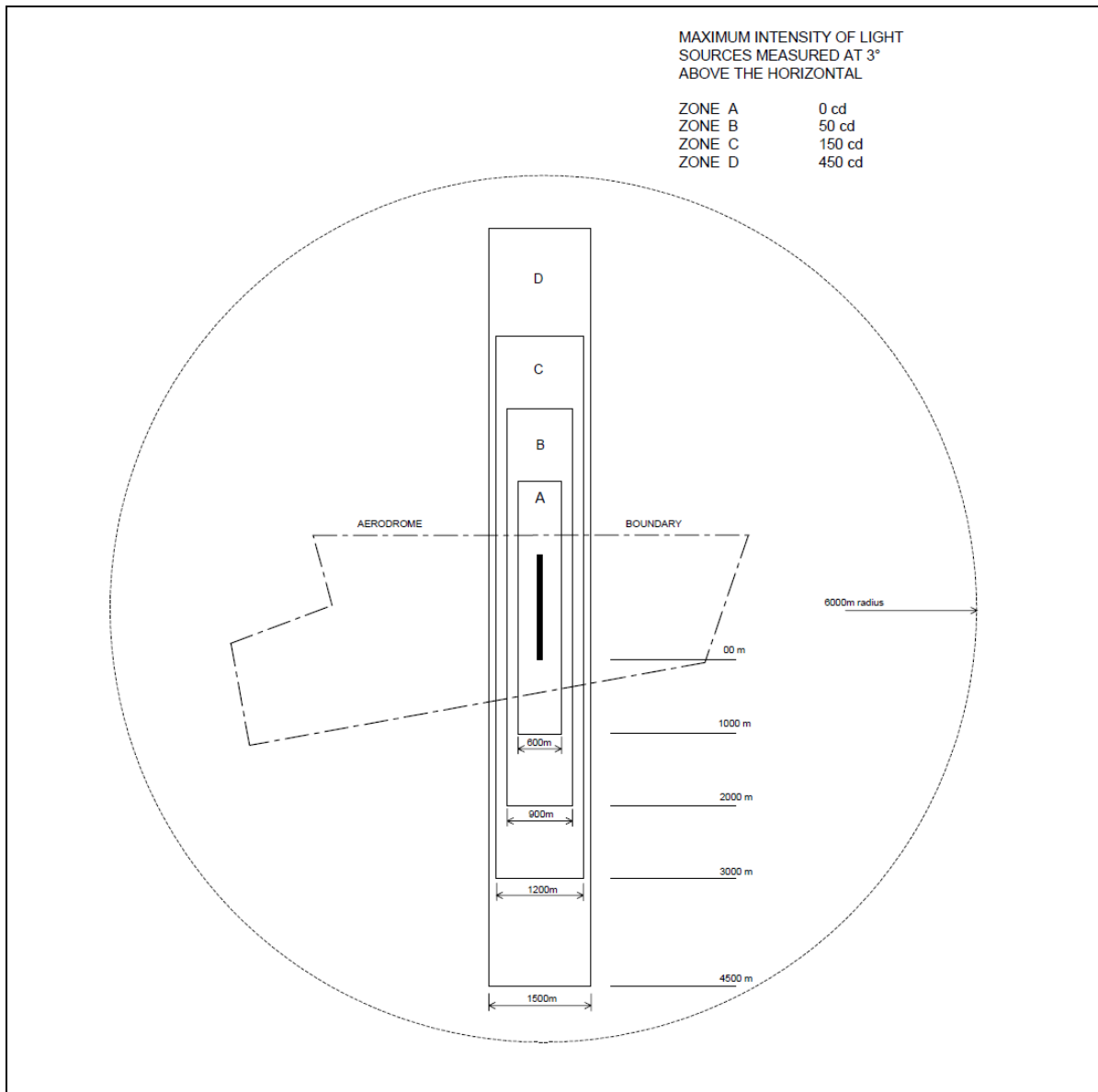
- (iii) avoiding artificial wetlands, extensive planting of fruit trees and the creation of large grassed areas capable of producing abundant seed within 3 kilometres of the boundaries of an airport; and
- (iv) for development within 8 kilometres of an airport:-
  - (A) limiting the use of dense vegetation buffers around the edges of water bodies;
  - (B) limiting the planting of trees likely to form hollows;
  - (C) including short grass open areas that drain freely;
  - (D) keeping waterways free of vegetation that might provide habitat or food sources for ducks, ibis and other medium to large water birds;
  - (E) maintaining long grass (i.e.>30cm) in non-essential areas to reduce bird access to soil based food sources and serve to discourage feeding by limiting the birds ability to observe potential predators;
  - (F) limiting the use of signs, posts, structures and the like that provide resting and perching opportunities for birds;
  - (G) reducing opportunities for birds to scavenge from rubbish bins, composting facilities and the like by careful design and placement;
  - (H) installing anti-perching spikes and wires to deter birds, particularly magpies and raptors from roosting; and
  - (I) carefully considering the selection of plant species used in landscaping and in particular, avoiding known food trees for birds and flying foxes; and
- (c) Compliance with Acceptable Outcome AO4 of **Table 8.2.2.3.1 (Performance outcomes and acceptable outcomesCriteria for assessable development)** of the **Airport environs overlay code** may be achieved (in part) by ensuring that lighting within 6 kilometres of an airport:-
  - (i) is designed such that the intensity of lighting specified within each of the zones shown on **Figure SC6.5A (Airport lighting intensity zones)** does not exceed the intensity nominated for the respective zone;

Note—light fittings chosen for an installation should have their iso-candela diagram examined to ensure the fitting will satisfy the zone requirements. In many cases the polar diagrams published by manufacturers do not show sufficient detail in the sector near the horizontal, and therefore careful reference should be made to the iso-candela diagram. For installations where the light fittings are generally selected because their graded light emissions above horizontal conform to the zone requirements, no further modification is required.

- (i) for installations where the light fitting does not meet the zone requirements, fitting a screen to limit the light emission to zero above the horizontal; and
- (ii) avoiding the use of coloured lighting, except where approved for use by CASA.

Note—coloured lights are likely to cause conflict irrespective of their intensity because they are used to identify different aerodrome facilities. Proposals for coloured lights should be referred to CASA for detailed guidance.

**Figure SC6.5A Airport lighting intensity zones**



### SC6.5.4 Guidelines for achieving airport environs overlay code outcomes

For the purposes of the performance outcomes and acceptable outcomes in the **Airport environs overlay code**, the following are relevant guidelines:-

- (a) the *State Planning Policy December 2013* (Department of State Development, Infrastructure and Planning) and relevant *State Planning Policy Guidelines 2013*; and
- (b) *Australian Standards AS2021: Acoustics-Aircraft noise intrusion – Building siting and construction*.

## SC6.6 Planning scheme policy for the biodiversity, waterways and wetlands overlay code

### SC6.6.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Biodiversity, waterways and wetlands overlay code**; and
- (b) identify and provide guidance about information that may be required to support a development application where subject to the **Biodiversity, waterways and wetlands overlay code**.

Note—nothing within this planning scheme policy limits Council's discretion to request other relevant information under the Development Assessment Rules made under section 68(1) of in accordance with the Act.

### SC6.6.2 Application

This planning scheme policy applies to assessable development which requires assessment against the **Biodiversity, waterways and wetlands overlay code**.

Note—Council may require an ecological assessment to be undertaken for an ecologically important area even if that area is not identified on a Biodiversity, Waterways and Wetlands Overlay Map.

### SC6.6.3 Advice for biodiversity, waterways and wetland protection outcomes

The following is advice for achieving outcomes in the **Biodiversity, waterways and wetlands overlay code** relating to the protection of ecologically important areas, management of impacts on ecologically important areas, koala conservation, linking and rehabilitation of ecologically important areas, buffers to natural waterways and wetlands, management of public access and edge effects, hydrological regimes, groundwater and surface water quality outcomes:-

- (a) compliance with PO1 to PO12 of **Table 8.2.3.3.2 (Performance outcomes and acceptable outcomesCriteria for assessable development)** of the **Biodiversity, waterways and wetlands overlay code** may be demonstrated in part or aided by the submission of:-
  - (i) an ecological assessment report prepared by a competent person in accordance with **Section SC6.6.4 (Guidance for the preparation of an ecological assessment report)**;
  - (ii) a site rehabilitation plan prepared by a competent person in accordance with **Section SC6.6.5 (Guidance for the preparation of a site rehabilitation plan)** where required to give effect to recommendations in the ecological assessment report; and
  - (iii) a biodiversity offset area management plan prepared in accordance with **Section SC6.21.4 (Guidance for the preparation of a biodiversity offset area management plan)** of the **Planning scheme policy for biodiversity offsets**.

Note—for the purposes of this planning scheme policy a competent person is an appropriately qualified and experienced consultant with tertiary qualifications in environmental science, botany, zoology or another related discipline and with appropriate and proven technical expertise in undertaking flora and fauna surveys and regional ecosystem, ecology and biodiversity assessments within the South East Queensland Bioregion.

### SC6.6.4 Guidance for the preparation of an ecological assessment report

#### General

- (1) An ecological assessment report is to include the following:-
  - (a) an accurate description of the characteristics of the site;
  - (b) a detailed assessment of flora and vegetation communities on the site;
  - (c) a comprehensive assessment of the fauna on the site, including fauna that could potentially use the site; and
  - (d) recommendations for avoidance, minimisation and as a last resort offset of the potential impacts upon the environmental values of the site.

- (2) An ecological assessment report is to be supported by surveys necessary to confirm the presence or likely presence of species on the site.
- (3) An ecological assessment report is to be provided to Council in electronic form with excel spread sheets including GPS and easting and northing coordinates.

Site Characteristics

- (4) An accurate and clear description of the site is to be provided, including:-
  - (a) a lot on plan description of the site;
  - (b) an Australian Map Grid (AMG) description of the site for use in GIS data systems;
  - (c) compass directions;
  - (d) a description of slope and aspect characteristics;
  - (e) the location of waterways and wetlands;
  - (f) position in the terrain;
  - (g) a description of the underlying soils and geology;
  - (h) regional ecosystem maps of both mature and regrowth vegetation; and
  - (i) accurate scale on each map.

Flora and vegetation community assessment

- (5) A flora and vegetation community assessment is to be undertaken in conjunction with a fauna assessment of the site.
- (6) Maps produced as part of the flora and vegetation community assessment are to be combined with maps produced as part of the fauna assessment to produce a single coordinated report and map for the site.
- (7) The flora and vegetation community assessment is to:-
  - (a) cover all vegetation communities and all microhabitats (e.g. gullies, ridges, etc.);
  - (b) survey all relevant rare, threatened and significant species (that would reasonably be expected to be on the site) listed under the *Nature Conservation 1992 Act* and/or the *Environmental Protection and Biodiversity Conservation Act 1999* and their associated habitats;
  - (c) provide for multiple survey times where necessary to collect a full list of annuals such as herbs, orchids and grasses which may only be obvious during fruiting/flowering periods; and
  - (d) provide a Queensland Herbarium determination on the identification of site samples of any rare or unknown plants found during the assessment.
- (8) The results of a flora and vegetation community assessment are to be reported in the following way:-
  - (a) through a flora and vegetation community map of the site which is A3 in size, at a scale not greater than 1:500 and containing the following information:-
    - (i) existing and proposed buildings, roads, services (sewer, water, power lines etc.), transects of the site and their potential construction impact zones (sheds, stockpile areas, access paths) and buffer setback distances for tree fall zones, waterways, wetlands and bushfire mitigation;
    - (ii) all vegetation associations (terrestrial and aquatic) and their regional ecosystems, including regrowth vegetation (and time until regional ecosystem status will be reached);
    - (iii) all rare, threatened or significant species within the site and on relevant adjacent properties;
    - (iv) fauna and flora environmental corridors, including waterways and wetlands areas;
    - (v) detail of transects and quadrant areas and locations of all fauna survey sites;

- (vi) extent of weed infestation (including species) and/or other disturbances such as erosion, land slippage, etc.;
  - (vii) core habitat for priority species of flora and fauna (including hollow bearing trees, forage trees and ground habitats such as rocks, dens, logs, etc.);
  - (viii) a clear legend detailing each element described above; and
- (b) through a written report containing the following information:-
- (i) date of survey;
  - (ii) names and qualifications of competent person(s) and staff that undertook the survey, including details of relevant permits;
  - (iii) a description of the structural and spatial floral diversity;
  - (iv) a table of all flora species identified on the site with a description of their abundance, estimate of age (juvenile or mature), general health, if fruiting or flowering and GPS location;
  - (v) any potential or active threatening process;
  - (vi) an assessment of the biodiversity significance (State, Regional, Local) in accordance with the SEQ Biodiversity Planning Assessment; and
  - (vii) an assessment against the **Biodiversity, waterways and wetlands overlay code**.

Fauna assessment

- (9) A fauna assessment is to be undertaken in conjunction with a flora and vegetation community assessment of the site.
- (10) Maps produced as part of the fauna assessment are to be combined with maps produced as part of the flora and vegetation community assessment to produce a single coordinated report and map for the site.
- (11) The fauna assessment is to:-
- (a) cover all vegetation communities and all microhabitats (e.g. gullies, ridges, etc.);
  - (b) survey all relevant rare, threatened and significant species (that would reasonably be expected to be on the site) listed under the *Nature Conservation 1992 Act* and/or the *Environmental Protection and Biodiversity Conservation Act 1999* and their associated habitats;
  - (c) provide for at least one sampling site to be established in each hectare or broad ecosystem and habitat type;
  - (d) be conducted over a minimum of four days and nights with additional seasonal survey sampling undertaken when appropriate and necessary to fully assess the potential species on the site;
  - (e) provide for multiple survey times in terms of both time of day and throughout the year to ensure that all cryptic, migratory and/or seasonal species are recorded;
  - (f) provide a Queensland Museum determination on the identification of rare or unknown animals found during the assessment. A determination by someone recommended by the Queensland Museum is also accepted, provided recommendation of the person is also provided; and
  - (g) utilise the survey techniques and methods for the minimum duration periods set out in **Table SC6.6A (Fauna survey techniques, methods and minimum duration)**.

**Table SC6.6A Fauna survey techniques, methods and minimum duration**

Survey technique	Methods	Minimum duration
Diurnal search	This involves intensive investigation of streams, ground layer (under logs, rocks and leaf litter), low vegetation (under bark and tree stumps) and caves for target invertebrates and all amphibians, reptiles, bats and animal signs (e.g. scats, owl pellets, remains and tracks).  Records of search area must be shown on an A3 plan with a scale of 1:500.	1-2hr/day for each vegetation community during the middle of the day during winter or 1-2 hours at the beginning and end of each day during summer.
Pitfall traps	A pitfall trap line should comprise 3 of more pits (20L	4 days and 4 nights.



Survey technique	Methods	Minimum duration
	containers) and appropriate drift fencing. At least 1 pitfall trap line for each habitat type/vegetation community with a minimum of 3 pitfall trap lines for the site. Pitfall traps should be cleared early morning and late afternoon.	
Opportunistic records	Covers all fauna outside the systematic survey times.	None.
Spotlighting	Using a combination of high powered spotlights and head torches to be carried out on foot only. This method surveys nocturnal fauna.	2hr/night for 4 nights.
Elliot traps	The Elliot transects should comprise of approximately 20 Elliot traps (varying sizes should be used). At least 1 Elliot transect for each habitat type/vegetation community with a minimum of 4 Elliot transects for the site.	4 days and 4 nights.
Wire cage (possum) and Arboreal traps	Each Elliot transect should include 2 wire cage traps and up to 5 platform mounted arboreal traps which are secured to selected trees.	4 days and 4 nights.
Bird surveys	Transects are walked with 10 minutes spent at each spot. Birds are recorded indicating method of identification (i.e. call or visual observation). Surveys are conducted for 1 hour from dawn to early morning, 1 hour at dusk to early evening and 1 hour during night for nocturnal species.	1hr/day and night for 4 days and nights.
Nocturnal voice playback and call recording	This technique uses voice playback to determine the presence of species that may be difficult to physically observe in the field (e.g. owls and frogs).	1hr/night for 4 nights.
Ultrasonic batt call detectors And/or Harp traps and mist nets	This device records the ultrasonic calls of micro chiropteran bats.  For the capture of micro chiropteran bats.	1hr/night for 4 nights.  2hr/night for 4 nights.
Hair tubes	Different sizes of hair tube should be left on site as an additional method of mammal detection. Identification of samples must be undertaken by an expert in this method and their names must be provided in the report.	2 weeks.
Scats, tracks and other traces search	Evidence of fauna can be determined from scats, tracks, scratches, bones, etc.	1hr/night for 4 nights.
Aquatic bait trap/netting	Various methods of aquatic surveying should be undertaken where there is a water body on the site.	To be undertaken when water body is on site.

(12) The results of the fauna assessment are to be reported in the following way:-

- (a) through provision of a fauna map for the site which is A3 in size, at a scale no greater than 1:500 and containing the following information:-
  - (i) all vegetation associations (terrestrial and aquatic) and their regional ecosystem status, including regrowth vegetation (and time until regional ecosystem status will be reached);
  - (ii) all rare, threatened or significant species within the site and on relevant adjacent properties;
  - (iii) fauna and flora environmental corridors, including waterways and wetland areas;
  - (iv) details of fauna sampling areas;
  - (v) core habitat for priority species of flora and fauna;
  - (vi) a clear legend detailing each element described above; and
- (b) through provision of a written report containing the following information:-
  - (i) date of survey;
  - (ii) names and qualifications of competent person(s) and staff that undertook the survey, including details of relevant permits;
  - (iii) a table of all fauna species identified on the site with a description of their abundance, estimate of age (juvenile or mature), if nesting or feeding, if observed more than once during trapping;

- (iv) any potential or active threatening process;
- (v) an assessment of the biodiversity significance (State, Regional, Local) in accordance with the SEQ Biodiversity Planning Assessment;
- (vi) an assessment against the **Biodiversity, waterways and wetlands overlay code**;
- (vii) a description of the potential impacts of the proposed development on the species on the site, including during the design, construction and operational phases of the development;
- (viii) recommendations to avoid or minimise adverse impacts through sympathetically designed development layout plans;
- (ix) identified areas for the retention, protection, buffering and fencing of remnant native vegetation and native fauna habitat; and
- (x) identified areas requiring weed control and revegetation/regeneration to enhance fauna and flora habitat.

#### Survey parameters

- (13) A fauna survey conducted to inform an ecological assessment report is to:-
- (a) be conducted for a minimum of 4 days and nights unless otherwise specified by Council's environmental assessment officers for larger sites and for areas of significant environmental value;
  - (b) include the maximum area likely to be affected by the construction and ongoing operation of the proposed development and adjacent properties that could provide habitat for animals that may migrate to and from the site; and
  - (c) record the survey dates, weather conditions, locations of all survey sites, methods used to survey fauna, justification for locations and methods used and any other relevant information about the activities undertaken during the survey period.
- (14) All surveys are to identify any past records of rare, threatened or significant species in the general vicinity from Council's Ecological Report Card, Nature Search (Wildnet), Queensland Museum, Queensland Herbarium and other databases from local naturalists.

#### Recommendations for threat abatement

- (15) Recommendations for threat abatement are to be provided that address all measures or changes to the development design required to avoid or mitigate the impacts of the proposed development. These measures may include, but not necessarily be limited to:-
- (a) threat abatement plans;
  - (b) species recovery plans;
  - (c) conservation management plans;
  - (d) environmental management plans;
  - (e) fire management plans;
  - (f) site rehabilitation plans;
  - (g) sediment and erosion control plans;
  - (h) water quality management plans; and
  - (i) fauna management plans for both operational works phase and rehabilitation phase.
- (16) Where a proposed development has the potential to adversely impact on biodiversity values, Council may request the preparation of one or more of the above plans, in conjunction with other measures to abate potential impacts.

### Provision of biodiversity offsets

- (17) For development proposing biodiversity offsets, an ecological assessment of the receiving site is also to be provided in accordance with the **Planning scheme policy for biodiversity offsets**.

### **SC6.6.5 Guidance for the preparation of a site rehabilitation plan**

- (1) A site rehabilitation plan is to reflect and be guided by the SEQ Ecological Restoration Framework (as amended) and must include ground fauna habitat restoration.
- (2) A site rehabilitation plan is to incorporate/depict the following as relevant to the site and the development:-
- (a) reference to any ecological assessment report(s) for the site and how they are addressed in the site rehabilitation plan;
  - (b) details from any fauna management plan that requires ground fauna habitat restoration and nesting boxes or native bee hives to be located in the revegetation or retained vegetation areas;
  - (c) a revegetation layout on A3 plans at a scale of not greater than 1:500;
  - (d) a species palette incorporating the selection of native indigenous species only that are of the appropriate regional ecosystems for the area;
  - (e) clear zone delineation of species suitable for waterways, wetlands, steep slopes, edge planting, bushfire reduction areas, etc.;
  - (f) details of ground habitat such as rocks and hollow logs and other structural elements are provided at a similar density and diversity to that which occurs within the regional ecosystem being rehabilitated;
  - (g) near to equal numbers of each species to be used within the relevant revegetation areas or a bias towards understory species targeted for recovery of a specific flora or fauna species;
  - (h) as a minimum, the following diversity of species (in appropriate location):-
    - (i) 3 species of wetland sedges;
    - (ii) 5 species of macrophytes;
    - (iii) 5 species of native grasses;
    - (iv) 20 species of native shrubs; and
    - (v) 10 species of native trees;
  - (i) as a minimum, planting at the following density:-
    - (i) sedges, macrophytes and grasses – 0.5 metre centres;
    - (ii) shrubs – 1.5 metre centres;
    - (iii) trees – 3 metre centres for those species 4 metres from the boundary of the rehabilitation works for weed exclusion purposes and 3 to 5 metre centres where further from the edge;
  - (j) measurable and achievable criteria on which the performance of the floristic and structural components of the revegetation strategy can be assessed annually over three years;
  - (k) the requirement that the area be weed free at the end of the revegetation period;
  - (l) nomination of a total bond amount of 1.5 times the schedule of works estimate of costs (plus GST) for the revegetation works, including maintenance for at least three years to be paid to Council;
  - (m) nomination of triggers for the release of this bond at 10% for the first year, 10% for the second year, and 80% in the third year; and
  - (n) a methodology for monitoring success of the revegetation.

Note—For areas larger than 5,000m<sup>2</sup> in area refer to **Section SC6.6.6 (Monitoring requirements for rehabilitation of large sites)**.

- (3) For those sites proposing natural regeneration or the translocation of ground flora via the transport of clumps of vegetation or the use of 'live' topsoil with minimal 'infill' planting the following requirements are also to be detailed in a site rehabilitation plan:-
  - (a) criteria on which the performance of the floristic and structural components of the natural regeneration or translocation strategy can be assessed;
  - (b) the requirement for inspections to be undertaken at monthly intervals for the first 2 years to ensure that regeneration is meeting the performance criteria, including weed removal;
  - (c) the requirement that if the natural recruitment of species is not similar in density and diversity as the areas of revegetation within 12 or 24 months (at the discretion of Council) the non-performing natural regeneration or translocation areas are to be immediately revegetated to achieve these densities;
  - (d) the requirement that a supplementary report be provided to Council detailing the performance criteria for the revegetation of the non-performing natural regeneration or translocation areas;
  - (e) the requirement that a new/additional bond be provided to Council providing for at least 3 years of maintenance at the end of 12 months for the areas of non-performing natural regeneration areas; and
  - (f) the requirement that no bond be released for any revegetation works until such time as the natural regeneration areas have either met the performance criteria specified above or a plan of works has been approved by Council and a bond for the extra revegetation works paid to Council.
- (4) A site rehabilitation plan may be required to be supported by a soil assessment report which incorporates the following:-
  - (a) the results of a soil test conducted under *Australian Standard AS4419* for each distinct soil type that works are to be conducted in;
  - (b) an additional soil test for any excessive nutrients identified by the first soil test; and
  - (c) recommendations for soil amelioration to amend the planting medium in response to the results of the soil tests.

### SC6.6.6 Monitoring requirements for rehabilitation of large sites

- (1) Where a site rehabilitation plan provides for revegetation and natural regeneration of sites larger than 5,000m<sup>2</sup> in area, monitoring is to be carried out in accordance with Council's ecological restoration monitoring protocol.
- (2) The monitoring conducted under this protocol provides a framework for an inexpensive and quick understanding of the state of success of revegetation works and natural regeneration.
- (3) The protocol relies upon completion of a table of assessment (see **Appendix SC6.6B (Example table of assessment for monitoring)**) which provides an indication of the type and diversity of species, their health, density and mulch cover. The table of assessment is not intended to provide a scientific comparison with a regional ecosystem reference site, but is a simple guide to see how revegetation works are succeeding.
- (4) Under the protocol, every six months each ecosystem (i.e. wetlands, riparian, dry heath, open forest, etc.) targeted for revegetation/natural regeneration is to be subject to the following monitoring:-
  - (a) two permanent 21 metre transects, placed along the contour are to be established for every 5,000m<sup>2</sup> of area, as detailed in the protocol;
  - (b) at each end and 7 metres along the 21 metre transect a small quadrant of 2 metres x 2 metres is centred, for monitoring species of plants less than 1 metre high at time of monitoring;
  - (c) at each end of the transect a large quadrant 7 metres x 7 metres is centred for monitoring of species of plants greater than 1 metre high at time of monitoring;
  - (d) diversity is shown by the number of species and how many of each there is;
  - (e) density is shown by the number of stems per 100m<sup>2</sup>;

- (f) health of plants is recorded for each species as a group, on a subjective scale of 0 (dead), 1 (poor) to 5 (good), either as an average or individually if there is too much of a difference between them;
- (g) mulch is recorded for each quadrant for depth and % cover; and
- (h) other issues such as erosion, vandalism, pests, feral animals, etc. are also recorded.



## Appendix SC6.6A Example table of assessment for monitoring

**Table SC6.6B Diversity and density of plants in Transect No.A (large quadrant 49m<sup>2</sup>, small quadrant 4m<sup>2</sup>)**

Quad	Species	Height (m)	Veg type	No. in quad	Stems/ 100m <sup>2</sup>	Ave heath (outlier)	Mulch depth Mulch % Cover Other issues
X	<i>Acmena smithii</i>	1.7, 1.5, 1.25	Tree	3	6	4	Depth 5cm Cover 60%
X	<i>Euc grandis</i>	1, 1.5	Tree	2	4	5	
1	<i>Thermeda triandra</i>	.90, .80, .80, .75, .50, .70	Grass	6	150	4	Depth 1cm Cover 20%
1							<b>Erosion rills need mulching</b>
2	<i>Dianella caerulea</i>	.30, .40, .10	Herb	3	75	4(1)	Depth 1cm Cover 80%
2	<i>Lomandra hysterix</i>	.85	Herb	1	25	5	
3	<i>Crinum pedunculatum</i>	.45, .55	GC	2	50	4	Depth 2cm Cover 80%
3							<b>Extra plants in quad</b>
4	<i>Crinum pedunculatum</i>	.45, .55, .55	GC	3	70	4	Depth 2cm Cover 80%
4	<i>Lomandra hysterix</i>	.85, .95	Herb	2	25	5	
Y	<i>Banksia spp.</i>	1, 1.5, 1.5	S Tree	3	6	4	Depth 2cm Cover 50%
Y	<i>Euc grandis</i>	1, 1.5	Tree	2	4	5	<b>Weeds 25%</b>

## SC6.7 Planning scheme policy for the bushfire hazard overlay code

### SC6.7.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Bushfire hazard overlay code**;
- (b) identify and provide guidance about information that may be required to support a development application where subject to the **Bushfire hazard overlay code**; and
- (c) identify guidelines that may be relevant to achieving outcomes in the **Bushfire hazard overlay code**.

Note—nothing in this planning scheme policy limits Council's discretion to request other relevant information [under the Development Assessment Rules made under section 68\(1\) of in accordance with](#) the Act.

### SC6.7.2 Application

This planning scheme policy applies to development which requires assessment against the **Bushfire hazard overlay code**.

### SC6.7.3 Advice for bushfire hazard assessment and management outcomes

The following is advice for achieving outcomes in the **Bushfire hazard overlay code**:-

- (a) compliance with Performance Outcomes PO1 to PO9 of **Table 8.2.4.3.2 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Bushfire hazard overlay code** may be demonstrated in part or aided by the submission of a bushfire hazard assessment report and a bushfire hazard management plan prepared by a competent person in accordance with **Section SC6.7.4 (Guidance for the preparation of a bushfire hazard assessment report and bushfire hazard management plan)**.

Note—for the purposes of this planning scheme policy, a competent person is an appropriately qualified and experienced consultant with appropriate and proven technical expertise in the preparation of bushfire hazard assessment reports and management plans.

Note—the **Planning scheme policy for development works** provides advice in relation to Performance Outcome PO10 of **Table 8.2.4.3.2 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Bushfire hazard overlay code**.

### SC6.7.4 Guidance for the preparation of a bushfire hazard assessment report and bushfire hazard management plan

#### Bushfire hazard assessment report

- (1) A bushfire hazard assessment report is to:-
  - (a) be prepared generally in accordance with the methodology prescribed in **Appendix SC6.7A (Methodology for undertaking bushfire hazard assessment)**;
  - (b) include more detailed site specific calculations of the bushfire hazard score(s) for the site based upon:-
    - (i) a quantitative assessment of predicted bushfire behaviour including calculation of predicted fire intensity and rate of spread using McArthur's equation and radiant heat flux using a recognised model (i.e. the View Factor Model or the Leicester Model). Calculations should be based on an Forest Fire Danger Index (FFDI) of 50 (Sunshine Coast) and maximum predicted fuel loads to determine appropriate setbacks;
    - (ii) a quantitative assessment including discussion of past fire behaviour/history, any prescribed burning undertaken on the site or adjoining sites, likely fire paths, site factors that would minimise or maximise fire behaviour, fuel arrangements and loads, potential ignition points, fire run distances towards houses (or proposed house sites), slopes and any other matter considered important in respect to the issue; and

- (iii) a comparison of the above to the more general calculation methodology prescribed in **Appendix SC6.7A (Methodology for undertaking bushfire hazard assessment)**;
- (c) include a bushfire hazard management summary detailed on an A3 size map/s at a scale of 1:500; and
- (d) be informed by consultation with the local Fire Brigade and where the land adjoins Council, State or Commonwealth land, the relevant land manager.

Bushfire management plan

- (2) A bushfire management plan is to:-
- (a) state the purpose, aim and objectives of the bushfire management plan (e.g. to define the level of hazard on the land and identify actions and responsibilities for the management of the hazard);
  - (b) summarise the results of the bushfire hazard assessment undertaken for the land, including identification of the various parts of the land that have been determined to be high, medium and low bushfire hazard area;
  - (c) be informed by consultation with the local Fire Brigade and where the land adjoins Council, State or Commonwealth land, the relevant land manager;
  - (d) include consideration of potential off-site sources of fire hazard including particular land uses or physical features of the surrounding area (including details of properties within 100 metres of the land);
  - (e) address the impacts of the proposed development on the level of fire hazard experienced by other land in the surrounding area, including any land containing water, electricity, gas or telecommunications infrastructure;
  - (f) address any implications for ecologically important areas, areas of cultural heritage significance or areas of landscape significance, including steps taken to minimise the potential impacts of specified fire hazard mitigation measures;
  - (g) address the potential impacts of bushfire hazard mitigation measures on slope stability, and on water quality in local receiving waters;
  - (h) specify fire hazard mitigation measures, such as:-
    - (i) elements of the development design, including the layout of roads and driveways, and the location, size and orientation of lots and buildings;
    - (ii) specifications and materials for building design and construction in accordance with the Building Code of Australia;
    - (iii) fire fighting infrastructure, including water supply and storage, equipment and fittings, fire breaks and maintenance/access trails;
    - (iv) potential areas of clearing of native vegetation based on an ecological assessment report or environmental management plan recently prepared for the site;
    - (v) details of landscape design requirements, including installation and maintenance requirements;
    - (vi) information for occupants, including required training for persons employed on the site during both construction and operational phases;
    - (vii) details of long term management requirements, including the frequency, extent and intensity of burning in areas proposed to be subject to regular controlled ignitions;
    - (viii) details of areas to be subject to mosaic or patch burning techniques and manual fuel reduction zones; and
    - (ix) any other measures based on or identified in a recently approved ecological assessment report or environmental management plan for the site;
  - (i) identify the parties to be responsible for specific actions taken under the terms of the bushfire management plan; and
  - (j) provide justification for any variation from the bushfire hazard mitigation measures outlined in the **Bushfire hazard overlay code**.

## Appendix SC6.7A Methodology for undertaking bushfire hazard assessment

### Step 1: Assessment of vegetation communities

- 1.1. The different types of vegetation communities determine the rate at which dry fuel accumulates. Some vegetation communities protect fuel from drying out in all but extreme bushfire seasons and can then be susceptible to very destructive bushfires. Alternatively, vegetation communities may expose fuels to drying and therefore be frequently available for burning. Frequent bushfires can result in the development of bushfire-tolerant grassy woodlands or grasslands and less destructive bushfire behavior. The characteristics of different vegetation communities are reflected in **Table SC6.7A.1 (Hazard scores and associated fire behaviors for various vegetation communities)**. This table also presents the hazard scores for a range of vegetation communities. Vegetation community data is available in digital map form from the Queensland Herbarium, Environmental Protection Agency, at a scale of 1:100,000.

**Table SC6.7A.1 Hazard scores and associated fire behaviors for various vegetation communities**

Vegetation communities <sup>1</sup>	Fire behaviour	Hazard score
Wet sclerophyll forest, tall eucalypts (>30 m), with grass and mixed shrub understorey.	Infrequent fires under severe conditions, flame lengths may exceed 40 m, floating embers attack structures for 1 hour, radiant heat and direct flame are destructive for 30 minutes.	10
Paperbark heath and swamps, eucalypt forest with dry-shrub ladder fuels.	Fire intensity depends on fuel accumulation, but can be severe, with flame lengths to 20 m, spot fires frequent across firebreaks, radiant heat and direct flame for 15 minutes.	8
Grassy eucalypt and acacia forest, exotic pine plantations, cypress pine forests, wallum heath.	Fire intensity may be severe with flame lengths to 20 m, but less attack from embers.	6
Native grasslands (ungrazed), open woodlands, canefields.	Fast moving fires, available to fire annually to 4 years. Usually no ember attack, radiant heat for >10 m, duration <2 minutes.	5
Intact acacia forests, with light grass to leaf litter, disturbed rainforest.	Fires infrequent, usually burn only under severe conditions, relatively slow fires, usually little ember attack.	4
Orchards, farmlands, kikuyu pastures.	Fires very infrequent, slow moving, may be difficult to extinguish, frequent fire breaks.	2
Grazed grasslands, slashed grass.	Grazing reduces intensity and rate of spread of fire, duration <2 minutes.	2
Desert lands (sparse fuels), mowed grass.	Gaps in fuel, usually slow fire spread.	1
Intact rainforest, mangrove forest, intact riverine rainforest.	Virtually fireproof.	0

Note 1—vegetation assessment should be based upon examination of the vegetation on the subject site and surrounding the subject site. Narrow strips of vegetation may be flammable; however, bushfires will not generally reach their full intensity where bushfire fronts are less than 100 metres wide. For this reason the following examples may be viewed as having the next lower hazard score (i.e. paperbark heath would have a score of 6 not 8, cypress pine forest 5 not 6):

- i) areas with a linear shape (e.g. roadside vegetation beside a cleared paddock); and
- ii) units of vegetation less than 50 hectares in area and more than one kilometre from the nearest extensive vegetation.

- 1.2. Where the vegetation community is assessed as having a vegetation community hazard score of zero, no other factors need to be taken into account and the relevant sub-units should be given a Low severity of overall bushfire hazard. No further action is required.

## Step 2: Assessment of slope

- 2.1. Studies have shown that fires burn more quickly and with greater intensity up slopes, generally doubling every 10 degrees of slope. Also, the steeper the slope the more difficult it is to construct ring roads, firebreaks and provide access for emergency crews. Trees situated downhill from structures will have their crowns close to the structures. This presents bushfire hazards particularly for exposed structures such as timber decks. **Table SC6.7A.2 (Hazard scores for slope)** presents the hazard scores for different categories of slope.

**Table SC6.7A.2 Hazard scores for slope**

Slope	Hazard score
Gorges and mountains (>30%)	5
Steep Hills (>20% to 30%)	4
Rolling Hills (>10% to 20%)	3
Undulating (>5% to 10%)	2
Plain (0% to 5%)	1

Note—For site-specific assessment of bushfire hazard, if the site is downhill from the hazard, the slope effect may be taken as zero as the fire intensity will be less. However, burning heavy fuels may roll downhill and trees may fall down, so recommended setbacks from the hazard still need to be observed.

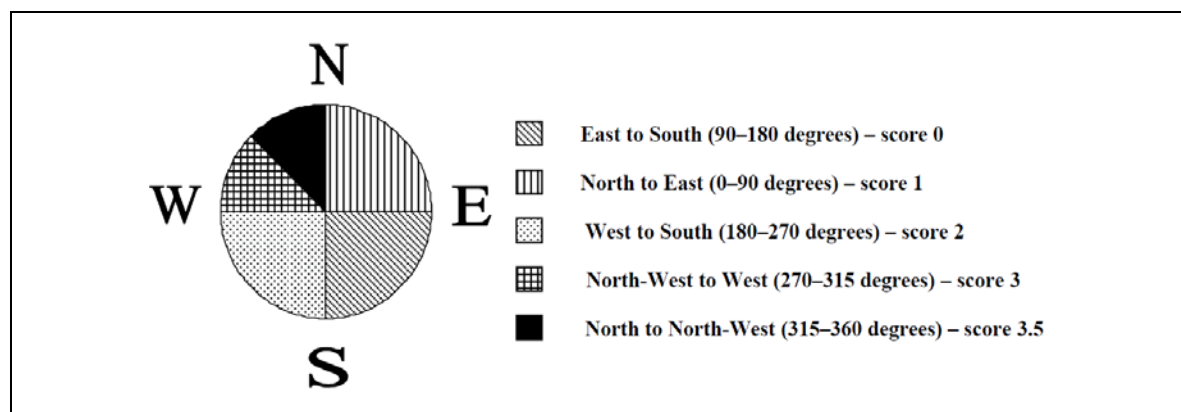
## Step 3: Assessment of aspect

- 3.1. Aspect affects bushfire hazard due to the effects that exposure to direct sunlight has on different vegetation communities, including the drying rates of fuels. Aspect also correlates closely with exposure to low humidity winds that increase bushfire intensity. In extremely broken country where there is a variety of aspects, the predominant aspect should be used.
- 3.2. As aspect has only a minor influence on flatter land, aspect is not considered to be significant on land with a slope less than 5%. **Table SC6.7A.3 (Hazard score for aspect)** lists the hazard score for different aspects and **Figure SC6.7A.1 (Compass degree ranges for each aspect category)** illustrates the compass degree ranges for each aspect category.

**Table SC6.7A.3 Hazard score for aspect**

Aspect	Hazard score
North to North-West	3.5
North-West to West	3
West to South	2
North to East	1
East to South and all land under 5% slope	0

**Figure SC6.7A Compass degree ranges for each aspect category**





## Step 4: Combining scores to identify the severity of bushfire hazard

- 4.1. The scores for the individual factors determined for vegetation communities, slope and aspect are added together to give a total for each sub-unit as follows:

*Total hazard score = vegetation community hazard score + slope hazard score + aspect hazard score.*

- 4.2. The total hazard score determines the severity of bushfire hazard for each sub-unit as set out in Table SC6.7A.4 (Hazard score ranges to identify the severity of bushfire hazard).

**Table SC6.7A.4 Hazard score ranges to identify the severity of bushfire hazard**

Total hazard score	Severity of bushfire hazard
13 or greater	High <sup>2</sup>
6 to 12.5	Medium
1 to 5.5	Low

Note 2—Buildings in High severity bushfire areas should be constructed in accordance with the Level 1 requirements of AS 3959:1999 'Construction of Buildings in Bushfire-prone Areas'.

## Step 5: Field verification

- 5.1. Preliminary bushfire hazard maps should be prepared based on the results of Step 4 above by aggregating all sub-units with similar levels of bushfire hazard severity into High and Medium severity classifications<sup>3</sup>. Field verification or 'ground truthing' of these preliminary results should then be undertaken. A number of sample areas should be evaluated to test the accuracy of the preliminary bushfire hazard findings.

## Step 6: Qualitative assessment

- 6.1. Known bushfire behaviour complements the quantitative assessment and should be considered as part of the qualitative review.
- 6.2. Known bushfire behaviour is extremely difficult to use as a quantitative planning tool. This is because the absence of bushfire, even for an extended period of time, does not mean that an area will not burn and may lead to massive fuel accumulation with dangerous bushfire behaviour if it does ignite. Known bushfire behaviour may identify sites where combinations of slope and wind have led to severe bushfire behaviour in the past, and where extra precautions to protect assets might be required. The reliability of known bushfire behaviour may be difficult to assess and Queensland Fire and Rescue Service (QFRS) should be consulted if problems are indicated.

## Step 7: Safety buffers

- 7.1. The final step in identifying bushfire hazard areas is to add a safety buffer, as land adjacent to bushfire hazard areas is vulnerable to bushfire attack from these areas.
- 7.2. Any land within 100 metres of an area identified as having a High bushfire severity classification should be included in the High bushfire hazard area and any land within 50 metres of an area identified as having a Medium bushfire severity classification should be included in the Medium bushfire hazard area<sup>4</sup>. The safety buffers should be integrated into the preparation of maps identifying bushfire hazard areas. **Table SC6.7A.5 (Total hazard score and severity of bushfire hazard with safety buffers)** shows the width of the safety buffers that apply to the various bushfire hazard severity classifications.

**Table SC6.7A.5 Total hazard score and severity of bushfire hazard with safety buffers**

Total hazard score	Severity of bushfire hazard	Width of safety buffer
13 or greater	High	100 metres
6 to 12.5	Medium	50 metres
1 to 5.5	Low	Not applicable

Note 3—areas of Low bushfire hazard severity may also be mapped, but the natural hazard management area (bushfire) for the purposes of the SPP comprises only areas identified as being of High or Medium severity.

Note 4—safety buffer areas on the boundary between High and Medium bushfire severity areas should be included in the High bushfire severity area.

## SC6.8 Planning scheme policy for the extractive resources overlay code

### SC6.8.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Extractive resources overlay code**; and
- (b) identify and provide guidance about information that may be required to support a development application where subject to the **Extractive resources overlay code**.

Note—nothing in this planning scheme policy limits Council's discretion to request other relevant information under the Development Assessment Rules made under section 68(1) of in accordance with the Act.

### SC6.8.2 Application

This planning scheme policy applies to assessable development which requires assessment against the **Extractive resources overlay code**.

### SC6.8.3 Advice for extractive resource and separation areas outcomes

The following is advice for achieving outcomes in the **Extractive resources overlay code**:-

- (a) compliance with Performance Outcome PO1 to PO7 of **Table 8.2.6.3.1 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Extractive resources overlay code** may be demonstrated in part or be aided by the submission of an extractive industry impact assessment report prepared by a competent person in accordance with **Section SC6.8.4 (Guidance for the preparation of an extractive industry impact assessment report)**.

Note—for the purposes of this planning scheme policy, a competent person is an appropriately qualified and experienced consultant with appropriate and proven technical expertise in the preparation of extractive industry assessment reports.

### SC6.8.4 Guidance for the preparation of an extractive industry impact assessment report

An extractive industry impact assessment report should describe through detailed analysis and assessment, the following:-

- (a) the likely impacts of the proposed development on the existing or future exploitation of extractive resources in the area;
- (b) the likely impacts arising from the entire winning of the extractive resources, including in respect to noise, dust, land stability, flooding and drainage impacts;
- (c) the potential for land use conflicts between the proposed development and impacts arising from the winning of extractive resources in the area;
- (d) the measures to be adopted to mitigate potential land use conflicts without imposing on the extractive resource or its associated operations; and
- (e) the likely impacts upon the biodiversity and riparian values of the site including the provision for biodiversity offsets.

## SC6.9 Planning scheme policy for the flood hazard overlay code

### SC6.9.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Flood hazard overlay code**;
- (b) identify and provide guidance about information that may be required to support a development application where subject to the **Flood hazard overlay code**; and
- (c) identify guidelines that may be relevant to achieving outcomes in the **Flood hazard overlay code**.

Note—the **Planning scheme policy for development works** also provides advice and sets out information that may be required to support a development application subject to the **Flood hazard overlay code** in relation to the stormwater management.

Note—nothing in this planning scheme policy limits Council's discretion to request other relevant information under the Development Assessment Rules made under section 638(1) of in accordance with the Act.

### SC6.9.2 Application

This planning scheme policy applies to development which requires assessment against the **Flood hazard overlay code**.

### SC6.9.3 Advice for floodplain protection, flood and storm tide inundation immunity and safety, building design and built form, essential network infrastructure, essential community infrastructure, hazardous and other materials and flood impacts outcomes

(1) The following is advice for achieving outcomes in the **Flood hazard overlay code**:-

- (a) compliance with Performance Outcome PO1 to PO9 of **Table 8.2.7.3.2 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Flood hazard overlay code** may be demonstrated in part or aided by the submission of a flood hazard assessment report and a flood hazard mitigation report prepared by a competent person in accordance with **Appendix SC6.9A (Reporting template for flood hazard assessment report and flood hazard mitigation report)**

Note—for the purposes of this planning scheme policy a competent person is a Registered Professional Engineer of Queensland (RPEQ) with appropriate and proven technical experience in the preparation of flood hazard assessment and mitigation reports.

(2) The following is advice for achieving Performance Outcome PO3 and PO5 of **Table 8.2.7.3.2 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Flood hazard overlay code**:-

- (a) freeboard above the DFE/DSTE or Historical should not apply to ground floor commercial uses where activating the street frontage through direct pedestrian entry to the building from the road reserve;
- (b) floor levels should be set above the minimum floor level to the greatest level feasible;
- (c) building design should account for the potential need to relocate property prior to a flood event and recover quickly following a flood event;
- (d) businesses should ensure that they have the necessary continuity plans in place that:
  - (i) understand the likely warning time for a flood event;
  - (ii) define a trigger for action to implement a disaster management plan (flood);
  - (iii) define necessary asset protection actions, such as relocating stock to a higher location (and the time required to implement);

- (iv) define the necessary equipment required for clean-up and return to service and determine from where it will be sourced (based on an understanding that in a regional event demand may limit availability); and
- (e) resilient building materials, including those required for wet and/or dry flood proofing, for use within a flooding and inundation area should be determined in consultation with Council, in accordance with the relevant building assessment provisions.

## **SC6.9.4 Guidance for the preparation of a flood hazard assessment report and flood hazard mitigation report**

### Flood hazard assessment report

- (1) A flood hazard assessment report is to:-
  - (a) be prepared in accordance with the methodology prescribed in **Appendix SC6.9A (Reporting template for flood hazard assessment report and flood hazard mitigation report)**;

Note— the **Flood hazard overlay code** specifies alternative requirements for matching land use and flood hazard requirements.

- (b) include accurate hydrological and hydraulic modelling of the waterway network and assessment of existing flooding and flood levels of major water systems;
- (c) include modelling of the 39%, 10%, 5%, 1%, 0.5%, 0.2% and 0.05% AEP flood events and the PMF;
- (d) include a qualitative assessment of the piped drainage and hydraulic analysis of the drainage network particularly in relation to the potential for a regional event to cause backflow flooding of the drainage network; and
- (e) address the potential impacts of climate change.

### Flood hazard mitigation report

- (2) A flood hazard mitigation report is to:-
  - (a) assess the potential impacts of the development on flood hazard;
  - (b) assess the potential impacts of flood hazard on the development;
  - (c) recommend strategies to be incorporated into the proposed development to satisfy the outcomes of the **Flood hazard overlay code**;
  - (d) describe and evaluate the impact of the proposed mitigation strategies on the existing and likely future use of land and buildings in proximity to the proposed development; and
  - (e) address the following:-
    - (i) waterways, including bank stability;
    - (ii) impacts on adjacent properties both upstream and downstream;
    - (iii) preferred areas and non-preferred areas on site for various activities, based on the probability of inundation and the volume and velocity of flows;
    - (iv) the use of flood resistant materials and construction techniques able to withstand relevant hydraulic and debris loads where appropriate;
    - (v) the location and height of means of ingress and egress, including possible flood-free escape routes;
    - (vi) the location and height of buildings, particularly habitable floor areas;
    - (vii) structural design, including the design of footings and foundations to take account of static and dynamic loads (including debris loads and any reduced bearing capacity owing to submerged soils);
    - (viii) the location and design of plant and equipment, including electrical fittings;
    - (ix) the storage of materials which are likely to cause environmental harm if released as a result of inundation or stormwater flows;
    - (x) the appropriate treatment of water supply, sanitation systems and other relevant infrastructure;
    - (xi) relevant management practices, including flood warning and evacuation measures;
    - (xii) details of any easements or reserves required for stormwater design; and

(xiii) details of detention/retention storages.

- (3) The level of detail required for a particular development application should be determined in consultation with Council's engineering and environment assessment officers.

## SC6.9.5 Special design requirements

### Climate change/variability

- (1) Climate change/variability investigations must include tailwater increases that account for a projected sea level rise of 0.8m. A sensitivity analysis must be undertaken using a projected sea level rise of 1.1m to ensure the freeboard is not exceeded.

### Levees

- (2) Council will not permit the use of levees to satisfy flood immunity standards, for the following reasons:-
- (a) there is no guarantee that the levees will remain with the land;
  - (b) levees are a band-aid solution rather than an intrinsic solution; and
  - (c) there is possibility that levees can be breached or overtopped in extreme storms, which can lead to an increase in damage and subsequently greater potential for damage.

### Basements and carpark

- (3) Minimum standards for flood and storm tide inundation immunity for all developments are detailed in **Table 8.2.7.3.3 (Flood levels and flood immunity requirements for development and infrastructure)** of the **Flood hazard overlay code**.
- (4) As well as 10% AEP immunity, the 1% AEP flooding of carparking areas must not exceed a depth of inundation of 250mm, a depth x velocity ratio of 0.4m<sup>2</sup>/s and velocity of 2.0m/s.
- (5) Basement carpark can be constructed below the specified levels provided that suitably waterproofed perimeter walls, air vents, and entry/exit ramps at the carpark entrance are above at least 500mm above the 1% AEP flood levels for all flooding sources.

### Safety

- (6) Flood and storm tide inundation safety can be addressed by either providing effective evacuation routes or incorporating safe refuges within the development.
- (7) Developments which become isolated during a DFE and are inundated during a PMF shall be avoided.
- (8) An effective access route is defined as follows:-
- (a) at least one access route must be safely accessible and trafficable for evacuation purposes during the 1% AEP flood or storm tide event. This is achieved if the crown of the road which forms the evacuation route is at or above the 1% AEP flood or storm tide level;
  - (b) at least one evacuation route must be provided which enables people to progressively evacuate to areas above the PMF in the face of advancing flood or storm tide waters for events exceeding the DFE. This is achieved if the evacuation route continuously grades uphill from the development site to land not inundated during a PMF; and
  - (c) accounts for the time required for evacuation and ensures that this is achievable in the time between a DFE being exceeded and the peak of the PMF occurring.

## SC6.9.6 Guidelines for achieving Flood hazard overlay code outcomes

For the purposes of the performance outcomes and acceptable outcomes in the **Flood hazard overlay code**, the following are relevant guidelines:-

- (a) *Floodplain Management in Australia: Best Practice Principles and Guidelines SCARM Report 73* (CSIRO, 2000)



- (b) the *State Planning Policy December 2013* (Department of State Development, Infrastructure and Planning) and *State Planning Policy Guidelines*;
- (c) **Stormwater management code** and the **Planning scheme policy for development works**;
- (d) *Planning for stronger more resilient floodplains, Part 2, Measures to support floodplain management in future planning scheme* (Queensland Reconstruction Authority, 2012);
- (e) *QUDM, Australian Rainfall and Runoff* (IEAust, 1999);
- (f) any subsequent revisions or project guidelines from ARR.org.au;
- (g) *Guideline for improving flood resilience for new development: A selection of case studies* (Sunshine Coast Council, 2014); and
- (h) *Guideline for improving flood resilience for existing development* (Sunshine Coast Council, 2014).

## Appendix SC6.9A Reporting template for flood hazard assessment report and flood hazard mitigation report

This reporting template provides supplementary information relating to the **Planning scheme policy for the flood hazard overlay**. The template should be considered in conjunction with this planning scheme policy and the **Flood hazard overlay code**.

### Document details and certification

Details of the authorship of the Flood hazard assessment report and flood hazard mitigation report should be provided. The report must be certified an RPEQ with experience in Flood Modelling and Management. An appropriate way to present this information may be in tabular form.

Example:

<b>Report Title:</b>	Flood Hazard Assessment and Mitigation Report for Proposed Maroochy Woods Development, Maroochy Road, Maroochydore
<b>Affected Properties:</b>	
<b>Street Address</b>	15-35 Maroochy Rd, Maroochydore
<b>RP Description</b>	Lots 1,2 & 7 on RP 123456
<b>Prepared For:</b>	Maroochy Development Company Pty Ltd
<b>Date:</b>	7 Sept 2013
<b>Revision No.</b>	3
<b>Report Status:</b>	Draft/Final
<b>Prepared By:</b>	
<b>Name</b>	Bob Jones
<b>Qualifications</b>	BE
<b>Company</b>	Water Consultants Pty Ltd
<b>Phone No.</b>	5555 1234
<b>Certified By:</b>	
<b>Name</b>	John Smith
<b>Qualifications</b>	BE, MSci
<b>Company</b>	Water Consultants Pty Ltd
<b>Phone No.</b>	5555 1234
<b>Industry Accreditation</b>	RPEQ No. 1234
<b>Signature</b>	

## Executive summary

The summary provides a brief (1-2 page) overview of the development proposal, the findings and the associated recommendations and conclusions.

## Introduction

The introduction should give an overview of the proposed development application and any relevant background information. The scope of studies presented in the report should also be outlined.

It may be appropriate to include a locality plan showing the location of the proposed development site.

## Available data

Provide a summary of the sources of data used for the investigation. An appropriate way to present this information may be in tabular form, an example of which is shown below.

At the commencement of any hydrologic investigation, applicants are encouraged to contact Council's Customer Service Centre to determine whether Council holds existing information that may be of relevance. Applicants should be aware of Council's "Hydrologic Data Policy" which applies to any hydrologic information provided by Council. This includes extractions from regional flood models. Please note that fees apply.

The applicant should also contact Council's Customer Service Centre to determine whether historical flood levels are available in the area of interest. Council records such levels along waterways after major flood events and has a regional network of maximum height gauges. This data may be useful in the calibration of hydraulic models.

Example:

**Table 1 Source data**

Data	Source	Comments
Catchment boundaries	Determined from ALS	
Topographic Information	2008 ALS	
Hydraulic structure details	MSC hydraulic structure reference sheets: <ul style="list-style-type: none"> <li>• Maroochy Rd Culvert crossing</li> <li>• Smith Rd culvert crossing</li> </ul>	
Land use	SCRC Planning Scheme	
Historical flood levels	SCRC Advanced Flood Search Certificate No:12345	Peak flood levels for 1989 flood event
Existing SCRC Flood Studies	Smith Creek Flood Study, June 2003	
Historic Rainfall data	BoM	Daily rainfall, Station No. 040282 Pluviometer data, Station No. 040111
Streamflow data	DNRM Water Monitoring Portal	Daily volumes, Station No. 141003
Design Rainfall Data	BoM	2013 IFD at 4 locations within model extent
Site photographs	Taken by Water Consultants Pty Ltd, 7 July 2005	Site photographs for pre-development conditions

## Catchment drainage characteristics

This section provides a general description of the catchment, including how existing catchment naturally drains. The proposal for the developed catchment should be described, clearly articulating how the drainage and overland flow paths within the catchment are intended to change.

It is expected that this section will conceptually describe how the proposed development is to occur in a manner that ensures:-

- (a) natural hydrological systems are protected;
- (b) natural landforms and drainage lines are maintained to protect the hydraulic performance of waterways;
- (c) development integrates with the natural landform of the floodplain rather than modifying the landform to suit the development;
- (d) achieving flood immunity for the development minimises physical alteration to the floodplain; and
- (e) adequate overland flow paths are provided for all event severities, including those beyond the DFE.

This section of the report should include a plan showing flow paths and the boundaries of relevant catchment areas under existing and developed site conditions.

For ease of checking, plans should be prepared to an appropriate engineering scale (e.g. 1:1000 or 1:5000).

## Previous studies

A number of flood investigations have been undertaken of waterways draining the Region. The applicant should contact Council's Customer Service Centre to determine if previous flood investigations have been undertaken in the vicinity of the proposed development. Applicants should be aware of Council's "Hydrologic Data Policy" which applies to any hydrologic information provided by Council. This policy requires applicants to make their own assessment of the applicability of existing studies.

## Model setup

### Hydrology

#### Model software

Applicants should undertake hydrologic modelling using industry-accepted software. Council is unable to recommend any particular software, however, checking of results will be expedited if applicants use software currently employed by Council. Details of Council's current hydrologic modelling software may be obtained through the Customer Service Centre.

Details of the adopted model software should be documented in this section, including software version number.

#### Model setup

Describes detail of the model setup undertaken for the two required catchment conditions:

- Existing conditions (normally before the proposed development); and
- Post-development conditions (Catchment conditions as would exist after the proposed development).

#### Subcatchment delineation

Provide a plan showing the configuration of the model, in particular the extent of sub-catchments and the location of the proposed development. Discharges at locations of interest should not be obtained from the output at a single sub-catchment.

Where distinct areas of different land use occur within a catchment, the catchment sub-division should reflect land use boundaries wherever possible.

Summary details of the model, such as sub-catchment areas and routing parameters, should be presented in tabular form, in sufficient detail that a model could be developed from the supplied data.

### Fraction impervious

The Fraction Impervious should be determined from the land use category for the existing and developed catchments (Refer to **Table 2 (Fracture impervious)** below).

**Table 2 Fraction Impervious**

Land use category	Fraction impervious (FI)
Road Pavement Area	100%
Commercial and Industrial	90%
Low Density Urban	60%
Rural Residential	15%
Open Space	0%

### Catchment lag parameters

The method of calculating parameters for flow routing along links between sub-catchments should be specified.

## Hydraulics

### Model software

Applicants should undertake hydraulic modelling using industry-accepted software. Council is unable to recommend any particular software, however, checking of results will be expedited if applicants use software currently employed by Council. Details of Council's current hydraulic modelling software may be obtained through the Customer Service Centre.

### Model setup

Provide an overview of the method of analysis used to estimate design flood levels.

The two primary considerations in deciding on a modelling methodology are:

- whether a steady or unsteady flow model is required, and
- whether a one or two-dimensional model is required.

A steady flow hydraulic model may be appropriate where the proposed works do not involve earthworks within the DFE extent. Where the proposed works include excavation and/or filling within the DFE extent of flooding an unsteady hydraulic model should be used. The use of an unsteady model allows the impact of changes in floodplain storage on discharges to be assessed.

The need for two-dimensional, rather than one-dimensional, modelling sometimes arises where flow directions are not easily defined, such as across large, flat floodplain areas.

Note that Council has two-dimensional models of the Maroochy and Mooloolah Rivers. Extractions from these models may, at Council's discretion, be made available to consultants, where appropriate and noting that fee's will apply. Contact Councils Customer Service Centre for more details.

Details of the adopted model software should be documented in this section, including software version number.

### Inflow points

Provides detail on how the inflows from the hydrological model are integrated into the hydraulic model.

### Topography

Provide a plan showing the location and extent of cross-sections, or the arrangement and extent of the two-dimensional grid used in the model. Data used in deriving model cross-sections or the two-dimensional grid should be specified in the source data table (See **Table 1 (Source data)**).

Where two-dimensional grid data (ALS) is used, then a plan must be provided of the difference between pre and post development ground levels.



## Structures

Provide a plan showing the location of structures that are included in the hydraulic model setup.

## Hydraulic roughness

It must be assumed that waterways will not achieve optimal maintenance. Similarly it is reasonable to assume that flooding can occur towards the end of a maintenance cycle, or in periods of the years when regrowth is particularly aggressive. For these reasons, the design flood level for estimation of floor levels should be set using a conservative (high) Manning's n value, typically 0.15. All riparian areas corresponding to the buffer widths required for waterways and wetlands should be assumed to have a Manning's n value of 0.15. For inundated areas beyond the riparian buffer widths, lower Manning's n values of less than 0.15 must be supported by a landscape plan which confirms plant species, positions and densities and maintenance requirements.

The design of open channels within a development area must be consistent with the requirements of the **Planning scheme policy for development works**.

For assessment of the impact of a development on flood levels and velocities, a representative Manning's n value should be selected based on accepted industry standards, such as Brisbane City Council's Natural Channel Design Guidelines. A sensitivity analysis should be undertaken across the range of likely Manning's n values to assess the effect of channel roughness on flow velocity and flood level impacts.

## Boundaries

Provides details on the Boundary Conditions that were adopted in preparation for model calibration.

## Floodplain storage

The **Flood overlay code** has a strong intent to ensure that floodplain storage below the DFE is preserved. It is anticipated that in some instance compensatory earthworks will be an essential component of providing a flood solution for a development site. In such instances, earthworks that compensate for on-site fill must maintain their storage function in all circumstances. That is, they cannot fill with water, or any other material, and lose their flood storage capacity.

This section therefore is required to discuss how the proposed development will not directly, indirectly or cumulatively alter the flooding characteristics external to the development site for all flood events up to and including the DFE, based on current climate conditions and with climate change/variability allowances.

## **Calibration**

### **Calibration events**

Where suitable data exists, the hydrologic model should be calibrated to match recorded flow events, or discharges from an existing Council flood study. Flows should also be entered to the hydraulic model to ensure that levels are also matched.

Where a model is calibrated to recorded data at another location substantially downstream of the area of interest, a check should be made that the model produces reasonable discharge estimates at the location of interest.

### **Rational method calibration**

In the absence of available data for event calibration, the predicted design peak discharges should be compared with the results of Rational Method calculations. The appropriateness of adopted model parameters for urban and non-urban areas should be confirmed by checking model results against the Rational Method at a location with homogenous land use upstream.

That is, non-urban model parameters should be checked at a location with no urban development upstream. Urban model parameters should be checked at a location where the whole upstream catchment is developed. This approach ensures that changes in the timing of runoff along different model branches do not distort the calculated impact of urbanisation

### **Results of Calibration**

Commentary should be provided on the quality of the calibration and the confidence in the calibrated model for design flood estimation. The quality of the calibration should be informed by some form of goodness of fit qualification, between modelled and observed flood data.

The parameters derived from the calibration of the hydrologic and hydraulic models should be clearly tabulated in this section of the report.

## **Design flood events**

### **Hydrology methodology**

#### Temporal patterns

The rainfall hyetograph for design storm events should be obtained using Duration Independent Storm (DIS) Methodology.

The DIS temporal pattern is recommended for the consideration of design peak water levels. Where volume is an important consideration, temporal patterns extracted from significant historic events within the region should be considered. Contact Council's Customer Service Centre for further information.

#### Design loss rates

Design loss rates from a relevant regional flood may be available from Council. Contact Council's Customer Service Centre for assistance.

Where the available event calibration data support design loss calibration to flood frequency information, a proportional loss approach is preferred in conjunction with the DIS temporal pattern. This loss should be reduced log-linearly between the calibrated value at the 1% AEP to 0 at the AEP of the probable maximum precipitation (PMP).

#### Design rainfall estimates

##### *Bureau IFD estimates*

Design rainfall intensity frequency duration (IFD) data should be obtained for the catchment from the Bureau of Meteorology. For larger catchment, spatial variability in the design rainfall across the catchment should be considered. Bureau IFD estimates should be limited to the 1% AEP.

##### *Probable Maximum Precipitation (PMP)*

The Bureau of Meteorology provides two methods of PMP estimation relevant to the SEQ region. Generalised Short Duration Method (GSDM) and the revised Generalised Tropical Storm Method for longer durations. Both methods require determination for use with the DIS temporal pattern methodology.

##### *Intermediate AEP design rainfall estimates (0.2%, 0.05% AEP)*

Design rainfall depths at intermediate AEPs can be estimated using the methods of ARR87 Section 13.5.4 (Flood Frequency Curve Interpolation Based on Shape Factors). Alternatively FORGE estimates can be used but may require adjustment to ensure consistency where Australian Rainfall and Run off (ARR) 2013 Bureau IFD estimates have been used for design rainfalls up to the 1% AEP.

#### Climate change/variability allowances

A climate change/variability rainfall allowance is to be adopted as per the guidance of Schedule 3 of the Planning for stronger, more resilient floodplains, Part 2 (QRA, 2012). This recommends a 20% increase in rainfall intensity at year 2100.

A climate change/variability allowance of 0.8m at 2100 should be adopted for sea level rise. Additionally the sensitivity of a 1.1m increase should also be tested to ensure that freeboard is not exceeded.

### **Validation**

Where calibration has occurred using historic events, it is appropriate to validate the peak design discharges from the hydrological model against Rational Method estimates. The calculations must be presented in sufficient detail to show how each term in the Rational Method has been derived.

#### Runoff coefficient

Values of the runoff coefficient for a 10% AEP event may be obtained from QUDM. Runoff coefficients for other AEP events may be calculated using the Frequency Factors from QUDM.

### Time of concentration

Time of concentration should normally be calculated using at least two components of travel time. In a rural catchment these would usually be an overland flow component and a channel flow component. Overland flow time may be calculated using Friend's Equation. The Bransby-Williams Equation should NOT be used. In a rural catchment channel flow times may be estimated from QUDM and/or Manning's Equation.

In an urban catchment, Standard Inlet Times, from the version of QUDM current at the time of design, should be used to calculate the time for flow to reach the inlet of the pipe drainage system. For urban catchments channel flow time may be calculated using QUDM and/or Manning's Equation.

Detail the calculated discharges for event AEPs including: 39% AEP (Q2), 10% AEP, 1% AEP, 0.2% AEP, 0.05% AEP and the PMF.

Where another regional estimation tool is available, it may be used as an alternative validation method, with appropriate justification.

## Hydraulics methodology

### Design boundary conditions

Design boundary conditions should be sought from Council in the first instance to ensure integration with the wider regional model, where appropriate.

Where Council is unable to provide boundary conditions, it is the responsibility of the applicant to determine appropriate boundary conditions for the hydraulic model. These will depend upon the configuration and extent of the model. Typically, the downstream boundary condition is based on:

- normal flow depth;
- an analytically-derived rating curve for a downstream hydraulic structure, such as a culvert crossing, or
- a tailwater level from the receiving water, such as a tide level or design flood level in a downstream waterway.

In calculating normal flow depth, an appropriate bed slope should be determined from a longitudinal profile over a sufficient channel length to be representative of the reach of interest. The calculated bed slope should be checked against values obtained from topographic maps to ensure that the results are consistent.

It may be necessary to consider coincident flooding. This occurs when the location of interest is potentially affected by local and regional waterways with significantly different hydrologic response times (such as a small creek discharging into a major river) one rainfall pattern will produce floods of different recurrence interval in each system. These differences are automatically taken into account by simulating the hydrologic response of the entire catchment and estimating flood levels using an unsteady hydraulic model. However, where a steady-flow approach is appropriate, it may be necessary to consider combinations of local and regional events of different magnitudes.

In the absence of more detailed information, suitable event combinations, based on the ratio of the local to regional catchment area, may be obtained from **Table 3 (Event combinations for local and regional flooding)**. The 1% AEP flood level is the highest level resulting from:

- the smaller magnitude flood in the local system combined with the larger magnitude flood in the regional system; and
- the larger magnitude flood in the local system combined with the smaller magnitude flood in the regional system.

Hydraulic impacts of development should be considered for both cases.

Alternative event combinations may be acceptable with appropriate justification.

**Table 3 Event Combinations for Local and Regional Flooding**

Ratio of Local to Regional Catchment Area ( $A_L/A_R$ )	Event Combinations to Define 1% AEP Flood Level
< 0.001	39% AEP (Q2) + 1% AEP
0.001 – 0.01	18% AEP (Q5) + 1% AEP
0.01 – 0.1	5% AEP + 1% AEP
0.1 – 0.2	2% AEP + 1% AEP
> 0.2	1% AEP + 1% AEP

For determination of peak 1% AEP flood levels, the minimum downstream water level may be available from Councils Regional Flood Model, including for tidal reaches of estuaries. This data can be obtained by contacting Council's Customer Service Centre.

Where the development area is only a portion of the local catchment area (i.e. the local catchment area is the entire catchment area of the tributary to the point where it discharges to the regional water course), then the modelling for the development area must include the entire local catchment area and adopt the 1% AEP rainfall over the local catchment area.

#### Bridge and culvert blockages

Design blockage assumptions for bridges and culverts should be consistent with the guidance of QUDM 2013 (Section 7.5.2 and 10.4.10) or Australian Rainfall and Runoff, Project 11, Blockage of Hydraulic Structures (IEAust, 2013)

### **Design event results**

#### Existing catchment

Provide mapping for the pre-development catchment condition of WSL, depth, velocity and hazard (using the methodology of the Floodplain Management Guidelines of Australia). This mapping should be provided for the following events: 39% AEP (Q2), 18% AEP (Q5), 10% AEP, 1% AEP, 0.5% AEP, 0.2% AEP, 0.05% AEP and the PMF

#### Comparison of design event results with historic observation

Where historic observations are available within the catchment of interest, the probability of the historic event should be notionally considered in relation to the design flood levels. Where the historic information indicates a degree of confidence in the design flood levels, this should be documented. Similarly where the historic information does not indicate agreement, documentation should be provided to explain why the difference is accepted.

#### Developed catchment

Provide mapping for the developed catchment condition of WSL, depth, velocity and hazard (using the methodology of the Floodplain Management Guidelines of Australia). This mapping should be provided for the following events: 39% AEP (Q2), 18% AEP (Q5), 10% AEP, 1% AEP, 0.5% AEP, 0.2% AEP, 0.05% AEP and the PMF.

### **Impacts of development (afflux)**

Provide afflux mapping (water level difference between the pre-development and post-development) for the following events: 39% AEP (Q2), 18% AEP (Q5), 10% AEP, 1% AEP, 0.5% AEP, 0.2% AEP, 0.05% AEP and the PMF.

There should be no offsite impact. Water levels and velocities beyond the development site boundary should be unchanged between the pre and post development conditions. Numerical inaccuracies in the modelling process are accepted to 10mm (depth) and 0.5% (velocity).

### **Consideration of flood consequence**

Discuss how flood consequences are managed by the design of the development. In particular consider whether:-

- (a) essential network infrastructure within a site (e.g. electricity, water supply, sewerage and telecommunications) maintains effective function during and immediately after flood and storm tide inundation events;
- (b) building materials used have high water resistance and will improve the resilience of a building during and after a flood or storm tide event. (Council can provide further guidance materials: Flood Resilience Implementation Guideline for New Development);
- (c) community infrastructure is able to function effectively during and immediately after flood events;
- (d) development does not compromise the safety of people resulting from flooding, including the residual flood or storm tide inundation risk associated with events exceeding the DFE or DSTE. Is a direct

route to enable progressive evacuation to safe refuge above the level of the PMF available? Is there enough time required for evacuation been calculated and is there enough time between the DFE being exceeded and the peak of the PMF?;

- (e) warning times are likely to be less than 24 hours;
- (f) development ensures that public safety and the environment are not adversely affected by the detrimental impacts of floodwater on hazardous materials manufactured or stored in bulk during the DFE or DSTE;
- (g) car parks achieve flood immunity for the 10% AEP and limit the extent of flooding at the 1% AEP to 250mm, velocity to 2.0m/s and depth x velocity ratio to 0.4m<sup>2</sup>/s;
- (h) basements are provided waterproofed perimeter walls, air vents and entry/exit ramps that are at least 500mm above the 1%AEP flood level;
- (i) driveways that with a downhill slope have a raised entry ramp from the roadway, as per the requirements of QUDM to contain flood flows; and
- (j) backflow flooding of the local stormwater network from a regional event will be problematic under current or future climatic conditions.

## **Flood mitigation infrastructure**

### **Flood levees**

Flood levees are not considered an acceptable flood mitigation solution for the design of new developments.

### **Design of detention basins**

Detention basins, if required, should be designed in accordance with the QUDM. The DIS temporal pattern is not recommended for detention basin design. Where QUDM requires the consideration of alternative temporal patterns derived from significant historic regional events, these can be obtained from Council. Contact Council's Customer Service Centre for further information.

Where the outflow from a detention basin is potentially affected by backwater, this should be taken into account in developing the rating curve for the detention basin outlet.

Since the long-term maintenance of any air gap for stormwater detention cannot be guaranteed, rainwater tanks should be regarded as having no impact on stormwater detention.

### **Sensitivity of flood mitigation infrastructure design assumptions**

Where flood mitigation infrastructure has been included as part of the design, consider the sensitivity of the design assumptions adopted and how this may impact on future maintenance. For instance, where a detention basin is included, demonstrate the impact of a prior 5% AEP storm on the initial level. Where practical, design such basins to drain to normal operating level within 24hrs. Similarly provide some guidance on the impact of sedimentation on detention basins and assess the loss of flood storage after a period of 15 years. Demonstrate through mapping the impact this has on flood levels and flood immunity of properties.

## **Maintenance**

### **Sensitivity of waterway vegetation conditions**

Demonstrate, supported by mapping provided in Appendices, how the conveyance of waterways might be affected by hydraulic roughness assumptions that represent a "just maintained" condition.

Velocities of this condition should be checked to ensure that scour of the channel will not occur.

### **Sensitivity of blockage assumptions for bridges and culverts**

Demonstrate, supported by mapping provided in Appendices, how the flood levels and velocities might be affected by 0%, 50% and 90% blockage scenarios. Comment on the impact downstream where lower blockages are assumed and impact upstream where higher blockages are assumed.

## Conclusions and recommendations

This section should summarise the main findings of the report and make any recommendations arising from these findings.

### Recommended lot levels and floor levels

The minimum lot and habitable floor level requirements of the Planning Scheme differ with the type of development. **Table 8.2.7.3.3 (Flood levels and flood immunity requirements for development and infrastructure)** of the **Flood hazard overlay code** provides the specific requirements for setting minimum floor level based on the type of development.

### Qualifications and limitations

Detail any specific qualification and limitations that are relevant to the methodology, conclusions or recommendations of the report.

### References

Provide a list of documents referred to in the study. Where a reference document is not widely available a copy of the document or the relevant section should be included as an Appendix.

## Appendix A: Lot table information

As this information is also required in a tabulated electronic format for upload in to Council systems, an Excel template can be obtained from Council. Please contact Council's Customer Services Centre. This information will be provided on Council Flood Certificates until such time as Council is able to revise and re-run the regional flood model with ALS that represents the developed catchment.

The detail from this spreadsheet should also occur in this Appendix and follows the format.

#### General Notes and Assumptions

- Column 1: Lot number
- Column 2: Developed DFE level (Riverine)
- Column 3: Developed DFE level (Drainage)
- Column 4: Minimum floor level
- Column 5: Minimum building pad level
- Column 6: Stage number
- Column 7: Survey plan number
- Column 8: Comments specific to lot.



## SC6.10 Planning scheme policy for heritage and character areas overlay code

### SC6.10.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Heritage and character areas overlay code**; and
- (b) identify information that may be required to support a development application where affecting a heritage place or neighbourhood character area.

Note—nothing in this planning scheme policy limits Council's discretion to request other relevant information under the Development Assessment Rules made under section 68(1) of in accordance with the Act.

Note—the **Heritage and character areas overlay code** and the **Planning scheme policy for heritage and character areas code** does not apply to:-

- (a) Aboriginal cultural heritage which is protected under the *Aboriginal Cultural Heritage Act 2003* and which is subject to a cultural heritage duty of care; and
- (b) State heritage places or other areas which are protected under the *Queensland Heritage Act 1992*.

### SC6.10.2 Application

This planning scheme policy applies to assessable development which requires assessment against the **Heritage and character areas overlay code**.

### SC6.10.3 Advice for local heritage places and development adjoining a State or local heritage place outcomes

The following is advice for achieving outcomes in the **Heritage and character areas overlay code** relating to local heritage places and development adjoining a State or local heritage place:-

- (a) State and local heritage places have significant cultural significance and are important to the community as places that provide direct contact with evidence from the past;
- (b) State and local heritage places meet the criteria for cultural heritage significance based on the *Queensland Heritage Act (1992)*;
- (c) the Queensland Heritage Register records and provides a statement of significance for State heritage places and other State protected areas;
- (d) **Appendix SC6.10A (Significance statements for local heritage places)** records and provides a statement of significance for local heritage places;
- (e) compliance with Performance Outcomes PO1 to PO6 of **Table 8.2.9.3.1 (Performance outcomes and acceptable outcomesCriteria for assessable development on a local heritage place or adjoining a State or local heritage place)** of the **Heritage and character areas overlay code** may be demonstrated in part or aided by the submission of a heritage impact assessment report and conservation management plan prepared by a competent person in accordance with **Section SC6.10.5 (Guidance for preparation of a heritage impact assessment report and conservation management plan)**;

Note—For the purposes of this planning scheme policy, a competent person is an appropriately qualified and experienced consultant with appropriate and proven technical expertise in cultural heritage matters and membership of, or fulfilling the criteria for membership of, ICOMOS Australia.

- (f) in preparing a heritage impact assessment report or conservation management plan, an applicant should take into account and respond to the relevant statement of significance for the State or local heritage place;
- (g) the physical location of each heritage place is an aspect of its cultural significance and, in accordance with The Burra Charter, a local heritage place should remain in its historical, physical location; and
- (h) unless relocation is the sole practical means of ensuring survival of a heritage place, removal or relocation of a local heritage place is generally unacceptable.

## SC6.10.4 Advice for a neighbourhood character area outcomes

The following is advice for achieving outcomes in the **Heritage and character areas overlay code** relating to neighbourhood character areas:-

- (a) a neighbourhood character area is an area in which the historical origins and relationships between the various elements create a sense of place and demonstrate important aspects of the history of the locality;
- (b) neighbourhood character areas contain places that may not in themselves be of cultural heritage significance but which contribute to the significance of the character area as a group;
- (c) **Appendix SC6.10B (Significance statements for neighbourhood character areas)** records and provides a statement of significance for neighbourhood character areas;
- (d) Compliance with Performance Outcomes PO1 to PO8 of **Table 8.2.9.3.2 (Performance outcomes and acceptable outcomes Criteria for assessable development within a neighbourhood character area)** of the **Heritage and character areas overlay code** may be demonstrated in part or aided by the submission of a heritage impact assessment report prepared by a competent person in accordance with **Section SC6.10.5 (Guidance for preparation of a heritage impact assessment report and conservation management plan)**;
- (e) in preparing a heritage impact assessment report an applicant should take into account and respond to the relevant statement of significance for the neighbourhood character area; and
- (f) the measures required for the protection of neighbourhood character areas may differ from those adopted for heritage places, depending on the reasons for significance and should be determined as part of the development application and assessment process rather than through a conservation management plan.

## SC6.10.5 Guidance for preparation of a heritage impact assessment report and conservation management plan

### SC6.10.5.1 Heritage impact assessment report

- (1) A heritage impact assessment report is to be prepared in accordance with *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Heritage Significance, 2013* and associated guidelines.
- (2) A heritage impact assessment report is to include the following:-
  - (a) a description of the proposed development providing sufficient information to clearly distinguish the existing fabric, including photographs and plans of the existing place or area together with plans of the proposed development;
  - (b) a description of the history and context of the place or area demonstrating an understanding of the history and fabric of the place or area within the context of its class;
  - (c) an assessment of the impact of the proposed development on the heritage significance of the place or area including:-
    - (i) a description of how the development proposal will impact on the specific aspects of the significance of the place or area, as outlined in the statement of significance contained in a local heritage register, or where applicable, the Queensland Heritage Register;
    - (ii) how the fabric of the place or area would be impacted on and conserved; and
    - (iii) what works will be undertaken to adequately compensate for any loss of significant fabric or aspects of significance of the place or area;
  - (d) any other additional information that may assist in adequately assessing the significance of the place or area, including information drawn from a range of verifiable sources such as newspapers, government records, letters, books, photographs, maps or oral information which may help to establish the history of the place. Consideration of the historical context of the place or area shall be included to ascertain how its history contributes to an understanding of the place or area within broader historical events; and
  - (e) a conservation policy.

## SC6.11 Planning scheme policy for the landslide hazard and steep land overlay code

### SC6.11.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Landslide hazard and steep land overlay code**;
- (b) identify and provide guidance about information that may be required to support a development application where subject to the **Landslide hazard and steep land overlay code**; and
- (c) identify guidelines that may be relevant to achieving outcomes in the **Landslide hazard and steep land overlay code**.

Note—nothing in this planning scheme policy limits Council’s discretion to request other relevant information under the Development Assessment Rules made under section 68(1) of in accordance with the Act.

### SC6.11.2 Application

This planning scheme policy applies to development which requires assessment against the **Landslide hazard and steep land overlay code**.

### SC6.11.3 Advice for landslide hazard and steep land outcomes

The following is advice for achieving outcomes in the **Landslide hazard and steep land overlay code** relating to landslide hazard and steep land:-

- (a) compliance with Performance Outcomes PO1 and PO2 of **Table 8.2.10.3.1 (Criteria Requirements for accepted development self-assessable and performance outcomes and acceptable outcomes for assessable development)** and PO1 to PO5 of **Table 8.2.10.3.2 (Additional performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Landslide hazard and steep land overlay code** may be demonstrated in part or aided by the submission of a geotechnical assessment report prepared by a competent person in accordance with **Section SC6.11.4 (Guidance for the preparation of a geotechnical assessment report)**.

Note—for the purposes of this planning scheme policy, a competent person is a qualified registered professional engineer (RPEQ) with appropriate and proven technical experience in geotechnical engineering or engineering geology.

### SC6.11.4 Guidance for the preparation of a geotechnical assessment report

- (1) The extent and detail of investigations required to be incorporated in a geotechnical assessment report will depend upon the particular site characteristics and the nature of the development proposed. Council will require each report to demonstrate a method and scope of work appropriate to the subject site and the proposed development.
- (2) **Table SC6.11A (Indicative scope of work for geotechnical investigations)** provides an indication of the scope of work for geotechnical investigations that may be required to be undertaken for different levels of identified landslide hazard.

**Table SC6.11A Indicative scope of work for geotechnical investigations**

Level of identified hazard	Scope of geotechnical investigation
Very high/High	<ul style="list-style-type: none"> <li>• Investigation of existing conditions (including groundwater conditions) and soil strength.</li> <li>• Classification testing.</li> <li>• Walk over survey.</li> <li>• Review of aerial photography.</li> <li>• Site survey.</li> <li>• Numerical modelling such as slip circle analysis to determine the probability of global slip failure.</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>• Walk over survey.</li> <li>• Subsurface investigation.</li> </ul>

Level of identified hazard	Scope of geotechnical investigation
Low/Very low	<ul style="list-style-type: none"> <li>Walk over survey where slopes exceed 15%.</li> <li>Subsurface investigation where slopes exceed 15%.</li> </ul>

- (3) The extent of work actually required should be determined by the geotechnical engineer preparing the geotechnical assessment report, provided that the conclusion of the report is that the lot, site, building or other feature under assessment has a Factor of Safety of at least 1.5.
- (4) The following detailed guidance for geotechnical assessment reports may therefore be adjusted (particularly in respect to investigation of existing conditions) having regard to the scope of work determined to be appropriate in the circumstances.
- (5) A geotechnical assessment report is to:-
- describe the subject land and the proposed development;
  - describe the method and scope of investigations;
  - describe the existing conditions of the development site, including an assessment of land suitability and geotechnical constraints to development in accordance with **Section SC6.11.5 (Investigation of existing conditions for geotechnical assessment reports)**;
  - assess the suitability of the site for the proposed development, having regard to the prevailing geological and topographic conditions, including an assessment of the likely effects or impacts of the development upon slope stability and landslip potential;
  - recommend measures to mitigate impacts, including siting, engineering and other measures required to ensure a satisfactory form of development that does not involve high whole of life cycle costs such as deep sub-soil drainage within single residential lots or public land;
  - incorporate conclusions and recommendations in accordance with **Section SC6.11.6 (Conclusions and recommendations for geotechnical assessment reports)**;
  - use contour plans showing 1 metre contours developed from site survey or low level aerial photographs using objective photogrammetric techniques;
  - have regard and refer to the *Landslide Risk Management and Concepts Guidelines (Australian Geomechanics Society) 2007*;
  - utilise the preferred format outlined in **Appendix SC6.11A (Preferred format for a geotechnical assessment report)**; and
  - be illustrated by photographs and sketches as appropriate.
- (6) Where a geotechnical assessment report has already been prepared for the site and provided as supporting documentation to Council as part of a previous development application (i.e. reconfiguring a lot or material change of use of premises), these documents are to be clearly referenced in the geotechnical assessment report prepared as supporting documentation for the subsequent development application (i.e. operational work or building work).

Note—the guidance provided in this planning scheme policy outlines all matters to be addressed in a geotechnical assessment report, on the basis that such supporting documentation (i.e. earlier geotechnical reports) are not available. In the event that geotechnical assessment reports and certifications for the previous development applications are available, items already covered in these earlier reports/certifications may be referenced and covered in less detail.

### SC6.11.5 Investigation of existing conditions for geotechnical assessment reports

- (1) A geotechnical assessment report is to include an investigation of existing site conditions comprising an assessment of the existing stability of the subject land and details of geotechnical constraints on building and/or other development works on the site.
- (2) The investigation of existing conditions is to include:-
- a description of existing geology (surface and subsurface materials, soil/rock stratigraphy) and geomorphology (slopes, ground contours, natural features, terrain analysis, landslip features) both locally and regionally, including review of published materials;

- (b) the results of field investigations to assess the following factors:-
    - (i) depth of soil overburden within proposed works areas (including roads, infrastructure, building sites, potential swimming pools, tennis courts, garage, access driveways and the like);
    - (ii) classification of surface and subsurface materials to determine:-
      - (A) erosion potential;
      - (B) foundation conditions that could affect structural performance;
      - (C) suitability for wastewater disposal;
      - (D) any other relevant characteristics;
  - (c) the results of any numerical modelling/slip circle analysis to determine the probability of global slip failure;
  - (d) evidence of previous instability (i.e. irregular contours, hummocky topography, scarp faces in area of tension cracks, curved and/or non-vertical tree trunks, broken kerb and gutters, cracked or uneven roadway surfaces, distressed houses or other buildings);
  - (e) a description of the extent and type of any existing occurrences of erosion;
  - (f) an assessment of sub-surface drainage characteristics (i.e. presence of water table, springs, swampy areas, wet grass types, presence/depth to/ special conditions (artesian) of groundwater, and possible presence of confined aquifer beneath site);
  - (g) a description of existing vegetation cover; and
  - (h) a description of any existing site improvements (i.e. buildings, structures and earth works).
- (3) The results of all field and laboratory tests should be included in the geotechnical assessment report, including the location and level (including datum) of field investigations such as boreholes, trench pits and cone penetrometer results.

### **SC6.11.6 Conclusions and recommendations for geotechnical assessment reports**

- (1) The geotechnical assessment report is to include conclusions about the overall suitability of the land for the proposed development, including clear statements about:-
  - (a) whether all existing/proposed lots are presently stable;
  - (b) whether all lots, and associated completed buildings (i.e. dwelling houses) and infrastructure, will remain stable in the long term – that is, has a factor of safety against failure of at least 1.5; and
  - (c) whether any conditions need to be placed on the development of lot/s to maintain long term stability.
- (2) The geotechnical assessment report is to include recommendations that clearly outline the following:-
  - (a) whether the site has a history of landslip;
  - (b) whether the proposed development (including all lots and buildings where applicable) will alter the present state of stability of the subject land;
  - (c) whether any portion of the subject land should be excluded from the development and included in natural, undisturbed or rehabilitated areas;
  - (d) whether the proposed development (including all lots and buildings where applicable) will adversely affect the current state of stability of adjoining land;
  - (e) whether the proposed development (including all lots and buildings where applicable) should allow cuts and fills and if so, to what depth;
  - (f) whether retaining structures are required and if so, provide necessary foundations design parameters, including drainage requirements;

- (g) whether any special design features are required to stabilise or maintain the stability of the subject land, or portions of the subject land (including each lot where applicable);
  - (h) whether any special surface and/or subsurface drainage measures need to be taken to improve or maintain the stability of the subject land, or portions of the subject land (including each lot where applicable);
  - (i) whether on site disposal of liquids should be allowed; and
  - (j) whether any follow up inspections are required by the geotechnical engineer during construction.
- (3) The recommendations of the geotechnical assessment report should also provide guidance on appropriate measures required to make the site suitable for the proposed development, including:-
- (a) preferred locations for buildings, other structures, driveways, etc.;
  - (b) foundation requirements such as bearing pressures, piling parameters, special techniques for expansive clays;
  - (c) pavement type and design;
  - (d) construction methods to avoid problem areas associated with loose materials and groundwater seepage;
  - (e) preferred excavation/retention/stabilisation techniques and suitability of excavated materials for use in on-site earthworks;
  - (f) surface and subsurface drainage requirements;
  - (g) preferred methods of wastewater disposal (deep soil drainage within single residential lots or public land is not acceptable to Council; and
  - (h) vegetation protection and revegetation requirements.

### **SC6.11.7 Guidelines for achieving landslide hazard and steep land overlay outcomes**

For the purposes of the performance outcomes and acceptable outcomes in the **Landslide hazard and steep land overlay code**, the following are relevant guidelines:-

- (a) *Landslide Risk Concepts and Guidelines* (Journal and News of the Australian Geomechanics Society, 2007).



## **Appendix SC6.11A Preferred format for a geotechnical assessment report**

### **1. Introduction**

- 1.1 Details of development
- 1.2 Site location and description (including survey co-ordinates/co-ordinate system)
- 1.3 Method and scope of investigation
- 1.4 Qualifications of company and competent person(s) to prepare report

### **2. Description of existing conditions**

- 2.1 Geology (local and regional)
- 2.2 Topography
- 2.3 Groundwater
- 2.4 Surface drainage
- 2.5 Vegetation
- 2.6 Buildings, other structures

### **3. Assessment of land stability**

- 3.1 Existing conditions
- 3.2 Geotechnical constraints to development

### **4. Description of proposed development**

- 4.1 Site layout
- 4.2 Proposed development components
- 4.3 Potential geotechnical effects

### **5. Assessment of development impacts**

- 5.1 Site layout
- 5.2 Roadworks, driveways and other pavements
- 5.3 Earthworks (excavation, materials usage)
- 5.4 Foundations
- 5.5 Surface drainage
- 5.6 Wastewater treatment and disposal
- 5.7 Overall effect of development on stability

### **6. Recommendations and measures to mitigate impacts**

### **7. Summary and conclusions**

### **8. Site plan**

## **APPENDIX – Field and laboratory test results and modelling results**

## SC6.12 Planning scheme policy for the scenic amenity overlay code

### SC6.12.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Scenic amenity overlay code**; and
- (b) identify and provide guidance about information that may be required to support a development application where affecting identified scenic amenity values.

Note—nothing in this planning scheme policy limits Council’s discretion to request other relevant information [under the Development Assessment Rules made under section 68\(1\) of in accordance with](#) the Act.

### SC6.12.2 Application

This planning scheme policy applies to assessable development which requires assessment against the **Scenic amenity overlay code**.

### SC6.12.3 Advice for scenic routes, inter-urban breaks and significant views and vistas outcomes

The following is advice for achieving outcomes in the **Scenic amenity overlay code** relating to scenic routes, inter-urban breaks and significant views and vistas:-

- (a) compliance with Performance Outcomes PO1 to PO6 of **Table 8.2.12.3.1 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Scenic amenity overlay code** may be demonstrated in part or aided by the submission of a visual impact assessment report prepared by a competent person in accordance with **Section SC6.12.4 (Guidance for the preparation of a visual impact assessment report)**; and

Note—for the purposes of this planning scheme policy, a competent person is an appropriately qualified and experienced consultant (i.e. architect, landscape architect, urban designer) with appropriate and proven technical expertise in landscape and visual assessment.

- (b) the impacts of development on an element of scenic amenity value may be mitigated by incorporating such design responses as:-
  - (i) retention and/or rehabilitation of vegetation on ridgelines and prominent slopes;
  - (ii) retention and/or rehabilitation of waterways and drainage paths;
  - (iii) locating buildings below the canopy height of surrounding trees or ridgelines;
  - (iv) retaining established mature trees and stands of established vegetation;
  - (v) using non-reflective roofing materials and colours;
  - (vi) using building materials and colours that are drawn from or complement the natural or rural landscape of the locality;
  - (vii) avoiding the use of imported building types and themes that are incompatible with the natural or rural landscape of the locality;
  - (viii) avoiding extended straight lengths of new road or driveway in areas of hilly topography or where inconsistent with the established road pattern of the locality;
  - (ix) avoiding the use of fencing, landscaping and lighting treatments that are ‘urban’ in scale and appearance in rural or non-urban coastal settings;
  - (x) providing building setbacks to boundaries and spacing between buildings which are in proportion to the size of lots and consistent with the setbacks and spacing of other buildings in the locality; and

- (xi) locating buildings and other structures so as not to obscure or interrupt the significant views referred to in **Table 8.2.12.3.2 (Significant views)** of the **Scenic amenity overlay code**.

#### **SC6.12.4 Guidance for the preparation of a visual impact assessment report**

A visual impact assessment report is to describe, through detailed analysis and assessment, the following as relevant:-

- (a) the likely impact of development on visual qualities and characteristics of the landscape;
- (b) the impact of the development on the views of the coastline, hinterland or rural tablelands;
- (c) how the design of development minimises its impact on surrounding views by siting, stepping, chamfering or breaking up the visible mass of the building form or roofline, or by other design responses; and
- (d) the visual impact of the proposal when seen from roads and other public spaces and how the design of the development seeks to minimise the visual impacts by providing appropriate design responses and landscaping.

## SC6.13 Planning scheme policy for the utility code

### SC6.13.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice about achieving outcomes in the **Utility code**; and
- (b) identify and provide guidance about information that may be required to support a development application where subject to the **Utility code**.

Note—nothing in this planning scheme policy limits Council’s discretion to request other relevant information under the Development Assessment Rules made under section 68(1) of in accordance with the Act.

### SC6.13.2 Application

This planning scheme policy applies to development for a renewable energy facility which requires assessment against the **Utility code**.

### SC6.13.3 Advice relating to the establishment of a renewable energy facility

The following is advice for achieving outcomes in the **Utility code** relating to location and site suitability outcomes where involving development for a renewable energy facility:-

- (a) compliance with Performance Outcomes PO1 of **Table 9.3.21.3.1 (Performance outcomes and acceptable outcomes Criteria for assessable development)** of the **Utility code** may be demonstrated in part or aided by the submission of supporting information prepared by a competent person which provides details about:-
  - (i) the amount of electricity likely to be generated by, and the design voltage output of the proposed renewable energy facility;
  - (ii) the proximity of the proposed renewable energy facility to existing electricity infrastructure (e.g. substations, power lines);
  - (iii) whether existing electricity infrastructure has capacity to accept feed in from the proposed renewable energy facility; and
  - (iv) the extent of any new or upgraded electricity infrastructure that would be required to accommodate the proposed renewable energy facility (other than connection to an existing power line in an adjoining road or easement).

Note—for the purposes of this planning scheme policy, a competent person is an appropriately qualified and experienced electrical engineer with appropriate and proven technical experience in providing advice about electricity infrastructure networks and augmentation requirements.