



Amendment Instrument

Proposed Sunshine Coast Planning Scheme 2014 (Planning Scheme Policy Amendment) No. [insert] – Planning Scheme Policy for Development Works

Draft for Council consideration

October 2020

Made under the *Planning Act 2016*, section 22 (Making or amending planning scheme policies)

This amendment has effect on and from [to be inserted]



1. Short title

This amendment instrument may be cited as the proposed *Sunshine Coast Planning Scheme 2014 (Planning Scheme Policy Amendment) No. [insert] – Planning Scheme Policy for Development Works*.

2. Commencement

This amendment instrument has effect on and from [to be inserted].

3. Purpose

The purpose of this amendment instrument is to amend the *Planning Scheme Policy for Development Works* to:

- (a) update the standards, specifications and procedures to guide the design, construction and delivery of new development asset infrastructure and works, including roads, stormwater, landscaping and recreation infrastructure;
- (b) update references and guidelines in the planning scheme policy;
- (c) delete redundant water and sewer specifications;
- (d) include a new section for the delivery of local parks;
- (e) correct spelling and grammatical errors;
- (f) amend sections to improve legibility; and
- (g) make other consequential or administrative amendments.

4. Amendment table

This amendment instrument amends the component of the Planning Scheme Policy for Development Works in Table 1, Column 1, in respect of the planning scheme policy provisions stated in Table 1, Column 2, in the manner stated in Table 1, Column 3.

Table 1 Amendment table

Column 1	Column 2	Column 3
Planning scheme policy component	Planning scheme policy provisions	Amendment
SC6.14 (Planning scheme policy for development works) (whole policy document)	All provisions	Amend as shown in Appendix A

SC6.14 Planning scheme policy for development works

SC6.14.1 Introduction

SC6.14.1.1 Purpose

The purpose of this planning scheme policy is to:-

- (a) provide advice and guidance about achieving outcomes in the relevant planning scheme codes as contained in the planning scheme; ~~and~~
- ~~(a)(b) identify development and design standards for works undertaken as part of new developments which require Council approval and details standards and procedures for contributed assets with regard to construction, compliance and acceptance; and~~
- ~~(b)(c) provide advice and guidance for the design and construction of infrastructure works which reflects sound practice in engineering, environmental management and natural resource planning and sustainability, while also addressing considerations relating to whole of life cycle costs, safety, accessibility and aesthetics.~~

Note—nothing in this planning scheme policy limits Council's discretion to request relevant information in accordance with the Act.

SC6.14.1.2 Application

- (1) This planning scheme policy is to be read in conjunction with all codes in which reference is made to the **Planning scheme policy for development works**.
- (2) This planning scheme policy ~~is structured as follows~~ ~~comprises the following sections that identify development and design standards for works undertaken as part of new developments which require Council approval and details standards and procedures for contributed assets with regard to construction, compliance and acceptance:-~~

SC6.14.1	Introduction
SC6.14.2	Road infrastructure
SC6.14.3	Stormwater management
SC6.14.4	Water supply infrastructure
SC6.14.5	Sewerage infrastructure
SC6.14.64	Site development management
SC6.14.5	Local parks
SC6.14.76	Open space and ll landscaping infrastructure
SC6.14.87	Coastal and waterfront structures
SC6.14.98	Constructed waterbodies
SC6.14.109	Earthworks
SC6.14.110	Specifications and construction

SC6.14.1.3 General advice

Sections SC6.14.2 to SC6.14.10

- ~~(3)(1)~~ The standards identified in this planning scheme policy apply to all-assessable development and to infrastructure, capital assets such as roads, bridges, dams, drainage, electrical, lighting, telecommunications and intelligent transport systems (ITS) ~~water or sewerage systems~~, which are ~~is~~ required to be provided in conjunction with such assessable development.
- ~~(4)(2)~~ When undertaking development, developers and supervising engineers, professionally qualified engineering practitioners who are registered with the Board of Professional Engineers Queensland (supervising RPEQ engineers), ~~should have regard to~~ are to comply with the standards contained within this document, which are the minimum acceptable to satisfy the performance requirements of the planning scheme.
- ~~(5)(3)~~ Developers and supervising RPEQ engineers or suitably qualified and experienced persons may propose alternative solutions for Council approval to meet the objectives of these standards including sustainability, safety, legal and environmental considerations.

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SC6.14.1.3 General advice

- (1)(4) Where published standards, guidelines, and documents are referenced in this planning scheme policy, it is to be interpreted that the reference is the most current version (including any amendments) of that published standard, guideline or document.
- (2)(5) The developer and supervising RPEQ engineer are responsible for ensuring the current edition of reference documents is used.
- (3)(6) All standard forms (e.g. as-constructed certificates, CWITP etc.) will be made available by Council in both hard copy and electronic forms.
- (4)(7) Council has adopted the IPWEAQ standard drawings for roads and drainage (except where modified).

Note—all Council documents are available for perusal at Council's Customer Service Centres. Infrastructure guidelines and standards for development are available on Council's website.

SC6.14.1.4 Place making approach

- (1) In the application of the standards identified in this planning scheme policy, developers and consultants should also be aware that Council has adopted a place making approach to the development of designs for its unique community of communities. ~~In certain instances design standards for a locality may have already been developed.~~
- (2) Place making is an integrated approach to working with communities on a broad range of issues from infrastructure to town centre management to community capacity building. It has a philosophy and methodology which is holistic, multidisciplinary and requires long term commitments to people, places and partnerships. It is a tool to achieve sustainable outcomes socially, economically and environmentally to provide our communities with a sense of place and belonging.
- (2)(3) ~~In certain locations design standards for a place have already been developed.~~ In greenfield and other situations where no design palette exists, the purpose of a place making approach is to build on the existing character and values of an area rather than contrive it. Accordingly there will be instances where conditions of a development approval will specifically require that design of infrastructure ~~be is~~ consistent with Council's adopted place making approach for ~~the particular that~~ locality.
- (3) ~~Place making is an integrated approach to working with communities on a broad range of issues from infrastructure to town centre management to community capacity building. It has a philosophy and methodology which is holistic, multidisciplinary and requires long term commitments to people, places and partnerships. It is a tool to achieve sustainable outcomes socially, economically and environmentally to provide our communities with a sense of place and belonging.~~
- (4) Council has adopted the Place Making Charter – People, Places and Partnerships to ensure that the unique characteristics and needs of our places, local communities and people are recognised and maintained. The Charter outlines Council's vision with 5 key principles and is supported by Council's Place Making Policy – People, Places and Partnerships and Place Making Guidelines. The 5 key principles are:-
- (a) community values and people are at the heart of place making;
 - (b) engaging and collaborating with stakeholders and community;
 - (c) building community capacity to take action;
 - (d) the look and feel of our community centres should reflect the values of the people and place; and
 - (e) achieving integrated and sustainable place outcomes.
- (5) The Placemaking Place Making Charter, and Placemaking Policy and Guidelines provide an understanding of how Council is undertaking a place making approach to improve its service to each individual community. It outlines Council's vision and highlights a number of place making initiatives and interventions that contribute towards providing a sense of place.

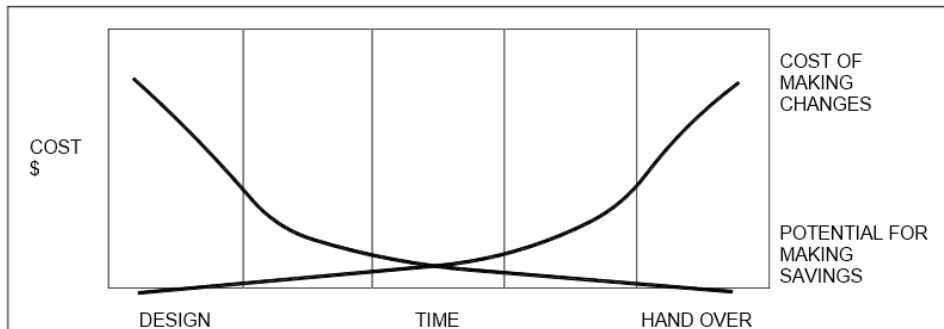
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- (6) The overarching philosophy in the design of all works ~~within Council-controlled land that become contributed assets~~ is to consider these spaces as places, and recognise that they have the ability to strengthen both our identity and our quality of life through good design.

SC6.14.1.5 Life cycle costs and life cycle management plans

- (1) The service provided by contributed assets ultimately becomes the responsibility of ~~the~~ Council to ~~continue to deliver~~. To support this ~~delivery~~, Council may require that during the design phase, a life cycle approach be adopted that considers the ongoing management obligations of the asset.
- (2) The required levels of service for contributed assets ~~should shall~~ be met in the most cost-effective way, and therefore infrastructure ~~should is to~~ be provided in a manner which maximises resource efficiency and minimises whole of life cycle costs.
- (3) Early identification of costs enables effective decisions to be made in balancing performance, reliability, maintainability, maintenance support and other goals against life cycle costs. Decisions made early in an asset's life cycle, for example during the design phase, have a much greater influence on reducing life cycle costs than those made post handover, as shown diagrammatically in **Figure SC6.14.1A (Potential savings and cost relationship)**.

Figure SC6.14.1A Potential savings and cost relationship



- (4) The preparation of a life cycle management plan and funding options may be requested for those proposed contributed assets that are considered over and above the level of service represented by the standards contained in this planning scheme policy.
- (5) For these assets to be acceptable to Council, the life cycle costing of the proposed asset needs to be evaluated to determine:-
- (a) maintenance and operational requirements for the ongoing management of the asset; and
 - (b) the costs associated with the ongoing management of the asset.
- (6) The maintenance, operational and replacement costs of these assets are to be evaluated over the operating life of the asset or for a minimum of 30 years. Applicants ~~should are to~~ provide:-
- (a) a detailed assessment of the relevant infrastructure network and how it operates;
 - (b) a detailed management system; and
 - (c) a forecast of ongoing maintenance costs associated with the operating life of the asset.
- (7) A life cycle management plan ~~should is to~~ consider all management options and strategies as part of the asset life cycle from planning to disposal. The objective of this is to consider lowest life cycle cost (rather than short term savings) when making asset management decisions.
- (8) Strategies are to be defined for each stage. Recurrent costs ~~being operations and maintenance, and capital costs, such as renewal/rehabilitation/replacement, upgrade/augmentation, enhancement (new assets) and disposal~~ are referred to in **Table SC6.14.1A (Life cycle expenditure categories)**.

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Table SC6.14.1A Life cycle expenditure categories

Category	Definition	Typical examples
Maintenance	Expenditure related to the ongoing up keep of assets	Mowing, painting, inspections
Operations	Expenditure on day to day activity of business operations	Power costs, utility costs
Renewals / Rehabilitation rehabilitation / Replacement replacement	Expenditure in maintaining the current level of service by reinstating the original life of the asset	Reseal, replacement
Upgrade / augmentation	Expenditure on upgrading the level of service by investment in an existing infrastructure or service	Widening or sealing of roads, traffic calming
Expansion	Expenditure on increasing the level of service by investment in new assets	New assets or services as part of a new subdivision
Disposal	Any costs associated with the disposal or decommissioning of assets	Sale of material or plant, road closure, removal of assets

~~(9) For proposed contributed assets for which Council requires submission of a life cycle management plan and life cycle costing to facilitate Council's assessment of the development proposal, the applicant's submission to Council should be prepared using:-~~

- ~~(a) Council's standard Whole of Life template;~~
- ~~(b) the asset life for each key component of infrastructure as shown in Council's Whole of Life template guideline document; and~~
- ~~(c) the set of financial indicators and criteria as shown in Council's Whole of Life template guideline document.~~

~~Note—the above documents are available on Council's website.~~

SC6.14.1.6 Responsibilities – design and construction of engineering works

- (1) All engineering infrastructure approved for construction (including works ~~which is~~ to be transferred to private ownership and works ~~which is~~ to be transferred to Council ownership as a contributed asset), is to be designed and supervised during construction by ~~an engineer who is registered with the Board of Professional Engineers, Queensland a supervising RPEQ engineer.~~
- (2) The ~~supervising RPEQ~~ engineer is to ensure that all such infrastructure has been designed and constructed in accordance with the standards identified in this planning scheme policy and in accordance with sound engineering practice. Should the ~~supervising RPEQ~~ engineer propose a design which does not fall within the range of design alternatives which are consistent with the standards identified in this planning scheme policy, the ~~supervising RPEQ~~ engineer ~~should is to~~ discuss the proposal with the relevant engineering and environmental assessment staff at an early stage to determine Council's attitude to the proposal.
- (3) Council's standards for engineering design drawings lodged with development applications are detailed in **Appendix SC6.14A (Standards for engineering design drawings)** of **Section SC6.14.1 (Introduction)**.
- (4) Drawings ~~should are to be~~ lodged ~~in electronic format as PDF and AutoCAD files complying with the Asset Design and As Constructed (ADAC) standard for use and direct transfer to Council's geographic information system (GIS) and Asset Management Systems on A1, and/or A3 sized sheets. Where designs are lodged on A1 sized sheets, at least one copy at A3 size should also be lodged. Design details may also be lodged on A4 sized sheets.~~
- (5) Stormwater catchment plans and drainage design calculations ~~should are to be~~ lodged as supporting information to the design drawings.
- (6) For development on existing allotments, site development plans ~~should are to~~ show proposed site layout, existing contours/levels, proposed levels, proposed paved areas, proposed stormwater layout and levels, proposed driveway access and car parking layout with line marking and other relevant details.

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- (7) Design drawings ~~should~~ are to detail existing and planned utility services and ~~should~~ highlight any potential service conflicts.
- (8) Specifications within design documentation detailing the requirements for the construction contractor inclusive of ADAC data and as constructed drawings are to be provided for Council approval.

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Appendix SC6.14A Standards for engineering design drawings

Preliminary

- (1) Standardisation of the presentation of engineering design plans submitted with an operational works (OPW), material change of use (MCU) or ~~reconfiguration (REC)~~ reconfiguring a lot (RAL) application is necessary for consistency in Council's and other service provider's records and desirable for facilitating Council's assessment.

Drawings required General requirements

- (2) Engineering drawings shall generally include but not be limited to, the following:-

- (a) cover sheet;
- (b) locality plan;
- (c) layout/staging (subdivision) ~~layout / staging~~;
- (d) earthworks, including roadworks and drainage; and
- ~~(e) roadworks and drainage;~~ location of infrastructure (existing and/or proposed); and
- ~~(e)(f) location of existing and proposed easements.~~
- ~~(f) longitudinal section of each road;~~
- ~~(g) standard cross-sections;~~
- ~~(h) cross-sections of each road;~~
- ~~(i) detail plan of each intersection, cul-de-sac, slow points;~~
- ~~(j) details of bikeways and disability points;~~
- ~~(k) longitudinal section of each drainline;~~
- ~~(l) stormwater device details;~~
- ~~(m) sewerage reticulation;~~
- ~~(n) longitudinal section of each sewer line;~~
- ~~(o) water reticulation;~~
- ~~(p) longitudinal section of watermains 300m diameter and greater;~~
- ~~(q) interlot drainage;~~
- ~~(r) drainage calculations and catchment plan;~~
- ~~(s) water quality control system;~~
- ~~(t) structural details; and~~
- ~~(u) erosion and sediment control.~~

Minimum requirements

- (3) ~~Title~~ The title block is to ~~show~~ include:-
- (a) estate name (if any);
 - (b) real property description and locality;
 - (c) developer's name and consultant's name(s);
 - (d) Council's development application number;

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- (e) scales and reference to AHD;
 - (f) plan number and sheet number;
 - (g) schedule and date of amendments;
 - (h) signed design certification, by an experienced designer;
 - (i) signed checking certification by a RPEQ engineer;
 - (j) north point; and
 - (k) amendments from a previous revision ~~must be~~ clouded, or otherwise highlighted.
- (4) Scales used for all plans should preferably be those recommended by the Standards Australia and Austroads, namely:-
- (a) 1:1, 1:2 and 1:5 and multiples of 10 of these scales; or
 - (b) although not preferred, the scales 1:25 will be accepted and 1:125 and multiples and submultiples of 10 of these scales;
 - (c) ~~general:-~~
 - (i) ~~overall layout plans - 1:1000 or 1:500;~~
 - (ii) ~~longitudinal sections - horizontal - 1:1000 or 1:500; and~~
 - (iii) ~~longitudinal sections - vertical - 1:100 or 1:50;~~
 - (d) ~~plans of intersections, cul-de-sacs and slow points:-~~
 - (i) ~~details - 1:200, 1:100 or 1:250;~~
 - (ii) ~~cross-sections - 1:100; and~~
 - (iii) ~~engineering details - 1:20 or 1:10; and~~
 - (e) ~~water and sewerage plans:-~~
 - (i) ~~overall layout plans - 1:1000;~~
 - (ii) ~~detail plans - 1:500;~~
 - (iii) ~~longitudinal sections - vertical - 1:100;~~
 - (iv) ~~longitudinal sections - horizontal - 1:1000; and~~
 - (v) ~~engineering details - 1:20 or 1:10.~~

(5) Table SC 6.14.2A (Scales for typical plans) details Council's requirements with regard to preferred scales for streets and roadworks.

Table SC6.14.2A Scales for typical plans

Category	Typical examples	Scales
General	Overall layout plans	1:1000 or 1:500
	Longitudinal sections - horizontal	1:1000 or 1:500
	Longitudinal sections - vertical	1:100 or 1:50
Intersections, cul-de-sacs and slow points	Details	1:200, 1:100 or 1:250
	Cross sections	1:100
	Engineering details	1:20 or 1:10

(5)(6) Linear dimensions on all roadwork plans should be in metres, with the exception of some detail plans of small structures (e.g. manholes) and some standard plans (e.g. kerb and channel), which may be in millimetres.

(6)(7) Standard cross-section intervals should be to:-

- (a) be provided to roads at 20.0m intervals, with further subdivision of 10.0m to 5.0m intervals where necessary due to horizontal or vertical curvature;
- (b) be shown at proposed culvert locations on rural roads;
- (c) show culvert dimensions, levels and cover; and

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(d) show ~~cross-sections~~cross sections of driveways where access profiles need level control.

~~(7)(8)~~ Chainages on plans shall be expressed to a minimum of 0.01m and generally commence on the bottom left hand corner and increase to the right.

~~(a)~~ shall be expressed to a minimum of 0.01m; and

~~(b)~~ are generally to commence on the bottom left hand corner and increase to the right.

~~(8)(9)~~ Levels shall be reduced to AHD. Reduced levels of road works, stormwater drainage, bench marks and reference pegs including PSMs are to be expressed to three decimal places (i.e. 0.001m).

~~(a)~~ reduced to AHD;

~~(b)~~ for reduced levels of bench marks and reference pegs including PSMs, expressed to three decimal places (i.e. 0.001m);

~~(c)~~ for reduced levels of road works and stormwater drainage, expressed to three decimal places i.e. 0.001m; and

~~(d)~~ for reduced levels of sewerage reticulation, expressed rounded to two decimal places (i.e. 0.01m).

~~(9)(10)~~ Grades, for roads shall be shown to two significant figures and for pipes, three significant figures.

~~(a)~~ roads, shall be shown to two significant figures; and

~~(b)~~ pipes, shall be shown to three significant figures.

Requirements for specific plans

~~(10)(11)~~ Locality. The locality plan shouldis to:-

(a) be at a scale of 1:25000;

(b) locate the subdivision in relation to adjacent towns, main roads, major streets, etc; and

(c) be included on layout /staging plan for large jobs or roadworks and drainage plan for smaller jobs.

~~(11)(12)~~ Layout /staging on plans shouldare to showinclude:-

(a) for large subdivisions, the relationship of all new roads to each other and to existing roads adjoining the subdivision; ~~For small subdivisions, where all new roads can be shown on one detail plan, the layout plan may be omitted; and~~

~~(b)~~ for small subdivisions, where all new roads can be shown on one detailed plan, the layout plan may be omitted; and

~~(b)(c)~~ where development is to be carried out by stages, the boundaries of proposed stages should be shown on this plan, and thewith stages identified by numbering and the method of connection (i.e. walkways, bikeways) between stages.

~~(12)(13)~~ Earthworks on plans are to showinclude:-

(a) a legend;

(b) existing site contours and finished surface levels and contours;

(c) limits and levels of major lot cut and fill - distinguished by hatching and/or finished surface levels (FSLs) at corner of lots;

(d) fill quantities;

(e) location of cut and fill batters relative to lot boundaries;

(f) location and levels of retaining walls (if required);

- (g) batter slopes;
- (h) defined flood level (if appropriate);
- (i) flood fill level (if appropriate); ~~and~~
- (j) planned locations of acid sulfate soils treatment as linked to an Acid Sulfate Soils Management Plan (refer to **Planning scheme policy for the acid sulfate soils overlay code** in the planning scheme); ~~and~~

~~(k) for small subdivisions, the earthwork details may be included on the roadworks and drainage plans.~~

~~Note for small subdivisions, the earthwork details may be included on the roadworks and drainage plans.~~

~~(13)(14)~~ Road works and drainage on plans are to ~~show~~include:-

- (a) a legend;
- (b) road reserve boundaries;
- (c) lot numbers and boundaries, both existing and proposed;
- (d) centreline, or other construction line;
- (e) chainages on centreline or construction line;
- (f) bearings of the centreline or construction line;
- (g) tangent point chainages of each curve;
- (h) radius, arc length, tangent length and secant distance of each curve;
- (i) chainage and the intersection point of road centrelines or construction lines;
- (j) kerb lines, kerb radii, and chainage of all tangent points of the kerb line;
- (k) edge of pavement, where no kerb is to be constructed;
- (l) dimensioned road reserve, footpath, pavement widths and bikeways, where these differ from the standard ~~cross-section~~cross section;
- (m) existing contours ~~and~~ levels and finished surface levels, highlighting cut and fill areas;
- (n) drainage catchment boundaries and identification reference (may be shown on separate catchment plan);
- (o) drain line locations, diameters and identification;
- (p) manhole locations, ~~and~~ inlet and outlet invert levels and identification on long sections;
- (q) gully locations and devices;
- (r) location of proposed new utilities and existing utilities or other existing works within the site;
- (s) location and levels of bench marks;
- (t) north point; and
- (u) line marking and signing (may be shown on separate plans).

~~(14)(15)~~ Longitudinal sections of roads on plans are to ~~show~~include:-

- (a) chainages;
- (b) existing surface or peg levels;
- (c) design road centreline and kerb lip levels or kerb levels;

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- (d) design grades;
- (e) chainages and levels of grade intersection points;
- (f) chainages and levels of tangent points of vertical curves;
- (g) chainages and levels of crest and sag locations;
- (h) lengths and radii of vertical curves;
- (i) super elevation diagrams showing transition lengths and rate of rotation;
- (j) road classification with ESAs;
- (k) minimum or nominal AC surfacing and pavement thicknesses;
- (l) location of other services with cross roads; and
- (m) a sight distance diagram, for each direction of travel, where warranted.

~~(15)~~(16) ~~Standard c~~Cross sections on plans are to ~~show~~include:-

- (a) road reserve width;
- (b) pavement widths;
- (c) verge widths;
- (d) crossfalls of pavement and verges;
- (e) pavement depth - minimal or nominal;
- (f) type of kerb and channel;
- (g) type of pavement surfacing (include special surface treatments);
- (h) subsoil drainage;
- (i) footpaths;
- (j) bikeways;
- (k) above ground services;
- (l) ~~cross-sections~~cross sections of roads;
- (m) road reserve boundaries;
- (n) pavement centreline and/or other construction line;
- (o) natural ~~surface~~ground; and
- (p) design ~~cross-section;~~ and ~~cross section.~~
- (q) ~~crossfall of pavement and verges, pavement and verge widths and pavement depths wherever these differ from the standard cross-section.~~

~~(16)~~(17) Longitudinal sections of drains on plans are to ~~show~~include:-

- (a) chainages;
- (b) existing surface levels;
- (c) design finished surface and invert levels;
- (d) manhole chainages and offsets and inlet and outlet invert levels;
- (e) distances between manholes;

- (f) grade of each pipe (anchor blocks where required);
- (g) diameter of each pipe length;
- (h) class of each pipe length;
- (i) hydraulic grade line and design storm frequency;
- (j) manhole diameters and/or reference to separate detail drawing; and
- (k) water quality treatment device locations.

~~(17) Sewerage reticulation plans are based on WSAA Sewerage Code of Australia and include the following changes:-~~

~~(a) Part 1 section 9.2.1 General, add to WSAA requirements. Design drawings are to include:-~~

~~(i) signed checking certification from an RPEQ.~~

~~(b) Part 1 Section 9.2.3 Sewers, add to WSAA requirements:-~~

- ~~(i) clouding of all revision amendments;~~
- ~~(ii) clearly defined stage boundaries;~~
- ~~(iii) kerb and channel location;~~
- ~~(iv) proposed sewerage easements drawn;~~
- ~~(v) where removal of trees is contemplated this shall be shown on plans;~~
- ~~(vi) size and location of other services located within 1.5 metres of sewerage infrastructure;~~
- ~~(vii) dimensioned clearances of services to the sewer main to be included;~~
- ~~(viii) finished surface level contours at intervals not greater than 0.5m;~~
- ~~(ix) existing surface spot levels at corners of proposed allotments;~~
- ~~(x) finished surface spot levels at corners of proposed allotments;~~
- ~~(xi) sewer line and maintenance hole numbers; and~~
- ~~(xii) details of allotments with zero or reduced building setback alignments.~~

~~(c) Part 1 Section 9.2.4 Structures, add to WSAA requirement:-~~

~~(i) structures are to be referenced to MGA (zone 56) mapping co-ordinates;~~

~~(d) Part 1 Section 9.2.5 Longitudinal sections (profiles), add to WSAA requirement:-~~

- ~~(i) ensure all revision amendments are clouded;~~
- ~~(ii) cut and fill notated;~~
- ~~(iii) natural surface and proposed finished surface levels;~~
- ~~(iv) bedding and sewer foundation details;~~
- ~~(v) pipe size, class and material;~~
- ~~(vi) existing and proposed services crossing the sewer main. Size, material and levels of these services;~~
- ~~(vii) levels and references to AHD;~~
- ~~(viii) chainages and invert levels of all proposed house connections;~~
- ~~(ix) sewer line and maintenance hole numbers;~~
- ~~(x) pipe bedding type;~~
- ~~(xi) depths to pipe invert; and~~
- ~~(xii) depth and location of other services including stormwater; and~~

~~(e) Part 1 Section 9.2.6 Title block notation and standard notes, design drawings are to include:-~~

- ~~(i) estate name (if any);~~
- ~~(ii) Council development application number – if available; and~~
- ~~(iii) drawing number and revision number.~~

~~(18) Water reticulation plans are based on WSAA Water Supply Code of Australia and include the following changes:-~~

~~(a) Part 1 Section 7.2.2(d):-~~

~~(i) ensure all revision amendments are clouded; and~~

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- (ii) ~~longitudinal sections are to be prepared for water mains 250mm diameter or larger;~~
- (b) ~~Part 1 Section 7.2.4 Contents of design drawings, add to WSAA:-~~
 - (i) ~~show angles of bends; and~~
 - (ii) ~~location of existing or proposed footpaths and other proposed frontage works; and~~
- (c) ~~longitudinal sections are to include:-~~
 - (i) ~~pegged chainages;~~
 - (ii) ~~pipe bedding requirements;~~
 - (iii) ~~invert levels in grades;~~
 - (iv) ~~surface levels, existing and finished;~~
 - (v) ~~AHD; and~~
 - (vi) ~~depths to invert.~~

~~(19)~~(18) ~~Interlot-Inter-allotment~~ drainage plans are to include:-

- (a) location and size of ~~interlot-inter-allotment~~ drainage lines;
- (b) invert and surface levels at pits;
- (c) location and size of pits;
- (d) location and size of house connections;
- (e) pipe material details;
- (f) lengths and grades to all ~~interlot-inter-allotment~~ drainage lines; and
- (g) labelling of ~~interlot-inter-allotment~~ drainage pits and receiving stormwater structures.

~~(20)~~(19) Drainage calculations and catchment plans are to include:-

- (a) north point;
- (b) a plan of the development showing the road and lot boundaries;
- (c) existing (where changes may affect adjacent properties) and finished surface contours (in different line types) at an interval close enough to define the terrain and allow definition of the sub catchments;
- (d) contours ~~are to that~~ extend beyond the limits of the development site to fully define the limits of external catchments;
- (e) subcatchment boundaries, labels and areas;
- (f) ~~a~~ line diagram of drainage lines, manholes, ~~gully-gullies~~ and outlet locations; and
- (g) labelling of stormwater structures.

~~(21)~~(20) Erosion and sediment control guidelines are contained in **Section SC6.14.64 (Site development management)** of this planning scheme policy.

~~(21)~~ ~~Electrical, lighting, telecommunications and intelligent transportation systems (ITS) drawings, where required, are to show:-~~

- (a) ~~legends, specification notes and compliance notes;~~
- (b) ~~location plan, drawing index and north point;~~
- (c) ~~road reserve boundaries, road names, lot numbers and property boundaries, footpaths and driveways;~~
- (d) ~~kerb lines or edge of pavement where no kerb is to be constructed;~~
- (e) ~~location of proposed new and existing utilities and all other existing services affecting the works;~~

- (f) details of coordinated points of conflict with water, sewer, stormwater and all other services;
- (g) cautionary notes for potential danger of conflict with electricity, telecommunications and all other services;
- (h) chainages, locations and levels where required to define the work;
- (i) cross sections, pit section details and detailed conduit plan/section details;
- (j) detailed civil work, pit/conduit, pole, luminaire, switchboard, calculations and other required schedules;
- (k) service point, network connection interface and district network service provider (DNSP) coordination details;
- (l) single line diagrams and controls schematics;
- (m) lighting isolux diagrams;
- (n) traffic signals sequencing diagrams;
- (o) compliance and certification schedules; and
- (p) general arrangements of main switch boards and associated electrical equipment.

SC6.14.2 Road infrastructure

SC6.14.2.1 Purpose

The purpose of this section of the **Planning scheme policy for development works** is to:-

- (a) provide advice and guidance on the policy and standards required in relation to the provision of road infrastructure for new development in order to ensure transport infrastructure design construction satisfies Council's requirements;
- (b) provide ensure environmental and safety expectations are met; and
- (c) make adequate provision for persons with disabilities.

SC6.14.2.2 Application

- (1) This section of the planning scheme policy applies to assessable development which requires assessment against the **Landslide hazard and steep land overlay code, Transport and parking code** and the **Works, services and infrastructure code**.
- (2) This section is structured as follows:-
 - (a) **Sections SC6.14.2.1 and SC6.14.2.2** provide the framework;
 - (b) **Sections SC6.14.2.3 to SC6.14.2.5** provides the requirements and procedures for achieving the outcomes detail Council's guidelines and standards to facilitate compliance with the relevant provisions of the **Landslide hazard and steep land overlay code, Transport and parking code** and the **Works, services and infrastructure code** and to achieve the purpose of this section of the planning scheme policy; and
 - (c) **Section SC6.14.2.6** contains guidelines for achieving compliance with this section of the planning scheme policy.

SC6.14.2.3 Transport and road hierarchy

- (1) Council's adopted road hierarchy is shown on **Figure 9.4.8A (2031 Functional Transport Hierarchy)** in the **Transport and parking code**.

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- (2) The functions, roles and objectives of the various elements of the road hierarchy are detailed in **Tables SC6.17A to SC6.17D.17E** of the **Planning scheme policy for the transport and parking code**.

SC6.14.2.4 Geometric and engineering design

- (1) The design characteristics and requirements of the various road and street types are detailed in **Tables SC6.17B to SC6.17D.17E** of the **Planning scheme policy for the transport and parking code**, including:-

- (a) minimum reserve width;
- (b) design speed;
- (c) stopping and sight distance requirements;
- (d) maximum traffic volume;
- (e) number of general traffic lanes;
- (f) vehicle property access;
- (g) transit/bus lanes;
- (h) ~~on-road~~ road cycling provisions;
- (i) pathway facilities;
- (j) pedestrian and cycle crossing treatments;
- (k) ~~on-street~~ on street parking;
- (l) provision for public transport;
- (m) intersections (restrictions, minimum spacing, ~~etc~~);
- (n) intersection treatments;
- (o) provision for turning traffic;
- (p) medians;
- (q) desirable and absolute maximum grades;
- (r) longitudinal drainage;
- (s) freight and dangerous goods route characteristics;
- (t) LATM treatments; and
- (u) street lighting categories.

- (2) Type ~~cross-sections~~ cross sections for streets and roads, showing required carriageway and verge elements, are included in **Appendix SC6.17A (Typical street and road cross sections)** of the **Planning scheme policy for the transport and parking code**.

- (3) Where there is any discrepancy between guidelines:-

- (a) the requirements specifically detailed in this section take precedence over other published guidelines, standards, or references; and
- (b) the order of precedence of published guidelines, standards, or references will be in accordance with the order those publications are listed in **Section SC6.14.2.6** of this planning scheme policy.

- (4) Compliance with Acceptable Outcome **AO4.4** of **Table 9.4.8.3.2 (Criteria-Additional performance outcomes and acceptable outcomes for assessable development only)** of the

Schedule 6

Transport and parking code may be demonstrated by the preparation and submission of a road safety audit:-

- (a) certified by a qualified road safety auditor; and
- (b) complying with Austroads Guide to Road Safety for all stages of the design and construction and operation of the transport infrastructure.

(5) Table SC6.14.2A (Street and road works) details Council requirements with regard to streets street and road works.

Table SC6.14.2A Street and road works

Element	Requirements																						
General	<ul style="list-style-type: none"> • Street and road works comply with:- <ul style="list-style-type: none"> ◦ DTMR requirements, where access is proposed onto a State controlled road, or where the proposed development is likely to have significant impact on a State controlled road; ◦ Austroads Guide to Road Safety for all stages of the design and construction and operation of the transport infrastructure; and ◦ all other relevant guidelines detailed in Section SC6.14.2.6. 																						
Horizontal and vertical alignment and grade	<ul style="list-style-type: none"> • Construct all changes to horizontal alignment with curves. • Vertical alignment to comply with:- <ul style="list-style-type: none"> ◦ DTMR design manuals; and ◦ Austroads design manuals. • Where there is kerb and channel, provide sag vertical curves at low points (with changes in grade ≤ 2%) with vertical curves of radii. • With regard to sag vertical curves on grade, instantaneous changes of grade (i.e. no vertical curve) will be considered where change of grade is <30/V% (where V is the design speed in km/h). • At intersections, the tangent point of the vertical curve is to be outside the line of the through road and have a minimum length of 10 metres. • A concrete invert is to be provided where the change in grade is <6%. • Vertical curves must shall not mask the commencement of horizontal curves. 																						
Cross fall	<ul style="list-style-type: none"> • 3% cross fall for asphalt and bitumen seal roads. • 5% cross fall for unsealed shoulders. • Cross fall may be varied below general requirements if contoured design detail is provided to demonstrate adequate surface drainage of the pavement. 																						
Medians and islands	<ul style="list-style-type: none"> • Avoid split level roads. • Provide central medians on sub-arterial main streets to reduce delays and conflicts from queuing vehicles in the middle of the road and accompany with intersection upgrades for increased u-turns from eliminated right turns. • Median kerbs to be SM3 type with 200mm wide decorative concrete backing strip, <u>or SM5 where not required for landscape character</u>. • All medians comply with:- <ul style="list-style-type: none"> ◦ Austroads design manuals; and ◦ MUTCD for delineation and line marking, except for internal residential streets where line marking and signage is reduced for residential amenity, subject to noses of all islands/medians being adequately lit. <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>Element</th> <th>Requirement</th> </tr> </thead> <tbody> <tr> <td>Residual median width</td> <td>≥1.2 metres</td> </tr> <tr> <td rowspan="3">Cross fall</td> <td>dDesirable</td> <td>≤1 in 6 on landscaped medians on divided roads</td> </tr> <tr> <td>aAbsolute maximum</td> <td>1 in 4 on landscaped medians on divided roads</td> </tr> <tr> <td>pPavement at openings</td> <td>≤ 5%</td> </tr> <tr> <td>Construction</td> <td>wwhere islands are designed to be mountable, provide full depth kerb into the pavement layer or form and pour a monolithic reinforced concrete island in existing pavements, cut back the asphalt surface a minimum of 300mm and reinstate to a minimum depth of 40mm</td> </tr> <tr> <td rowspan="3">Surface</td> <td>if >1 in 4 cross fall</td> <td>Concrete</td> </tr> <tr> <td>if <2 metres wide</td> <td>HHard surfaced, with a texture and colour which will provide high level of contrast to the traffic carriageway</td> </tr> <tr> <td>If ≥ 2 metres wide</td> <td>ILandscaped</td> </tr> <tr> <td>Landscaping</td> <td>eEnsures sight distances are not compromised at any stage, from initial planting to maturity</td> </tr> </tbody> </table>	Element	Requirement	Residual median width	≥1.2 metres	Cross fall	dDesirable	≤1 in 6 on landscaped medians on divided roads	aAbsolute maximum	1 in 4 on landscaped medians on divided roads	pPavement at openings	≤ 5%	Construction	wwhere islands are designed to be mountable, provide full depth kerb into the pavement layer or form and pour a monolithic reinforced concrete island in existing pavements, cut back the asphalt surface a minimum of 300mm and reinstate to a minimum depth of 40mm	Surface	if >1 in 4 cross fall	Concrete	if <2 metres wide	HHard surfaced, with a texture and colour which will provide high level of contrast to the traffic carriageway	If ≥ 2 metres wide	ILandscaped	Landscaping	eEnsures sight distances are not compromised at any stage, from initial planting to maturity
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Schedule 6

Element	Requirements
	<ul style="list-style-type: none"> incorporates perimeter subsoil drainage to the underground drainage system
<p>Verges</p>	<ul style="list-style-type: none"> Accommodate WSUD devices designed and constructed to ensure they do not negatively impact on verge functions such as property access, pathways and general pedestrian movement (including on residential street verges where a pathway may not be required), street trees and other services. Verges comply with:- <ul style="list-style-type: none"> Council's Standard Engineering Drawings for location of services and utilities and cross fall ≥ 1 in 6; Appendix SC6.17A (Typical street and road cross sections) of the Planning scheme policy for the transport and parking code for widths and pathways, modifications to standard profiles may be appropriate in existing road reserves, to address issues with retainment, property access, pedestrian access and stormwater drainage; the requirements of Section SC6.14.3 (Stormwater management) of this planning scheme policy relating to WSUD devices; SEQ Healthy Waterways design guidelines for WSUD devices; incorporate planning considerations identified in Table SC6.17P of the Planning scheme policy for the transport and parking code. Achieve minimum verge widths by:- <ul style="list-style-type: none"> increasing the width to accommodate any WSUD elements; and setting back or truncating allotment boundaries. Width may be reduced to an absolute minimum of 3.0 metres, if on access places, access streets or neighbourhood collector streets, adjacent to speed management devices and a pathway is not required. Avoid vertical retainment requiring handrails or barriers. Fully turf, or landscape all verges fronting newly created streets, roads or allotments.
<p>Road furniture</p>	<ul style="list-style-type: none"> Comply with:- <ul style="list-style-type: none"> DTMR's Road Planning Design Manual for warrants for installation and location of guardrails; DTMR standards for installation of guardrails (guardrails to be in accordance with type specified for Sunshine Coast Council area); and MUTCD for road edge guide post posts at all locations where kerb and channel is not constructed.
<p>Electrical, Lighting and telecommunications</p>	<ul style="list-style-type: none"> All electrical, lighting and telecommunications infrastructure shall comply with the following:- <ul style="list-style-type: none"> Legislated requirements (including National Construction Code, Electrical Safety Act 2002 and Telecommunication Act 1997); Australian Standards (including AS/NZS 3000 Electrical Installations, AS/NZS 1158 Public lighting (public walkways) and referenced standards); Telecommunications carrier regulations; Sunshine Coast Council Planning Scheme 2014, with particular reference to Part 7 Local Plans and any other Parts, Schedules Appendices or Plans with electrical, lighting or telecommunication's implications; Sunshine Coast Council Urban Lighting Master Plan; Sunshine Coast Council Public Lighting Policy; Sunshine Coast Council Electrical, Lighting and Telecommunications Design and Construction Standards; IPWEA Standards, Specifications and Engineering Drawings with particular reference to RS-100 and RS-101; DTMR Standards, Specifications and Engineering Drawings for works performed on State Controlled Roads or elsewhere as specified; Energy Queensland Limited Standards, Specifications and Engineering Drawings where works are performed on Electricity Network Infrastructure or elsewhere as specified; Telecommunication specific Standards, Specifications and Engineering Drawings where works are performed on Telecommunications Network Infrastructure or elsewhere as specified; Civil Aviation Authority for lighting in the vicinity of Airports; and SCC Traffic Signals Installation Guide. Lighting shall generally be as follows: <ul style="list-style-type: none"> Provided to enhance the safety, usability and/or aesthetic of the environment within which it is to be installed; Coordinated to suit the overall operational and functional intent of the space, generally in accordance with the guidance and recommendations provided in AS/NZS 1158, together with broader environmental considerations

Schedule 6

Element	Requirements						
	<p>associated with the area within which it is to be installed;</p> <ul style="list-style-type: none"> o Lighting levels should be appropriate to the character and function of the area, taking into consideration neighbouring properties, wildlife and other environmental sensitivities as applicable; o Lighting devices should be selected to minimise energy consumption; o Comply with Sunshine Coast Council Public Lighting Policy; and o National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shorebirds. <hr/> <ul style="list-style-type: none"> • Electrical distribution infrastructure shall generally be as follows: <ul style="list-style-type: none"> o Fully compliant with AS/NZS 3000 and Energy QLD requirements (as applicable); o Equipment shall be suitable for installation within the environment in which it is to be installed, including consideration of public safety, material performance in coastal environments, maintainability, etc.; o Electrical provisioning shall factor in considerations for future flexibility/expansion wherever possible; and o Coordinated with other services and elements to minimise overall site disruption wherever possible. • Comply with:- <ul style="list-style-type: none"> o Council's public lighting plan; and o street lighting tariff 3 • Provide lighting to sharp bends, bridges, culverts and road black spot areas as required. • Provide Aeroscreen Luminaires for:- <ul style="list-style-type: none"> o lighting in areas surrounding airports to the requirements of the Civil Aviation Authority; and o in areas where required to reduce glare where the background is intrinsically dark. • Non-standard lighting (eg lighting of intersections and curves only) may be accepted on some rural and rural residential collector and access streets. • Lighting levels should be appropriate to the character and function of the area. <ul style="list-style-type: none"> • Street lights are designed and located to face away from beaches so as not to disorientate turtle nestlings or nesting females. 						
Line marking	<ul style="list-style-type: none"> • Comply with:- <ul style="list-style-type: none"> o MUTCD, including augmentation of line markings, chevrons and islands with retro reflective pavement markers; o Council's Standard Engineering Drawings Specification (Pavement Markings); and o the materials specified herein, noting that intersections with high turning volumes, may require thermoplastic materials for all pavement and line marking. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Material</th> <th>Lines</th> </tr> </thead> <tbody> <tr> <td>Paint</td> <td>Edge lines Continuity lines Turn/direction arrows Diagonals/chevrons Cycle lanes in accordance with DTMR supplementary Specification A (Cycleway Coloured Surface Coatings)</td> </tr> <tr> <td>Thermoplastic</td> <td>Cycle lane symbols Zebra crossings Stop bars and give way lines Holding and exit lines (roundabouts) Turn lines</td> </tr> </tbody> </table>	Material	Lines	Paint	Edge lines Continuity lines Turn/direction arrows Diagonals/chevrons Cycle lanes in accordance with DTMR supplementary Specification A (Cycleway Coloured Surface Coatings)	Thermoplastic	Cycle lane symbols Zebra crossings Stop bars and give way lines Holding and exit lines (roundabouts) Turn lines
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Signage	<ul style="list-style-type: none"> • Complies with:- <ul style="list-style-type: none"> o MUTCD including advance street name and direction signs on district collector streets, sub-arterial and arterial roads; and o Council's Standard Engineering Drawings, with street and road name signs at all intersections, with a minimum height clearance of 2.2 metres. • Provide with loc-socket fittings and vandal proof bolts and class 1 anti-graffiti coating. • Use standard posts (not federation cast alloy style). 						
Utilities and service crossings	<ul style="list-style-type: none"> • Comply with Council's Standard Engineering Drawings for utility services within verge areas. • Bore services under any existing sealed street or road or paving. • Cross streets and roads at right angles, or as close to that as practicable with any variance approved by Council. 						

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Element	Requirements
	<ul style="list-style-type: none"> Where existing pavements are disturbed for installation, reinstate the street or road in accordance with Council's <u>sStandard Engineering dDrawing</u> to match the existing pavement and surfacing. Kerb markers at every service utility/kerb crossing. Utility services on Council owned infrastructure (e.g. culverts, bridges, boardwalks) or Council owned or controlled land, may be permitted subject to: <ul style="list-style-type: none"> the relevant service authority indemnifying Council against future costs of relocation; and works being undertaken at no cost to Council, and in accordance with Council's specific requirements.
<u>Fire Management</u>	<ul style="list-style-type: none"> <u>Road interfaces should be used for provision of fire management buffers when adjacent to bushland.</u> <u>Access to fire trails from roads should provide a dedicated formalised restricted access with LIM standard heavy duty gates and signage.</u>

SC6.14.2.5 Road pavements and drainage

Table SC6.14.2B (Street and road pavements and drainage) details Council requirements with regard to pavements and drainage.

Table SC6.14.2B Street and road pavements and drainage

Element	Requirement
General	<ul style="list-style-type: none"> Determine on the current and future hierarchy of the surrounding transport network, and the impacts of the proposed development on it. Match existing pavement widths, where works are required on, or to extend an existing street or road and the existing pavement width is greater than specified herein
Design of flexible pavements	<p>* The depth at which the joint subgrade inspection will be undertaken. The subgrade shall exhibit no visible signs of deformation under proof-rolling by a loaded water cart.</p> <p>MMDD = Modified Maximum Dry Density MDD = Standard Maximum Dry Density</p> <ul style="list-style-type: none"> Comply with:- <ul style="list-style-type: none"> the diagram above; Austrroads Guide to Pavement Technology Part 2: Pavement Structural Design; DTMR Pavement Design Manual; the four (4) day soaked California Bearing Ratio (CBR) value of the natural subgrade material (CBR tests <u>must are to</u> be representative of the subgrade over the various lengths of road at the weakest material between 00-600mm below subgrade level); minimum pavement thickness:- <ul style="list-style-type: none"> at least the minimum specified herein; base course 125mm; upper sub-base course 400mm<u>125mm</u>; lower sub-base course (where required) 100mm; and

Schedule 6

Element	Requirement																																																																																																																				
	<ul style="list-style-type: none"> ▪ full depth on shoulders (where the edge of the carriageway is not defined by kerb and channel); and ○ Austroads design manuals for tapers to existing construction, based on the design speed and constructed to the same standards as the road pavements. • Cement stabilised base or sub-base courses are not preferred for new road construction. • If the subgrade, at the time of construction, will not support a load test vehicle without deformation, establish a working platform, where the design of pavement depth is based on a subgrade CBR of 3, ignoring the depth of subgrade replacement or improvement, comprising: <ul style="list-style-type: none"> ○ excavation of a suitable depth of subgrade material (minimum 250mm) and replacement with a minimum CBR 15 material; or ○ lime stabilisation of the subgrade; or ○ another method approved by Council. • Temporary turnarounds (e.g. at a development stage boundary) to be compacted gravel, minimum 150mm deep. 																																																																																																																				
<p>Design traffic loading and pavement thickness</p> <p>Minimum 50mm AC surfacing at roundabouts regardless of street/road type</p>	<ul style="list-style-type: none"> • Design traffic loading using the minimum specified herein and increased: <ul style="list-style-type: none"> ○ for staged development (where construction traffic for subsequent stages will use pavements constructed in preceding stages), to account for construction traffic, or reconstruct prior to the acceptance of works "Off maintenance" of the last contributing stage of development; and ○ for industrial development, based on detailed traffic analysis, with a 2025 year design pavement life. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="color: red;">Street/road</th> <th style="color: red;">Minimum Design Traffic Loading (Equivalent Standard Axles)</th> <th style="color: red;">Minimum Pavement Thickness (mm) (Excluding surfacing)</th> <th style="color: red;">Asphalt Surfacing Minimum Thickness (mm)</th> </tr> </thead> <tbody> <tr> <td colspan="4">Urban</td> </tr> <tr> <td>Access place/laneway</td> <td>5 x 10⁴</td> <td>225</td> <td>35</td> </tr> <tr> <td>Access street</td> <td>1 x 10⁵</td> <td>225</td> <td>35</td> </tr> <tr> <td>Mixed use access street</td> <td>6 x 10⁵</td> <td>250</td> <td>35</td> </tr> <tr> <td>Neighbourhood collector street</td> <td>6 x 10⁵</td> <td>250</td> <td>35</td> </tr> <tr> <td>Neighbourhood collector street (bus route)</td> <td>1 x 10⁶</td> <td>250</td> <td>40</td> </tr> <tr> <td>Neighbourhood mixed use collector street</td> <td>1 x 10⁶</td> <td>250</td> <td>40</td> </tr> <tr> <td>District collector street</td> <td>2 x 10⁶</td> <td>300</td> <td>50</td> </tr> <tr> <td>District main street</td> <td>3 x 10⁶</td> <td>300</td> <td>50</td> </tr> <tr> <td>Sub-arterial road</td> <td>1 x 10⁷</td> <td>350</td> <td>50</td> </tr> <tr> <td colspan="4">Rural and rural residential</td> </tr> <tr> <td>Access street/place</td> <td>1 x 10⁵</td> <td>225</td> <td>35</td> </tr> <tr> <td>Neighbourhood collector</td> <td>5 x 10⁵</td> <td>250</td> <td>two coat bitumen seal is acceptable alternative to asphalt</td> </tr> <tr> <td>District collector</td> <td>1 x 10⁶</td> <td>250</td> <td>40</td> </tr> <tr> <td>Sub-arterial road</td> <td>1 x 10⁷</td> <td>350</td> <td>50</td> </tr> <tr> <td colspan="4">Industrial</td> </tr> <tr> <td>Industrial access street</td> <td>3 x 10⁶</td> <td>300</td> <td>50</td> </tr> <tr> <td>Industrial collector street</td> <td>6 x 10⁶</td> <td>300</td> <td>50</td> </tr> </tbody> </table> <table border="1" style="width: 100%; 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Industrial																																																																																																																					
Industrial access street	3 x 10 ⁶	300	50																																																																																																																		
Industrial collector street	6 x 10 ⁶	300	50																																																																																																																		
Street/road	Minimum Design Traffic Loading (Equivalent Standard Axles)	Minimum Pavement Thickness (mm) (Excluding surfacing)	Asphalt Surfacing Minimum Thickness (mm)																																																																																																																		
Urban																																																																																																																					
Access place/laneway	5 x 10 ⁴	250	35																																																																																																																		
Access street	1 x 10 ⁵	250	35																																																																																																																		
Mixed use access street	6 x 10 ⁵	275	35																																																																																																																		
Neighbourhood collector street	9 x 10 ⁵	300	35																																																																																																																		
Neighbourhood collector street (bus route)	6 x 10 ⁶	300	50																																																																																																																		
Neighbourhood mixed use collector street	6 x 10 ⁶	300	50																																																																																																																		
District collector street	1 x 10 ⁷	350	50																																																																																																																		
District main street	1.5 x 10 ⁷	350	50																																																																																																																		

Schedule 6

Element	Requirement																																																												
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Surfacing of flexible pavements	<ul style="list-style-type: none"> Asphaltic surfacing:- <ul style="list-style-type: none"> at least the minimum thickness specified herein; DG-10BCC Type 2 Austroads AC10 asphalt for up to 35mm thickness; and BCC Type 3 or Austroads AC14 DG-14 asphalt for >35mm thickness; 7mm primer seal under all DG asphalt; and minimum 14 day curing time between primer seal and asphalt. All streets and roads with asphaltic surfacing shall be under laid with a 7mm single seal (C170) primer seal and 7mm pre-coated stone. Grade of bitumen and application rate is to be as required to suit site conditions, but shall not be less than 0.9t/m². Sprayed seals may only be considered where matching existing works in rural areas. The standard design is a 14/7 double seal (C170), with all aggregate to be pre-coated. If approved for use, sprayed bitumen seal is to comprise a prime seal plus two (2) coats consisting of CL170 bitumen and a 16mm aggregate and a 10mm aggregate, with all aggregate to be pre-coated. Use coloured, or colour and stamped asphalt for thresholds and other areas where a contrast in the texture and colour of the pavement is required. Surface pattern (or pattern formed by the joints of any surfacing) should not cause confusion or be contradictory to the intended traffic flow. Segmental paving is not an appropriate surface material for road pavements for Council road assets, unless specifically identified in a relevant centres design palette and approved by asset custodians. 																																																												
Concrete pavements	<ul style="list-style-type: none"> Seek approval in principle prior to detailed design. Comply with Austroads Guide to Pavement Technology. 40 year pavement design life. Skid resistant surface (exposed aggregate finishes not permitted are only accepted where appropriate crushed/angular aggregates are specified). Use full depth oxide coloured and/or exposed concrete, for thresholds and other areas where a contrast is required. Surface treatments are not accepted. Surface pattern (or pattern formed by the joint of any surfacing) shall not cause confusion or be contradictory to the intended traffic flow. Colours and textures appropriate for the situation (white or light colours which do not allow white pavement markings to be easily distinguished are not acceptable) are to provide sufficient contrast with line marking and TGS1's. Coloured with oxides only (carbon blacks, organic dyes and painted surface sealants not permitted). Sub-surface drainage may be omitted in areas with a high water table, if pavements are appropriately designed and constructed. 																																																												
Kerb and channel	<ul style="list-style-type: none"> Comply with Table SC6.17B (Urban transport corridors), Table SC6.17C (Rural transport corridors) and Table SC6.17D (Industrial transport corridors) of the Planning scheme policy for the transport and parking code All kerb and channel and barrier kerb shall use 32MPa compressive strength concrete and be placed using the slip form wet mix placement method (not slurry topped dry mix zero slump extruded). Barrier kerb is required where parking is to be restricted on the verge and to protect street trees. Barrier kerb for all roads and streets adjacent to parks and areas of high pedestrian use or other hazards. Concrete inverts in trafficable areas are to be reinforced N32 concrete. Minimum 1 metre transition length from different kerb profiles. 																																																												

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Element	Requirement
	<ul style="list-style-type: none"> Minimum 1m² grouted rock for scour protection at kerb end terminations.
Bridges and culverts	<ul style="list-style-type: none"> Surface with a minimum 40mm depth of DG14 AC Decking preparation in accordance with MRTS 84 including surfacing with a minimum 50mm asphalt wearing course.
Subsurface drainage	<ul style="list-style-type: none"> Comply with Council's approved Standard Engineering Drawings and is to extend from underside of kerb and channel to a minimum of 50mm below lower sub-base. Provide cleaning points:- <ul style="list-style-type: none"> at the end of each sub-soil drainage line; at each stormwater pit; and at 50 metre intervals longitudinally. Provide screw caps and sub-soil drainage line pit entries at the downstream side of all on grade stormwater pits. In minimum depth pavements, install sub-soil drainage after the placement of the sub-base.
Surface drainage	<ul style="list-style-type: none"> Comply with:- <ul style="list-style-type: none"> QUDM (neighbourhood and district collector streets and all roads are major roads and all other streets are minor roads when using QUDM); Healthy Waterways WSUD Guidelines; DTMR Road Drainage Design Manual; Section SC6.14.3 (Stormwater Management) of the this planning scheme policy, including provision of overland flow pits at all sag locations to a lawful point of discharge; Table SC6.17B (Urban transport corridors), Table SC6.17C (Rural transport corridors) and Table SC6.17D (Industrial transport corridors), of the Planning scheme policy for the transport and parking code identifying the streets and roads where longitudinal drainage can typically be conveyed via swales. Preference to be given to piped drainage in activity centres and situations where there is medium and high turnover parking adjacent to pathways; Council's sStandard Engineering dDrawing for kerb adaptors: <ul style="list-style-type: none"> positioned to avoid conflict with services; and must shall be full height cast aluminium; Council's sStandard Engineering dDrawing for gully pits, to be 'lip in line' type and located:- <ul style="list-style-type: none"> on a straight where possible; to avoid clashes with other services and future driveway locations; and not on the apex of curves, particularly traffic calming deflected tee curves; and Council's sStandard Engineering dDrawing for drainage pipes from the kerb adaptor to the property boundary, where a concrete pathway is proposed. Ensure the downstream drainage system is not adversely affected. Where the downstream drainage system does not have capacity to accept flows, undertake further investigation to determine upgrades or alternative treatments. Locate the stormwater line from structure to structure beneath the kerb and channel. Avoid skewing pipes across the street or road. Provide:- <ul style="list-style-type: none"> anti-ponding pits with a side entry, chamber and grate; a concrete edge strip at the edge of the sealed carriageway, where swales are used on rural residential streets; diversion drains, spaced 30-100 metres apart, depending on grade, soil type and diversion opportunities; concrete or stone pitched chutes at outlets on steep embankments and batters; erosion protection in all swales and catch drains liable to scour, which may include concrete inverts on steep grades; catch drains/banks at the top of cut and fill batters; swales that are diverted away from the carriageway at close intervals to minimise scour; and swale outlets:- <ul style="list-style-type: none"> clear of likely building sites; and with energy dissipation and flow distribution devices before discharge of the stormwater into vegetated areas. Kerb and channel may be required in cuttings and other particular locations, in lieu of swales.

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SC6.14.2.6 Guidelines

- (1) For the purposes of achieving compliance with this section of the planning scheme policy, the following are relevant guidelines:-
- (a) Council's standard specifications and Standard [Engineering Drawings](#) (available on Council's website);
 - (b) DTMR Publications, including:-
 - (i) [Road Planning and Design Manual](#);
 - (ii) [Road Drainage Manual](#);
 - (iii) [Manual of Uniform Traffic Control Devices](#); and
 - (iv) [Pavement Design Manual](#);
 - (c) AUSTRROADS Publications, including:-
 - (i) [AUSTRROADS Guide to Road Design](#);
 - (ii) [AUSTRROADS Guide to Road Safety Part 6 – Road Safety Audit](#);
 - (iii) [AUSTRROADS Guide to Traffic Management](#);
 - (iv) [AUSTRROADS Guide to Pavement Technology](#); and
 - (v) [AUSTRROADS Design Vehicles and Turning Path Templates](#);
 - (d) IPWEAQ Publications:-
 - (i) [Complete Streets: Guidelines for Urban Street Design](#); and
 - (ii) [Queensland Streets: Design Guidelines for Subdivisional Streetworks](#);
 - (e) [Queensland Urban Drainage Manual](#);
 - (f) South East Queensland Healthy Waterways Partnership Publications, including:-
 - (i) [WSUD Technical Design Guidelines for South East Queensland Construction](#); and
 - (ii) [WSUD Deemed To Comply Solutions for SEQ](#);
 - (g) [Energex Design Guide – Design of Rate 2 Public Lighting Installations](#); and
 - (h) Australian Standards, including:-
 - (i) [AS1158 Public lighting \(public walkways\)](#);
 - (ii) [AS1428 Design for access and mobility](#);
 - (iii) [AS2890 Parking facilities](#); and
 - (iv) [AS1100 Technical drawing](#);
 - (v) [AS1170.1 Structural design actions – Permanent, imposed and other actions](#);
 - (vi) [AS/NZ3000 Electrical installations \(known as the Australian/New Zealand wiring rules\)](#);
 - (vii) [AS3600 Concrete structures](#);
 - (viii) [AS3727 Pavements](#);
 - (ix) [AS/NZ4282 Control of the obtrusive effects of outdoor lighting](#); and
 - (x) [AS/ACIF S009:2006 Installation requirements for customer cabling \(Wiring rules\)](#).

(2) [The following publication provides additional guidance regarding urban lighting:](#)

- (a) [Sunshine Coast Council – Urban Lighting Master Plan September 2016 – Version 2, Revision 3](#).

Note—relevant guideline documents in existence or available over the life time of this planning scheme policy **should are to** be referenced and used where appropriate. The above list is not exhaustive and the use of locally based guidelines by a recognised authority or agency would take preference to those developed regionally or nationally.

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SC6.14.3 — Stormwater management

SC6.14.3.1 — Purpose

The purpose of this section of the **Planning scheme policy for development works** is to:-

- (a) provide guidance on the policy and standards required in relation to the provision of stormwater infrastructure for new development; and
- (b) ensure stormwater infrastructure design and construction satisfies Council's requirements and environmental and safety expectations.

SC6.14.3.2 — Application

— This section is structured as follows:-

- (a) **Sections SC6.14.3.1 and SC6.14.3.2** provide the framework for the guidelines;
- (b) **Section SC6.14.3.3 and SC6.14.3.4** provides design requirements relating to development design;
- (c) **Section SC6.14.3.5** provides design requirements relating to stormwater drainage;
- (d) **Section SC6.14.3.6** provides design requirements relating to hydrology and watercourse stability;
- (e) **Section SC6.14.3.7** provides design requirements relating to stormwater quality;
- (f) **Section SC6.14.3.8** provides design requirements relating to stormwater harvesting;
- (g) **Section SC6.14.3.9** provides information requirements for stormwater management plans; and
- (h) **Section SC6.15.3.10** contains guidelines for achieving compliance with this section of the planning scheme policy.

SC6.14.3.3 — Design requirements

Adjacent properties and lawful point of discharge

- (1) A lawful point of discharge is to be provided to accommodate all roof and surface water runoff:-
 - (a) originating from and flowing through the development site; and
 - (b) originating from the external up-slope catchment flowing through the development site or diverted by the development;
- (2) An applicant proposing to discharge stormwater runoff from a proposed development site in an altered or concentrated form onto any adjoining and/or downstream property, must provide Council with written consent to a future easement from all property owners through which this runoff may flow. The easement is to be registered prior to Council endorsing the plan of survey for lot reconfiguration, or commencement of use for material change of use. Easements across affected properties are to be in accordance with the QUDM.
- (3) Where stormwater runoff from adjacent or upstream properties enters the proposed development site, a stormwater network is to be provided within the new works to accommodate such flows. The stormwater network must ensure that no stormwater ponding occurs on any adjacent or upstream properties and is to be designed in accordance with the hydrological requirements in **Section SC6.14.3.9 (Stormwater management plans)**.
- (4) The stormwater network is to be designed to accommodate a fully developed upstream catchment. The stormwater network must also be designed so that it can be constructed up to the development site's boundaries and extended in the future to accommodate future development without disturbing existing or recently proposed development.

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- (5) ~~The tests and principles of QUDM will be applied in determining if a lawful point of discharge has been achieved. If no lawful point of discharge or if no discharge approval agreement has been obtained, then the design cannot be accepted or approved.~~

Stormwater reserves and stormwater easements

- (6) ~~Stormwater reserve or where appropriate park or road reserve will generally be required over all stormwater flow paths and their verges unless specially approved in the following circumstances:-~~
- (a) ~~development of rural size lots;~~
 - (b) ~~development of rural residential size lots where:-~~
 - (i) ~~the catchment is smaller than 5 hectares;~~
 - (ii) ~~the flow path does not adjoin a park area; and~~
 - (iii) ~~blockage of the flow path will not cause flooding of adjoining lots; and~~
 - (c) ~~development of urban land where:-~~
 - (i) ~~Council controlled land does not drain into the flow path;~~
 - (ii) ~~the catchment is smaller than one hectare; and~~
 - (iii) ~~blockage of the flow path will not cause flooding of adjoining lots.~~
- (7) ~~Stormwater reserve or where appropriate park or road reserve will be required over all areas containing detention basins, gross pollutant traps and other stormwater quality improvement devices, and verges required to adequately serve or maintain these devices. The reserve will not be less than 5.0m wide.~~
- (8) ~~Easements are required over all stormwater networks (natural and constructed), which traverse private property. Additional information is provided in QUDM. All costs associated with the provision of an easement are to be borne by the applicant.~~
- (9) ~~The building of structures over or upon easements is not generally in the interest of the party that is vested in the easement. Accordingly, development applications that involve a proposal to build over or upon easements are required to demonstrate that:-~~
- (a) ~~the proposal does not conflict with the terms of the easement agreement;~~
 - (b) ~~the proposed structure or the construction of the proposed structure does not increase loadings on the underground infrastructure assets;~~
 - (c) ~~the stormwater network through the easement does not include an overland flowpath or an open channel;~~
 - (d) ~~the proposed structure does not restrict (or prevent) access of maintenance staff and plant; and~~
 - (e) ~~fencing allows free passage of flow.~~
- (10) ~~Vestment:-~~
- (a) ~~all reserves and easements to be vested to Council shall only occur after written consent is obtained from the relevant stormwater asset custodian and land custodians within Council;~~
 - (b) ~~easements are to be vested in favour of Council for all stormwater networks structures and/or facilities which are or will be the responsibility of Council to preserve and maintain; and~~
 - (c) ~~roofwater/inter-allotment stormwater systems and associated cut off/swale drains are considered as private drains and future maintenance responsibility will vest with the property owners. An easement in favour of Council will be required over these stormwater systems.~~
- (11) ~~Easement dimensions:-~~
- (a) ~~easements to be registered in favour of Council are to comply with QUDM and have a minimum width of 4.0m except where the easement is for inter-allotment stormwater systems; and~~

- (b) easements over inter-allotment stormwater systems are to be minimum width of 2.0m for pipes up to 300mm in diameter. All pipes 300mm in diameter or larger are to be covered by easements in accordance with QUDM.
- (12) Existing easements in favour of Council will only be extinguished where the need for the stormwater network through the land not in Council control is determined to be no longer warranted. All costs associated with the surrendering of an easement are to be borne by the applicant. In some cases, Council may require compensation for the loss of the rights under the easement.
- (13) Overland flow easements:-
- (a) this type of easement allows for the passage of stormwater runoff or redirection of flow across the natural land surface. These easements prohibit any activities or works which may obstruct or impede the flow of stormwater runoff unless prior approval is provided. Designs of overland flow path must take into account future fencing that may be constructed across the easement. Overland flow easements shall be in favour of Council;
- (b) any fences to be constructed across easements or along the easement boundary are to provide sufficient access for Council's maintenance or future construction by either the provision of gates or removable sections that are wide enough to allow access;
- (c) fencing is to allow free passage of flow; and
- (d) survey levels provided on the design plans will form the basis of the levels required for this overland flow. Survey levels are acceptable on the registered plan of subdivision and provided to AHD.
- (14) Access easements:-
- (a) access easements permit Council to have access from the nearest surveyed road to any stormwater easements, in order to carry out maintenance and/or construction activities or works. This will normally be a requirement of all other stormwater-related easements in favour of Council;
- (b) in order for stormwater management facilities to function at their designated level of service, most will require some level of periodic inspection, maintenance works, cleaning or repairs. Therefore, consideration is to be given to the maintenance of the stormwater system and stormwater quality management facilities during the design process; and
- (c) reasonable access for both personnel and equipment is one of the most critical design considerations of both the enclosed and open stormwater networks. Any proposed landscaping should be designed in conjunction with access requirements.
- (15) Maintenance of stormwater reserves and easements:-
- (a) stormwater easements will be covered by a binding agreement between Council and the landholder;
- (b) trees and understorey vegetation should not be planted on stormwater easements/reserves without the prior written consent of Council;
- (c) native vegetation is to be retained on the easement/reserve;
- (d) declared and environmental weeds are to be removed from any easement;
- (e) no structures, excavation, filling, or stormwater works are to be commenced on an easement or reserve without the prior written consent of Council; and
- (f)(a) maintenance (including costs) of all stormwater quality management facilities is an important consideration and a detailed management plan or maintenance strategy is to be produced for each facility and submitted to Council for review prior to development approval for operational works.

SC6.14.3.4 Development design

General

- (1) The design of urban stormwater systems is to be in accordance with the following guidelines with this order defining the precedence of any one document over another:-
 - (a) QUDM;
 - (b) *Water Sensitive Urban Design Guidelines for South East Queensland*; and
 - (c) *Australian Rainfall and Runoff (ARR)*.
- (2) The design of rural stormwater systems is to be in accordance with the following guidelines with this order defining the precedence of any one document over another:-
 - (a) *DTMR – Road Drainage Manual*; and
 - (b) *Australian Rainfall and Runoff (ARR)*.
- (3) The interpretation of urban and rural environments is to be made by reference to the zone within which the land is included in the planning scheme.
- (4) Drainage structures are to be in accordance with the IPWEAQ Standard Drawings.
- (5) Inter-allotment stormwater systems or roofwater stormwater systems that take more than one allotment do not discharge to kerb and channel. The inter-allotment stormwater systems or roofwater stormwater systems are to be connected to a Council gully pit, field inlet or manhole to the satisfaction of Council. Inspection pits or field inlets (constructed at the low point of each allotment) are to be provided at regular intervals along the roofwater stormwater system and must be in accordance with IPWEAQ Standard Drawing D-0110.
- (6) A connection point at the lowest point is to be provided for each property. This connection point is to be a minimum of 100mm in diameter for Urban Residential Low Density, 150mm for Urban Residential High Density and 225mm for commercial or industrial development as defined in QUDM.
- (7) Where there is a requirement for the stormwater management system to connect to an existing Council asset, the connection is to:-
 - (a) not cause structural damage to or failure of the existing asset;
 - (b) be appropriately sealed; and
 - (c) not interfere with or reduce the intended purpose of the existing asset.
- (8) For connecting pipes into enclosed stormwater networks connections are to be made only to gully pits, manholes and field inlets. The connection is to be core drilled and sealed with a two-part epoxy sealant.

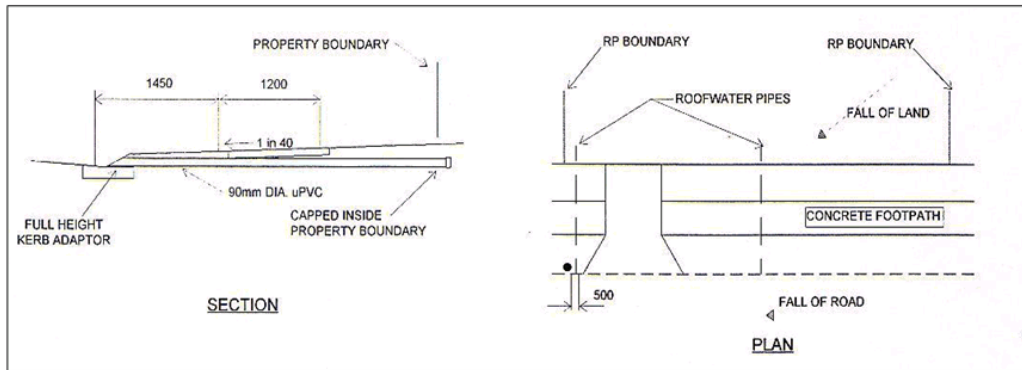
Residential zone category

- (9) Land in the Low density residential zone as defined in the planning scheme is to be considered as Urban Residential Low Density where greater than 5 dwellings per hectare but less than 20 dwellings per hectare in accordance with QUDM and as such, the appropriate minor storm design event and runoff co-efficient as per QUDM will apply.
- (10) Land in the Medium density residential zone, High density residential zone or Tourist accommodation zone as defined in the planning scheme where greater than 20 dwellings per hectare or for multiple dwellings is to be considered as Urban Residential High Density in accordance with QUDM.
- (11) Allotments which do not fall towards the road reserve must be provided with a rear of allotment roofwater stormwater system in accordance with QUDM. A minimum Level 3 is required for all residential development (except rural and rural residential). This roofwater system will be required regardless of the downhill property type.

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- (12) For allotments which do fall towards the road reserve (refer **Figure SC6.14.3A (Residential outfalls towards the road)**), two kerb adaptors are to be provided and are to conform to IPWEAQ Standard Drawing R-0081. One should be located at the centre of the block and the other 500mm from the common boundary on the low side. Where a concrete footpath is to be constructed a 90mm diameter UPVC pipe is to extend from the adaptor to the property boundary in accordance with Council's Standard Drawings.

Figure SC6.14.3A Residential outfalls towards the road



- (13) At least one connection point generally at the lowest point is to be provided for each property. This connection point is to be a minimum of 100mm in diameter for Urban Residential – Low Density and 150mm for Urban Residential – High Density (QUDM).

Rural and Rural residential zone category

- (14) Development in the Rural zone and the Rural residential zone as defined in the planning scheme is to be considered as Rural Residential in accordance with QUDM.
- (15) For land in the Rural zone or Rural residential zone, stormwater runoff from the road reserve may be discharged directly onto the subject subdivision should it be impossible to direct stormwater to a watercourse.
- (16) A stormwater reserve or easement will be required over the stormwater outlet from the road reserve (refer to **Section SC6.14.3.5 (Design requirements – stormwater drainage)**). A property note informing property owners that stormwater discharges will occur during rainfall and that the amenity of their allotment may be reduced may be applied.
- (17) Allotments which are less than 2000m² in area and have on-site effluent disposal require inter-allotment stormwater. This should be designed as per Urban Residential – Low Density (QUDM).
- (18) Access to rural residential and rural building sites is to flood free during a 30% AEP event and ensure that a low hazard criteria is met. The safety of the site can be determined by the following equation: Low Hazard: $D \pm 0.3V \leq 0.8$ where D = depth of floodwater in the DFE (m) and must be less than 0.8m and V = velocity of floodwaters in the DFE (m/s) and must be less than 2m/s.

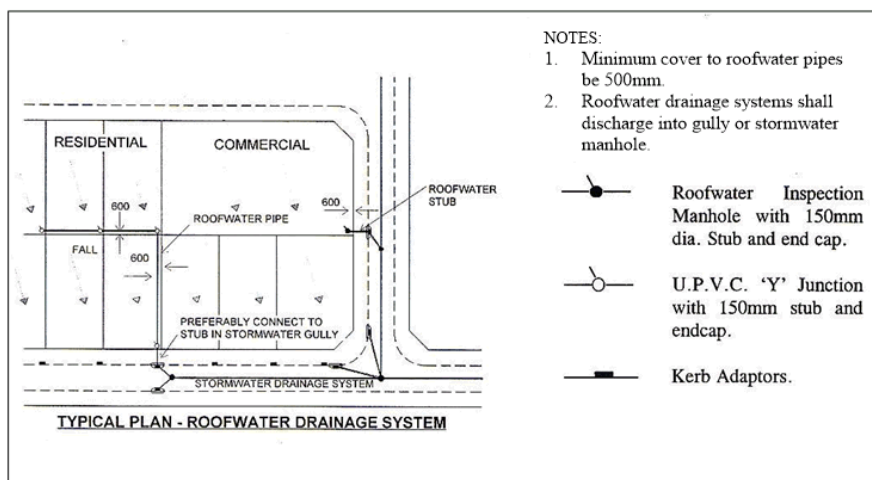
Centre zone category and Industry zone category

- (19) Development in the Centre zone category as defined in the planning scheme is to be considered as:-
- (a) Commercial and Industrial in accordance with QUDM; and
 - (b) Central Business and Commercial in accordance with QUDM.
- (20) Development in the Industry zone category as defined in the planning scheme is to be considered as:-
- (a) Commercial and Industrial in accordance with QUDM; and

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- (b) Industrial in accordance with QUDM.
- (21) Should the land fall away from the road reserve, roofwater stormwater system must be provided in accordance with QUDM (Levels, 3, 4 and 5).
- (22) For land which falls towards the road reserve, the roofwater system is to be piped and connected to the trunk drainage system at a manhole or gully. A stub is to be provided in new stormwater networks for this purpose, located 600mm within the front property boundary (refer **Figure SC6.14.3B (Inter-allotment stormwater locations)**). This must also be within 1.2m from the common boundary on the low side (refer Council's Standard Drawings). Where a site is being redeveloped, the lot must be reconfigured to ensure that these requirements are met.
- (23) At least one connection point, generally at the lowest point, is to be provided for each property. This connection point is to be minimum of 225mm for commercial or industrial development (QUDM).

Figure SC6.14.3B Inter-allotment stormwater locations



Recreation zone category

- (24) Development in the Recreation zone category as defined in the planning scheme is to be considered as Open Space and Parks in accordance with QUDM.
- (25) The natural stormwater corridor should be retained in land designated for public open space, i.e. park, stormwater, or road reserve.
- (26) Pipe stormwater networks are generally required through parks designated for active use. Care should be taken over the design of surcharge pits and inlet structures, so as to ensure that safety and amenity criteria are satisfied.
- (27) The planning for dual use (e.g. stormwater networks and park) is to be integrated within the whole planning process to ensure that the final design provides for amenity, health and safety and stormwater management functions of the development.
- (28) For public safety purposes, all public facilities such as play equipment and BBQs are to be located clear of 1% AEP flood levels and clear of 1% AEP overland flow paths.
- (29) Stormwater standards to be applied to a dual use area must be considered in terms of the mix of functional uses such as:-
 - (a) general open space areas with a low to high need for access by pedestrians and cyclists;
 - (b) passive areas with a low to high visitation;
 - (c) active areas in low to high tourist significant areas; and

- (d) ~~— natural watercourses with low to high ecological significance.~~
- (30) ~~Appropriate stormwater standards for particular areas will be required by Council having regard to the following:-~~
 - (a) ~~— major flood capacity;~~
 - (b) ~~— convenience flood capacity — minor event in terms of interval event and the time to drain ponded sites;~~
 - (c) ~~— maintenance costs (e.g. batter slopes between 1 in 4 and 1 in 6);~~
 - (d) ~~— safety (e.g. maximum D x V of 0.4 m²/sec);~~
 - (e) ~~— stability factors such as resistance to scour or slip; and~~
 - (f) ~~— ecological considerations such as preserving valuable areas, appropriate planting in waterway areas and minimum impact on existing riparian/aquatic ecosystems.~~

SC6.14.3.5 — Design requirements — stormwater drainage

General

- (1) ~~— All stormwater quantity discharges are to be calculated in accordance with QUDM unless approved otherwise.~~
- (2) ~~— Roofwater and allotment surface stormwater runoff is to be piped for the minor design storm and must comply with AS 3500.3 and QUDM.~~
- (3) ~~— Discharge from outside of Council's stormwater catchments is not to be directed into Council's stormwater system.~~
- (4) ~~— To reduce sudden increases in roadway flow widths, stormwater runoff discharges in excess of 50 litres per second for the 5% AEP storm event must be piped to a Council stormwater drainage system (i.e. gully (catchpit), access chamber, etc.) and not to the kerb and channel.~~
- (5) ~~— Should any internally collected stormwater runoff be designed to bypass its pre-developed point of discharge into Council's stormwater system, Council's gully which would receive this additional runoff must be analysed to ensure its functionality. This also includes the gully's connection to the trunk stormwater network.~~
- (6) ~~— Should an adjacent property or properties by virtue of topography and/or existing development require current or future gravity fed stormwater discharge through the subject site an easement in favour of that property or properties is to be provided. This easement will extend from the road reserve to the registered boundaries adjoining these properties (refer to QUDM for easement widths). A drain or connection (minimum of 225mm diameter) is to be constructed in this easement so as to reduce future impacts to residents of the subject site.~~
- (7) ~~— Existing overland flow paths are to be preserved.~~
- (8) ~~— The development design may be rejected if it incorporates structures and facilities that:-~~
 - (a) ~~— require considerable maintenance;~~
 - (b) ~~— are difficult to maintain;~~
 - (c) ~~— require specialist maintenance services that are not common to Council's maintenance services; or~~
 - (d) ~~— are small and numerous when there is a viable alternative.~~
- (9) ~~— The stormwater system will not be accepted off-maintenance or connected to an existing downstream canal or waterway until there has been compliance with all aspects of the approved stormwater management plan including water quality objectives and performance criteria.~~

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Natural waterways and drainage paths

- (10) ~~The development design and site layout is required to consider the natural waterways and drainage paths to achieve the requirements of the **Biodiversity, waterways and wetlands overlay code**.~~
- (11) ~~Council's preferred approach is for waterways and drainage paths to remain in their natural state. Some selective clearing and maintenance may only be carried out with the approval of Council.~~
- (12) ~~The natural waterway and drainage paths are to be analysed for 39%, 18%, 10%, 5%, 1%, 0.5%, 0.2% AEP flows and PMF with the predicted flood contour lines provided on all relevant plans. Council may relax the required AEP events to be modelled dependent on the scale and type of the development and the characteristics of the natural waterway. Land filling is not to occur below these levels unless it can be demonstrated that there will be no detrimental effects to other properties along the waterway/drainage path and there is no net filling below these levels. The waterway's natural state should control the type, volume and placement of fill allowable in a development application.~~
- (13) ~~For natural waterways and drainage paths, the development is to be planned and designed so that the 1% AEP flood event is contained within a drainage reserve or where appropriate park or drainage easement.~~

Natural channel design

- (14) ~~The design, implementation and/or construction of any natural channel or natural channel rehabilitation works are to be in accordance with the *Brisbane City Council (BCC) Natural Channel Design Guidelines*.~~
- (15) ~~In addition to the requirements within the *BCC Natural Channel Design Guidelines*, Sunshine Coast's local topography, geology and geomorphology are to be considered in the design of natural channel works or natural channel rehabilitation works.~~
- (16) ~~An extended maintenance period may be required until the channel has sufficiently stabilised and vegetative cover is well established. The desired style of drainage channel can vary from a grass lined overland flow path for very small catchments, to a fully established river channel for large catchments.~~
- (17) ~~Desirable bed conditions in a reconstructed watercourse usually depend on the following factors:-~~
- (a) ~~catchment areas;~~
 - (b) ~~catchment soil type (infiltration capacity) and erodibility; and~~
 - (c) ~~canopy cover.~~
- (18) ~~Any works within receiving waters, including natural channel design, are not to be included as a treatment device in any stormwater treatment train models.~~

Open channel design

- (19) ~~Open channels are to be designed in accordance with QUDM, with particular attention to the structural design requirements.~~
- (20) ~~Open channels are to be designed to cater for the major design storm event and are to include freeboard provisions in accordance with this planning scheme policy. Open channels through parkland or open space areas may be designed to cater for 10% AEP flows. The associated overbank flow areas, which cater for the difference between 1% AEP and 10% AEP flows are to be designed to ensure low velocities occur during flood, while enhancing amenity values during non-flood periods.~~
- (21) ~~Soft lined channels are to be designed to have maximum 1v:4h side slopes for vegetated channels and 1v:6h side slopes for grass lined channels. Soft lined open drains or channels must be designed in a manner that permits maintenance activities such as grass and brush cutting, debris removal, relining and structural repairs.~~
- (22) ~~Council's minimum landscaping requirements for open channels dictates a minimum Manning's of 0.12 although greater values may be directed by Council where deemed appropriate. A sensitivity analysis should always be undertaken for a Manning's n 50% higher than design~~

roughness to ensure the freeboard is not exceeded and a sensitivity analysis should always be undertaken for a Manning's n 50% lower than design roughness to ensure scour thresholds are not exceeded.

- (23) **Table SC6.14.3A (Floodplain re-vegetation density guidelines for various Manning's Roughness values)** provides a semi-quantitative approach towards the evaluation of various Manning's roughness coefficients (refer *BCC Natural Channel Design Guidelines*).

Table SC6.14.3A Floodplain re-vegetation density guidelines for various Manning's Roughness values

Manning's n	Description
0.03	Short grass with the water depth >> grass height.
0.04	Short grass with the water depth >> grass height on a slightly irregular earth surface. Trees at 10.0m spacing and areas are easy to mow.
0.05	Long grass on an irregular (bumpy) surface with few trees and irregular ground could make grass cutting difficult. Alternatively, trees at 8.0m spacing on an even, well grassed surface, no shrubs, no low branches.
0.06	Long grass, trees at 6.0m spacing, few shrubs. Easy to walk through vegetation. Area not mowed, but regular maintenance is required to removed weeds and debris.
0.07	Trees at 5.0m spacing, no low branches, few shrubs, walking may be difficult in some areas.
0.08	Trees at 4.0m spacing, some low branches, few shrubs, few restrictions to walking.
0.09	Trees at 3.0m spacing, weeds and long grasses may exist in some locations. Walking becomes difficult due to fallen branches and woody debris.
0.10	Trees at 2.0m space, low branches, regular shrubs, no vines. Canopy cover possible shades weeds and it is difficult to walk through.
0.12	Trees at 1.5m spacing with some low branches, a few shrubs. Slow to walk through.
0.15	Trees and shrubs at 1.0m spacing, some vines, low branches, fallen trees, difficult and slow to walk through. Alternatively, a continuous coverage of woody weeds with sparse leaves and no vines.
0.20	Trees and shrubs at 1m spacing plus thick vine cover at flood level and fallen trees, very difficult to walk through. Alternatively, a continuous coverage of healthy shrubs and woody weeds from ground level to above flood level.

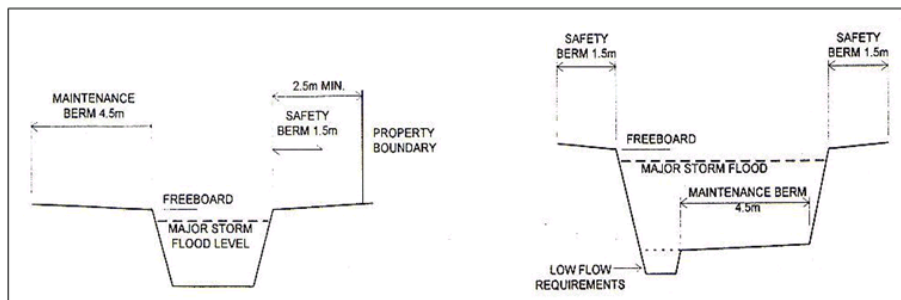
Note—maximum possible flow velocities for water passing through/over vegetation is dependant on the Mannings roughness and shall be in accordance with QUDM Table 9.05.1 and Table 9.05.3.

- (24) Designed open channels are to have as minimum a 1.5m safety berm on each side. A 4.5m maintenance berm is also required on one side or both sides, if more than 15.0m between top of banks. This maintenance berm may be located within the open channel above the minor storm flow level or alternatively it may also include the safety berm, provided that the maintenance berm is above the major storm flow level and associated freeboard (refer **Figure SC6.14.3C (Berms)**).

- (25) The top of bank should be a minimum of 3.0m from any private property.

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Figure SC6.14.3C Berms



Overland flow paths

- (26) Overland flow paths are to be shaped so that the overland flow component of the 1% AEP storm flow is fully contained within the flow path, reserve or easement with a minimum 100mm freeboard to adjoining lots. Flow paths are to also fully contain the 1% AEP storm flow as overland flow to cater for the incidence of a fully blocked underground stormwater network.
- (27) Where an overland flow path is used also for public access the depth by velocity product for the overland flow component of the 1% AEP storm flow does not exceed 0.4m²/sec.
- (28) Any proposed development is to take account of existing or created overland flow paths and make due provision in the design. Design maximum overland flow velocity should not exceed 2.0m/sec with depth of flow not exceeding 300mm and depth by velocity product not exceeding 0.4m²/sec.
- (29) Overland flow paths should be located in road reserves, parks, pathways or other Council controlled land. Overland flow paths should not traverse private property, but may be permitted through non-Council controlled land with the appropriate easements as detailed in this section.
- (30) Overland flow paths and proposed drainage reserves and easements are to be clearly indicated on the engineering drawings.
- (31) In site developments such as multiple dwellings (apartments/ townhouses) where the sites are filled to provide suitable falls to the roadway, particular attention is to be paid to the preservation of existing overland flow paths, the obstruction of which may cause flooding or ponding of stormwater on adjoining properties.
- (32) Overland flow paths not in designated channels are required to have a velocity depth product of no greater than 0.4 m²/sec and a maximum depth of 300mm (applicable to vehicular accommodation and access areas) for the 1% AEP event. Where these values are exceeded, alternative layout or upgrade to the pipe drainage system may be required.
- (33) Where there is no alternative layout (especially in built up areas) or where the overland flow path is completely blocked, underground drainage to PMF capacity will be required. The inlet capacity is to be designed to allow for an additional 50% blockage factor.
- (34) Details and calculations are required for all overland flow paths. Calculations are to demonstrate that overland flow will not enter lots during a 1% AEP flow and that freeboard is achieved during this event. Stormwater calculations, cross sections and plan layouts are to be provided for any proposed overland flow path. The applicant is required to ensure that as-constructed levels are consistent with those shown on the approved engineering drawings.
- (35) The localised overland flow and site drainage in smaller allotment subdivisions or where built to boundary building envelopes apply will also require the applicant to carefully design the stormwater network. Additional pipe stormwater networks, easements and concrete lined drains may be required along the rear boundary of lots including the boundary of the development.

Public safety

- (36) The enclosed stormwater network (including manholes, GPTs, gully manholes and other enclosed structures) is to be designed in accordance with AS 2865 - Safe Working in Confined Spaces and particular attention is required in regard to Section 7 of AS 2865.

- (37) ~~Detailed safety requirements for all ponded water bodies proposed for areas of public open space are:-~~
- (a) ~~side slopes are to be no steeper than 1:6 (H:V), with recommended slopes of 1:8 (H:V);~~
 - (b) ~~water's edge is to be offset at least 15.0m from allotment boundaries or roadways except where safety fencing is provided;~~
 - (c) ~~interim fencing is required between the construction and establishment of vegetation within the water body (typically during the on-maintenance period) where any part of the water body is deeper than 350mm; and~~
 - (d) ~~areas are to be fenced and gated in any areas where the above safety requirements are not met (e.g. in maintenance access areas).~~
- (38) ~~Urban waterways and stormwater drainage systems can represent a significant safety risk during storms and times of flood. The design of urban waterways and stormwater drainage systems that require safety fencing is strongly discouraged and should only be used if it is impractical or unfeasible to design the system such that it does not represent an unacceptable risk. Risks associated with urban waterways and stormwater drainage systems shall be managed in accordance with QUDM.~~
- Stormwater network layout
- (39) ~~The stormwater network layout is to be generally in accordance with QUDM. However, pipe work within the verge is generally not permitted.~~
- (40) ~~Alignments may vary depending on the location of sewer mains and pits but should generally be located as follows:-~~
- (a) ~~rear boundary within 2.5m; and~~
 - (b) ~~side boundary within 1.2m.~~
- (41) ~~Manhole covers within road carriage ways are to be located to reduce potential noise created by covers that are driven over.~~
- (42) ~~Gully to gully drain lines are acceptable for pipes 600 mm diameter or less provided that the design complies with all the following:-~~
- (a) ~~gullies are consistent with Council's Standard Drawings;~~
 - (b) ~~acute angles in connecting pipes are avoided to minimise head losses;~~
 - (c) ~~potential interference with other utility services on the footpath is avoided;~~
 - (d) ~~the major stormwater line (spine) of the gully to gully system is constructed on one side of the road only. Any gullies on the opposite side of the road are to be connected directly across the road. Under no circumstances are spines of gully to gully systems permitted on both sides of the road; and~~
 - (e) ~~the gully pit is appropriately benched.~~
- (43) ~~Gully manholes are not considered to be appropriate and are not a preferred solution. However, there are rare instances that gully manholes are necessary. Accordingly, gully manholes may be approved provided that compliance with all of the following is achieved:-~~
- (a) ~~the inlet and manhole is at the same point (e.g. at the sag of the road);~~
 - (b) ~~it is the only alternative to a multi-grated inlet;~~
 - (c) ~~written advice from the responsible utility authority is submitted stating that the existing services will preclude the construction of the conventional herringbone layout without substantial utility service relocation costs;~~
 - (d) ~~Council's standard components such as lintels and grates are to be used wherever possible;~~

- ~~(e) hydraulic analysis and structural testing data are to accompany the design if it is proposed to use alternative components;~~
- ~~(f) the gully manholes are not to pose a public safety risk; and~~
- ~~(g) the gully manhole complies with the requirements as detailed in this section.~~

Pipes

- ~~(44) Pipes within the stormwater conveyance system shall have a minimum diameter of 375mm including anti-ponding gullies.~~
- ~~(45) Pipes of 300mm are acceptable for driveway or road culverts providing that if the capacity is exceeded there is no risk to other assets or worsening.~~
- ~~(46) While Council will approve the use of any structurally sound pipe, prior approval must be sought for the use of any pipe other than steel reinforced (RCP) concrete pipes. Saltwater cover RCP pipes are to be used in locations where the stormwater network may be subject to tidal wetting and drying.~~
- ~~(47) Rubber ring joint pipes are to be used for all pipes. Prior approval must be sought for the use of external band joint pipes. Butt joint pipes are not permitted.~~
- ~~(48) Service and construction loadings are to be calculated in accordance with AS 3725: Loads on Buried Concrete Pipes. In many cases, construction loading will be the critical load case for selection of pipe class. AS 4058: Precast Concrete Pipes (Pressure and Non-Pressure) will apply for testing requirements or where standard steel reinforced concrete pipes may be exposed to aggressive conditions.~~
- ~~(49) To counteract premature pipe cracking, the following are required:-~~
 - ~~(a) the design and selection of the pipe type and class is to consider construction loading (based upon the calculations described above), which is usually the critical load case for pipes < 900mm diameter;~~
 - ~~(b) stormwater plans issued for construction are required to indicate for each drain line the following:-~~
 - ~~(i) pipe type and class;~~
 - ~~(ii) installation type; and~~
 - ~~(iii) construction method (layer thickness, compaction plant);~~
 - ~~(c) design aids available from concrete pipe manufacturers may be used and are recommended. These include software for calculation of loads on pipes to AS 3725, tables and charts. It is recommended that charts showing the relationship between compaction equipment and pipe class are also included with the engineering drawings;~~
 - ~~(d) no more than two weeks before the on-maintenance inspection and prior to the formal acceptance of on-maintenance, closed circuit television camera (CCTV) inspection is required to demonstrate that the standard of the stormwater network is acceptable to Council. CCTV inspections can be arranged through suitably qualified service providers. Any defects identified by the inspection are to be repaired or replaced or as directed by Council. A follow up camera survey is required to demonstrate that the remediation measures are satisfactory. The CCTV pipe surveys are required to conform to Council's standard inspection and reporting protocols; and~~
 - ~~(e) cracked pipes shall be rejected. Hairline or crazing cracks associated with concrete shrinkage are permitted.~~

Box culverts

- ~~(50) Box culverts may be used where low vertical clearances exist or as approved; however, circular sections should be used in enclosed stormwater networks wherever possible.~~
- ~~(51) Box sections are to be constructed from precast reinforced concrete box culvert sections.~~
- ~~(52) The minimum dimension of a box culvert is to be 375mm.~~

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Manholes

- (53) ~~Manholes are to be designed and constructed in accordance with Standard Drawings from IPWEAQ or the State Road Authority or equivalent. Any manholes required outside these standards must be structurally certified by a RPEQ.~~
- (54) ~~Benching is not recommended. However, deflection devices may be used if improved hydraulic efficiency is required.~~
- (55) ~~Manholes are to be avoided in road pavements and trafficable areas wherever possible. Typically stormwater drainage systems are to be designed from gully pit to gully pit.~~
- (56) ~~Precast manholes are acceptable.~~
- (57) ~~The spacing of manholes is to be in accordance with QUDM.~~
- (58) ~~Where stormwater manholes are located in major stormwater event flow paths or where the design hydraulic grade line is above the top of the manhole, bolt down manhole covers are required.~~

Gully pits and catch pits

- (59) ~~Council will permit the following types of gullies or catchpits (or alternative brands that meet the same specifications):-~~
- (a) ~~IPWEAQ Gully with cast iron bicycle-safe grate roadway type, lip in line (Refer IPWEAQ Standard Drawing D-0063); and~~
- (b) ~~inlets are to be provided with Max Q bicycle-safe grates only. Fluted grates and concrete filled covers will not be permitted.~~
- (60) ~~Inlet capacity charts for IPWEAQ are available in QUDM. Designers should use these charts and the appropriate provisions for blockage as set out in QUDM.~~
- (61) ~~All gullies or catchpits are to be designed so as to be Lip in line (Refer IPWEAQ Standard Drawings D-0063 and D-0067), except for "anti-ponding" gullies. The minimum outlet pipe for gullies or catchpits is to be 375mm nominal diameter, except for anti-ponding gullies where a 300mm diameter pipe may be used.~~
- (62) ~~Allowable flow widths and capacity are as follows:-~~
- (a) ~~multilane roads (with more than one lane travelling in one direction) – refers to Section 11.2.2 of the Queensland Department of Transport and Main Roads – Road Drainage Manual 2010;~~
- (b) ~~sub-arterial roads, trunk collector roads, collector streets and access streets, as defined in Queensland Streets;~~
- (c) ~~intersections on State controlled roads and side streets connecting to State controlled roads (up to the end of the auxiliary lanes or tapers leading onto the state controlled road) – refer to Section 11.2.2 of the Queensland Department of Transport and Main Roads – Road Drainage Manual 2010; and~~
- (d) ~~other intersections – refer to QUDM.~~
- (63) ~~None of the requirements outlined in this section reduces the depth requirements stipulated elsewhere in these guides.~~
- (64) ~~On rural roads the design flows or ponding in the table drain is not to encroach upon the shoulder for the longitudinal or cross drainage.~~
- (65) ~~For gully pit capture charts, refer to Council's Standard Drawings.~~

Field inlets and pipe outlets

- (66) ~~General design:-~~

- (a) for inlets within or outlets to an overland flow path, the design should generally be in accordance with IPWEA Standard Drawing D-0080. Maintenance and amenity factors should also be considered.
- (67) Field inlets:-
- (a) Council will permit the use of IPWEA Field Inlet Type 1 & 2 (Refer Standard Drawing D0050) or alternatives that meet the same specifications;
 - (b) field inlets (and surcharge pits) are to be designed and constructed in accordance with the above mentioned standard drawing or DTMR equivalent;
 - (c) a 50% blockage factor is to be applied during design calculations. When debris is expected, a raised grated inlet is required with a locking device;
 - (d) further design information, including appropriate bar spacing of the grate is provided in QUDM.
- (68) Pipe outlets:-
- (a) energy dissipaters will generally be required at all outlets to reduce velocity to acceptable levels. Refer to QUDM for permissible velocities;
 - (b) drowned outlets are not to be used without prior approval, except where enclosed drains outlet to a canal;
 - (c) for inlet headwalls where the pipe invert is located below the natural channel invert such that a standard field inlet is not warranted (e.g. the drop is less than the pipe diameter), a masonry "inverted curtain wall" is to be constructed across the headwall apron in preference to stone pitching outside the headwall;
 - (d) refer to *BCC Stormwater Outlets in Parks and Waterways* for design of drop structures and stormwater outlets.

Structural design

- (69) Designers are referred to QUDM for the structural design of the enclosed stormwater network. Further information on pipe, RCBC bedding and backfilling can be gained from IPWEAQ Standard Drawings or State Road Authority equivalent.

SC6.14.3.6 — Design requirements — hydrology and watercourse stability

Waterway stability management

- (1) Development prevents increased channel bed and bank erosion in watercourses by limiting changes in flow rate and flow duration within receiving waters. This will be achieved by limiting the post-development peak 63% AEP event discharge within the receiving waterway to the pre-development peak 63% AEP discharge.
- (2) The waterway stability objective is only applicable when runoff from the site passes through or drains to natural channels, non-tidal waterways or wetlands as detailed in **Table SC6.14.3B (Triggers for application of waterway stability management objective)**.

Table SC6.14.3B Triggers for application of waterway stability management objective

Situation	Application of Waterway Stability Management Objective
Runoff from or within the site does not pass through or drain to natural channels, non-tidal waterways or wetlands	Exempt
Runoff from or within the site passes through or drains to natural channels, non-tidal waterways or wetlands	Apply if development type is not exempt from application of stormwater quality design objectives

- (3) Compliance with this design objective can be demonstrated using design procedures detailed in QUDM.

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Frequent flow management

- (4) Development protects in-stream ecology by maintaining pre-development low flow discharge regimes in accordance with the frequent flow management objective detailed in **Table SC6.14.3C (Frequent flow management objective)**.

Table SC6.14.3C Frequent flow management objective

Total fraction impervious of proposed development (%)	Capture and manage the following design run-off capture depth (mm/day) from all impervious surfaces of the proposed development
0-40	At least first 10mm
>40	At least first 15mm

Note—Run-off capture capacity needs to be replenished within 24 hours of the run-off event.

- (5) The frequent flow management objective is only applicable when runoff from the site passes through or drains to natural channels, non-tidal waterways or wetlands as detailed in **Table SC6.14.3D (Triggers for application of frequent flow management objective)**.

Table SC6.14.3D Triggers for application of frequent flow management objective

Situation	Application of frequent flow management objective
Runoff from or within the site does not pass through or drain to natural channels, non-tidal waterways or wetlands	Exempt
Runoff from or within the site passes through or drains to natural channels, non-tidal waterways or wetlands	Apply if development type is not exempt from application of stormwater quality design objectives

- (6) Compliance with this design objective can be demonstrated by providing a total stormwater capture volume calculated as follows:-

(a) capture volume (m³) = Impervious area (m²) X target design runoff capture depth (m).

- (7) The required capture volume may be incorporated within stormwater quality treatment measures, potentially eliminating the need for separate additional storage to meet the frequent flow management design objective. Since the objective required the capture volume to be available each day, the management system (whether infiltration, evaporation, re-use or discharge via bioretention) must be capable of draining the captured stormwater within 24 hours.
- (8) A complying solution for the frequent flow management objective is inclusion of a bioretention device(s) or constructed stormwater treatment wetland(s) sized to achieve the design objectives for stormwater quality management.

Peak flow management

- (9) Development prevents increased nuisance flooding and potential flood damage by limiting the post-development peak 50%, 10%, 5% and 1% AEP event discharge within the downstream drainage system and/or receiving waterway to the pre-development peak 50%, 10%, 5% and 1% AEP discharge. Refer to **Table SC6.14.3E (Triggers for application of peak flow management objective)**.

Table SC6.14.3E Triggers for application of peak flow management objective

Situation	Application of peak flow management objective
Runoff discharges directly to tidal waterway	Exempt
Downstream major and minor drainage system has been sized to accept unmitigated peak flows from the development within acceptable limits	Exempt
All other development	Apply

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- (10) Developments for which compliance with the peak flow management objective is required must determine the volume of detention needed and ensure that the required detention volume is provided in the development design. The objective is to ameliorate the impact of urbanisation as much as possible, and to prevent nuisance flooding and flood damage as best as physically practical.
- (11) The required detention volume for the development is to be calculated through the hydrological routing methods. Using such hydrological routing methods, the detention volume for a sub-catchment can be determined across the development site thus allowing the developer to assign detention requirements between separate basins and/or on-site detention requirements.
- (12) Detention basins:-
- (a) the hydraulic design of detention (dry) and retention (wet) basins is outlined in QUDM and further information is provided in various publications;
 - (b) basins are to be analysed for the entire range of design storms (1% AEP). Design procedures are provided in QUDM;
 - (c) the recommended maximum batter for grassed slopes is to be 1v in 6h and for vegetated batters is to be 1v in 4h;
 - (d) the maximum depth of water in a wet basin, lake or dam less than 0.5ha in area is to be 1.2m during dry weather flows;
 - (e) for detention or dry basins:-
 - (i) the maximum depth of water in the basin is to be 1.2m at 5% AEP flows;
 - (ii) subsoil drainage may be required. However, designs which assist the recharge of groundwater are encouraged, provided that the surface does not remain water-logged for more than a few days;
 - (iii) the relevant site soil conditions will determine if this is possible or necessary; and
 - (iv) low flow provisions are to be catered for. This is to be a minimum of 63% AEP and should be piped between the inlet and outlet structure. The basin floor is to have a minimum grade of 1v in 150h;
 - (f) inlet/outlet weirs:-
 - (i) are to have depth-velocity products in line with QUDM. In some cases, a number of smaller outlets may be required, instead of one large outlet. The use of multiple outlets will also reduce the likelihood of system blockage. Multiple outlets may also be necessary when limiting outflow to pre-developed rates; and
 - (ii) should employ appropriate landscaping so as to improve the amenity of the area by screening of inlets and outlet(s). Care must be taken to ensure trees or shrubs used do not affect the hydraulics of the structure or increase the risk of blocking by vegetative matter (i.e. small leaved type vegetation is preferred to broad leaved type);
 - (g) for safety:-
 - (i) signs are to be placed at relevant locations warning of the possible hazards such as water depth, piped inlet suction, major spillway effects; and
 - (ii) downstream effects of spillway usage need to be considered during design; and
 - (h) detention basins are also required to comply with the requirements under the *Water Act (2000)*.

SC6.14.3.7 Design requirements – stormwater quality

Design objectives for stormwater quality management

- (1) Development protects or enhances the environmental values and water quality of receiving waters or buffer areas within or downstream of the site by achieving the design objectives for stormwater quality management specified in **Table SC6.14.3F (Stormwater quality design objectives – operational (post construction) phase of development)** prior to discharge to receiving waters or buffer areas within or downstream of the site.

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Table SC6.14.3F—Stormwater quality design objectives – operational (post construction) phase of development

Pollutant	Minimum reductions in mean annual loads from unmitigated development (%)
Total Suspended Solids (TSS)	80
Total Phosphorous (TP)	60
Total Nitrogen (TN)	45
Gross Pollutants > 5mm	90

(2) The stormwater quality design objectives are only applicable when required by **Table SC6.14.3G (Triggers for application of stormwater quality design objectives)**. For development where the stormwater quality design objectives are not applicable alternative measures appropriate for the scale of development are outlined.

Table SC6.14.3G Triggers for application of stormwater quality design objectives

Development type		Application of stormwater quality design objectives	Alternative management measures required
Dual occupancy		Exempt from WSUD load reduction targets	
MCU for urban purposes other than industrial (refer QUDM)	Lot size < 2500m ²	Exempt from WSUD load reduction targets	Harvesting and reuse of stormwater (rainwater tanks connected to toilet and for outdoor use) and runoff from impervious areas to be sloped to landscaped areas
	Lot size ≥ 2500m ²	WSUD load reduction targets apply to the developed portion of the site ¹	
MCU for industrial	Lot size < 850m ²	Exempt from WSUD load reduction targets	Harvesting and reuse of stormwater (rainwater tanks connected to toilet and for outdoor use) and runoff from impervious areas to be sloped to landscaped areas
	Lot ≥ size 850m ²	WSUD load reduction targets apply to the developed portion of the site ²	
Reconfiguring a Lot	Reconfiguring that includes a new road ³	WSUD load reduction targets apply	
	Reconfiguring that does not include a new road	Exempt from WSUD load reduction targets	Harvesting and reuse of stormwater (rainwater tanks). Protect vegetated buffers to waterways

Notes –

1. Sparse or distributed sites (e.g. cabins spread over a site) are exempt from WSUD targets.
2. For sites between 850m² and 2500m², the WSUD load reduction targets only apply if it is reasonable to extend the existing piping system to the site. The calculation to determine a reasonable extension is: reasonable length of pipe (m) = site area (m²)/50.
3. For rural residential/rural reconfigurations with lot sizes greater than 3,000m², see alternative management measures for stormwater quality management (refer SC6.14.3.7(8)).

Complying solutions for stormwater quality management

- (3) For certain types of development for which application of stormwater quality design objectives is required, deemed to comply solutions will be accepted. The deemed to comply solutions and developments for which they are applicable are detailed in the latest version of the *Water by Design: Bioretention Technical Design Guideline*.
- (4) The deemed to comply solutions remove the need to undertake detailed modelling to size the stormwater quality treatment measures. Preparation of a flood and stormwater management plan is still required.

Alternative management measures for stormwater quality management

- (5) ~~Alternative management measures for stormwater quality management are applicable when, in accordance with **Table SC6.14.3F (Stormwater quality design objectives – operational (post construction) phase of development)**, the development is exempt for complying with stormwater quality design objectives.~~
- (6) ~~For MCU (multiple dwelling, commercial, industrial) development with greater than 25% of site impervious:-~~
- (a) ~~a minimum of 80% of roof area is to be connected to a rainwater tank in accordance with **Section SC6.14.3.7 (Design requirements – stormwater quality)**. Tank capacity is to be not less than 15 litres per square metre of total roof area and for external use, washing machine and toilet flushing only; and~~
- (b) ~~where not precluded by site conditions (steep slopes, inability to achieve free draining outlet) achieve stormwater quality design objectives.~~
- (7) ~~For MCU (multiple dwelling, commercial, industrial) development with less than 25% of site impervious and sparse:-~~
- (a) ~~a minimum of 80% of roof area connected to a rainwater tank in accordance with **Section SC6.14.3.7 (Design requirements – stormwater quality)**. Tank capacity not less than 15 litres per square metre of total roof area. Tank to supply external use, washing machine and toilet flushing only;~~
- (b) ~~where not precluded by site conditions (inability to separate road runoff from site runoff) achieve stormwater quality design objectives for road runoff;~~
- (c) ~~reduce as far as practicable directly connected impervious area by using a combination of stormwater harvesting, vegetated swales and buffers, and infiltration systems. The proposed stormwater management strategy should ensure that no impervious area runoff discharges from the site without appropriate treatment;~~
- (d) ~~locate all drainage lines with catchment area greater than 1 hectare within drainage easement and re-vegetate the area of drainage easement to provide vegetated buffer to drainage line. Minimum width of drainage easement to extend 4.0m either side of centre of drainage line; and~~
- (e) ~~locate all areas subject to flooding during a 1% AEP flood event within drainage easement and re-vegetate the area of drainage easement to provide vegetated buffer to waterway.~~
- (8) ~~For REC with proposed lot sizes greater than 3,000m² and no internal road:-~~
- (a) ~~locate all drainage lines with catchment area greater than 1 hectare within drainage easement and re-vegetate the area of drainage easement to provide vegetated buffer to drainage line. Minimum width of drainage easement to extend 4.0m either side of centre of drainage line; and~~
- (b) ~~locate all areas subject to flooding during a 1% AEP flood event within drainage easement and re-vegetate the area of drainage easement to provide vegetated buffer to waterway.~~
- (9) ~~For REC with proposed lot sizes greater than 3000m² with internal road:-~~
- (a) ~~where not precluded by site conditions (inability to separate road runoff from site runoff) achieve stormwater quality design objectives for road runoff;~~
- (b) ~~locate all drainage lines with catchment area greater than 1 hectare within drainage easement and re-vegetate the area of drainage easement to provide vegetated buffer to drainage line. Minimum width of drainage easement to extend 4.0m either side of centre of drainage line; and~~
- (c) ~~locate all areas subject to flooding during a 1% AEP flood event within drainage easement and re-vegetate the area of drainage easement to provide vegetated buffer to waterway.~~

Stormwater quality treatment measures

- (10) ~~CWBs including ponds and lakes are not to be used as stormwater quality treatment measures.~~

- (11) ~~Source controls such as education, street sweeping and rubbish bins are not considered as stormwater quality treatment measures. Education relates to engendering a social and cultural shift in the attitudes and practices of the community. It is important to note that these source controls are critical to improving stormwater quality, but they cannot be considered as stormwater quality treatment measures to achieve required stormwater quality design objectives.~~
- (12) ~~Cleanout or maintenance will need to utilise plant and equipment currently in use by Council. The contributed assets are to be designed and constructed so that they can be maintained and operated without specialised equipment that is not currently available to Council's maintenance operations.~~
- (13) ~~Detailed life cycle costing is required for the entire treatment train system with particular reference to replacement costs of asset parts such as filter media. Treatment systems dedicated to Council as public assets must be designed to minimize maintenance, renewal and adaption costs and the requirement for specialised equipment, materials or maintenance techniques.~~
- (14) ~~Treatment systems that use natural processes and materials shall be used whenever practicable to enhance biodiversity and landscape benefits.~~
- (15) ~~Treatment systems are to be designed to eliminate or minimise health, safety and aesthetic hazards.~~
- (16) ~~Where the maintenance will be carried out by a body corporate the maintenance requirements for the stormwater quality treatment system shall be included within the community titles scheme. The maintenance requirements are to include:-~~
- ~~(a) a plan showing the location of the individual components of the system;~~
 - ~~(b) manufacturer's data and product information sheets for any proprietary devices;~~
 - ~~(c) location of inspection and monitoring points shown clearly on the plan;~~
 - ~~(d) a schedule or timetable for the proposed regular inspection, maintenance and monitoring of the devices; and~~
 - ~~(e) all inspection, maintenance and monitoring requirements are to be fully costed.~~

Water sensitive urban design stormwater quality treatment measures

- (17) ~~Conceptual design of water sensitive urban design treatment measures is to be undertaken in accordance with the *Healthy Waterways Water by Design – Concept Design Guidelines for Water Sensitive Urban Design* (2009).~~
- (18) ~~Detailed design of water sensitive urban design treatment measures is to be undertaken in accordance with:-~~
- ~~(a) the latest version of the *Water by Design Bioretention Technical Design Guideline*;~~
 - ~~(b) IPWEQA Standard Drawings WSUD – 001 to WSUD – 012; and~~
 - ~~(c) specific Council requirements detailed in this planning scheme policy.~~
- (19) ~~Safety is to be addressed in the design of all stormwater quality treatment measures without the need for fencing.~~
- (20) ~~Swales:-~~
- ~~(a) for roadside application, when providing access across the footpath to a residential lot, the swale shall be shaped to suit a driveway for travel by a standard car with the necessary clearances. Pipe crossings are not to be located in the swale. The driveway is to be constructed prior to acceptance of the swale "on maintenance";~~
 - ~~(b) swales are to be designed to ensure that the depth-velocity limit of 0.4m²/s is not exceeded for all flows up to the major flow event (or in the case of inter-allotment drainage, the design event as defined above);~~

(c) alongside roadway pavements, the swales must be sized so that the water level in the swale during the 39% AEP event is below the base of the roadway pavement (typically in the order of 300mm below the roadway surface); and

(d) alternative systems (involving, say, impermeable membranes separating the swale from the pavement) may be considered if it can be demonstrated that these flows will be prevented from seeping into the pavement.

(21) Bioretention systems:-

(a) all bioretention systems are required to achieve the following minimum design objectives:-

(i) bioretention with saturated zone is not used;

(ii) all bioretention systems are provided with a subsurface drainage system irrespective of the hydraulic conductivity of the underlying soils;

(iii) subsoil pipes are to be minimum 100mm diameter upvc pipe and slotted pipe is to be proprietary manufactured product not slotted on site;

(iv) all bioretention devices with the exception of roadside at source devices are provided with an overflow pit;

(v) bioretention devices treating catchments >0.5ha are provided with pre-treatment incorporating either a swale or coarse sediment forebay or GPT if high gross pollutant load;

(vi) bioretention devices treating catchments >5ha are provided with pre-treatment incorporating either a sediment basin or sediment basin and GPT if high gross pollutant load; and

(vii) do not conflict with other infrastructure including minimum offsets to underground services;

(b) bioretention swales are required to achieve the same minimum design objectives as conventional swales;

(c) roadside at source bioretention devices are required to achieve the following minimum design objectives:-

(i) allow for unimpeded access for pedestrians along the road reserve;

(ii) not cause any ponding to extend onto the road pavement when ponding is at the top of the extended detention depth;

(iii) filter media must be offset a minimum of 1.0m from the kerb line;

(iv) minimum width of 1.5m;

(v) driveways either side of the bioretention device must be constructed as part of operational works; and

(vi) to not be reliant on safety fencing to address safety risks;

(d) bioretention tree pits are required to achieve the following minimum design objectives:-

(i) allow for unimpeded access for pedestrians along the road reserve;

(ii) only implemented in high density urban and constrained environments where required to achieve streetscape requirements;

(iii) to not be reliant on safety fencing to address safety risks;

(iv) to have sufficient depth to prevent tree roots from entering the subsurface pipes;

(v) to include measures to protect the road pavement from tree roots and seepage from the tree pits;

(vi) minimum filter media depth of 0.8m; and

(vii) maximum of 1 tree per 20m² of filter media;

(e) landscaping for bioretention basins is to include a mixture of the following species for planting in the bioretention basin batters at a suitable density and ensuring the species that are taller and/ or have longer denser leaf growth are planted towards the top of the batter (e.g. *Lomandra* and *Ghania*) to minimise shading to the treatment area:-

(i) *Carex appressa*;

(ii) *Ficinia nodosa*;

(iii) *Juncus usitatis*;

- (iv) ~~Lomandra longifolia;~~
- (v) ~~Ghania sieberiana;~~
- (vi) ~~Banksia robur;~~
- (vii) ~~Dianella brevipedunculata;~~
- (viii) ~~Themada triandra;~~
- (ix) ~~Cymbopogon refractus;~~
- (x) ~~Melaleuca thymifolia;~~
- (xi) ~~Nandina domestica; and~~
- (xii) ~~Acmena Allyn Magic.~~

- (f) ~~where landscaping/garden beds are proposed adjacent to the bioretention basin, a 900mm deep root barrier is to be installed to the interface between the landscape/garden area and the bioretention basin; and~~
- (g) ~~mulch to be provided in accordance with the Water by Design Construction and Establishment Guidelines Section 3.6.4 Mulching.~~

(22) ~~Wetlands:-~~

- (a) ~~All wetland systems are required to achieve the following minimum design objectives:-~~
 - (i) ~~due to wet summers experienced on the Sunshine Coast maximum notional detention time of 48 hours.~~

(23) ~~Sediment basins:-~~

- (a) ~~sediment basins are to be used to pre-treat stormwater prior to entering wetlands or large bioretention systems;~~
- (b) ~~sediment basins are to be designed in accordance with HWP Guidelines and shall not be either undersized or oversized for the catchment area draining to the basin; and~~
- (c) ~~all sediment basins are required to achieve the following minimum design objectives:-~~
 - (i) ~~sized according to the 63% AEP design operation flow;~~
 - (ii) ~~sized to capture a target particle size of 0.125mm; and~~
 - (iii) ~~sediment storage volume sized for 5 year clean out frequency.~~

(24) ~~Infiltration systems:-~~

- (a) ~~generally, infiltration systems are used where stormwater discharge is to a natural system and groundwater recharge and maintaining pre-development runoff volume is required. Stormwater quality design objectives shall be achieved prior to stormwater entering an infiltration device; and~~
- (b) ~~to address health, safety and aesthetic hazards infiltration systems shall be designed without any extended detention depth.~~

(25) ~~Sand filters:-~~

- (a) ~~sand filters operate in a similar way to bioretention systems, with the exception that stormwater passes through a filter media (typically sand) that has no vegetation growing on the surface. The absence of vegetation and the associated biologically active soil layer typically created around the root zone of vegetation planted in bioretention systems means sand filters have an increased maintenance requirement and reduced stormwater treatment performance compared to bioretention systems;~~
- (b) ~~sand filters shall only be considered for re-development situations were the surrounding urban environment is already developed and site conditions limit the use of bioretention systems; and~~
- (c) ~~all sand filters are required to achieve the minimum design objectives.~~

Proprietary stormwater quality treatment measures

(26) ~~General:-~~

- (a) ~~pollutant reduction performance testing is required for all proprietary stormwater quality treatment measures. The testing is to include the following as a minimum:-~~

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- (i) ~~pollutant reduction performance independently verified using methods to suit conditions within the Sunshine Coast Council area;~~
 - (ii) ~~performance under dry weather flows;~~
 - (iii) ~~maintenance frequency representative of current practice;~~
 - (iv) ~~performance under high flows;~~
 - (v) ~~testing undertaken of inflow and outflow concentrations over a range of flow rates including the design flow rate, below design flow rate and above design flow rate;~~
 - (vi) ~~analysis of retained pollutants for GPT when maintenance is due to confirm which pollutants have been retained; and~~
 - (vii) ~~testing of media for media filtration systems when replacement of media is due to confirm which pollutants have been retained.~~
- (27) ~~Media filtration systems are to be designed and installed in accordance with the manufacturer's guidelines.~~
- (28) ~~Porous pavements:-~~
- (a) ~~porous pavement is only to be used to treat stormwater which falls directly onto the porous pavement. Areas of porous pavement do not require any further stormwater quality treatment;~~
 - (b) ~~porous pavement is designed such that it achieves the same engineering requirements as conventional pavement; and~~
 - (c) ~~porous pavement is to be provided in car parks and adjacent to mature/existing trees where surrounding hard surfaces do not allow adequate conditions for reasonable growth.~~
- (29) ~~Gross pollutant trap (GPT):-~~
- (a) ~~GPTs function to trap gross pollutants (i.e. litter, general garden waste etc.) and coarse sediments (approximately greater than 2mm diameter).~~
 - (b) ~~GPTs are used as part of the pre-treatment within the overall treatment system in areas where there is a high gross pollutant load (commercial, industrial and high density urban). Low and medium density residential development is typically characterised by low anthropogenic gross pollutant loads and do not require GPTs. GPTs can also be used in existing enclosed minor stormwater systems, where there is sufficient hydraulic capacity for the installation.~~
 - (c) ~~GPTs are not used for the removal of:-~~
 - (i) ~~pollutants/fine sediments that are less than 2 mm;~~
 - (ii) ~~colloidal material;~~
 - (iii) ~~dissolved chemical pollutants;~~
 - (iv) ~~nutrients; or~~
 - (v) ~~hydrocarbons (including oil and grease).~~
 - (d) ~~GPTs are to be designed and constructed so that:-~~
 - (i) ~~the GPT can be located in an accessible location (not in swampy areas, at the bottom of embankments or other inaccessible locations);~~
 - (ii) ~~the GPT is not located near electrical equipment or where a voltaic cell can occur;~~
 - (iii) ~~the GPT can be fitted with a suitably designed lockable access cover approved by Council that prevent entry of unauthorised persons;~~
 - (iv) ~~re-suspension of captured pollutants during flows in excess of the SQID design event is prevented;~~
 - (v) ~~a minimum of 90 percent of pollutants re-suspended by back flushing is recaptured;~~
 - (vi) ~~grills/mesh have a self-cleansing mechanism to prevent blockage;~~
 - (vii) ~~the GPT does not create surcharge at the pit/manhole immediately upstream of the GPT, unless there is an acceptable overland flowpath or high flow bypass;~~

- (viii) ~~the GPT can be suitably located in public road, park or drainage reserve;~~
 - (ix) ~~the GPT can be hydraulically isolated during cleanout;~~
 - (x) ~~when located in areas where tidal backflow is present, the downstream drain includes provision of a tide gate to prevent tidal inflow; and~~
 - (xi) ~~any proprietary products are to be designed and installed in accordance with the manufacturer's guidelines; and~~
- (e) ~~it is preferred that GPTs are located adjacent to a sewer access point, so that any water that collects in the GPT can be pumped directly to the sewer as trade waste.~~
- (30) ~~Gully pit GPTs:-~~
- (a) ~~gully pit GPTs are used as part of the pre-treatment within the overall treatment system in areas where enclosed minor stormwater systems (that is, piped drainage systems) are installed. Gully pit GPTs can also be used in existing enclosed minor stormwater systems, where there is sufficient hydraulic capacity for the installation;~~
 - (b) ~~the gully pit GPT should not be used in retrofit situations where the existing systems inlet capacity is insufficient for the major stormwater system to take the events greater than the minor enclosed stormwater system (i.e. if there is no overland flowpath from a trapped sag gully);~~
 - (c) ~~gully pit GPTs are to be designed and constructed so that:-~~
 - (i) ~~gross pollutants for the SQID design event are captured prior to entry to the minor stormwater system;~~
 - (ii) ~~sufficient overflow capacity is provided so that the minor storm event enters the minor stormwater system when the gully pit GPT is fully blocked. In certain circumstances, this will mean that additional gully pits will need to be installed;~~
 - (iii) ~~any proprietary products are designed and installed in accordance with the manufacturer's guidelines;~~
 - (iv) ~~the pollutant collection chamber is free draining to prevent anaerobic decomposition of collected matter. Anaerobic decomposition may be a source of odour and polluted leachate; and~~
 - (v) ~~the grates of the gully pit GPT are to be lockable such that a member of the public cannot access the pollutant collection chamber, but so that:-~~
 - (A) ~~Council maintenance crews can easily clean utilising a vacuum truck or a vacuum street cleaner; and~~
 - (B) ~~for work, health and safety reasons manual lifting or cleaning of gully pit GPTs can be minimised through appropriate design and development.~~
- (31) ~~Grease and grit separators:-~~
- (a) ~~oil and grit separators are intended to remove the bulk of hydrocarbons and grit flushed from commercial areas, industrial areas, carparks and other land uses where oil spills may potentially occur or where hydrocarbons and sediment can accumulate;~~
 - (b) ~~land uses where oil spills may potentially occur are to have a spill containment system which is separate to the stormwater system;~~
 - (c) ~~oil and grit separators are not accepted as Council assets but may be used as part of a private stormwater treatment system;~~
 - (d) ~~key issues involved with the implementation of oil, grease and grit separators include:-~~
 - (i) ~~limited removal of fine sediments or soluble pollutants;~~
 - (ii) ~~potential re-suspension of sediments and/or entrainment of floating oil with turbulence;~~
 - (iii) ~~trapped debris is likely to have high concentrations of pollutants, possibly toxicants;~~
 - (iv) ~~potential safety hazard to maintenance personnel;~~
 - (v) ~~require frequent maintenance to provide continued performance;~~
 - (vi) ~~potential release of nutrients and heavy metals from sediments;~~
 - (vii) ~~total suspended solids minimum 85% removal efficiency at 150µm;~~
 - (viii) ~~oil removal based on specific gravity of 0.82 – 0.87: >95%;~~
 - (ix) ~~installation of units is to be performed in strict accordance with the manufacturer recommendations and specifications;~~

- (x) ~~the installation of the device must account for prevailing soil pressures and must be designed to prevent hydrostatic uplift when the water table is at or close to the ground surface; and~~
- (xi) ~~the installation must be designed to prevent damage by vandals;~~
- (e) ~~a range of devices are commercially available for installation in appropriate situations. A list of these devices can be supplied on request.~~
- (f) ~~maintenance requirements for oil and grit separators are regularly cleaned out and removed to appropriate disposal points.~~
- (g) ~~Council requires that discharges from these traps including overflows are diverted to wastewater treatment facilities under a trade waste permit or to a holding tank;~~
- (h) ~~oil and grease separators are not suitable for the removal of dissolved or emulsified oils and pollutants such as coolants, soluble lubricants, glycols and alcohols. There is significant risk of re-suspension of accumulated sediments during heavy storm events. Accordingly, Council requires that oil and grease separator units be installed off line with a high flow by-pass.~~

SC6.14.3.8 — Design requirements — stormwater harvesting and reuse

- (1) ~~The following documents provide design requirements with respect to stormwater harvesting and reuse systems:-~~
 - (a) ~~HWP Water by Design – Stormwater Harvesting Guidelines (2011); and~~
 - (b) ~~Queensland Development Code Mandatory Part 4.2 & 4.3.~~
- (2) ~~For systems that are to be dedicated to Council as public assets it is to be demonstrated that there is an overriding community benefit resulting from the stormwater harvesting system. A detailed operations and maintenance budget is required to be prepared for the project life and financial assurances must be in place to operate and maintain the system for the project life.~~
- (3) ~~Private stormwater harvesting schemes may be implemented at the applicant's discretion as part of achieving the outcomes of the **Stormwater management code**. However, there are no specific requirements mandating use of these systems or specific stormwater capture and reuse targets.~~

SC6.14.3.9 — Stormwater management plans

- (1) ~~This section sets out the information requirements for Council to assess the development application in the context of the development design standards and in reference to the planning scheme codes. Hydraulic and flooding issues that affect a development site are considered to be a constraint for the site, and consequently the submission of a report addressing concerns of flooding needs to be submitted in response to the codes at REC and/or MCU stage and not left to be addressed at OPW stage.~~
- (2) ~~Stormwater Management Plans (SWMP) are required to document how the development will achieve the Acceptable Outcomes of the codes. The core principle in preparing a SWMP is to provide all the necessary information for Council to be able to make a decision. The detail required with a SWMP may differ for the various types of development applications.~~
- (3) ~~SWMPs may not be approved by Council if they incorporate open drains that will demand considerable maintenance, will be difficult to maintain, or utilise specialised equipment or if other alternatives are physically possible. Background information and design approach are provided in the QUDM.~~
- (4) ~~Stormwater runoff water quality controls and best management practices are to consider whole of life costs prior to adoption. A management plan or proposed maintenance schedule is to be supplied to Council for these facilities.~~
- (5) ~~The site development requirements set out in **Section SC6.14.3.5 (Design requirements – stormwater drainage)** are to apply in all cases.~~
- (6) ~~Where a SWMP is required for a development the following information must be included:-~~
 - (a) ~~a plan or plans at a scale of 1:200, 1:500 or 1:1000 showing:-~~

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- (i) site location;
 - (ii) existing contours at sufficient intervals to adequately define general drainage paths, catchment boundaries and estimated 1% AEP flood contours for local area and regional flood plans;
 - (iii) physical improvements on the site;
 - (iv) location, dimensions, elevations and details of the stormwater network and any stormwater quality management devices;
 - (v) location of proposed stormwater discharge point(s) from the site, both during construction and following completion of the development;
 - (vi) location and size of any proposed land disturbance works in relation to existing stormwater corridors, or proposed stormwater network or facility;
 - (vii) any proposed natural channel designs, including incorporation of existing natural vegetation;
 - (viii) any proposed easements or reserves internal or external to the site;
 - (ix) details, including location and sizing, of any proposed detention/retention storages, including on-site detention schemes; and
 - (x) details of proposed stormwater and/or wastewater recycling scheme, including water balance calculations;
- (b) supporting information including:-
- (i) description of how stormwater runoff is to be managed for the entire site, whether or not a staged development is proposed. This may include a flood study on any relevant watercourse;
 - (ii) description of the topographic, vegetative and soil conditions for the site;
 - (iii) description of the adjacent properties (in particular, the upstream catchment and the downstream receiving properties) and any existing structures, buildings, stormwater infrastructure or improvements located on these properties;
 - (iv) a letter of approval from the adjacent (or downstream) property owner(s) accepting that the development proposes to discharge an altered or concentrated flow of stormwater runoff onto their property. Failing this, stormwater flows must be kept to pre-developed runoff peak rates and overall catchment response, or else the development will not be permitted to proceed;
 - (v) description of the method used in selection of soil erosion and sediment control measures for the development and commencement and completion dates of any stages; and
 - (vi) sufficient engineering detail to demonstrate that the proposed infrastructure meets the requirements of design;
- (c) depending on the nature of the development application, the following additional information to that described in (a) and (b) above may be required:
- (i) plans to include:-
 - (A) the enclosed stormwater system (shown on plan, long section, watershed and details);
 - (B) construction and design details for structural controls. These should generally be in accordance with information provided by the IPWEAQ Standard Drawings – Drainage Section;
 - (C) detailed modeling on the determination of detention/retention requirements for the site; and
 - (D) longitudinal and cross sections of the open stormwater system including natural watercourses are to be provided;
 - (ii) additional supporting information may include:-
 - (A) all calculations needed to design the system and associated structures, including pre and post development velocities and peak rates of discharge of stormwater runoff at all existing and proposed points of discharge from the site;
 - (B) inflow and outflow hydrographs for all stormwater retarding facilities;
 - (C) the expected timing of flood peaks through the downstream stormwater system to be assessed when planning the use of retarding facilities;
 - (D) in determining downstream effects from the stormwater system and stormwater quality management facilities of the development, hydrological-hydraulic engineering studies are to extend downstream to a point where the proposed development represents less than 10% of the total catchment;
 - (E) if the SWMP and/or design report indicates that there may be a stormwater or flooding problem at the exit from the proposed development or at any location between the exit point and the point downstream where the development represents less than 10% of the total catchment, Council may require:-

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1. water surface profiles plotted for the conditions of pre and post development for the minor system design event;
 2. water surface profiles plotted for the conditions of pre and post development for the major system design event;
 3. elevations of all structures potentially damaged by the minor and/or major system design event flows; and
 4. roughness factors (n) used for the main channel and overbank areas of the stormwater system including natural waterways is to be shown on the longitudinal and cross sections. Photographic reference is also to be provided to assist the maintenance of the vegetation to ensure the roughness factor is maintained to prevent flooding from overgrown drainage systems and natural waterways;
- (F) analysis of all stormwater management facilities and all major portions of the conveyance system through the proposed development (that is, channels, culverts and the like), using the minor and major system design events and for design conditions and operating conditions which can reasonably be expected during the life of the facility;
- (G) designation of all easements needed for inspection and maintenance of the stormwater system and stormwater management facilities;
- (H) evidence that upstream and/or adjacent flood levels will not be aggravated;
- (I) evidence that the existing downstream stormwater network will adequately cater for the altered stormwater runoff conditions (if any);
- (J) geotechnical advice on the stability of any basin or dam wall and any soft-lined batters steeper than 1(v) in 2.5(h) and greater than 2.0m deep;
- (K) the estimated 1% AEP flood contours for all flows on natural stormwater corridors, designed channels or overland flowpaths;
- (L) details, including hydrological, hydraulic and structural, of any interim stormwater requirements for staged subdivisions or developments; and
- (M) all model files are to be submitted electronically accompanying the written report.

Stormwater quality requirements

- (7) While under treatment which achieves less than the targets is an acceptable compromise for a particular sub-catchment (on the basis that overall the targets are met), no treatment at all for a sub-catchment is not acceptable. If under treatment or no treatment is proposed for an area, then compelling justification of why the constraints prevent this is required.

Stormwater quality modelling

- (8) Stormwater quality modelling must be undertaken in accordance with the HWP Water by Design MUSIC Modelling Guidelines.
- (9) The performance of the MUSIC Version 5 bioretention treatment node is heavily dependent on the Total Nitrogen (TN) and orthophosphate content of the filter media. TN and orthophosphate concentrations of the filter media is to be representative of the TN and orthophosphate concentrations of the filter media over the design life of the filter media. Test results are to be submitted to support the TN and orthophosphate concentrations of the filter media used. Alternatively the MUSIC V3 treatment node may be used without submitting any test results.

Hydrological requirements

- (10) Design flows are to be determined assuming the catchment is fully developed. Catchment development is to be in accordance with the appropriate stormwater management plan or catchment management plan in the first instance or in areas where these do not exist, the planning scheme.
- (11) Council specific information is to be used to determine catchment responses.
- (12) For major/minor stormwater system requirements refer to QUDM. A minor road in the Council area is defined as one with < 3000 AADT while a major road is defined as having > 3000 AADT.
- (13) QUDM presents the concept of major system and minor system design. It presents appropriate AEPs and notes that a local authority may vary the design AEPs to suit local conditions.
- (14) The boundaries of catchments and sub-catchments are to be determined in accordance with QUDM. Council has additional information within its GIS system to assist in the determination of catchment and sub-catchment areas. Boundaries should be verified by site inspection and certified as correct.

(15) For urban catchments, the coefficient of runoff will be determined in accordance with **Table SC6.14.3H (C₁₀ vs development category)**.

Table SC6.14.3H C₁₀ vs development category

Development Category	C ₁₀	f _i
Central business	0.90	1.00
Commercial and industrial	0.88	0.90
Significant paved areas e.g. roads and carparks	0.88	0.90
Urban residential – High density	0.88	0.90
Urban residential – Low density (including roads)		
Average lot		
< 450m ²	0.86	0.80
≥ 450m ² and < 650 m ²	0.82	0.60
≥ 650 m ²	0.76	0.30
Urban residential – Low density (excluding roads)		
Average lot		
< 450m ²	0.86	0.80
≥ 450m ² and < 650 m ²	0.81	0.55
≥ 650 m ²	0.75	0.25
Rural or Rural residential	0.74	0.20
Open space and parks, etc.	0.70	0.00

(16) For developments that include rural or bushland catchment areas, the Queensland DTMR Road Drainage Design Manual section 3.5.3.3 Table 3.5 is to be used in determining the coefficient of runoff.

(17) Time of concentration for urban catchments:-

- (a) is to be calculated in accordance with QUDM;
- (b) where inlets are applied, the standard inlet times (QUDM) will be applied for urban areas, except where approval is given to utilise other methods. The average slopes referred to are the slopes along the predominant flow paths for the catchment in its developed state; and
- (c) the kinematic wave and the Bransby-Williams equations are not to be used. The time of concentration must take due account of partial area effects in accordance with QUDM, particularly where there is open space within a residential area or for developments with significant directly connected impervious areas.

(18) Time of concentration for rural catchments is to be calculated in accordance with the Queensland DTMR Road Drainage Design Manual section 3.5.3.2.

Hydrological modelling

- (19) The catchment is to be modelled using a hydrological modelling package. The applicant will be required to justify to Council the advantages of any particular model chosen for the analysis. The applicant will need to demonstrate to Council's satisfaction that the chosen software is suitable to model all open channel components within the catchment. (Council requires the choice of model to be an off-the-shelf item, standard software, such that Council can access the model data in future through the purchase of its own software).
- (20) The model network should include all major stormwater and waterways in the catchment and is to take into account the physical characteristics of the catchment and waterways for all cases assessed. The sub-catchment areas need to be confirmed to best represent flow estimates at critical locations.
- (21) Comparison of the computed peak flows (hydrological model) against the Rational Method is required. Availability of recorded flood level information for calibration purposes is to be determined and is the responsibility of the applicant. Where no recorded flood level information is available, a Rational Method check will be used to confirm estimated discharges at key locations throughout the catchment.

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- (22) Determination and assessment of the peak discharges for the 39%, 18%, 10%, 5%, 1%, 0.5%, 0.2% AEP and PMF events under existing and defined development conditions is required. Council may relax the required AEP year events to be modelled dependent on the scale and type of development. These peak flows should be calculated at all critical locations to allow assessment on the impact of future developments.
- (23) The applicant is required to ensure the hydrological model is detailed enough for use in conjunction with the Rational Method to calculate the design peak discharge for the assessment of minor or local piped stormwater systems.
- (24) The applicant is required to state all assumptions and justify the adoption of all parameters used in the modelling process as part of the detailed design component of the development application phase.

Hydraulic requirements

- (25) A detailed hydraulic grade line (HGL) is required for the analysis of the enclosed and open drainage system (refer to QUDM for details).
- (26) Stormwater networks, both open and closed, servicing catchments having sub-catchments with varying AEPs (e.g. a stormwater network servicing a roadway with 10% AEP with an abutting residential subdivision with a 39% AEP) are to comply with the following:-
- (a) the whole network is to be analysed for each AEP within the catchment. In the above example this means that the 39% AEP sub-catchment would have a 10% AEP rainfall intensity applied to it so that the HGL can be proved for the 10% AEP area and the 10% AEP sub-catchment would have a 39% AEP rainfall intensity applied to it;
 - (b) surcharge bypass from the lower AEP sub-network during the greater AEP analysis is to be taken into consideration;
 - (c) separate catchment calculation tables are to be provided for each of the AEPs;
 - (d) HGLs and tailwater levels are to be shown for each AEP on the long sections; and
 - (e) hydraulic grades levels are to be shown for each AEP on the cross sections of open stormwater networks.
- (27) All hydrologic and hydraulic calculations for major watercourses or creeks for the purpose of determining ultimate flood levels and development and flood levels are based on:-
- (a) 1% AEP flows for a fully developed catchment. The effects of lesser flows are to be investigated; and
 - (b) a fully vegetated waterway corridor using a Manning's n of 0.15, unless the scope of full vegetation is not possible due to an unacceptable increase in flood levels. The restricted vegetation areas are usually identified in available Council studies such as stormwater management plans, waterway management plans and flood studies. In general, the planting of trees and shrubs impedes the passage of flow, thereby leading to increased flood levels. The high vegetal roughness coefficient allows for generally unrestricted planting of vegetation.

Hydraulic modelling

- (28) The purpose of the hydraulic model is to assess existing stormwater systems, determine flood levels, and design mitigation options to minimise the impact of future developments on flooding and the environment.
- (29) The hydraulic modelling is to include analysis of the complete piped system and all open stormwater components.
- (30) The model should incorporate all relevant hydraulic structures and physical constraints including culverts and bridges.
- (31) A sensitivity analysis should be undertaken to verify the adopted flood level parameters of the model when historical flood levels have not been recorded, or are unavailable for the catchment.
- (32) Determination and assessment of flood levels along the main waterways for the 39%, 18%, 10%, 5%, 1%, 0.5%, 0.2% AEP and PMF design events under existing and defined development

~~conditions is required. Council may relax the required AEP year events to be modelled, dependent on the scale and type of development.~~

- ~~(33) Depending on development location the hydrological and hydraulic models are to produce comparable peak discharges with similar timing for the same event at all locations, so that the information from the hydrological model can be utilised for Council flood warning systems in the future.~~
- ~~(34) A hydraulic analysis of the complete piped stormwater network should be undertaken, and shall include the existing network to receiving waters and other hydraulic control.~~

As constructed information

- ~~(35) As constructed information for all contributed assets is to provide an accurate capture of the condition and construction of the asset.~~
- ~~(36) As constructed information is to be provided to Council in accordance with **Section SC6.14.11 (Specifications and construction)** of this planning scheme policy. The following information is to be supplied:-~~
- ~~(a) the as constructed survey of the final location and levels to AHD of all elements of the following:-
 - ~~(i) stormwater management system(s);~~
 - ~~(ii) stormwater network(s);~~
 - ~~(iii) inter allotment stormwater system(s);~~
 - ~~(iv) water harvesting system(s); and~~
 - ~~(v) rehabilitated or constructed natural channel(s); and~~~~
 - ~~(b) any changes that were made to the design during the construction process (i.e. size of facilities, materials used, additions to or elimination of facilities); and any variation between the original plans and specifications and the final installed facilities.~~

SC6.14.3.10 Guidelines

For the purpose of achieving compliance with this section of the planning scheme policy, the following are relevant guidelines:-

- ~~(a) Queensland Urban Drainage Manual (QUDM) Vol. 1 Second Edition (2007);~~
- ~~(b) Road - Drainage Manual (Queensland Department of Transport and Main Roads, 2010);~~
- ~~(c) Australian Rainfall and Run-off (ARR);~~
- ~~(d) ADAC - Asset Design & As Constructed;~~
- ~~(e) Aus-Spec Specifications;~~
- ~~(f) Institute of Public Works Engineering Australia (IPWEA) Standard Drawings;~~
- ~~(g) Institute of Municipal Engineering Australia Queensland (IMEAQ) Standard Drawings;~~
- ~~(h) Brisbane City Council Guidelines:-
 - ~~(i) Natural Channel Design Guidelines; and~~
 - ~~(i) Stormwater Outlets in Parks and Waterways;~~~~
- ~~(i) South East Queensland Healthy Waterways Partnership Publications, including:-
 - ~~(i) Concept Design Guidelines for Water Sensitive Urban Design;~~
 - ~~(i) MUSIC Modeling Guidelines;~~
 - ~~(i) Water Sensitive Urban Design Technical Design Guidelines for South East Queensland;~~
 - ~~and~~
 - ~~(i) WSUD Deemed to Comply Solutions for South East Queensland.~~~~

~~Note - relevant guideline documents in existence or available over the life time of this planning scheme policy should be referenced and used where appropriate. The above list is not exhaustive and the use of locally based guidelines by a recognised authority or agency would take preference to those developed regionally or nationally.~~

SC6.14.3 Stormwater Management

SC6.14.3.1 Purpose

The purpose of this section of the **Planning scheme policy for development works** is to:-

- (a) provide advice and guidance on the policy and standards required in relation to the provision of stormwater infrastructure for new development; and
- (b) ensure stormwater infrastructure design and construction satisfies Council's requirements and environmental and safety expectations.

SC6.14.3.2 Application

- (1) This section of the planning scheme policy applies to assessable development which requires assessment against the **Stormwater management code** and the **Works, services and infrastructure code**.
- (2) This section is structured as follows:-
 - (a) Sections **SC6.14.3.1** and **SC6.14.3.2** provide the framework;
 - (b) Sections **SC6.14.3.3** to **SC6.14.3.8** provides the requirements and procedures for achieving the outcomes of the **Stormwater management code** and the **Works, services and infrastructure code** and to achieve the purpose of this section of the planning scheme policy; and
 - (c) Section **SC6.15.3.9** contains guidelines for achieving compliance with this section of the planning scheme policy.

SC6.14.3.3 Design requirements – stormwater drainage systems

General

- (1) The design of urban stormwater drainage systems is to be in accordance with the following guidelines with this order defining the precedence of any one document over another:-
 - (a) *Flooding and Stormwater Management Guidelines*, Sunshine Coast Council, 2020;
 - (b) QUDM;
 - (c) *Water Sensitive Urban Design Technical Design Guidelines prepared by Water by Design*; and
 - (d) *Australian Rainfall and Runoff (ARR)*.
- (2) The design of rural stormwater drainage systems is to be in accordance with the following guidelines with this order defining the precedence of any one document over another:-
 - (a) *DTMR – Road Drainage Manual*; and
 - (b) *Australian Rainfall and Runoff (ARR)*.
- (3) Drainage structures are to be in accordance with the IPWEAQ Standard Drawings.
- (4) The QUDM landuse category corresponding to each urban planning scheme zone is to be in accordance with **Table SC6.14.3A (QUDM development categories by urban zone)**. The hydrologic methods for peak flow estimation are to be based on the methods specified in Council's *Flooding and Stormwater Management Guidelines* in preference to the methods specified in QUDM. The AEP for the minor and major event as well as the C₁₀ value for each category is to also be in accordance with this Table. The AEP event is to include projected climate change effects at 2100. These values are representative of the ultimate development potential of a zoning and should be adopted for drainage design. For estimates of peak flows for pre-development/existing conditions, fi values are to be based on GIS analysis of existing site conditions.

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Table SC6.14.3A QUDM development categories by urban zone

Planning Scheme Zone	QUDM Development Category	C ₁₀	f _i	Minor Event AEP ¹	Major Event AEP ¹
Principal centre zone Major centre zone District centre zone Local centre zone	Central business and commercial	0.90	1.00	10%	1%
Low impact industry zone Medium impact industry zone High impact industry zone Waterfront and marine industry zone	Industrial	0.89	0.90	39%	1%
NA	Significant paved areas e.g. roads and carparks	0.89	0.90	NA	NA
Medium density residential zone High density residential zone Tourist accommodation zone	Urban residential - High density	0.89	0.90	10%	1%
Low density residential zone ¹ Emerging community zone ¹	Urban residential - Low density	0.88	0.80	39%	1%
Rural zone Rural residential zone ² Limited development (landscape residential) zone ²	Rural or Rural residential	0.86	0.60	39%	1%
Open space zone Environmental management and conservation zone	Open space and parks, etc.	0.80	0.00	63%	1%
Sport and recreation zone Specialised centre zone Tourism zone Community facilities zone	Appropriate criteria for development in these zones will depend on the details of the proposal and will be subject to site-specific assessment				
Minor road <3000 AADT ³	Kerb and channel flow – refer development category (minor event AEP) Cross drainage – 10%AEP				
Major road >3000 AADT ³	Kerb and channel flow – 10%AEP Cross drainage – 2%AEP				

Notes –

1. If development within the Low density residential zone or Emerging community zone is denser than 20 dwellings per hectare then development is treated as QUDM development category Urban residential – High density
 2. C₁₀ and f_i parameters for the Rural residential zone and the Limited development (landscape residential) zone are applicable to the area of the lot which can be built on (i.e. excludes areas outside of approved building envelopes, vegetation covenant and drainage easements)
 3. The design criteria apply to longitudinal drainage and cross-road drainage standards for local catchment flows only. For immunity standards for regional flooding refer to the **Flood hazard overlay code**. Higher standards for both regional and local catchment flood immunity may apply
 4. The AEP is to include projected climate change effects at 2100
- (5) Roofwater and allotment surface stormwater runoff (where relevant) within each lot is to be piped for the minor design storm and is to comply with *AS/NZS 3500.3 Plumbing and drainage Stormwater drainage* and QUDM.

Hydrological requirements

- (6) Hydrologic estimates are to be undertaken in accordance with QUDM and ARR except as varied below:-
- (a) rainfall intensities are to be obtained for the specific location being analysed and are to be in accordance with the recommendations of the Bureau of Meteorology (BoM) and ARR;
 - (b) a 20% increase in rainfall intensities above those supplied by BoM is to be applied in order to account for the effects of Climate Change; and
 - (c) methods as specified in the *Flooding and Stormwater Management Guidelines* released by Council.

Hydraulic requirements

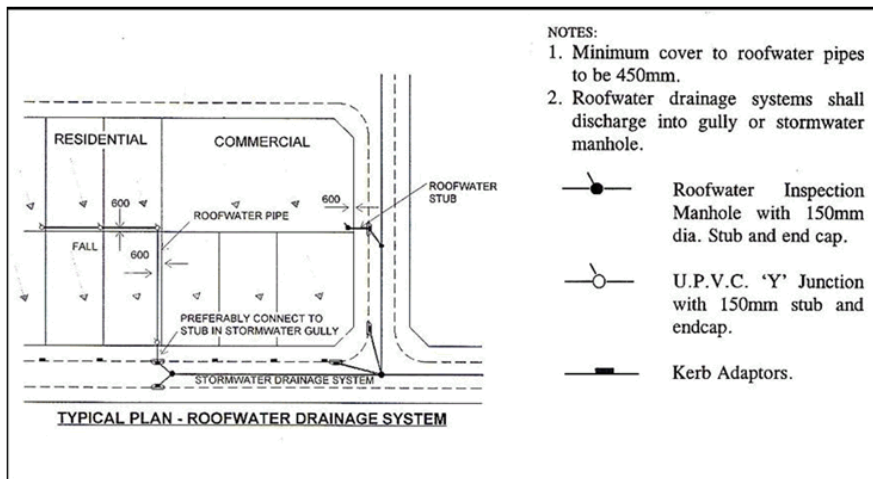
(7) Hydraulic estimates of the drainage network are to be undertaken in accordance with QUDM and ARR except as varied below:-

- (a) a 800mm increase is to be applied to tailwater levels where discharges are to a tidal waterway in order to account for the effects of Climate Change; and
- (b) hydraulic modelling of the major event is to be undertaken in sufficient detail to enable accurate levels to be provided to Council for the purposes of providing Flood Search results to future residents. This will generally imply 2-Dimensional modelling though simpler approaches may be acceptable on a case-by-case basis. This information is to be provided to Council as part of the lot table requirements of the flood hazard assessment and is to be certified by an RPEQ engineer. Refer to the **Planning scheme policy for the flood hazard overlay code**. Further guidance on lot table preparation is provided in the *Flooding and Stormwater Management Guidelines*.

Inter-allotment drainage and connections to existing Council system

(8) Inter-allotment stormwater systems or roofwater stormwater systems that take more than one allotment do not discharge to kerb and channel. The inter-allotment stormwater systems or roofwater stormwater systems are to be connected to a Council gully pit, field inlet or manhole to the satisfaction of Council. Refer to **Figure SC6.14.3A (Inter-allotment stormwater locations)**. Inspection pits or field inlets (constructed at the low point of each allotment) are to be provided at regular intervals along the roofwater stormwater system and shall be in accordance with IPWEAQ Standard Drawing DS-0110.

Figure SC6.14.3A Inter-allotment stormwater locations



(9) A connection point at the lowest point is to be provided for each property. This connection point is to be a minimum of 90mm in diameter for Urban residential - Low density, 150mm for Urban residential - High density and 225mm for commercial or industrial development as defined in QUDM.

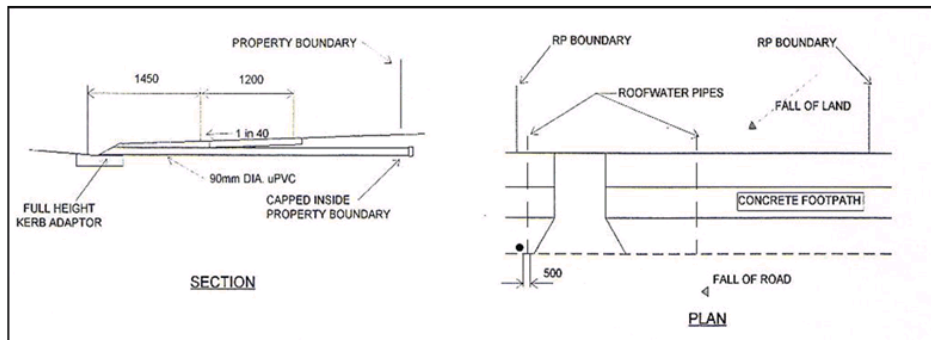
(10) To reduce sudden increases in roadway flow widths, stormwater runoff discharges in excess of 50 litres per second for the 5% AEP storm event are to be piped to a Council stormwater drainage system (i.e. gully (catchpit), access chamber, etc.) and not to the kerb and channel.

(11) Where there is a requirement for the stormwater management system to connect to an existing Council asset, the connection is to:-

- (a) not cause structural damage to or failure of the existing asset;
- (b) be appropriately sealed; and
- (c) not interfere with or reduce the intended purpose of the existing asset.

- (12) For connecting pipes into enclosed stormwater networks, connections are to be made only to gully pits, manholes and field inlets. The connection is to be core-drilled and sealed with a two-part epoxy sealant.
- (13) For the Urban residential - Low density development category, the following applies:-
- (a) for allotments which do not fall towards the road reserve are to be provided with a rear of allotment roofwater and stormwater system in accordance with QUDM. A minimum Level 3 is required for all residential development (except rural and rural residential). This drainage system will be required regardless of the downhill property type; and
- (b) for allotments which do fall towards the road reserve, two kerb adaptors are to be provided and are to conform to IPWEAQ Standard Drawing R-0081. Refer to **Figure SC6.14.3B (Residential outfalls towards the road)**. One should be located at the centre of the block and the other 500mm from the common boundary on the low side. Where a concrete footpath is to be constructed a 90mm diameter UPVC pipe is to extend from the adaptor to the property boundary in accordance with Council's Standard Engineering Drawings.

Figure SC6.14.3B Residential outfalls towards the road



- (14) For the Urban residential - High density, central business, commercial and industrial development categories, the following applies:-
- (a) when creating lots by subdivision for future development into the above uses, temporary inter-allotment drainage consisting of a field inlet and swale drains on the low side of the lot are to be provided so that excessive surface flows do not traverse the verge or flow to neighbouring properties. The field inlet is to connect to an underground point of connection to the trunk stormwater system which is sized for the future development category of the lot;
- (b) the point of connection for each lot is to be provided generally at the lowest point and is to be piped and connect to the trunk drainage system at a manhole or gully. A stub is to be provided in new stormwater networks for this purpose, located 600mm within the front property boundary and 1.2m off the side boundary for lots which fall towards the street. Refer to **Figure SC6.14.3A (Inter-allotment stormwater locations)**;
- (c) when developed into the ultimate landuse, these lots are to be provided with underground drainage for surface and roofwater corresponding to QUDM inter-allotment drainage category IV or V, dependent on scale. The inter-allotment drainage system is to connect directly to public land and/or infrastructure – the use of level spreaders and/or infiltration devices in lieu of a direct connection is not permitted; and
- (d) the use of pumped drainage systems will not be accepted due to the risk and consequences of failure and the on-going maintenance required for the system to function.
- (15) For the Rural or Rural residential development category, the following applies:-

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- (a) for land in the Rural zone or Rural residential zone, stormwater runoff from the road reserve may be discharged directly onto the subject subdivision should it be impossible to direct stormwater to a watercourse;
- (b) a stormwater reserve or easement will be required over the stormwater outlet from the road reserve. A property note informing property owners that stormwater discharge will occur during rainfall and that the amenity of their allotment could be reduced, may be applied;
- (c) for Rural residential subdivisions, an inter-allotment drainage system is to be provided in order to protect the building envelopes of down-slope lots from runoff generated from upslope lot or external catchments. The drainage system is to consist of swale drains located in the upslope lot (where possible). The drains are to be sized to convey the 1%AEP CC event and are to be contained in a drainage easement where they flow through any private land other than the land in which the runoff is generated; and
- (d) access to rural residential and rural building sites is to be flood free during a 39% AEP event and is to ensure that a low hazard criteria is met in the DFE. The safety of the site can be determined by the following equation: Low Hazard: $D + 0.3V \leq 0.8$ where D = depth of floodwater and is to be less than 0.8metre and V = velocity of floodwaters and less than 2m/sec.

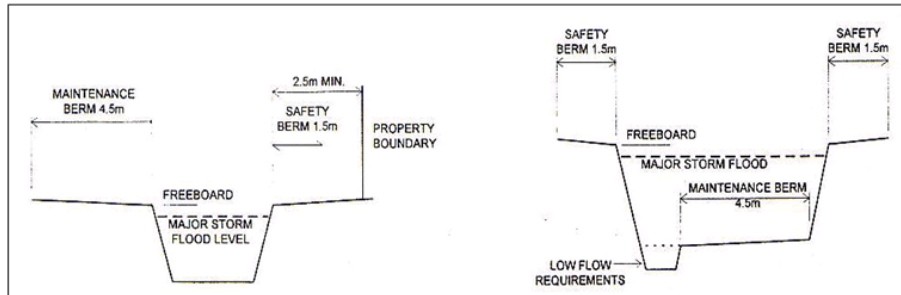
Open Channels

- (16) Existing waterways and buffer widths are to be retained and rehabilitated in accordance with the requirements of the **Biodiversity, waterways and wetlands overlay code**. The extent of flooding and immunity of development adjacent to waterways is to be in accordance with the requirements of the **Flood hazard overlay code** and the **Planning scheme policy for the flood hazard overlay code**.
- (17) Any works within receiving waters, including natural channel design, are not to be counted as a treatment device in any stormwater treatment train models due to uncertainty relating to efficacy and the time required to achieve design performance.
- (18) The design and construction of new open channels is to follow natural channel design principles and are to be in accordance with the *Brisbane City Council (BCC) Natural Channel Design Guidelines* and QUDM, with particular attention to the structural design requirements. Specific aspects to be addressed include:-
 - (a) channels are to be provided as either QUDM Type C4, C5, C6 or C7 densely vegetated channels. The choice of channel type is to be based on contributing catchment area in accordance with Table 9.2.1 of QUDM;
 - (b) use of rock or concrete in the base on the channel is to be avoided except where necessary to address channel stability and scour. Appropriate lining of the channel base is to be provided dependent on estimated velocities during establishment, with the preferred lining being either mulch covered by biodegradable netting or bio-degradable matting. Where rock is required due to expected velocities then rock is to be hand placed (not dumped) and plantings with suitable native species, so as not to impact on design flow rates, are to be implemented between the rock voids (pocket planting) such that a fully vegetated channel will establish;
 - (c) suitable native vegetation are to be incorporated into the channel and riparian batters to create fully closed ground cover;
 - (d) pool and riffle systems are to be included where fish passage requirements are to be met. Channels are to all be free draining with preferred minimum longitudinal grade of 0.5%. The exception is for channels with catchment area >30ha which are to be provided with formal in-line sediment basins which are to be designed to prevent resuspension of sediment during the major event and which are provided with concrete invert and concrete maintenance access;
 - (e) hydraulic capacity should be designed based on a minimum Manning's roughness value of 0.15 although greater values may be directed by Council where deemed appropriate. A sensitivity analysis should always be undertaken for a Manning's n 50% higher than design roughness to ensure the freeboard is not exceeded and for a Manning's n 50% lower than design roughness to ensure scour thresholds are not exceeded and hydraulic jumps do not occur; and

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- (f) safety and maintenance berms are to be included. Refer to Figure SC6.14.3C (Berms). Maintenance berms are to incorporate a maintenance access track which is concrete and a minimum width of 2.5 metres and the top of bank should be a minimum of 2.5 metres from any private property.

Figure SC6.14.3C Berms



- (19) Open channels are to be designed to cater for the major design storm event and are to include freeboard provisions in accordance with QUDM. Open channels through parkland or open space areas may be designed to cater for 5% AEP CC flows. The associated overbank flow areas, which cater for the difference between 1% AEP CC and 5% AEP CC flows are to be designed to ensure low velocities occur during flood, while enhancing amenity values during non-flood periods and may be eligible to be considered as creditable open space.
- (20) An extended maintenance period may be required until the channel has sufficiently stabilised and vegetative cover (including canopy) is well established. Performance bonds linked to specific design outcomes may be required for this purpose.

Overland flow paths

- (21) Overland flow paths are to be designed in accordance with QUDM to accommodate the 1%AEP flow and to address the following additional requirements:-
- (a) overland flow paths are preferably to be located in road reserves, parks, pathways or other Council controlled land. Overland flow paths created as a result of new development should not traverse private property;
 - (b) overland flow paths are shaped so that the 1% AEP CC storm flow is fully contained within the flow path, reserve or easement with a minimum 100mm freeboard to adjoining lots and 300mm freeboard to adjacent floor levels in accordance with QUDM;
 - (c) particular attention is to be paid to the preservation of existing overland flow paths, the obstruction of which may cause flooding or ponding of stormwater on adjoining properties;
 - (d) details and calculations are required for all overland flow paths. Calculations are to demonstrate that overland flow will not enter lots during a 1% AEP flow and that freeboard is achieved during this event. Stormwater calculations, cross sections and plan layouts are to be provided for any proposed overland flow path. The applicant is required to ensure that as-constructed levels are consistent with those shown on the approved engineering drawings;
 - (e) for developments (particularly in-fill) which would result in no overland flowpaths being available, particular attention is to be given to the preparation of the Severe Storm Impact Statement. In such situations assessment of the consequences of events up to PMF is to be undertaken and consideration should be given to providing underground drainage to PMF capacity, dependent on the impacts; and
 - (f) for developments other than noted in (e), the Severe Storm Impact Statement is to be completed to demonstrate that the concept landform and associated structures do not introduce new hazards off-site or unforeseen hazards on-site for events greater than the DFE. The *Flooding and Stormwater Management Guidelines* contain detailed guidance on undertaking severe storm assessments.

Public safety

- (22) The enclosed stormwater network (including manholes, GPTs, gully manholes and other enclosed structures) is to be designed in accordance with AS 2865 Confined Spaces and particular attention is required in regard to Section 7 of AS 2865.
- (23) Detailed safety requirements for all ponded water bodies proposed for areas of public open space are as follows:-
- (a) side slopes are to be no steeper than 1.6 (H:V), with recommended slopes of 1.8 (H:V);
 - (b) water's edge is to be offset at least 15 metres from allotment boundaries or roadways except where safety fencing is provided;
 - (c) interim fencing is required between the construction and establishment of vegetation within the water body (typically during the on-maintenance period) where any part of the water body is deeper than 350mm; and
 - (d) areas are to be fenced and gated in any areas where the above safety requirements are not met (e.g. in maintenance access areas).
- (24) Urban waterways and stormwater drainage systems can represent a significant safety risk during storms and times of flood. The design of urban waterways and stormwater drainage systems that require safety fencing is strongly discouraged and should only be used if it is impractical or unfeasible to design the system such that it does not represent an unacceptable risk. Risks associated with urban waterways and stormwater drainage systems shall be managed in accordance with QUDM. Potential for blockage and the implications for hydraulic design performance are also to be considered when contemplating such fences.
- Stormwater network layout
- (25) The stormwater network layout is to be generally in accordance with QUDM. However, pipe work within the verge is generally not permitted.
- (26) Alignments may vary depending on the location of sewer mains and pits but are to be generally located as follows:-
- (a) rear boundary within 2.5 metres; and
 - (b) side boundary within 1.2 metres.
- (27) Manhole covers within road carriage ways are to be located to reduce potential noise created by covers that are driven over.
- (28) Gully to gully drain lines are acceptable for pipes 600 mm diameter or less provided that the design complies with all the following:-
- (a) gullies are consistent with Council's Standard Engineering Drawings;
 - (b) acute angles in connecting pipes are avoided to minimise head losses;
 - (c) potential interference with other utility services on the footpath is avoided;
 - (d) the major stormwater line (spine) of the gully to gully system is constructed on one side of the road only. Any gullies on the opposite side of the road are to be connected directly across the road. Under no circumstances are spines of gully to gully systems permitted on both sides of the road; and
 - (e) the gully pit is appropriately benched.
- (29) Gully manholes are not considered to be appropriate and are not a preferred solution. However, there are rare instances that gully manholes are necessary. Accordingly, gully manholes may be approved provided that compliance with all of the following is achieved:-
- (a) the inlet and manhole is at the same point (e.g. at the sag of the road);
 - (b) it is the only alternative to a multi-grated inlet;

- (c) written advice from the responsible utility authority is submitted stating that the existing services will preclude the construction of the conventional herringbone layout without substantial utility service relocation costs;
- (d) Council's standard components such as lintels and grates are to be used wherever possible;
- (e) hydraulic analysis and structural testing data are to accompany the design if it is proposed to use alternative components;
- (f) the gully manholes are not to pose a public safety risk; and
- (g) the gully manhole complies with the requirements as detailed in this section.

Pipes

- (30) Pipes within the stormwater conveyance system shall have a minimum diameter of 375mm including anti-ponding gullies.
- (31) Pipes of 300mm are acceptable for driveway or road culverts providing that if the capacity is exceeded there is no risk or worsening to other assets.
- (32) While Council will approve the use of any structurally sound pipe, fibre reinforced cement (FRC) pipes will not be accepted under any circumstances. Prior approval is to be sought for the use of any pipe other than a steel reinforced concrete pipe (RCP). Saltwater cover RCPs are to be used in locations where the stormwater network may be subject to tidal wetting and drying. This requirement should also consider whether sea level rise within the design life of the pipe is likely to affect the pipe.
- (33) Rubber ring joint pipes are to be used for all pipes. Prior approval is to be sought for the use of external band joint pipes. Butt joint pipes are not permitted.
- (34) Service and construction loadings are to be calculated in accordance with AS 3725 *Design for installation of buried concrete pipes*. In many cases, construction loading will be the critical load case for selection of pipe class. AS 4058 *Precast Concrete Pipes (Pressure and Non-Pressure)* is to apply for testing requirements or where standard steel reinforced concrete pipes may be exposed to aggressive conditions.
- (35) To counteract premature pipe cracking, the following is required:-
 - (a) the design and selection of the pipe type and class is to consider construction loading (based upon the calculations described above), which is usually the critical load case for pipes < 900mm diameter;
 - (b) stormwater plans issued for construction are required to indicate for each drain line the following:-
 - (i) pipe type and class;
 - (ii) installation type; and
 - (iii) construction method (layer thickness, compaction plant);
 - (c) design aids available from concrete pipe manufacturers may be used and are recommended. These include software for calculation of loads on pipes to AS 3725 *Design for installation of buried concrete pipes* (tables and charts). It is recommended that charts showing the relationship between compaction equipment and pipe class are also included with the engineering drawings;
 - (d) no more than two weeks before the on-maintenance inspection and prior to the formal acceptance of on-maintenance, closed circuit television (CCTV) inspection is required to demonstrate that the standard of the stormwater network is acceptable to Council. CCTV inspections can be arranged through suitably qualified service providers. Any defects identified by the inspection are to be repaired or replaced or as directed by Council. A follow up camera survey is required to demonstrate that the remediation measures are satisfactory. The CCTV pipe surveys are required to conform to Council's standard inspection and reporting protocols; and
 - (e) cracked pipes shall be rejected. Hairline or crazing cracks associated with concrete shrinkage are permitted.

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Box culverts

- (36) Box culverts may be used where low vertical clearances exist or as approved. However, circular sections are to be used in enclosed stormwater networks wherever possible.
- (37) Box sections are to be constructed from precast reinforced concrete box culvert sections.
- (38) The minimum dimension of a box culvert is to be 375mm.

Manholes

- (39) Manholes are to be designed and constructed in accordance with Standard Engineering Drawings from IPWEAQ or DTMR or equivalent. Any manholes required outside these standards are to be structurally certified by a RPEQ engineer.
- (40) Benching is not recommended. However, deflection devices may be used if improved hydraulic efficiency is required.
- (41) Manholes are to be avoided in road pavements and trafficable areas wherever possible. Typically stormwater drainage systems are to be designed from gully pit to gully pit.
- (42) Precast manholes are acceptable.
- (43) The spacing of manholes is to be in accordance with QUDM.
- (44) Where stormwater manholes are located in major stormwater event flow paths or where the design hydraulic grade line is above the top of the manhole, bolt down manhole covers are required.

Gully pits and catch pits

- (45) Council will permit the following types of gullies or catchpits (or alternative brands that meet the same specifications):-
- (a) IPWEAQ Gully with cast iron bicycle-safe grate roadway type, lip in line (Refer IPWEAQ Standard Drawing DS-0063); and
- (b) inlets are to be provided with Max Q bicycle-safe grates only. Fluted grates and concrete filled covers will not be permitted.
- (46) Inlet capacity charts for IPWEAQ are available in QUDM. Designers are to use these charts and the appropriate provisions for blockage as set out in QUDM.
- (47) All gullies or catchpits are to be designed so as to be Lip-in-line (Refer IPWEAQ Standard Drawings DS-0063 and DS-0067).
- (48) Allowable flow widths and capacity are as follows:-
- (a) multilane roads (with more than one lane travelling in one direction) and intersections on State controlled roads and side streets connecting to State controlled roads (up to the end of the auxiliary lanes or tapers leading onto the state-controlled road) – refer to Section 11.2.2 of the DTMR - Road Drainage Manual 2019; and
- (b) sub-arterial roads, trunk collector roads, collector streets, access streets, and all other intersections apart from those noted in (a) - refer to QUDM.
- (49) None of the requirements outlined in this section reduces the depth requirements stipulated elsewhere in these guides.
- (50) On rural roads the design flows or ponding in the table drain is not to encroach upon the shoulder for the longitudinal or cross drainage.

Field inlets and pipe outlets

- (51) For inlets within or outlets to an overland flow path, the design is to generally be in accordance with IPWEAQ Standard Drawing DS-0080. Maintenance and amenity factors are also to be considered.
- (52) Field inlets are to comply with the following:-

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- (a) IPWEAQ Field Inlet Type 1 and 2 (Refer Standard Drawing DS-0050) or alternatives that meet the same specifications; and
 - (b) field inlets (and surcharge pits) are to be designed and constructed in accordance with the above mentioned standard drawing or DTMR equivalent.
- (53) Pipe outlets are to comply with the following:-
- (a) energy dissipaters will generally be required at all outlets to reduce velocity to acceptable levels. Refer to QUDM for permissible velocities;
 - (b) drowned outlets are not to be used without prior approval, except where enclosed drains outlet to a canal. All drowned outlets are to be marked at the outlet end for marine safety and maintenance;
 - (c) for inlet headwalls where the pipe invert is located below the natural channel invert such that a standard field inlet is not warranted (e.g. the drop is less than the pipe diameter), a masonry "inverted curtain wall" is to be constructed across the headwall apron in preference to stone pitching outside the headwall; and
 - (d) BCC Stormwater Outlets in Parks and Waterways for design of drop structures and stormwater outlets.

Structural design

- (54) Designers are referred to QUDM for the structural design of the enclosed stormwater network. Further information on pipe, RCBC bedding and backfilling can be gained from IPWEAQ Standard Drawings or DTMR equivalent.

SC6.14.3.4 Design requirements – discharge rights and land tenure

Provision of reserves and easements within development sites

- (1) Stormwater reserve or where appropriate park or road reserve will generally be required over all stormwater flow paths and their verges within a development site, unless specially approved in the following circumstances:-
- (a) development of rural size lots;
 - (b) development of rural residential size lots where:-
 - (i) the catchment is smaller than 5 hectares;
 - (ii) the flow path does not adjoin a park area; and
 - (iii) blockage of the flow path will not cause flooding of adjoining lots; and
 - (c) development of urban land where:-
 - (i) Council-controlled land (current or future) does not drain into the flow path;
 - (ii) the catchment is smaller than one hectare; and
 - (iii) blockage of the flow path will not cause flooding of adjoining lots;
 - (d) concentrated surface flows and/or stormwater infrastructure not required to be in stormwater reserve shall be contained within stormwater easement with widths in accordance with QUDM
- (2) Stormwater reserve or where appropriate park or road reserve will be required over all areas containing detention basins, GPTs and other stormwater quality improvement devices, and verges required to adequately serve or maintain these devices. The reserve will not be less than 5 metres wide.

Provision of discharge rights for external up-slope catchments

- (3) Formal discharge rights are to be provided to accommodate all roof and surface water runoff originating from the external up-slope catchment flowing through the development site or diverted by the development. Either drainage reserve or drainage easement is to be provided through the development site according to the land use, catchment area and other considerations as specified under sub-section (1).

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(4) Where stormwater runoff from adjacent or upstream properties enters the proposed development site, a stormwater network is to be provided within the new works to accommodate such flows. The stormwater network is to ensure that no stormwater ponding occurs on any adjacent or upstream properties.

(5) The stormwater network is to be designed to accommodate a fully developed upstream catchment. The stormwater network is to also be designed so that it can be constructed up to the development site's boundaries and extended in the future to accommodate future development without disturbing existing or recently proposed development.

Discharge rights required through downstream private land

(6) Where development proposes to discharge through adjacent or downstream private property, easements are required over all associated stormwater networks (natural and constructed), which traverse the private property. Easement widths are to be in accordance with QUDM. All costs associated with the provision of an easement are to be borne by the applicant. An easement may only be considered to be unnecessary in rare circumstances where the applicant can demonstrate that there are no lawful works a downstream owner could undertake to block the drainage feature (infrastructure, gully, watercourse) or that the consequences of a lawful blockage are negligible. The *Flooding and Stormwater Management Guidelines* provided further detail on the implementation of this policy.

(7) An applicant proposing to discharge stormwater runoff from a proposed development site onto any adjoining and/or downstream property, is to provide Council with a legally binding document granting consent to a future easement from all property owners through which this runoff may flow. That agreement shall be legally registered so as to be binding against the property, and not only the current owner. In addition, the land subject to the proposed easement is to form part of the development application. The easement is to be registered prior to Council approving any development application for operational works for the development. Easements widths across affected properties are to be in accordance with the QUDM.

Easements generally

(8) No three dimensional or volumetric drainage easements will be permitted.

(9) All drainage easements shall be registered prior to Operational Works approval being granted by Council.

(10) The building of structures over or upon easements is not generally in the interest of the party that is vested in the easement. Accordingly, development applications that involve a proposal to build over or upon easements are required to obtain prior written permission from the Stormwater Asset Custodian, and demonstrate that:-

(a) the proposal does not conflict with the terms of the easement agreement;

(b) the proposed structure or the construction of the proposed structure does not increase loadings on the underground infrastructure assets;

(c) the stormwater network through the easement does not include an overland flowpath or an open channel;

(d) the proposed structure does not restrict (or prevent) access of maintenance staff and plant; and

(e) fencing allows free passage of flow (with appropriate allowance made for blockage in the hydraulic design).

Vestment

(11) Vestment of all reserves and easements to Council shall only occur after written consent is obtained from the relevant stormwater asset custodian and land custodians within Council and include all stormwater networks structures and/or facilities which are or will be the responsibility of Council to preserve and maintain.

(12) Roofwater/inter-allotment stormwater systems and associated cut off/swale drains are considered as private drains and future maintenance responsibility will vest with the property owners. An easement in favour of Council will be required over these stormwater systems.

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Easement dimensions

- (13) Easements to be registered in favour of Council are to comply with QUDM and have a minimum width of 4 metres except where the easement is for inter-allotment stormwater systems.
- (14) Easements over inter-allotment stormwater systems are to be minimum width of 2.0m for pipes up to 300mm in diameter. All pipes 300mm in diameter or larger are to be covered by easement widths in accordance with QUDM.
- (15) Existing easements in favour of Council, will only be extinguished where the need for the stormwater network through the land not in Council control is determined to be no longer warranted. All costs associated with the surrendering of an easement are to be borne by the applicant. In some cases, Council may require compensation for the loss of the rights under the easement.

Overland flow easements

- (16) Overland flow easements allow for the passage of stormwater runoff or redirection of flow across the natural land surface. These easements prohibit any activities or works which may obstruct or impede the flow of stormwater runoff unless prior approval is provided. Designs of overland flow path are to take into account future fencing that may be constructed across the easement. Overland flow easements shall be in favour of Council and are to comply with the following:-
- (a) any fences to be constructed across easements or along the easement boundary are to provide sufficient access for Council's maintenance or future construction by either the provision of gates or removable sections that are wide enough to allow access;
- (b) fencing is to allow free passage of flow (with appropriate allowance made for blockage in the hydraulic design); and
- (c) survey levels provided on the design plans are to form the basis of the levels required for the overland flow. Survey levels are acceptable on the registered plan of subdivision and provided to AHD.

Access easements

- (17) Access easements permit Council to have access from the nearest surveyed road to any stormwater easements, in order to carry out maintenance and/or construction activities or works. This will normally be a requirement of all other stormwater-related easements in favour of Council. Access easements are to comply with the following:-
- (a) in order for stormwater management facilities to function at their designated level of service, most will require some level of periodic inspection, maintenance works, cleaning or repairs. Therefore, consideration is to be given to the maintenance of the stormwater system and stormwater quality management facilities during the design process; and
- (b) reasonable access for both personnel and equipment is one of the most critical design considerations of both the enclosed and open stormwater networks. Any proposed landscaping is to be designed in conjunction with access requirements.

Maintenance

- (18) Maintenance of stormwater reserves and easements are to comply with the following:-
- (b) stormwater easements are to be covered by a binding agreement between Council and the landholder;
- (c) trees and understorey vegetation are not to be planted on stormwater easements/reserves without the prior written consent of Council;
- (d) native vegetation is to be retained on the easement/reserve;
- (e) environmental weeds and invasive plants are to be treated and/or removed from any reserve or easement as obligated under the Biosecurity Act 2014;
- (f) drain surfaces (betters and base) are constructed to a standard that ensures effective machine access and operation for maintenance;

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- (g) no structures, excavation, filling, or stormwater works are to be commenced on an easement or reserve without the prior written consent of Council; and
- (h) maintenance (including costs) of all stormwater quality management facilities is an important consideration and a detailed management plan or maintenance strategy is to be produced for each facility and submitted to Council for review prior to development approval for operational works.

SC6.14.3.5 Design requirements – impact mitigation and actionable nuisance

- (1) Development is required to not cause unacceptable impacts to infrastructure or property external to the development site. Combined with the issues specified in SC16.14.3.3, these considerations can be considered to cover the range of issues known traditionally as 'lawful point of discharge' as used in the acceptable outcomes of the Stormwater management code.
- (2) Applicants are required to consider the impacts associated with the physical changes of discharge characteristics resulting from the development and whether the consequences of these impacts constitute an actionable nuisance. The consequences will be specific to both the nature of the development and the physical characteristics of the downstream land and drainage system. Where the change in discharge characteristics results in damage to the downstream property or affects the downstream owners established use or ongoing enjoyment of their land then an actionable nuisance has occurred. This consequence of development is unacceptable and mitigation options are required to be implemented.
- (3) Where a physical change in discharge characteristics is predicted to occur as a result of development and a reduction in the performance of the trunk drainage network or other public infrastructure has the potential to result, then options to mitigate the impact are also required to be implemented.

Detention basins and peak flow management

- (4) Changes in peak flow are only one aspect of discharge characteristics which can be altered by development but can have significant impacts on the extent and duration of flooding on downstream land and infrastructure.
- (5) QUDM identifies that, in the absence of total catchment management planning, the objective of flood control detention systems is the protection of land and control of peak discharges immediately downstream of the development/basin to match pre-development discharge in peak and timing. In some instances, this may be informed by a Council Master Drainage Study. Where available, Council Master Drainage Study requirements take precedence over site based assessments of flood detention.
- (6) The performance requirements for stormwater detention systems are therefore to either:-
 - (a) deliver the infrastructure required by a Council Master Drainage Study; or
 - (b) demonstrate no increase in the post-development peak 39%, 18%, 10%, 5%, 1% AEP, 1% AEP CC event discharge immediately downstream of the development compared to pre-development, for all storm durations up to and including a duration that is 2x the pre development critical duration or 3-hour duration, whichever is the greater; and
 - (c) demonstrate no increase in the frequency, duration or levels of flooding on land adjoining the development site or basin. Refer to Table SC6.14.3B (Triggers for application of peak flow management objective).

Table SC6.14.3B Triggers for application of peak flow management objectives

Situation	Application of peak flow management objective
<p><u>Runoff discharges directly to a watercourse (defined under the <i>Water Act 2000</i>) or tidal waters (defined under the <i>Coastal Protection and Management Act 1995</i>¹) and either:</u></p> <ul style="list-style-type: none"> a) <u>The site is in the lower third of the waterway catchment; or</u> b) <u>Peak site discharge in the 1%AEP event represents less than 1% of the peak discharge in the receiving waterway in the</u> 	<p><u>Exempt</u></p>

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Situation	Application of peak flow management objective
39%AEP event, or c) <u>Development site area <1% of the catchment area of receiving waterway at the point of discharge.</u>	
<u>The entire downstream major and minor drainage system has been sized to accept unmitigated peak flows from the development within acceptable limits</u>	<u>Exempt</u>
<u>All other development</u>	<u>Apply</u>

Note-

1. Tidal waters under this exemption are to have minimum dimensions of more than 1m depth and cross sectional area 2.5m²

(7) Design of detention basins is to be undertaken using an ensemble storms approach as specified in ARR and detailed in the *Flooding and Stormwater Management Guidelines*. Basins are to incorporate all features specified by QUDM (including freeboard, outlet properties and protection, embankments and safety features) except as noted below:-

(a) low flow provisions are to be catered for. This is to be a minimum of 63% AEP and should be piped or provided with a low-flow channel between the inlet and outlet structure and downstream if necessary. The basin floor is to have a minimum grade of 1v in 150h; and

(b) WSUD features such as bioretention basins or wetlands may be co-located with detention basins in order to minimise the overall footprint of the devices. The extended detention volume associated with the WSUD device is not to be included in the available detention storage calculations.

SC6.14.3.6 Design requirements – open space integration

(1) Integration of stormwater with open space is allowed, however minimum land requirements for open space are to be provided in addition to land for stormwater purposes. Only open space areas which achieve the flood immunity requirements specified in **Table SC14.5.5 (Local park specifications)** for either fluvial flooding or stormwater (i.e. including overland flowpaths, detention basins, vegetated channels or WSUD devices) may be considered for credit towards the LGIP trunk open space network or minimum land required for non-trunk open space (i.e. local recreation park). In practice this means that stormwater infrastructure will require additional area to the trunk and non-trunk open space requirements, even if the stormwater and open space infrastructure is contiguous. The following points (2) to (6) are provided in this context.

(2) The natural stormwater corridor should be retained in land designated for public open space, i.e. park, stormwater or road reserve.

(3) Pipe stormwater networks are generally required through parks incorporating active uses. Care should be taken over the design of surcharge pits and inlet structures, so as to ensure that safety and amenity criteria are satisfied.

(4) The complementary co-location of stormwater with open space (e.g. stormwater networks and park networks) needs to be considered holistically as part of the whole planning process to ensure that the final design avoids fragmentation of open space, minimises level differences and reduces the hazard associated with the stormwater function to eliminate the need for fencing or retaining walls. Council's Open Space Landscape Infrastructure Manual (LIM) provides further guidance on demonstrating effective and complementary co-location of stormwater with open space.

(5) All park embellishments are to achieve flood immunity requirements specified in **Table SC14.5.5 (Local park specifications)** for both fluvial flooding and stormwater overland flow paths.

(6) Land used for the sole purpose of maintaining stormwater assets shall be excluded from creditable trunk and non-trunk open space.

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SC6.14.3.7 Design requirements – hydrology and waterway stability

Waterway stability management

- (1) Development prevents increased channel bed and bank erosion in watercourses by limiting changes in flow rate and flow duration within receiving waters. This will be achieved by matching the post-development peak 63% AEP event discharge within the receiving waterway to the pre-development peak 63% AEP discharge.
- (2) The waterway stability objective is only applicable when runoff from the site passes through or drains to natural channels, non-tidal waterways or wetlands as detailed in **Table SC6.14.3C (Triggers for application of waterway stability management objective).**

Table SC6.14.3C Triggers for application of waterway stability management objective

Situation	Application of Waterway Stability Management Objective
<u>Runoff from or within the site does not pass through or drain to natural channels, non-tidal waterways or wetlands</u>	Exempt
<u>Runoff from or within the site passes through or drains to natural channels, non-tidal waterways or wetlands</u>	Apply if development type is not exempt from application of stormwater quality design objectives

- (3) Compliance with this design objective can be demonstrated using design procedures detailed in the *Flooding and Stormwater Management Guidelines*.

Frequent flow management

- (4) Development protects in-stream ecology by maintaining pre-development low flow discharge regimes.
- (5) The frequent flow management objective is only applicable to non-tidal receiving waterways and when runoff from the site passes through or drains to high ecological value (HEV) receiving waters which have catchments with low (<5%) existing catchment imperviousness.
- (6) In such situations the development is considered to have high likelihood of causing irreversible impact on the receiving environment and development should be avoided. If not avoided, site-specific frequent flow objectives will be required to be derived based on the nature of the receiving environment. Such objectives may be very difficult to achieve without significant stormwater harvesting and reuse schemes.

SC6.14.3.8 Design requirements – stormwater quality

Design objectives for stormwater quality management

- (1) Development protects or enhances the environmental values and water quality of receiving waters or buffer areas within or downstream of the site by achieving the design objectives for stormwater quality management specified in **Table SC6.14.3D (Stormwater quality design objectives – operational (post construction) phase of development)** prior to discharge to receiving waters or buffer areas within or downstream of the site.

Table SC6.14.3D Stormwater quality design objectives – operational (post construction) phase of development

Pollutant	Minimum reductions in mean annual loads from unmitigated development (%)
Total suspended solids (TSS)	80
Total phosphorous (TP)	60
Total nitrogen (TN)	45
Gross pollutants > 5mm	90

- (2) The stormwater quality design objectives are only applicable when required by **Table SC6.14.3E (Triggers for application of stormwater quality design objectives)**. For development where the stormwater quality design objectives are not applicable alternative measures appropriate for the scale of development are outlined.

Table SC6.14.3E Triggers for application of stormwater quality design objectives³

Development type		Application of stormwater quality design objectives	Alternative management measures required
Dual occupancy		Exempt from stormwater quality design objectives	Nil
MCU for purposes other than industrial use (refer QUDM)	Lot size < 2500m ²	Stormwater quality design objectives apply unless alternative management measures are implemented in full	Single harvesting tank for roofwater and reuse to communal landscape (via automated irrigation system), outdoor taps and bin washdown plus ground-level impervious graded to landscaped areas or gully pit baskets
	Lot size ≥ 2500m ² and Fraction impervious <25%	Stormwater quality design objectives apply unless alternative management measures are implemented in full ¹	As for sites < 2500m ² plus: Provide vegetated buffers to waterways and drainage lines
	Lot size ≥ 2500m ² and Fraction impervious >25%	Stormwater quality design objectives apply to the developed portion of the site	
MCU for industrial use	Lot size < 850m ²	Stormwater quality design objectives apply unless alternative management measures are implemented in full	Single harvesting tank for roofwater and reuse to communal landscape (via automated irrigation system), outdoor taps and bin washdown plus ground-level impervious graded to landscaped areas or gully pit baskets
	Lot ≥ size 850m	Stormwater quality design objectives apply to the developed portion of the site ²	
Reconfiguring a lot in all zones other than the rural zone	Reconfiguring involving 6 or more lots that includes a new road	Stormwater quality design objectives apply	
	Reconfiguring involving less than 6 lots or that does not include a new road	Stormwater quality design objectives apply unless alternative management measures are implemented in full	Incorporate swales into site drainage. Protect vegetated buffers to waterways and drainage lines. Ensure adequate maintenance access along buffer boundaries. Grade shared-access and hatchet-lot driveways to swales or landscaped areas.
	Reconfiguration involving proposed lot sizes ≥ 6,000m ²	Stormwater quality design objectives apply unless alternative management measures are implemented in full	Harvesting and reuse of stormwater (rainwater tanks). Provide vegetated buffers to waterways and drainage lines. Ensure adequate maintenance access along buffer boundaries.
Reconfiguring a Lot in the rural zone		Stormwater quality design objectives apply unless alternative management measures are implemented in full	Provide vegetated buffers to waterways and drainage lines. Ensure adequate maintenance access along buffer boundaries.

Notes –

1. Sparse or distributed sites (e.g. cabins spread over a site) are exempt from WSUD targets where the total fraction imperviousness will be less than 25%.
2. For sites between 850m² and 2500m², the WSUD load reduction targets only apply if it is reasonable to extend the existing piping system to the site. The calculation to determine a reasonable extension is: reasonable length of pipe (m) = site area (m²)/50.
3. Compliance methodologies for demonstrating compliance with the stormwater quality design objectives and further details on the required alternative management measures are provided in the *Flooding and Stormwater Management Guidelines*.

Stormwater quality treatment measures – Guiding Principles

- (3) Constructed water bodies including ponds and lakes are not to be used as stormwater quality treatment measures.
- (4) Stormwater quality treatment measures for new development are not to be located in receiving waters, including constructed water bodies.
- (5) Riparian rehabilitation (including riparian buffer planting and bank stabilisation) required to comply with other requirements of the planning scheme may not be counted towards the stormwater quality design objectives.
- (6) Source controls such as education, street sweeping and rubbish bins are not considered as stormwater quality treatment measures. Education relates to prompting a social and cultural shift in the attitudes and practices of the community. It is important to note that these source controls are critical to improving stormwater quality, but they cannot be considered as stormwater quality treatment measures to achieve required stormwater quality design objectives.
- (7) Cleanout or maintenance will need to utilise plant and equipment currently in use by Council. The contributed assets are to be designed and constructed so that they can be maintained and operated without specialised equipment that is not currently available to Council's maintenance operations.
- (8) Detailed life cycle costing is required for the entire treatment train system with particular reference to replacement costs of asset parts such as filter media. Treatment systems dedicated to Council as public assets are to be designed to minimise maintenance, renewal and adaption costs and the requirement for specialised equipment, materials or maintenance techniques.
- (9) Treatment systems that use natural processes and materials shall be used whenever practicable to enhance biodiversity and landscape benefits.
- (10) Treatment systems are to be designed to eliminate or minimise health, safety and aesthetic hazards. Safety is to be addressed in the design of all stormwater quality treatment measures without the need for fencing.
- (11) Where the maintenance will be carried out by a body corporate the maintenance requirements for the stormwater quality treatment system shall be included within the community management statement and budget. The maintenance requirements are to include:-
 - (a) a plan showing the location of the individual components of the system;
 - (b) manufacturer's data and product information sheets for any proprietary devices;
 - (c) location of inspection and monitoring points shown clearly on the plan;
 - (d) a schedule or timetable for the proposed regular inspection, maintenance and monitoring of the devices; and
 - (e) all inspection, maintenance and monitoring requirements fully costed. Where costs exceed those expected for non-proprietary bioretention devices then a maintenance contract may be required by Council prior to endorsement of the community management scheme or commencement of use.
- (12) The *Flooding and Stormwater Management Guidelines* provide guidance which is to be followed on design and implementation on a range of specific stormwater quality treatment measures.

Proprietary and Emerging stormwater quality treatment measures

- (13) Proprietary products are to demonstrate that they provided stormwater treatment in a manner that is complementary to and integrates with the environment in which it is situated.
- (14) Proprietary products are to also demonstrate that they are using natural processes to provide treatment, to the greatest extent possible.
- (15) Proprietary products with specialised componentry will not generally be accepted as donated infrastructure due to issues with maintenance and replacement of parts. The exception is devices aimed solely at capture of gross pollutants. Wherever possible such devices should remain in private ownership, however public gross pollutant capture devices may be appropriate for

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subdivisions involving commercial, industrial or high density residential uses. Low and medium density residential development is typically characterised by low anthropogenic gross pollutants loads and do not require GPTs except where discharging directly to a high amenity waterway such as a constructed lake, beach/foreshore area or Intermittently Closed and Open Lakes and Lagoons (ICOLL).

(16) Media filtration devices which are proposed to remain private infrastructure will not generally be accepted due to the higher whole-of-lifecycle costs, lack of amenity and habitat benefits and lack of security of supply for replacement parts, compared to non-proprietary systems which utilise natural treatment processes. Consideration will only be given in the specific circumstances specified in the *Flooding and Stormwater Management Guidelines*.

(17) Proprietary products aimed solely at capture of gross pollutants will generally be accepted as private infrastructure as part of treatment trains for private development sites, provided the development type has need of gross pollutant capture as specified in the *Flooding and Stormwater Management Guidelines*.

(18) In-ground GPT's and gully-pit litter baskets are not to have performance counted towards the removal of the following pollutants:-

(a) pollutants/fine sediments that are less than 2mm;

(b) colloidal material;

(c) dissolved chemical pollutants;

(d) nutrients; or

(e) hydrocarbons (including oil and grease).

Note: This policy prevails despite any performance claims or verifications made through the SQIDEP.

(19) Development applications which incorporate proprietary products which are proposed to remain private infrastructure are required to be accompanied by RPEQ certification which confirms the following:-

(a) the RPEQ has confirmed the product performance has been tested using the Stormwater Quality Improvement Evaluation Protocol and validated by the Stormwater Australia Technical Review Panel;

(b) that the device, as proposed in the engineering drawings and/or stormwater management plan, will achieve the stormwater quality design objectives required by the planning scheme, under local conditions on the Sunshine Coast;

(c) that safety in design considerations have been incorporated as part of the device integration to the built environment;

(d) that the natural deterioration of the device over time will not pollute receiving waters or cause problems for community health; and

(e) that the site complies with clauses (17) and (18) of this section.

(20) Proprietary products (i.e. GPTs) or emerging technologies (e.g. floating wetlands) which are proposed to be considered for policy endorsement as suitable developer contributed public infrastructure are required to undergo a 3 stage process to demonstrate efficacy. This process is summarised below and expanded in clauses 21 to 24 of this section:-

(a) performance claims validated by the Stormwater Australia Technical Review Panel following testing using the Stormwater Quality Improvement Evaluation Protocol;

(b) field testing within the Sunshine Coast Council Local Government Area to demonstrate required water quality performance, safety in design, robustness and reliability; and

(c) independent expert peer review assessment of documented trial results.

(21) Proprietary products or emerging technologies which are proposed to be considered for policy endorsement as suitable public infrastructure are required to have the stormwater treatment and pollutant removal performance claims verified by the Stormwater Australia Technical Review

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Panel following testing using the Stormwater Quality Improvement Evaluation Protocol. Documentation is to be provided to Council that demonstrates:-

- (a) the verified performance claims satisfy the stormwater treatment needs of the site considering Sunshine Coast climatic conditions;
- (b) pollutant removal performance under dry weather flows;
- (c) maintenance frequency representative of current practice (and an estimation of maintenance under future climate conditions at year 2100);
- (d) pollutant removal performance over a range of flow rates including the design flow rate, below design flow rate and above design flow rate;
- (e) for GPTs, details of retained pollutants;
- (f) details of retained pollutants within sediments at the base of a water body when the device is proposed to be contained within a water body; and
- (g) details of retained pollutants within media for media filtration systems.

(22) Where proprietary products or emerging technologies are proposed to be provided as developer contributed public infrastructure, the proponent is required to:-

- (a) provide full lifecycle costings and a sinking fund to manage and maintain the asset over a 80 year design life;
- (b) have had performance claims validated as per clause 16;
- (c) provide RPEQ certification that:-
 - (i) incorporates safety in design considerations as part of the device integration into the built environment; and
 - (ii) confirms robustness, reliability and stability of the device to natural deterioration over time ensuring that the material of the device itself will not pollute receiving waters or cause problems for the health of the community.
- (d) undergo field trial within the Sunshine Coast Council Local Government Area for a period of three years (with a six month establishment period preceding this), with reliability and operational lifecycle costs assessed by an independent expert engaged by Council and funded by the device proponent. Field trials are to be specific to a unique circumstance that is being evaluated (i.e. plant species, brackish water). Only one field trial shall be permitted per device from a given manufacturer, unless a prior trial has been inconclusive. Trials are permitted to form part of a stormwater treatment train for a development site however an alternative stormwater treatment solution that satisfies the scheme performance outcomes is also to be documented. In the event of a trial being unable to demonstrate the reasonable operational lifecycle costs or required outcomes for safety in design or reliability and stability, the cost of removing a trial and reinstating the alternative solution is to be borne by the developer. Full costings for such a scenario are to be demonstrated to Council prior to a trial being initiated. Evidence that the developer has an appreciation of the cost of this requirement is to be demonstrated to Council. This evidence is to be in writing and signed by the developer. A performance bond equivalent to 1.5 times the cost of the alternative measure is to be lodged with Council prior to commencement of use or endorsement of the plan of survey;
- (e) provide documentary evidence that the developer will grant access permission to Council, or a representative of Council, for the purpose of unsupervised inspection at any time. This evidence is to also acknowledge that this requirement is a condition of the trial and that failure to provide access may result in the immediate revocation of Council's agreement to the trial. A revocation of the trial will require the developer to remove the trial and implement the alternative solution at the developer's expense;
- (f) have undergone rigorous field testing to demonstrate robustness during high flow, low flow, drought and high ambient heat conditions;
- (g) provide a detailed maintenance plan that demonstrates a maintenance regime that is not reliant on the use of glyphosates or any other chemical spray; and

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(h) provide a landscape plan that demonstrates the integration of the device into the natural or built environment in a manner that minimises visual disruption.

- (23) Failures of any component of a device that is subject of an endorsed public infrastructure trial is to be reported to Council Officers responsible for administering the trial within 7 days. The proponent is to ensure that a receipt notification is received and recorded as part of the trial documentation. Failure to comply may result in the revocation of Council's agreement to the trial. A revocation of the trial will require the developer to remove the trial and implement the alternative solution at the developer's expense.
- (24) Emerging proprietary technologies that are endorsed as acceptable developer contributed public infrastructure are to have had reliability and lifecycle cost claims validated by an independent expert review of field trial results and costing methodology. Endorsed devices will be recognised in Council's *Flooding and Stormwater Management Guidelines*. Devices that are not recognised are not to be deployed as public infrastructure outside of a trial.

SC6.14.3.9 Design requirements – stormwater harvesting and reuse

- (1) The following documents provide design requirements with respect to stormwater harvesting and reuse systems:-
- (a) HWP Water by Design - Stormwater Harvesting Guidelines (2011); and
- (b) Queensland Development Code Mandatory Part 4.2 & 4.3.
- (2) For systems that are to be dedicated to Council as public assets it is to be demonstrated that there is an overriding community benefit resulting from the stormwater harvesting system. A detailed operations and maintenance budget is required to be prepared for the project life and financial assurances are to be in place to operate and maintain the system for the project life.
- (3) Private stormwater harvesting schemes may be implemented at the applicant's discretion as part of achieving the outcomes of the **Stormwater management code**. However, there are no specific requirements mandating use of these systems or specific stormwater capture and reuse targets.
- (4) Stormwater harvesting is to ensure that any extraction rate/timings are sustainable in terms of impact on water source.
- (5) Private extraction from public assets is not allowed.

SC6.14.3.10 Guidelines

For the purpose of achieving compliance with this section of the planning scheme policy, the following are relevant guidelines:-

- (a) Flooding and Stormwater Management Guidelines (Sunshine Coast Council, 2020)
- (b) Queensland Urban Drainage Manual V4 (QUDM) (IPWEAQ, 2016) – in relation to all matters other than the tests for Lawful Point of Discharge;
- (c) Road Drainage Manual (Queensland Department of Transport and Main Roads, 2019);
- (d) Australian Rainfall and Run-off (ARR);
- (e) ADAC – Asset Design & As Constructed;
- (f) Aus-Spec Specifications;
- (g) Institute of Public Works Engineering Australia (IPWEA) Standard Drawings;
- (h) Institute of Municipal Engineering Australia Queensland (IMEAQ) Standard Drawings;
- (i) Brisbane City Council Guidelines:-
- (i) Natural Channel Design Guidelines; and
- (ii) Stormwater Outlets in Parks and Waterways;

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(j) South East Queensland Healthy Waterways Partnership / Water by Design Publications, including:-

- (iii) Concept Design Guidelines for Water Sensitive Urban Design;
- (iv) MUSIC Modeling Guidelines;
- (v) Water Sensitive Urban Design Technical Design Guidelines for South East Queensland (excluding bioretention and wetland chapters)
- (vi) Bioretention Technical Design Guidelines
- (vii) Wetland Technical Design Guidelines
- (viii) Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands
- (ix) Maintaining Vegetated Stormwater Assets
- (x) Transferring Ownership of Vegetated Assets

Note—relevant guideline documents in existence or available over the life time of this planning scheme policy should be referenced and used where appropriate. The above list is not exhaustive and the use of locally based guidelines by a recognised authority or agency would take preference to those developed regionally or nationally.

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SC6.14.4 — Water supply infrastructure

SC6.14.4.1 — Purpose

The purpose of this section of the **Planning scheme policy for development works** is to provide guidance on standards applying where potable water is to be provided for development.

SC6.14.4.2 — Application

- (1) Council through Unitywater (a business jointly owned by the Council and Moreton Bay Council) provides reticulated water to the region.
- (2) The Level of Service Impact Assessment Specification is the framework by which Unitywater may require information to assess development applications, due diligence requests or other information that may impact upon Unitywater's ability to achieve the desired standard of service (DSS) for customers as defined in Unitywater's current water supply and sewerage growth management strategies.
- (3) The specification sets out information requirements essential to assess the existing and future effects on the performance and capacity of water assets including the identification of infrastructure needs, costs and timings associated with deviation from population assumptions/sequencing underpinning Unitywater's current long term infrastructure planning.

SC6.14.4.3 — Standard drawings

- (1) The *Water Supply Code of Australia* WSA 03-2002 drawings detail a number of infrastructure options and arrangements. A number of these options are not compatible with current Unitywater practice. The acceptance, modification or deletion of the WSA drawings is set out in **Table SC6.14.4A** below.

Table SC6.14.4A — WSA drawing numbers

WSAA Drawing Numbers	Status	Remarks
WAT-1100	Not adopted	Use SCW-385 — drawing under development
WAT-1101	Not adopted	Use SCW-380 — drawing under development
WAT-1102	Adopted	Valve to be directly off tee
WAT-1103	Adopted	Valve to be directly off tee
WAT-1104	Adopted	1.) 63 OD PE water mains in cul de sac heads only. 2.) 63 OD PE water mains to be looped using entire head of Cul de sac.
WAT-1105	Adopted	
WAT-1106	Not adopted	Use SCW-350, MWD-355 and SCW-360.
WAT-1107	Not adopted	Use SCW-355
WAT-1108	Not adopted	Use SCW-360
WAT-1109	Not adopted	Use SCW-350
WAT-1200	Adopted	
WAT-1201	Adopted	
WAT-1202	Adopted	
WAT-1203	Adopted	
WAT-1204	Adopted	
WAT-1205	Adopted	
WAT-1206	Not Adopted	
WAT-1207	Adopted	Hydrant tees are to be restrained in accordance with socketed valve restraints.
WAT-1208	Adopted	
WAT-1209	Adopted	
WAT-1210	Adopted	
WAT-1211	Adopted	
WAT-1212	Adopted	
WAT-1213	Adopted	
WAT-1214	Adopted	
WAT-1300	Not adopted	Use SCW-365
WAT-1301	Not adopted	Use SCW-320

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WSAA – Drawing Numbers	Status	Remarks
WAT-1302	Not adopted	Use SCW-320 & SCW-325
WAT-1303	Not adopted	Use SCW-320 & SCW-325
WAT-1304	Not adopted	Use SCW-320 & SCW-325
WAT-1305	Not adopted	Use SCW-320 & SCW-325
WAT-1306	Not adopted	Use SCW-320 & SCW-325
WAT-1307	Adopted	
WAT-1308	Not adopted	
WAT-1309	Not adopted	Use SCW-330
WAT-1310	Adopted	
WAT-1311	Adopted	
WAT-1312	Adopted	
WAT-1313	Adopted	
WAT-1400	Adopted	
WAT-1401	Adopted	
WAT-1402	Adopted	
WAT-1403	Adopted	
WAT-1404	Adopted	
WAT-1405	Adopted	
WAT-1406	Adopted	
WAT-1407	Adopted	
WAT-1408	Adopted	
WAT-1409	Not adopted	

(2) — The alignments and details for water and sewerage mains and service conduits should be in accordance with **Table SC6.14.4B (Service corridors and alignments)**.

Table SC6.14.4B – Service corridors and alignments

Public Utilities – Typical Service Corridors and Alignments	Remarks
SEQ-R-100	Public utilities in Verges, Service Corridors & Alignments
SEQ-R-101	Public Utilities – Typical Service Conduit Sections

SC6.14.4.4 – Planning and design

- (1) — The standards in this section have been developed to define the particular requirements of Unitywater in relation to the *WSAA National Codes*. Only details that differ from that of the *WSAA National Codes* are provided.
- (2) — These standards shall be read in conjunction with, and take precedence over, the *WSAA Water Supply Code of Australia – WSA 03-2002* to define the technical requirements of Unitywater in relation to the planning, design and construction of water supply systems (refer **Table SC6.14.4C (Variations to the WSAA national codes)**).

Table SC6.14.4C – Variations to the WSAA national codes

Part	Variations
Pt 1 – 1.5.2 Water Agency	Add to WSAA requirement – <ul style="list-style-type: none"> For development proposals, Unitywater may request that a water supply network analysis be undertaken to determine (a), (b) and (c).
Pt 1 – 2.1 System Planning Process	Add to WSAA requirement – <ul style="list-style-type: none"> The designer shall liaise with Unitywater prior to commencement of the design.
Pt 1 – 2.2 Demands	Replace WSAA requirement with – <ul style="list-style-type: none"> Water demands shall be determined in accordance with Unitywater's "Level of Service Impact Assessment Specification".
Pt 1 – 2.2.3 Peak Demands	Replace WSAA requirement with – <ul style="list-style-type: none"> The designer shall liaise with Unitywater to obtain the peak demand factors.
Pt 1 – 2.3 System Configuration (a) & (b)	Add to WSAA requirement – <ul style="list-style-type: none"> Where deemed necessary by Unitywater, existing asbestos cement water mains shall be replaced along the full frontage of any proposed development site. Replacement of existing water mains will be required in commercial and

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Part	Variations
	<p>industrial and high density residential precincts where existing mains fronting any proposed development are less than 150mm diameter.</p> <ul style="list-style-type: none"> Mains shall be replaced along the full frontage of the proposed development site prior to the placement of any site sheds or construction materials over or adjacent to the water main.
Pt 1 – 2.4.2 Network Analysis	<p>Add to WSAA requirement –</p> <ul style="list-style-type: none"> Unitywater will undertake, at the designer's applicant's expense, an assessment, and establish any adverse impacts of the proposed developments on the existing system using Unitywater's hydraulic model. The designer applicant shall provide details of the proposed system development and demands to allow completion of this assessment. Alternatively, Unitywater may require the applicant to carry out this assessment. Network analyses are to include all pipes in the network model and comply with Unitywater's "Level of Service Impact Assessment Specification".
Pt 1 – 2.4.3 Operating Pressures	<p>Add to WSAA requirement –</p> <ul style="list-style-type: none"> The minimum desirable service pressure shall be 220kPa at the water meter. The maximum service pressure shall be 800kPa.
Pt 1 – 3.2.2 Minimum Pipe Sizes	<p>Add to WSAA requirement –</p> <ul style="list-style-type: none"> Pipe sizes shall not be less than DN150mm diameter for high density residential, commercial, industrial and rural residential precincts.
Pt 1 – 3.2.4 Fire Flows	<p>Replace WSAA requirement with –</p> <ul style="list-style-type: none"> Fire flows shall comply with the requirements specified in Chapter 6 of the Department of Environment and Resource Management "Planning and Guidelines for Water Supply and Sewerage". The water supply scheme must be capable of supplying the following fire flow demands above maximum hour demand: <ul style="list-style-type: none"> commercial and industrial precincts – 30 litres per second at 12.0m residual pressure; and residential precincts – 15 litres per second at 12.0m residual pressure. Conduits shall be provided under all roads to carry water services to properties on the opposite side to the main. Conduits shall be as follows: <ul style="list-style-type: none"> Residential living zone – 1 x 100mm diameter conduit for every second lot Residential choice zone – 1 x 100mm diameter conduit for each lot.
Pt 1 – 3.7.2 Minimum Pressure Class	<p>Replace WSAA requirement with –</p> <ul style="list-style-type: none"> The minimum pipe and fitting pressure class for reticulation mains shall be Class 16.
Pt 1 – 6.1.1 Design Tolerances	<p>Add to WSAA requirement –</p> <ul style="list-style-type: none"> Horizontal alignment shall be referenced to MGA (zone 56). Survey must be based on true MGA co-ordinates.
Pt 1 – 6.3 Location of Water Mains	<p>Add to WSAA requirement –</p> <ul style="list-style-type: none"> Reticulation water mains shall generally be located within the road reserve on a 1.5m alignment from the property boundary. In general, water mains are not to be constructed on private property. However, in instances where this is unavoidable, it will be necessary to provide an easement of minimum 3.0m width registered for the benefit of Unitywater on the title of the land. The main is to be constructed centrally within the easement. A wider easement may be necessary in some instances, as determined by Unitywater to ensure adequate access for maintenance purposes.
Pt 1 – 6.3.2 Water Mains in Road Reserves	<p>Add to WSAA requirement –</p> <ul style="list-style-type: none"> Landscape planting within 1.0m of Unitywater's water supply infrastructure or within a water easement shall be low growing when mature and be suitable approved varieties. Consideration shall be given at land reconfiguration stage to ensure road reserves are of adequate width to provide required clearances between all services and improvements.
Pt 1 – 6.4 Shared Trenching	<p>Replace WSAA requirement with –</p> <ul style="list-style-type: none"> Water mains shall not be co-located with other services.
Pt 1 – 6.5 Duplicate Mains	<p>Add to WSAA requirement –</p> <ul style="list-style-type: none"> Water mains are to be provided on both sides of the road in the case of divided carriage ways, commercial, industrial and high density residential precincts.
Pt 1 – 6.7 Connection of	<p>Add to WSAA requirement –</p> <ul style="list-style-type: none"> All works on the existing reticulation system shall be considered "live works"

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Part	Variations
New Mains to Existing Mains	and will be constructed by Unitywater at the applicant's cost. These works shall be clearly delineated on the drawings and shown in sufficient detail such that the works can be readily constructed. <ul style="list-style-type: none"> The connection point to the existing system shall be located to minimise disruption of supply to customers and be subject to Unitywater's approval.
Pt 1 – 6.8.3 Temporary Ends of Water Mains	Add to WSAA requirement: <ul style="list-style-type: none"> Water mains shall be constructed across the full frontage of any property being developed. Dead end mains are not desirable and Unitywater may require linking to a nearby existing main.
Pt 1 – 6.9 Property Services	Replace WSAA Standard Drawings WAT – 1106, WAT – 1107 and WAT – 1109 with: <ul style="list-style-type: none"> Unitywater's Standard Drawings SCW 350, SCW 355 and SCW 360.
Pt 1 – 6.9 Property Services	Add to WSAA requirement: <ul style="list-style-type: none"> Ductile iron pre-tapped fittings and service pipework shall be installed by the developer at the time of lot reconfiguration in accordance with Unitywater's Standard Drawing SCW 360. Conventional tapping bands may be utilised for pipe diameters where pre-tapped fittings are not available. Property service connections shall only be installed on reticulation mains with a diameter of 300mm or less. Property connections shall be installed in accordance with Unitywater's Standard Drawings. Water service pipework shall be provided for the full length of access strips and access easements serving lots (25mm NB min). Conduits shall be provided under all roads to carry water services to properties on the opposite side to the main. Conduits shall be as follows: <ul style="list-style-type: none"> Neighbourhood and Hill Slope Residential Precincts – 1 x 100mm diameter conduit for every second lot; and Mixed Housing Precinct – 1 x 100mm diameter conduit for each lot. Conduits shall be installed in accordance with Unitywater's Standard Drawings and at an alternate position to power and/or telecommunication services. Kerb markers shall be placed in accordance with Unitywater's Standard Drawings. Where electrical pillar boxes are located on both side boundaries, the property service connection shall be placed at the registered plan boundary truncation point. Community title schemes shall be provided with a single service immediately within the boundary of the property. All internal works will be privately owned and the responsibility of the body corporate. All new unit type development whether single or multi-storey are to be provided with individual water meters. The cost of the installation of the water meters will be at the developers cost and the water meters may be supplied by Unitywater. Primary water meters shall be located within the immediate title boundary. Unitywater may request that in multi-storey strata title unit developments of three (3) storeys or more, individual meters shall be connected with remote reading counters located at the ground floor level or, for two storey unit developments, all individual meters shall be located at the ground level above ground. Water meters shall be installed by the developer prior to plan of subdivision release. Unitywater will advise the type and supplier of the approved water meters. Meters shall be installed in accordance with Unitywater's Standard Drawings SCW 350, SCW 355, SCW 360.
Pt 1 – 6.10.4 Clearance from Structures	Replace WSAA requirement with: <ul style="list-style-type: none"> Other structures deemed satisfactory to be constructed over or adjacent to Unitywater's water supply must be designed and constructed to protect the infrastructure from physical damage and to allow Unitywater access when necessary.
Pt 1 – 5.4.2 Pipe Cover	Add to WSAA requirement: <ul style="list-style-type: none"> Where site works either reduce the depth of cover below the minimum, or increase the depth of cover to invert above 1.5m, the water main shall be re-laid to maintain the required depth.
Pt 1 5.5.1 Geotechnical Considerations – General	Add to WSAA requirement: <ul style="list-style-type: none"> Considerations to include the existence of acid sulphate soils (ASS) and potential acid sulphate soils (PASS).
Pt 1 – 6.1.4 Installation	Replace WSAA Standard Drawings WAT – 1301, WAT – 1304 and WAT – 1309 with: <ul style="list-style-type: none"> Unitywater's Standard Drawings SCW 320, SCW 365 and SCW 330.
Pt 1 – 6.2.1.1	Replace first paragraph of WSAA requirement:

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Part	Variations
Stop Valves – General	<ul style="list-style-type: none"> When extending an existing water main, a stop valve may only be installed at the junction of the existing and new water mains if approved by Unitywater.
Pt 1 – 6.2.3 Stop Valves for Reticulation Mains	Add to WSAA requirement: <ul style="list-style-type: none"> Stop valves are required on each side of all mains crossing railway reserves, major roads and on mains traversing easements. Valves shall be resilient seated, coated, o-ring stem sealed, anticlockwise closing class 16 and conforming to AS2638. The wedge shall be totally encapsulated in an approved synthetic rubber conforming to AS1646. The body shall be internally and externally coated with fusion bonded epoxy (FBE) or a thermoplastic polyamide such as Rilsan Nylon 11. Valves shall be installed in accordance with SCW 320 and WAT 1207.
Pt 1 – 6.2.5.1 Stop Valves – Location and Arrangements – General	Add to WSAA requirement: <ul style="list-style-type: none"> Stop valve locations shall be in accordance with Arrangement 1. Zone valves shall be in accordance with Arrangement 3(b).
Pt 1 – 6.3.2 Pressure Reducing Valves (PRVs)	Add to WSAA requirement: <ul style="list-style-type: none"> PRVs shall be designed in accordance with Unitywater’s Standard Drawing SCW 330.

(3) The following provisions in **Table SC6.14.4D (Variations to products and materials)** and **Table SC6.14.4E (Approved water pipe materials)** relate to variations to products and materials.

Table SC6.14.4D – Variations to products and materials

Part	Variations
Pt 1 – 6.4.1 Air Valves – Installation Design Criteria	Replace WSAA Standard Drawing WAT – 1302 with: <ul style="list-style-type: none"> Unitywater’s Standard Drawings SCW 320 and SCW 325.
Pt 1 – 6.7 Swabbing Points	Add to WSAA requirement: <ul style="list-style-type: none"> Swabbing points will generally only be required on large diameter or lengthy transfer mains. Unitywater will advise any requirements on a case by case basis.
Pt 1 – 6.8 Hydrants	Add to WSAA requirement: <ul style="list-style-type: none"> Hydrants shall be installed as follows: <ul style="list-style-type: none"> location – opposite common boundaries, generally installed at crests or sags and end of mains; spacing – maximum 80.0m; orientation – spring hydrants shall be oriented with bolts parallel to the water main; and hydrants shall comply with AS3952-1991 for DN80 spring hydrants and shall be fusion bonded epoxy (FBE) or thermoplastic polyamide (Rilsan Nylon 11) coated. All fasteners are to be 316 stainless steel. Pt 1 6.8.8 Hydrant Locations: <ul style="list-style-type: none"> Replace WSAA Standard Drawings WAT – 1300 with Unitywater’s Standard Drawing SCW 365; Replace WSAA Standard Drawing WAT 1301 with Unitywater’s Standard Drawing SCW 320; and Replace WSAA Standard Drawing WAT 1302 with Unitywater’s Standard Drawings SCW 320, SCW 325.
Pt 2 – 8.4 Product Standards and Specifications	Add to WSAA requirement: <ul style="list-style-type: none"> The following materials (refer Table SDC6.14.4E (Approved water pipe materials)) are approved for use in the construction of water reticulation and trunk main systems.

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Table SC6.14.4E— Approved water pipe materials

Diameter mm (DN)	Function	Material				
		Copper	PVC-O	PE 100	DICL	MSCl (Sintakote)
20	Water Service	Approved	NA	PE100B PN16	NA	NA
50-100	Water Service	Approved	NA	NA	NA	NA
63	Water main cul- de-sac only	NA	NA	PE100B PN16	NA	NA
100-150	Water Main	NA	PN16 SN10	PN16	PN35 *	Approved
200-300	Water Main	NA	NA	PN16	PN35 *	Approved
375-750	Water Main	NA	NA	PN16	PN35 *	Approved
WSAA Purchase Specification		AS3500	PS-210	PS-207	PS-234	PS-203

* Requires RPEQ validation

(4) The following provisions in **Table SC6.14.4F (Variations to construction)** relate to variations to construction:-

Table SC6.14.4F— Variations to construction

Part	Variations
Pt 3— 10.2 Personnel Qualifications	Add to WSAA requirement:- <ul style="list-style-type: none"> ● Pipe layers shall be accredited by the pipe manufacturer including "Century Plus" accreditation for DICL, "Pipelines Installation" for PVC and "Electrofusion/Butt Welding" for Polyethylene Pipe.
Pt 3— 11.5.4.2 Traffic Management	Replace WSAA requirement with:- <ul style="list-style-type: none"> ● A traffic management plan shall be prepared for all projects.
Pt 3— 15.1.4 Laying	Replace WSAA Standard Drawing WAT—1101 with:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawing SCW 380.
Pt 3— 15.5 Thrust and Anchor Blocks and Restrained Joints	Add to WSAA requirement:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawing SCW 310. ● Hydrant tees are to be restrained in accordance with socketed valve restraint standard. Refer WAT—1207. ● Delete WSAA Standard Drawing WAT—1206
Pt 3— 15.6 Property Services and Water Meters	Replace WSAA Standard Drawings WAT—1106 to WAT—1109 inclusive with:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawings SCW 350, SCW 355 and SCW 360.
Pt 3— 15.11.1 Installation	Replace WSAA Standard Drawings WAT—1301 to WAT—1306 with:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawings SCW 320 and SCW 325.
Pt 3— 15.11.2 Valve Chambers for Large Diameter Mains	Replace WSAA Standard Drawings WAT—1308 and WAT—1309 with:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawing SCW 330.
Pt 3— 15.16 Location Markers	Replace WSAA Standard Drawing WAT—1300 with:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawing SCW 365.
Pt 3— 22 Connections to Existing Water Mains	Replace WSAA requirement with:- <ul style="list-style-type: none"> ● All works that may involve connection to or modifications of the existing water supply system shall be undertaken by Unitywater at the applicant's expense. Water mains are considered to be live once accepted "on maintenance" by Unitywater. ● No person, other than authorised Unitywater employees shall operate any existing valve or draw water from any existing main without the authority of Unitywater.

SC6.14.4.5— Guidelines

All relevant guidelines are applied under the *Water Services Association of Australia (WSAA) National Code*.

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SC6.14.5 Sewerage infrastructure

SC6.14.5.1 Purpose

The purpose of this section of the **Planning scheme policy for development works** is to provide guidance on standards applying where sewerage is to be provided for development and requirements in non-sewered areas.

SC6.14.5.2 Application

- (1) Council through Unitywater (a business jointly owned by the Council and Moreton Bay Council) provides sewerage services to the region.
- (2) The development design standards in this document have been developed to define the particular requirements of Unitywater in relation to the WSAA National Codes. Only details that differ from that of the WSAA National Codes are provided.
- (3) All on-site sewerage systems require the relevant approval from Council. All applications are to comply with the *Plumbing and Drainage Act (2002)*, *Standard Plumbing and Drainage Regulation (2003)*, *AS1547-2000 On-site domestic wastewater management ()*, and *Queensland Plumbing and Wastewater Code* (Department of Infrastructure and Planning).
- (4) These standards shall be read in conjunction with and take precedence over the WSAA *Sewerage Code of Australia – WSA 02-2002*, to define the technical requirements of Unitywater in relation to the planning, design and construction of reticulated sewerage systems.
- (5) Unitywater generally does not support the construction of buildings or structures over sewers.

SC6.14.5.3 Standard drawings

The *Sewerage Code of Australia* WSAA standard drawings detail various infrastructure options and arrangements. A number of these options are not compatible with current Unitywater practice. The acceptance, modification or deletion of the WSA drawings is set out in **Table SC6.14.5A (WSAA drawing numbers)** below.

Table SC6.14.5A WSAA drawing numbers

WSAA Drawing Numbers	Status	Remarks
SEW-1100	Not Adopted	Drawing under development
SEW-1101	Adopted	
SEW-1102	Not Adopted	
SEW-1103	Not Adopted	
SEW-1104	Not Adopted	Use SCW 125
SEW-1105	Not Adopted	Use SCW 160 – Drawing under development
SEW-1106	Not Adopted	Use SCW 125, SCW 130
SEW-1107	Not Adopted	Use SCW 125, SCW 130
SEW-1108	Not Adopted	Use SCW 125
SEW-1109	Not Adopted	Use SCW 125 and SCW130
SEW-1200	Adopted	
SEW-1201	Adopted	
SEW-1202	Adopted	
SEW-1203	Adopted	
SEW-1204	Adopted	
SEW-1205	Adopted	
SEW-1206	Adopted	
SEW-1207	Adopted	
SEW-1208	Adopted	
SEW-1300	Adopted	
SEW-1301	Adopted	
SEW-1302	Adopted	
SEW-1303	Adopted	
SEW-1304	Adopted	

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WSAA Drawing Numbers	Status	Remarks
SEW-1305	Adopted	
SEW-1306	Adopted	
SEW-1307	Not Adopted	
SEW-1308	Adopted	
SEW-1309	Adopted	
SEW-1310	Adopted	
SEW-1311	Adopted	
SEW-1312	Adopted	
SEW-1313	Adopted	
SEW-1314	Adopted	
SEW-1315	Not Adopted	
SEW-1316	Adopted	
SEW-1317	Adopted	
SEW-1400	Not Adopted	
SEW-1401	Adopted	
SEW-1402	Adopted	
SEW-1403	Adopted	
SEW-1404	Adopted	
SEW-1405	Adopted	
SEW-1406	Adopted with Modification	Excluding Option 2
SEW-1407	Adopted	
SEW-1408	Adopted	
SEW-1409	Not Adopted	
SEW-1410	Not Adopted	
SEW-1411	Not Adopted	
SEW-1412	Not Adopted	Use SCW-135
SEW-1500	Adopted	
SEW-1501	Adopted	
SEW-1502	Not Adopted	

SC6.14.5.4 — Planning and design

(1) — The following provisions in **Table SC6.14.5B (Variations to the WSAA National Codes)** relate to variations to the *WSAA National Codes*:-

Table SC6.14.5B — Variations to the WSAA National Codes

Part	Variations
Pt 1 — 1.4.2 Objectives of the Sewerage System	Add to WSAA requirement:- <ul style="list-style-type: none"> • Sewerage system provisions to include:- <ul style="list-style-type: none"> ○ extension of sewers to upstream property boundaries of development sites; and ○ sewage pumping stations will not be approved where a reticulated gravity system could be provided.
Pt 1 — 2.3 — Planning Parameters	Replace WSAA loading rates with:- <ul style="list-style-type: none"> • Average daily loading shall be determined by the product of the estimated EP draining to the point of design interest and the loading rate in L/EP/day. The equivalent population and loading rates shall be determined in accordance with the Unitywater's "Level of Service Impact Assessment Specification".
Pt 1 — 3.2.2 — Traditional design Flow Estimation Method	Replace WSAA requirement with:- <ul style="list-style-type: none"> • Design flows shall be determined in accordance with Unitywater's "Level of Service Impact Assessment Specification".
Pt 1 — 6 — Detail Design	Add to WSAA requirement:- <ul style="list-style-type: none"> • The minimum pipe size for sewer reticulation shall be 150mm diameter.

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Part	Variations										
Pt 1 – 6.2.3 – Sewer Layout	<p>Add to WSAA requirement-</p> <ul style="list-style-type: none"> Where practicable all sewers are to be located as shown below: <p>Preferred Sewer Alignments</p> <table border="1"> <thead> <tr> <th>Location</th> <th>Alignment</th> </tr> </thead> <tbody> <tr> <td>Roadway</td> <td>On application</td> </tr> <tr> <td>Footpath</td> <td>On application – not usually favoured, except for commercial areas</td> </tr> <tr> <td>Private Properties (side boundaries)</td> <td>1.0m</td> </tr> <tr> <td>Private Properties (rear and front boundaries)</td> <td>1.5m</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Sewers shall be located- <ul style="list-style-type: none"> in lots with zero lot boundaries at the front of lots where possible; in industrial zones, at the front of lots where possible; and in commercial zones, within the road reserve, where possible. Sewers are to be constructed to serve the entire area of each lot within the development site and are to be extended to the boundaries of the site to serve existing lots and potential development sites upstream. Where sewers are located in road reserves, they shall be located on the opposite side to water mains, electricity and communications cables. Sewers shall be constructed to serve the entire area of the allotment using a fall of 1:60 for the internal allotment drains allowing 300mm cover to top of pipe at head of drain. Sewers shall be designed to follow the natural grade of the land and be located to allow future access for maintenance and repair. 	Location	Alignment	Roadway	On application	Footpath	On application – not usually favoured, except for commercial areas	Private Properties (side boundaries)	1.0m	Private Properties (rear and front boundaries)	1.5m
Location	Alignment										
Roadway	On application										
Footpath	On application – not usually favoured, except for commercial areas										
Private Properties (side boundaries)	1.0m										
Private Properties (rear and front boundaries)	1.5m										
Pt 1 – 6.2.5 – Easements	<p>Add to WSAA requirement-</p> <ul style="list-style-type: none"> All sewers located within private property shall be contained within a minimum 3.0m wide easement. Sewers in excess of 3.0m deep shall be contained within a minimum 4.0m wide easement. Unless otherwise agreed with Unitywater, sewers shall be located centrally in the easement. 										
Pt 1 – 6.3.4 – Public and Private Property	<p>Add to WSAA requirement-</p> <ul style="list-style-type: none"> Maintenance structures on private property shall generally be 1.0m from side boundaries and 1.5m from front and rear boundaries and be a minimum of 500mm clear of the property boundary. Landscape planting within 1.5m of Unitywater’s sewerage infrastructure or within a sewer easement shall be low growing when mature and be suitable approved varieties. 										
Pt 1 – 6.3.5 – Changes in Direction Using a Maintenance Hole	<p>Replace WSAA requirement with-</p> <ul style="list-style-type: none"> The maximum change in direction at a maintenance hole shall be 90 degrees unless otherwise approved by Unitywater. 										
Pt 1 – 6.3.7 – Horizontal Curves in Sewers	<p>Replace WSAA requirement with-</p> <ul style="list-style-type: none"> Horizontal curves in sewers are not permitted. 										
Pt 1 – 6.3.8 – End of Lines (NEW)	<p>Replace WSAA requirement with-</p> <ul style="list-style-type: none"> Sewers are to be designed to terminate at a MH or TMH, except for branch lines less than 15.0m in length that serve no more than one lot. 										
Pt 1 – 6.4.4 – Clearance from Structures	<p>Replace WSAA requirement with-</p> <ul style="list-style-type: none"> Buildings must provide at least 1.5m clearance from the outermost projection of the structure to the nearest edge of any existing or proposed infrastructure. Other structures deemed satisfactory to be constructed over or adjacent to Unitywater’s sewerage infrastructure must be designed and installed to protect the infrastructure from physical damage and to allow Unitywater access when necessary. 										

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Part	Variations												
Pt 1 – 6.4.5 – Underground Structures and Services	Add to WSAA requirement- <ul style="list-style-type: none"> • Sewerage mains crossing stormwater culverts or pipes in excess of 225mm diameter are to be laid or replaced with PVC-U class 12 pipe for the full extent of the crossing plus 1.5m either side. Spigot ends of the class 12 pipe are to be chamfered to provide a smooth transition of flows. • A minimum horizontal separation of 1.0m shall be maintained between stormwater pipes greater than 225mm diameter and any sewerage pipes. • Stormwater infiltration and filtration devices, and soakage trenches shall be located to provide a minimum 1.5m horizontal clearance to any sewerage infrastructure. 												
Pt 1 – 6.5.3 – Minimum Air Space for Ventilation	Replace WSAA requirement with- <ul style="list-style-type: none"> • Minimum air space in sewer mains shall be in accordance with Unitywater’s “Level of Service Impact Assessment Specification”. 												
Pt 1 – 6.5.7 – Minimum Grades for Self-Cleansing	Replace WSAA table 4.6 with- <ul style="list-style-type: none"> • Minimum grades for reticulation sewers shall be as shown as below:- <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Diameter</th> <th style="text-align: center;">Minimum Grade</th> </tr> </thead> <tbody> <tr> <td>150mm (up to 2 lots)</td> <td>1 in 80</td> </tr> <tr> <td>150mm (3 – 5 lots)</td> <td>1 in 100</td> </tr> <tr> <td>150mm general (6 or more lots)</td> <td>1 in 150</td> </tr> <tr> <td>225mm</td> <td>See WSA02 Table 6.6</td> </tr> <tr> <td>300mm</td> <td>See WSA02 Table 6.6</td> </tr> </tbody> </table> <p>Note—Sewers shall not be upsized to take advantage of flatter grades.</p>	Diameter	Minimum Grade	150mm (up to 2 lots)	1 in 80	150mm (3 – 5 lots)	1 in 100	150mm general (6 or more lots)	1 in 150	225mm	See WSA02 Table 6.6	300mm	See WSA02 Table 6.6
Diameter	Minimum Grade												
150mm (up to 2 lots)	1 in 80												
150mm (3 – 5 lots)	1 in 100												
150mm general (6 or more lots)	1 in 150												
225mm	See WSA02 Table 6.6												
300mm	See WSA02 Table 6.6												
Pt 1 – 6.5.8 – Minimum Grades for Slime Control	Add to WSAA requirement- <ul style="list-style-type: none"> • Unless otherwise agreed with Unitywater, the minimum grade of sewer mains of 300 mm diameter and greater shall ensure that a slime stripping velocity is achieved. 												
Pt 1 – 6.6.1 – Vertical Alignment of Sewers – General	Add to WSAA requirement- <ul style="list-style-type: none"> • Sewers shall not be in excess of 5.0m deep. • Junctions in excess of 3.0m in depth shall be “Sugden” type. 												
Pt 1 – 6.6.2 – Long Section Design Plan	Replace first paragraph of WSAA requirement with- <ul style="list-style-type: none"> • Vertical alignments of sewers shall be shown on the longitudinal section of the design drawings. 												
Pt 1 – 6.6.3 – Minimum Cover Over Sewers	Add to WSAA requirement- <ul style="list-style-type: none"> • Additional sewer depth may be required in lots and footpaths where future access driveways could be constructed. In exceptional circumstances, a minimum 600mm pipe cover may be approved in road reserves subject to construction in D1CL or PVC-U Class 18 pipe from maintenance hole to maintenance hole. 												
Pt 1 – 6.6.4 – Lot Servicing Requirements	Add to WSAA requirement- <ul style="list-style-type: none"> • Where development is proposed on allotments currently serviced by combined house drainage systems, the applicant will be responsible to upgrade the system to current sewerage standards. This responsibility may extend to any affected adjacent properties. • The use of private sewage pump stations is not acceptable for any proposed development within Unitywater’s sewerage headworks planning areas. 												
Pt 1 – 6.6.5.4 – Depth of Connection Point	Replace part (b) and (d) of WSAA requirement with- <ul style="list-style-type: none"> • Sewer connections shall not be in excess of 1.5m deep. • Replace WSAA Standard Drawing SEW-1109 with Unitywater’s Standard Drawings SCW 125 and SCW 130. 												
Pt 1 – 6.6.7 – Vertical Curves	Replace WSAA requirement with- <ul style="list-style-type: none"> • Vertical curves are not permitted. 												
Pt 1 – 6.6.8 – Compound Curves	Replace WSAA requirement with- <ul style="list-style-type: none"> • Compound curves are not permitted. 												

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Part	Variations
Pt 1 – 5.2 – Limitations of Connection to Sewers	<ul style="list-style-type: none"> WSAA Standard Drawings SEW – 1409 to SEW – 1411 inclusive are not adopted by Unitywater.
Pt 1 – 5.3.1 – Methods of Property Connection – General	Replace WSAA requirement with: <ul style="list-style-type: none"> House drainage connections shall comply with Unitywater's Standard Drawings and approved WSAA Standard Drawing.
Pt 1 – 5.3.1 – Methods of Property	Replace WSAA Standard Drawing SEW – 1107 with: <ul style="list-style-type: none"> Unitywater's Standard Drawings SCW 125 and SCW 130.
Pt 1 – 5.6 – Location of Connection Points	Add to WSAA requirement: <ul style="list-style-type: none"> Connection points shall be located clear of driveways and a minimum of 1.0m inside the property boundary and otherwise in compliance with WSA 02 Section 5.6. For battleaxe allotments, where the sewer house connection lies within the access strip, sanitary house drainage is to be extended from the provided inspection opening along the access strip, at a minimum grade of 1 in 60, to a point 1.0m inside the main body of the lot prior to construction of the driveway.
Pt 1 – 5.7 – Y – Property Connections	Replace WSAA requirement with: <ul style="list-style-type: none"> Property connections shall be in accordance with Unitywater's Standard Drawing SCW 125.
Pt 1 – 5.8 – Length of Property Connection Sewers	Replace WSAA requirement with: <ul style="list-style-type: none"> The maximum length of a house connection, measured from the reticulation sewer to the boundary of the property to be served, shall be 5.0m.
Pt 1 – 6.1 – Types of Maintenance Structures	<ul style="list-style-type: none"> WSAA Standard Drawings SEW – 1307 and SEW – 1315 are not adopted by Unitywater.
Pt 1 – 6.3.2 – Maintenance structure spacing – Reticulation Sewers	Replace WSAA requirement with: <ul style="list-style-type: none"> For reticulation sewers, the maximum distance between any two consecutive maintenance structures shall be 90.0m subject to the provisions of Clause 6.3.1. Plastic maintenance structures shall not be used at junctions of mains.
Pt 1 – 6.5 – Special Considerations for Connection of New Sewers to Existing Sewers	<ul style="list-style-type: none"> WSAA standard Drawing SEW – 1502 is not adopted by Unitywater. Where pressure sewers discharge to a gravity system, the receiving structure shall be a plastic maintenance hole or approved alternative. Connection to Unitywater's sewer system shall be by gravity only to a maintenance hole with an approved H₂S gas inhibiting product. The two maintenance holes immediately downstream and one immediately upstream are also to be treated with an approved H₂S gas inhibiting product.
Pt 1 – 6.6.2 – Types of MH Construction	<ul style="list-style-type: none"> WSAA Standard Drawing SEW – 1307 is not adopted by Unitywater.
Pt 1 – 6.6.8 – Ladders, Step Irons and Landings	Replace WSAA requirement with: <ul style="list-style-type: none"> Fixed internal access arrangements are not required in maintenance holes servicing sewers. Stainless steel safety bars and landings shall be provided in maintenance holes servicing sewers of 400mm diameter and greater.
Pt 1 – 6.6.9 – MH Covers	Add to WSAA requirement: <ul style="list-style-type: none"> Bolt down metal access covers (water tight type) shall be specified on MHs located: <ul style="list-style-type: none"> on all MH covers below the 1% AEP flood level; on all MH covers on sewers of 450mm diameter or greater; on all MH covers within roadways; and on all MH covers designated by Unitywater.
Pt 1 – 7.2 – Boundary Traps	Replace WSAA requirement with: <ul style="list-style-type: none"> Boundary traps are not required.
Pt 1 – 7.3 – Gas Check MHs	Replace WSAA requirement with: <ul style="list-style-type: none"> Gas check MHs are not required.
Pt 1 – 7.9.2 Design Parameters for Emergency relief Structures (ERS)	Replace WSAA Standard Drawing SEW – 1412 with: <ul style="list-style-type: none"> Unitywater's Standard Drawing SCW 135.
Pt 1 – 8 – Structural Design	Add to WSAA requirement: <ul style="list-style-type: none"> Concrete encasement of sewerage mains is not permitted.
(Pt 1, Section 9.2.1) General	Add to WSAA requirement:

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Part	Variations
Pt 1, Section 9 Design Review and Drawings	<ul style="list-style-type: none"> Design Drawings are to include signed checking certification from an RPEQ. Refer to Section 10, Appendix B – Plan Presentation

(2) Proposals to construct within 1.5m of infrastructure – 150mm diameter or less:-

- (a) Unitywater’s consent is required to construct within 1.5m of water supply or sewerage infrastructure and will only be considered where it is demonstrated that clauses (i) or (ii) below cannot be achieved:-
 - (i) the building or other structure is redesigned, or relocated to provide a minimum 1.5m horizontal clearance from the existing infrastructure to the outermost projection of the proposed structure; or
 - (ii) existing infrastructure is relocated, with the approval of Unitywater, to provide a minimum 1.5m horizontal clearance from the outermost projection of the proposed building or other structure.
- (b) where it is demonstrated that clauses (i) and (ii) above cannot be achieved, Unitywater may consider giving consent to construct within 1.5m of the infrastructure subject to any or all of the following requirements:-
 - (i) submission of a structural footing design prepared and certified by a registered professional engineer, demonstrating that the building or other structure does not impose any load on the infrastructure;
 - (ii) any footings of the building or structure which are within the zone of influence of the infrastructure are to extend below Line B (refer Figure SC6.14A (Zone of influence)) either with piers or a continuous footing located a minimum horizontal distance of 1.0m clear of the pipe;
 - (iii) replacement of the existing pipe work with DICT or an approved PVC-U pipe material to ensure a future life in excess of 50 years;
 - (iv) design of the building or structure to permit its easy removal for access to Unitywater’s infrastructure if required;
 - (v) a pre and post construction video inspection of the affected sewerage infrastructure;
 - (vi) lodgement of a security bond, as determined by Unitywater under bonding requirements, to cover potential damage to the infrastructure as a result of the proposed building works;
 - (vii) construction of a maintenance hole immediately upstream and/or downstream of the structure;
 - (viii) completion of a Deed of Indemnity, by the property owner/s, legally indemnifying Unitywater against any future structural failure, repair or reinstatement works; and
 - (ix) payment of the prescribed application fee.

(3) Proposals to construct within 1.5m of infrastructure larger than 150mm diameter:-

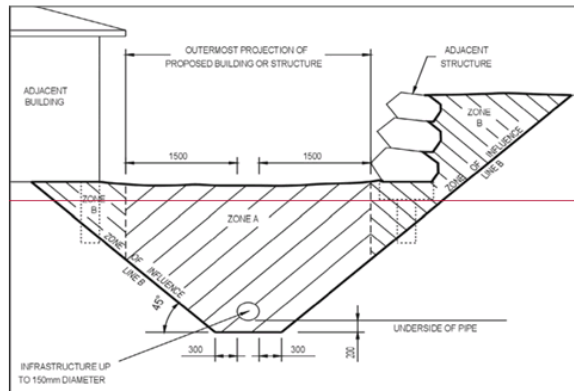
- (a) for infrastructure larger than 150mm diameter, building within 1.5m of infrastructure is not permitted. The infrastructure is to be relocated or the building designed to provide a minimum 1.5m horizontal clearance from the outermost projection of the structure to the nearest edge of the pipe.

(4) Proposals to construct 1.5 metres or greater from infrastructure:-

- (a) the foundations of any structure, located 1.5m or a greater horizontal distance from water supply or sewerage infrastructure, but within Zone B (refer **Figure SC6.14.5A (Zone of influence)**) are to extend below Line B either with piers or a continuous footing; and
- (b) there are no requirements for structures outside the zone of influence.

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Figure SC6.14.5A Zone of influence



- (5) The following structures do not require consent from Unitywater. However, the design considerations of this planning scheme policy still apply:-
- (a) any structure located 1.5m, or greater horizontal distance, from water supply or sewerage infrastructure;
 - (b) any lightweight demountable fence;
 - (c) masonry fences up to 1.8m high, located on the road frontage boundary and constructed parallel to the sewer with a minimum horizontal distance from the fence foundation of 1.0m clear of the sewer pipe;
 - (d) retaining walls less than 1.0m high; and
 - (e) a single demountable lightweight garden shed with wall lengths of less than 3.0m with lightweight roof and concrete floor no greater than 100mm thick. The shed shall be easily removable from the concrete pad.
- (6) Other considerations:-
- (a) where masonry fences greater than 1.0m high cross a sewer, the fence shall be self-supporting for a minimum of 1.0m either side of the sewer main;
 - (b) no excavation or filling shall be undertaken over or adjacent to sewerage infrastructure without the consent of Unitywater;
 - (c) where consent is obtained, any affected maintenance holes or fittings shall be adjusted as required;
 - (d) ground surface levels must not be altered in a way causing ponding of water over any maintenance hole;
 - (e) a sewer connection point must have:-
 - (i) a clear area encompassing a 1.0m radius around the connection point;
 - (ii) minimum horizontal clearance of 1.0m from any building; and
 - (iii) a minimum unobstructed vertical clearance of 2.4m; and
 - (f) Unrestricted access must be maintained to sewerage infrastructure at all times.
- (7) The following provisions in Table SC6.14.5C (Approved sewer pipe materials) and Table SC6.14.5D (Approved sewer pressure mains materials) relate to variations in products and materials in Part 2 - 10.4.1 Product Standards.

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Table SC6.14.5C—Approved sewer pipe materials

Diameter mm (DN)	Function	Material							
		PVC-U	VC	Concrete-PVC Lined	ABS (Acrylonitrile Butadiene Styrene)	Poly-propylene	PE100	DICL	MSCL (Sintakote)
100	House connection	SN6	CS 34	NA	NA	NA	SDR 21	PN35 [*]	NA
150	House connection	SN8	CS 34	NA	SN 8	NA	SDR 21	PN35 [*]	NA
150	Sewer Main	SN8	CS 34	NA	SN 8	NA	SDR 21	PN35 [*]	Approved
225	Sewer Main	SN8	MCN 160	NA	SN 8	NA	SDR 21	PN35 [*]	Approved
300	Sewer Main	Min Class PN12 AS1477	MCN 120	NA	SN 8	SN 10	SDR 21	PN35 [*]	Approved
375-450	Sewer Main	NA	MCN 95	NA	SN 8	SN 10	SDR 21	PN35 [*]	Approved
525	Sewer Main	NA	MCN 95	NA	SN 8	SN 10	SDR 21	PN35 [*]	Approved
600	Sewer Main	NA	MCN 95	Class 3	SN 8	SN 10	SDR 21	PN35 [*]	Approved
Applicable Notes		1, 2, 3, 4	1, 4	1, 4,	1, 4, 5	1, 4,	1, 5,	1, 4, 7, 8	1, 5
WSAA Purchase Specification		PS-230	PS-231	PS-232	PS-234	PS-238	-	PS-234	PS-203

^{*} Requires REPE validation

Table SC6.14.5D—Approved sewer pressure mains materials

Diameter – mm (DN)	Function	Material	
		PE100	DICL
100	Sewer Main	SDR 21	PN 35 [*]
150	Sewer Main	SDR 21	PN 35 [*]
225	Sewer Main	SDR 21	PN 35 [*]
300	Sewer Main	SDR 21	PN 35 [*]
375-450	Sewer Main	SDR 21	PN 35 [*]
525	Sewer Main	SDR 21	PN 35 [*]
600	Sewer Main	SDR 21	PN 35 [*]
Applicable Notes		1, 5,	1, 4, 7, 8
WSAA Purchase Specification		PS-207	PS-234

^{*} Requires REPE validation

Notes to tables of materials—

1. Pipe classes specified are minima only. The designer shall confirm pipe class suitability by structural analysis.
2. Class SN 8 is acceptable for sewers up to max. 3.0m depth. Sewers in excess of 3.0m deep to be constructed from PVC-U PN 12 series 1 pipework.
3. Pipe to be solid wall type, maximum 3.0m lengths.
4. Rubber ring seal only.
5. Suitable for specific uses only, as approved by Unitywater.
6. Allowable in sewerage pressure pipeline systems.
7. Sewerage pressure pipeline fittings shall be fusion bonded polymer encapsulated ductile iron cement lined.
8. DICL pipes shall be protected against chemical attack by an approved method such as Calcium aluminate cement mortar lining.
9. WSSA Product Purchase Specifications are available to download at www.wsaa.asn.au

(8) The following provisions in **Table SC6.14.5E (Variations to construction)** relate to variations to construction.

Table SC6.14.5E Variations to construction

Part	Variations
PT 3 – 12.2 Personnel Qualifications	Add to WSAA requirement:- <ul style="list-style-type: none"> ● Pipe layers shall be accredited by the pipe manufacturer including "Century Plus" accreditation for DICL, "Pipelines Installation" for PVC and "Electrofusion/Butt Welding" for Polyethylene Pipe.
PT 3 – 13.5.4.2 – Traffic Management	Replace WSAA requirement with:- <ul style="list-style-type: none"> ● A traffic management plan shall be prepared for all projects.
PT 3 – 17.1.4 Laying	<ul style="list-style-type: none"> ● WSAA Standard Drawing SEW – 1103 is not adopted by Unitywater.
PT 3 – 17.7 Property Connection Sewers	Replace WSAA Standard Drawing SEW 1109 with:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawings SCW 125 and SCW 130.
PT 3 – 17.8 – Dead Ends	Replace WSAA Standard Drawing SEW – 1109 with:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawings SCW 125 and SCW 130.
PT 3 – 17.9 – Marking of Property Connection Sewers and Dead Ends	Replace WSAA Standard Drawings with:- <ul style="list-style-type: none"> ● Unitywater's Standard Drawings SCW 130 and SCW 125.
PT 3 – 17.12 – Bored Pipes Under Roads, Driveways and Elsewhere:-	<ul style="list-style-type: none"> ● WSAA Standard Drawing SEW – 1400 is not adopted.
PT 3 – 18.1 – Maintenance Holes (MHs) – General:-	<ul style="list-style-type: none"> ● WSAA Standard Drawing SEW 1307 is not adopted by Unitywater. ● WSAA Standard Drawing SEW – 1400 is not adopted by Unitywater.
PT 3 – 19.1 – Maintenance Shafts (MS and TMS) and Inspection Openings (IO) – General	Replace WSAA referenced Standard Drawings with: <ul style="list-style-type: none"> ● SCW 160, SCW 125, SCW 130, SEW – 1314, SEW – 1316 and SEW – 1317.
PT 3 – 19.2 – Sealing Caps	Replace WSAA Standard Drawing SEW – 1106 with: <ul style="list-style-type: none"> ● Unitywater's Standard Drawing SCW 125 and SCW 130.
PT 3 – 19.3 – Covers	Replace WSAA Standard Drawings SEW – 1106 and SEW – 1109 with: <ul style="list-style-type: none"> ● Unitywater's Standard Drawings SCW 125 and SCW 130.
PT 3 – 20.6 – Concrete Embedment and Encasement:-	<ul style="list-style-type: none"> ● WSAA Standard Drawing SEW – 1400 is not adopted by Unitywater.
PT 3 – 22.4 – Air Pressure and Vacuum Testing of Sewers	Add to WSAA requirement:- <ul style="list-style-type: none"> ● Vacuum testing shall be undertaken on all sewers and maintenance holes.
PT 3 – 22.6 – Deflection (Ovality) Testing of Flexible Sewers	Add to WSAA requirement:- <ul style="list-style-type: none"> ● Deflection testing shall be undertaken on all flexible sewers.
PT 3 – 22.6.3 – Flexible Sewers	Replace WSAA requirement with:- <ul style="list-style-type: none"> ● replace with 22.6.4
PT 3 – 22.7 – CCTV Inspection	Add to WSAA requirement:- <ul style="list-style-type: none"> ● CCTV inspection shall be undertaken on all sewers prior to "on" and "off" maintenance inspections.
PT 3 – 24 – Connection to Existing Sewers	Replace WSAA requirement with:- <ul style="list-style-type: none"> ● All works that may involve connection to or modification of the existing sewerage system are known as "live sewer works". Typical works include:- <ul style="list-style-type: none"> ○ new connections to existing maintenance holes, and sewers; ○ connection of a new maintenance hole over an existing sewer or dead end; ○ extension or relaying existing sewers; ○ replacement of sewers; ○ raising or lowering of existing maintenance holes; and ○ other works on existing sewers and maintenance holes. ● "Live sewer works" shall be clearly identified on the drawings. All "live sewer works" shall be undertaken by Unitywater at the applicant's expense. Sewer mains are considered to be live once accepted "on maintenance" by Unitywater.
PT 3 – 27 – Excavation or Filling	Add to WSAA requirement:-

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Part	Variations
over Existing Sewers	<ul style="list-style-type: none"> • Where Unitywater's approval is granted to alter the existing ground surface level over an existing sewer: <ul style="list-style-type: none"> ○ house connections on the sewer are to be altered to the minimum depth capable of draining the entire property; and ○ maintenance holes affected by the works are to be altered as required.

(9) Specifications:-

(a) All relevant details are applied under *Water Services Association of Australia (WSAA) National Code*.

SC6.14.5.5 Design and construction of sewerage pumping stations

(1) This section shall be read in conjunction with and take precedence over the *WSAA Sewerage Pumping Station Code of Australia – WSA 04-2005* to define the technical requirements of Unitywater in relation to the planning, design and construction of reticulated sewerage systems and read in conjunction with *Unitywater Standard Specification Supply and Installation of Electrical Equipment for Pumping Stations*. Where discrepancies exist Unitywater's specification shall have precedence.

(2) Refer to **SC6.14.5A (WSAA drawing numbers)** for relevant adopted drawings.

(3) The following provisions in **Table SC6.14.5F (Planning and design)** relate to Part 1: Planning and Design.

Table SC6.14.5F Planning and design

Part	Variations
PT 1 – 5.2.6 Landscaping	Add to WSAA requirement:- <ul style="list-style-type: none"> • Landscaping works require an Operational Works approval.
PT 1 – 5.3.2 Inlet MH design	Replace WSAA requirement with:- <ul style="list-style-type: none"> • House overflow monitoring/telemetry equipment not required.
PT 1 – 5.4.2 Sizing	Replace WSAA requirement with:- <ul style="list-style-type: none"> • The wet well diameter shall be a minimum of 2.4m.
PT 1 – 6.6.5 Junction Boxes	<ul style="list-style-type: none"> • Junction Boxes are not permitted.
PT 1 – 6.8.1 Pump Starters and Variable Speed Drives	<ul style="list-style-type: none"> • Autotransformers are not permitted.
PT 1 – 7.3.1 Power and Control Cubicle:	<ul style="list-style-type: none"> • Aluminium/zinc coated steel sheet not permitted.
PT 1 – 7.3.2.4 Degree of Protection:	<ul style="list-style-type: none"> • The switching mechanism component shall be rated at a degree of protection of IP42.
PT 1 – 8.3.1 Pumping Control	<ul style="list-style-type: none"> • Interlock control is not required.
PT 1 – 8.3.5 Pump Starts and Interlocks:	<ul style="list-style-type: none"> • Interlock control is not required.
PT 1 – 10.11.2 Discharge Manholes	Add to WSAA requirement:- <ul style="list-style-type: none"> • Where pressure sewers discharge to gravity system, the receiving structure shall be a plastic maintenance hole or approved alternative. Connection to Unitywater's sewer system shall be by gravity only to a maintenance hole with an approved H2S gas inhibiting product. • The two maintenance holes immediately downstream and one immediately upstream shall also be treated with an approved H2S gas inhibiting product.
PT 1 – 15.3.3 Recording of as-constructed information	Add to WSAA requirement:- <ul style="list-style-type: none"> • The <i>Unitywater Asset Manual for Sewerage Pump Station Assets</i> must be completed and submitted to Unitywater prior to the on maintenance inspection. • The <i>Unitywater Asset Record for Water Supply and Sewerage Pump Station Assets</i> must be completed and submitted to Unitywater prior to the "on maintenance" inspection.
PT 3 – 21.4.6 (a) Mains Requirements	<ul style="list-style-type: none"> • Item (a) is not required.

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Part	Variations
PT 3 – 21.4.8.1 Underground Cable Installation	<ul style="list-style-type: none"> Method (b) is the required method.
PT 3 – 21.7.2 Control circuit wiring	Replace WSAA conductor requirement with:- <ul style="list-style-type: none"> use flexible PVC-coated tinned 30/0.65 copper conductors of minimum size 1.5mm² with 250 V grade insulation. Extra-low voltage devices are coloured orange.
PT 3 – 21.8.2 Conduits	<ul style="list-style-type: none"> Hot dip galvanised saddles are not permitted.
PT 3 – 36.4.2.2 Low pressure air testing	Replace WSAA requirement with:- <ul style="list-style-type: none"> Vacuum testing is required for gravity sewers.

SC6.14.5.6 Guidelines

All relevant guidelines are applied under the *Water Services Association of Australia (WSAA) National Code*.

SC6.14.6 SC6.14.4 Site development management

SC6.14.6.1 SC6.14.4.1 Purpose

- (1) The purpose of this section of the **Planning scheme policy for development works** is to:-
- provide **advice and** guidance on general management practices relating to development works; and
 - detail environmental performance standards for developments, which when applied, will achieve the protection and enhancement of the environmental values of waters and the healthy functioning of aquatic, marine, and wetland ecosystems from the impacts of land development.

SC6.14.6.2 SC6.14.4.2 Application

- (1) This section of the planning scheme policy applies to **all** assessable development **which** requires **assessment** against the **Works, services and infrastructure code**.
- (2) This section is structured as follows:-
- Section SC6.14.6.1** and **Section SC6.14.6.2** provides the framework;
 - Sections SC6.14.6.3** to **SC6.15.6.5** detail **provides** the requirements and procedures to **facilitate compliance with the relevant provisions for achieving the outcomes of the Works, services and infrastructure code and to achieve the purpose of this section of the planning scheme policy**; and
 - Section SC6.14.6.6** contains guidelines for achieving compliance with this section of the planning scheme policy.

SC6.14.6.3 SC6.14.4.3 Site management practices

General construction activities

- (1) All works are to be constructed in accordance with the approved plans.
~~(1) General:-~~
- ~~all works are to be constructed in accordance with approved plans.~~
- (2) Construction ~~debris and waste~~ works are to ensure that:-
- Construction works are to be undertaken in such a manner so as to prevent the entry of ~~no~~ **debris, waste or** pollutants **and waste into** enter the stormwater drainage system, waterways or adjacent land;
 - ~~No~~ wastes are ~~to be~~ disposed to the stormwater drainage system or sewer system;

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- (c) ~~Provision is to be made~~ on site for the orderly collection and temporary storage of all site debris and waste. All construction waste is to be disposed of at an approved waste disposal facility.
 - (d) ~~The storage area or areas for site debris and waste are to be kept covered and located away from drainage paths to prevent litter and debris entering the stormwater drainage system;~~ and
 - (e) ~~Catch drains are to be installed upslope from stockpiles to divert water around stockpiles.~~
- (3) De-watering ~~activity is to ensure that:-~~
- (a) ~~All ground water overflows from de-watering activity are to be treated before being discharged into the stormwater drainage system. Prior to discharge to the stormwater system or any waterway, discharges are to be tested to meet the requirements of the ANZECC Guidelines for Fresh and Marine Water Quality;~~ and
 - (b) ~~Copies of testing and monitoring reports for all de-watering activities are to be kept on site.~~
- (4) Concrete works ~~are to ensure that:-~~
- (a) ~~All residues and wastes generated by the carrying out of concrete works are to be prevented from entering the stormwater system;~~
 - (b) ~~Site mixing of concrete, either by hand or mechanical means, is to be carried out in a designated area of the site that prevents the chance of wastewaters entering the stormwater system;~~ and
 - (c) ~~Concrete mix trucks, pumps and equipment are not to be washed down on roadways, footpaths or reserves. This should be conducted at wash-down bays, either on-site or at the applicant's depot.~~
- (5) Exposed aggregate or coloured concrete ~~finishes are to ensure that:-~~
- (a) ~~All slurry from exposed aggregate concrete finishes is to be directed to a contained area on site so that the sediments can be filtered out. At no times is slurry to be allowed to enter the stormwater system, waterways or adjacent land;~~ and
 - (b) ~~If colouring is added following the placement of concrete, appropriate methods are to be implemented to prevent the waste which may be blown or washed into the stormwater drainage system.~~
- (6) Brick, ~~paver and tile works and paver-cutting are to ensure that:-~~
- (a) ~~Mortar is not to be mixed in locations which drain directly to the stormwater drainage system or adjacent land;~~ and
 - (b) ~~All wastewater from brick, paver and tile cutting activities is to be prevented from entering the stormwater drainage system.~~

Air pollution and dust control

- (7) At all times, appropriate controls and construction methods are to be employed to prevent air pollution from the construction activities.
- (8) Appropriate methods for dust suppression ~~should shall~~ include minimising disturbed areas, re-vegetation of disturbed areas immediately after works completed, and the use of dust suppression methods.
- (9) At all times the requirements of the *Environmental Protection Act 1994* for air quality are to be maintained on site, including any odours, dust or air pollution.

Noise and construction hours

- (10) Working hours are to be ~~as per relevant State legislation between 7am to 6pm Monday to Saturday inclusive,~~ unless otherwise specified in the conditions of the development approval.

- (11) If works are required to be undertaken outside of these hours, requests are to be made in writing to Council's Development Services Branch. Written requests are to outline the reasons why works cannot be undertaken during the times nominated, including consideration of alternate construction methods. Council will review and inform the applicant if works outside the nominated times can be undertaken.

Note: ~~the~~ the hours of works nominated includes general works, site set-up, deliveries and any other activities that may generate noise, disruption or inconvenience to ~~the~~ surrounding ~~environment and~~ residents ~~and~~ amenity.

Vehicular access

- (12) Engineering design plans are to indicate the location, type, size and finish of accesses.
- (13) For site development on all land other than in the Low density residential zone, a heavy duty vehicular access is to be constructed. Accesses are to comply with Council's ~~approved~~ Standard ~~Engineering~~ Drawings.
- (14) Accesses are not to cross the footpath or verge in front of adjoining properties, unless otherwise approved.
- (15) A grated drain is required on the inside of the boundary alignment on ascending driveways and may be piped directly to the kerb and channel (a kerb adaptor ~~should is to~~ be used where practical, refer Council's Standard ~~Engineering~~ Drawings). Grated drains are to be bolted down to diminish noise. The piping across the footpath to the kerb and channel is to be constructed of hot dip galvanised rectangular hollow sections (RHS) with a maximum height of 100mm and a minimum width of 75mm. The RHS is to be placed at 45° to the frontage kerb and ~~must shall~~ not encroach upon the verge fronting any adjoining land.
- (16) Driveway surfaces are to have a non-slip finish, while stamped concrete is not to include edges or lips that compromise pedestrian safety.
- (17) Saw cuts are to be used at existing footpath, kerb and channel and road pavements when constructing a driveway.
- (18) All existing vehicular crossings that will be redundant are to be closed and the footpath reinstated. Kerb and channeling is to be in accordance with Council's Standard ~~Engineering~~ Drawings.

Traffic management

- (19) A Traffic Management Control Plan (TMCP) is to be prepared to provide for the safe and orderly passage of vehicular, pedestrian and bicycle traffic through and around the site during construction of works and for management of environmental impacts of traffic. TMCPs are to be prepared in accordance with Part 3 of the ~~Transport & Main Roads~~ ~~DTMR~~ ~~Queensland~~ Manual for Uniform Traffic Control Devices (MUTCD) and are subject to Council approval.
- (20) The TMCP is to be prepared by a suitably qualified person and is to:-
- describe traffic arrangements that provide for the construction of the work while minimising disruption to local traffic from adjacent communities, emergency vehicles, pedestrians and cyclists;
 - provide details of all traffic management changes, including staging of construction activities where required;
 - describe how the construction work zone is to be physically isolated from traffic and pedestrians;
 - provide details of how local access to communities and adjacent businesses will be maintained;
 - provide advance notification to the supervising RPEQ ~~engineer~~, ~~P~~police and ~~E~~emergency ~~S~~services ~~personnel~~ of proposed significant changes to traffic arrangements on the major network roads;
 - describe measures to effectively minimise any dust which may occur during construction activity including transport of material to and from the site that may affect the safety and general comfort of the public, employees and/or occupants of adjacent buildings;

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- (g) describe measures to ensure access for emergency vehicles to the construction site;
 - (h) describe measures to provide adequate information to ensure the community, including local businesses, are informed of changes to traffic movements as a result of construction; and
 - (i) describe where police officers are to be employed to assist with control of traffic, and provide evidence of approval of necessary arrangements with the Queensland Police Service.
- (21) Short duration closures of an entire carriageway may be approved, but are subject to the issue of a permit from Council. For a temporary carriageway closure to be approved, it is to be demonstrated that:-
- (a) partial lane closures are impractical because of:-
 - (i) an unacceptable hazard to motorists or workers; and/or
 - (ii) the extent of delays to motorists or rework occasioned by partial closures over a more extended period; and
 - (b) the duration of any closure is to be the minimum required to affect the critical works.

Public utility plant

- (22) Provision is to be made for the relocation of any public utility plant, being any railway, viaduct, aqueduct, conduit, water channel, pipeline (water, stormwater, oil, gas, sewerage or otherwise), fixed mechanical conveyor, tower, pole, cable, electrical installation or telecommunications plant (including cameras), whether above or below the ground, that is affected by the construction of development works.
- (23) The applicant will be responsible for the management of all work associated with relocation of affected utilities and to ensure that the specific relocation and/or replacement requirements of each responsible public utility authority are met.
- (24) The applicant will be responsible for any damage to any public utility plant (including any completed public utility plant relocation) caused by the execution of work. The applicant is to make arrangements directly with the relevant public utility authority for any such repair work.
- (25) The applicant is to ensure that disruption in disconnecting and reconnecting public utility plant to individual land owners and/or occupiers is kept to a minimum. The applicant is to consult with the relevant public utility authority regarding special requirements regarding involving continuity of supply of any public utility plant and take all measures necessary to satisfy such requirements.
- (26) The applicant is to notify affected landowners and/or occupiers at least 24 hours prior to planned works commencing.
- (27) The applicant is to provide as-constructed drawings to the standard specified in **Section SC6.14.410.10.9 (As-constructed documentation)** as soon as practicable after the responsible Public Utility Authority has approved the completed public utility works.

SC6.14.6.4SC6.14.4.4 Stormwater management programs and erosion and sediment control plans

General

- (1) Concept erosion and sediment control (ESC) plans, ESC plans, construction phase stormwater management (CPSM) programs, design certificates and inspection certificates are to be prepared by a suitably qualified and experienced professional, who has completed an advanced specialised training course in erosion and sediment control, provided under the auspices of a reputable body such as the International Erosion Control Association.

Information required in support of a development application

- (1)(2) All applications, including material change of use (MCU), reconfiguring a lot (RAoL) and operational work OPW (where not previously addressed as part of MCU/RAoL application), which will result in a total area in excess of 5000m² of either land disturbance and/or exposure of soil and which are included in one of the categories listed in Column 1 of Table SC6.14.6A.4A (Information required at development application stage) are required to submit the

information required at development application stage summarised in Column 2 at the time specified in Column 3. Further detail of the information required is provided under the heading of **Concept erosion and sediment control plans** in this section of the planning scheme policy.

Table SC6.14.6A4A Information required at development application stage

<u>Column 1</u> <u>Category</u>	<u>Column 2</u> <u>Information required</u>	<u>Column 3</u> <u>Timing</u>
Applications involving the endorsement of a staging plan	Concept ESC Plan which demonstrates that the proposed staging will facilitate provision of effective ESC during construction and effective WSUD during the operation of each stage.	With application
Applications proposing works below the 1% AEP flood level	Concept ESC Plan which demonstrates that conventional ESC infrastructure is able to be provided to treat runoff from the development site and that exposed areas and ESC infrastructure will not be inundated with flood waters for at least the flood event having a 39% AEP (Q2). Where filling below the 1% AEP is proposed, a construction phase flood study is required to be provided in conjunction with the above and is to demonstrate that the proposed construction methodology will not worsen off-site flood levels at any time during construction.	With application
Applications proposing works or necessitating infrastructure works which cross waterways or are within riparian protection areas identified on relevant overlay maps in the <u>Planning Scheme</u>	Concept ESC Plan which demonstrates how impacts on the waterway have been minimised through appropriate route selection and type of crossing and how construction of the crossing will be managed in accordance with a current best practice manual such as <i>IECA 2008, Best Practice Erosion and Sediment Control – Appendix I</i> .	With application
Applications for which 1ha or greater external catchment area contributes stormwater runoff to the subject site	Concept ESC Plan which demonstrates that clean stormwater from upslope external catchment(s) can be diverted around or through the site without causing either an increase in turbidity of the flow, or erosion on site or off-site. Alternatively, if it is not feasible to divert clean stormwater from upslope external catchment(s) around or through the site the Concept ESC Plan <u>should is to</u> demonstrate that there is sufficient area to install a sediment basin which is sized to accommodate the stormwater runoff from the whole upslope catchment.	With application
Applications proposing works below <u>5.0 metres</u> AHD	Concept ESC Plan which demonstrates that: <ul style="list-style-type: none"> there is sufficient area to install an appropriately sized sediment basin; the runoff from all disturbed areas can be directed to a sediment basin; <u>and</u> it is feasible to install sediment basins which will have sufficient storage volume to contain design storm event i.e. the sediment basin(s) will not be inundated with groundwater. 	With application
Applications proposing works on land identified in a planning scheme overlay map as a landslide hazard area or otherwise having a slope of greater than 20%	Concept ESC Plan which demonstrates that: <ul style="list-style-type: none"> there is sufficient area to install an appropriately sized sediment basin; <u>and</u> the runoff from all disturbed areas can be directed to a sediment basin. Preliminary engineering sections of proposed sediment basins showing that they may be practically implemented on the slopes proposed. Preliminary earthworks plan <u>showing demonstrating</u> proposed extent of land disturbance. Geotechnical Report which assesses the probability of	With application

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Column 1 <u>Category</u>	Column 2 <u>Information required</u>	Column 3 <u>Timing</u>
	landslip instability as a result of the construction phase ESC measures.	

Note—for development not meeting any of the trigger criteria in the Category Column 1, no Concept ESC Plan is required with the application

Concept erosion and sediment control plans

~~(2)(3)~~ Concept ESC plans are to be submitted with applications for developments involving issues identified in **Table SC6.14.6A-4A (Information required at development application stage)**, to assist Council in deciding the application. The purpose of concept ESC plans is to demonstrate the feasibility of implementing the required level of protection to receiving waters from the potential impacts of the development using best practice ESC. Normally concept ESC plans do not contain engineering drawings of structures, unless specified in **Table SC6.14.6A-4A (Information required at development application stage)**.

~~(3)(4)~~ In addition to the information required by **Table SC6.14.6A-4A (Information required at development application stage)**, concept ESC plans ~~must~~**are to** demonstrate the following:-

- (a) the design, intensity, configuration and establishment of development is compatible with the physical constraints of the site and receiving environment;
- (b) the feasibility of effective erosion and sediment control measures being implemented is substantiated, including consideration of the impacts of the overall development until permanent stabilisation of the site. A drawing showing a conceptual treatment train and giving preliminary calculations for the sizing of a sediment basin or basins is to be provided; and
- (c) a contoured site plan showing natural features and location of the proposed control structures, including sediment basins is to be provided with an overview strategy for the site, outlining the sequence of development and temporary and permanent management mechanisms until commissioning of permanent water sensitive urban design features is undertaken.

Information required in support of construction phase

~~(4)(5)~~ Any development involving a total area in excess of 5000m² of either land disturbance and/or exposure of soil, and included in one of the categories listed in **Column 1 of Table SC6.14.6B-4B (Information required at construction stage)** is required to submit the information summarised in **Column 2** at the time specified in **Column 3**. Further details of the information required are provided under the headings of **Design certificate, Erosion and sediment control plans, Construction phase stormwater management program, Design certificate** and **Inspection certificate** in this section of the planning scheme policy.

Table SC6.14.6B-4B Information required at construction stage

Column 1 <u>Category</u>	Column 2 <u>Information required</u>	Column 3 <u>Timing</u>
All works subject to an <u>Operational Works OPW</u> Development Permit	Erosion and Sediment Control Plan(s) See relevant heading for requirements.	2 business days prior to pre- start prestart meeting or the relevant ¹ works commencing
	Design Certificate See relevant heading for requirements	2 business days prior to pre- start prestart meeting or works commencing
All works subject to an <u>Operational Works OPW</u>	Construction Phase Stormwater Management Program	2 business days prior to pre-

¹—~~ESC plans might be required for several different stages of the works such as clearing, civil construction, rehabilitation etc. In which case, the ESC plan relevant to the civil works stage would be required 2 business days prior to commencement of that stage~~

Column 1 Category	Column 2 Information required	Column 3 Timing
Development Permit and involving:- <ul style="list-style-type: none"> a total disturbance area of greater than 5000m² and /or an issue listed in <u>Column 1 of Table SC6.14.6A4A</u> 	See relevant heading for requirements	start prestart meeting or works commencing
	Inspection Certificates	As indicated in SC6.14.6A.45
	See relevant heading for requirements	Quality Assurance (Inspection Certification)
	Schedule of Registered Business Names	At the pre- startprestart meeting or prior to works commencing
	See relevant heading for requirements	

Note—ESC plans might be required for several different stages of the works such as clearing, civil construction, rehabilitation etc. In which case, the ESC plan relevant to the civil works stage would be required 2 business days prior to commencement of that stage.

Design certificate

(6) The Design Certificate Erosion and Sediment Control Form is to be completed and submitted to Council at least 2 business days prior to the prestart meeting. The form can be obtained on Council's website.

Schedule of registered business names

(7) The name and contact details of the land owners, supervising RPEQ engineer and principal contractor for the purposes of compliance with the conditions of the approval are to be provided to Council's delegate at the prestart meeting in writing. The details are to include the registered business name and ABN/CAN. Any changes to these parties during construction are to be notified to Council in writing within 5 business days of the change occurring.

Erosion and sediment control plans

(5)(8) The primary purpose of an ESC plan is to inform those constructing the development contractors on what controls need are to be implemented throughout all stages of the development from site establishment to plan sealing approval. Typically a separate ESC plan is required for each phase of the development including the site clearing, bulk earthworks, civil construction, services installation of services and final stabilisation. These plans could are to be considered an element as a measure of complying with the general environmental duty, that is doing all that's that is reasonable and practicable to prevent or minimise environmental harm (s319 Environmental Protection Act 1994).

(9) Where engineering structures (either temporary or permanent) such as inlets, outlets and spillways form part of an ESC plan, the design and inspection of such structures are to be undertaken and certified by a RPEQ engineer.

(6)(10) ESC plans should are to:-

- (a) be consistent with this planning scheme policy and current best practice guidelines (such as Council's Manual for Erosion and Sediment Control or IECA Best Practice Erosion and Sediment Control). ~~For issues wW~~ here a guideline is not consistent with this planning scheme policy, the policy prevails;
- (b) be based on an assessment of the physical constraints and opportunities of the development site, including ~~those for~~ soil, landform type and gradient and hydrology;
- (c) provide a set of contour drawings showing the real property description, north point, roads, site layout, boundaries and features. Contours on and surrounding the site ~~should are to~~ be shown so that catchment boundaries can be considered;
- (d) be at a suitable scale for the size of the project (as a guide around 1:1000 at A3 for a 2 hectare development and 1:500 at A3 for a 3000m² development);
- (e) provide background information including site boundaries, existing vegetation, location of site access and other impervious areas and existing and proposed drainage pathways ~~with including~~ discharge points ~~also shown~~;
- (f) show the location of lots;

- (g) show the location of stormwater drainage systems;
- (h) include details on the nature and specific location of works and controls (revegetation, cut and fill, run-off diversions, stockpile management, access protection), timing of measures to be implemented and maintenance requirements (extent and frequency);
- (i) show the way that works will modify the landscape and surface and subsurface drainage patterns (adding new or modifying existing constraints);
- (j) show the staging of works and scheduling of progressive and final rehabilitation as civil works progress;
- (k) identify the riparian buffers and areas of vegetation which are to be protected and fenced off to prevent vehicle access;
- (l) indicate the location and provide engineering details with supporting design calculations for all necessary sediment basins;
- (m) include the location and diagrammatic representations of all other necessary erosion and sediment control measures;
- (n) identify clean and disturbed catchments and flow paths, showing:-
 - (i) diversion of clean runoff;
 - (ii) collection drains and banks, batter chutes and stream crossings;
 - (iii) location of discharge outlet points; and
 - (iv) water quality monitoring locations.
- (o) show calculated flow velocities, sizing and channel lining protection, and velocity/energy checks required for all stormwater diversion and collection drains, banks, chutes and outlets to streams;
- (p) show streams (perennial and non-perennial) and detail of stabilisation measures for all temporary stream crossings;
- (q) locate topsoil stockpiles; and
- (r) provide details of chemical flocculation proposed, including equipment, chemical, dosing rates and procedures, quantities to be stored and storage location, and method of decanting any sediment basin.

Construction phase stormwater management program

~~(7)~~(11) A construction phase stormwater management (CPSM) program is a set of documents and plans that describes what controls are required throughout all stages of the development including the integration of post construction stormwater management. In addition to the provision of ESC plans for each phase of the development as described above, the CPSM Program **must** **also** **shall**:-

- (a) be prepared by a suitably qualified and experienced professional;
- (b) be consistent with this planning scheme policy and current best practice guidelines (such as the IECA Best Practice Erosion and Sediment Control). For issues where a guideline is not consistent with this planning scheme policy, the policy prevails;
- (c) prescribe non-structural controls where applicable, such as minimising the extent and duration of soil exposure, staging the works, identifying areas for protection and delaying clearing until construction works are imminent;
- (d) include a maintenance schedule for ensuring ESC and stormwater infrastructure is maintained in effective working order;
- (e) include an adaptive management program to identify and rectify non compliances and deficiencies in environmental performance;
- (f) include contingency management measures for the site, for example to ensure ESC measures are effective at all times, particularly just prior to, during and after wet weather;

- (g) for each phase of the works (including clearing, earthworks, civil construction, services installation and landscaping) detail the type, location, sequence and timing of measures and actions to effectively minimise erosion, manage flows and capture sediment;
- (h) be consistent with current best practice standards, taking into account all environmental constraints including erosion hazard, season, climate, soil and proximity to waterways;
- (i) be prepared to a sufficient standard and level of detail such that compliance with the concept ESC plans section of this planning scheme policy ~~will be~~ achieved if the plans are correctly implemented on site;
- (j) include an effective monitoring and assessment program to identify, measure, record and report on the effectiveness of ESCs and the lawfulness of releases; and
- (k) be submitted to Council at least 2 business days prior to the ~~pre-start~~ meeting.

Design certificate

- (8) ~~The Design Certificate for Erosion and Sediment Control must be completed using the form provided on Council's webpage and submitted to Council at least 2 business days prior to the pre-start meeting.~~

Inspection certificate

- (9)(12) Refer to **SC6.14.6.4.5 (Protecting waters from the impacts of development)** - Quality Assurance (Inspection Certification).

Schedule of registered business names

- (10) ~~The name and contact details of the land owner, supervising RPEQ and principal contractor, for the purposes of compliance with the conditions of this approval, is to be provided to Council's delegate at the pre-start meeting in writing. The details must include the registered business name and ABN/ACN. Any changes to these parties during construction are to be notified to Council in writing within 5 business days of the change occurring.~~

Qualifications

- (11) ~~Concept ESC plans, ESC plans, CPSM programs, design certificates and inspection certificates are to be prepared by a suitably qualified and experienced professional. This person is to have completed an advanced specialised training course in erosion and sediment control, provided under the auspices of a reputable body such as the International Erosion Control Association.~~
- (12) ~~Where engineering structures (either temporary or permanent) such as inlets, outlets and spillways, form part of an ESC Program, the design and inspection of such structures are to be undertaken and certified by a RPEQ.~~

SC6.14.6.5SC6.14.4.5 **Protecting waters from the impacts of developments**

Quality assurance (inspection certification)

- (1) This section does not apply to developments which have a total disturbance area of less than 5000m².
- (2) The land owner is ~~to ensure~~ **responsible for ensuring** that certification is provided at the intervals specified in (3) (c) below, verifying that matters pertaining to the environmental management of the development are either:-
 - (a) in compliance with **Avoiding and minimising releases, flow and discharges of prescribed water contaminants** of this section, or
 - (b) where not in compliance with (a) above, specific advice has been given to the land owner, which if implemented, will achieve compliance with **Avoiding and minimising releases, flow and discharges of prescribed water contaminants** of this section.
- (3) Certification is to:-
 - (a) be on the approved form;

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- (b) be undertaken by a suitably qualified and experienced professional, not directly employed by the principal contractor;
 - (c) be undertaken at the following minimum intervals:-
 - (i) prior to the commencement of bulk earthworks;
 - (ii) prior to requesting a Council sub grade inspection;
 - (iii) prior to requesting a Council WSUD hold-point inspection; and
 - (iv) at intervals not exceeding 1 month. ~~and~~
 - (d) be provided to the land owner, supervising RPEQ engineer, the principal contractor and Council and verify that:-
 - (i) it is a true and accurate assessments of the findings; and
 - (ii) it is kept available (copies) on site together with copies of all specific directions issued in relation to the certification for inspection by Council.
- (4) This requirement does not diminish the responsibility of any parties involved in the development to do all that is reasonable and practicable to ensure effective environmental management is implemented on site at all times and in accordance with the requirements of the applicable development permits and the *Environmental Protection Act 1994*.

Avoiding and minimising releases, flow and discharges of prescribed water contaminants

- (5) Prescribed water contaminants (as defined in the *Environmental Protection Act 1994*) are not to be released from the site or be likely to be released should rainfall occur, unless all reasonable and practicable measures are taken to prevent or minimise the release and concentration of contamination. These measures are to include as a minimum but not limited to the following:-
- (a) ensure non-essential exposure of soil is avoided by restricting the extent of clearing to that necessary for access to and safe construction of the approved works;
 - (b) vegetation in all other areas of the site is to be protected;
 - (c) the duration of soil exposure is to be minimised by:-
 - (i) only clearing vegetation immediately prior to an area being actively worked;
 - (ii) staging the works to minimise the area of soil exposed at any one time;
 - (iii) effectively stabilising cleared areas if works are delayed or works are not intended to occur immediately;
 - (iv) effectively stabilising areas at finished level without delay and prior to rainfall; and
 - (v) effectively stabilising steep areas, such as stockpiles, batters and embankments, which are not being actively worked and prior to rainfall. ~~;~~

Note ~~—~~an effectively stabilised surface is one that does not have visible evidence of soil loss caused by sheet, rill or gully erosion, lead to sedimentation or lead to water contamination.

- (d) ensure clean stormwater is diverted or managed around or through the site without increasing the concentration of total suspended solids or other contaminants in the flow and without causing erosion (on site or off site). If it is not feasible to divert all areas discharging clean stormwater around or through the site, manage the clean stormwater runoff as for contaminated stormwater runoff and ensure that sediment basins are sized to accommodate the additional volume of runoff;

Note ~~—~~diverting clean stormwater runoff into a sediment basin is an inferior option to diverting clean stormwater around or through the site because it will cause an increase in the volume and frequency of contaminated release from the sediment basin. For this reason, diverting clean stormwater into a sediment basin is not acceptable unless the proponent demonstrates that diverting clean stormwater around or through the site is not feasible.

- (e) ensure sheet flows of stormwater are managed such that sheet and rill erosion are prevented or minimised;
- (f) ensure that all concentrated stormwater flows including drainage lines, diversion drains, channels and batter chutes are managed onto, through, and at release points from the site in all rain events up to and including the AEP event of:-
 - (i) 39% AEP if the disturbed area is open for less than 12 months; or
 - (ii) 18% AEP if the disturbed area is open for between 12 and 24 months; or
 - (iii) 10% AEP if the disturbed area is open for more than 24 months; and

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(g) concentrated stormwater flows are not to cause:-

- (i) water contamination; or
- (ii) sheet, rill or gully erosion; or
- (iii) sedimentation; or
- (iv) damage to structures or property.

Sediment basins

(6) Each sediment basin **should shall** have capacity to treat flows to current best practice standards and as a minimum to contain all the stormwater runoff from the 80th percentile 5 day rainfall depth and store 2 months sediment from the receiving catchment, as determined using the Revised Universal Soil Loss Equation.

Note—research has shown that sediment basins designed on a batch or total storm capture approach are only capable of treating a small percentage of the annual runoff volume without basin size becoming excessive. Innovation in sediment basin design to incorporate continuous flow treatment is likely to occur in the future and as this technology becomes available in best practice guidelines it is required to be adopted where a better water quality outcome will result. In the interim, the minimum basin size is as specified above.

(7) Sediment basins **should are to** be maintained with sufficient storage capacity to capture and treat the runoff for the design rainfall depth or event. Where sediment basins are proposed to be oversized for storage of captured water for re-use, install survey markers in each such basin to indicate the level that water within the basin **must is to** be lowered to, in order to meet the storage capacity specified in requirement (6) above.

(8) Sediment basins **should are to** be dewatered as soon as practicable after each rainfall event and within 2 days of rainfall ceasing.

(9) Stormwater captured in sediment basins **should shall** be treated prior to discharge to minimise the concentration of contaminants released from the site, having due regard to forecast rainfall and ensuring that releases are in accordance with the release limits as specified in this section.

Note—dewatered flows from sediment basins **should shall** be compliant with the release limits as specified, unless it can be demonstrated that a non-compliant release occurred to facilitate a better environmental outcome. For example, higher TSS concentrations may be acceptable in circumstances where further rain is imminent and it can be substantiated that releasing partially treated basin water that has a TSS concentration exceeding the release limit would minimise the total contamination released from the site, by providing for the capture and treatment of expected runoff. However, releasing waters from sediment basins without treatment is not acceptable.

(10) Sediment basins and associated structures such as inlets, outlets and spillways are to be constructed to be structurally sound for a 10% AEP rainfall event under normal circumstances and for a 1% AEP rainfall event if failure of the basin poses a threat to downstream dwellings or public safety.

(11) Accumulated sediment from basins and other controls **should is to** be removed and disposed of appropriately without causing water contamination.

Erosion and sediment controls (other than sediment basins)

(12) Measures **should are to** be implemented such that the runoff from all disturbed areas flows to a sediment basin or basins. Where it is not feasible to divert runoff from small disturbed areas of the site to a sediment basin, implement compensatory erosion and sediment controls prior to rainfall to ensure that erosion of those areas does not occur, including erosion caused by either splash (raindrop impact), sheet, rill or gully erosion processes.

Note—compensatory controls are erosion controls, flow controls and sediment controls which compensate for the lack of sediment basin and are applied such that the type, timing, placement and management of controls minimise the potential for water contamination and environmental harm. This is primarily achieved by reducing the risk of erosion and subsequent sediment release, for example, by turfing or mulching and managing concentrated flows in the area.

(13) Where it is not feasible to effectively stabilise cleared areas of exposed soil, such as areas being actively worked, a full suite of erosion and sediment controls **should are to** be implemented to maximise sediment capture in those areas and minimise erosion such that all forms of erosion, other than splash erosion (raindrop impact) and sheet erosion, does not occur.

(14) In areas of exposed soil where it is not feasible to either effectively stabilise the surface or implement a full suite of erosion and sediment controls (for example in the areas being actively worked and where the implementation of some erosion and sediment controls would impede

construction activities) ensure contingency measures are available on site and are implemented, prior to rain, to maximise sediment capture in those areas and minimise erosion such that all forms of erosion, other than splash erosion (raindrop impact) and sheet erosion does not occur.

Note—this does not apply to major erosion and sediment controls such as sediment basins. Major controls ~~should~~ are to be installed before other works commence.

- (15) All stockpiles, batters and embankments ~~should~~ are to be effectively stabilised without delay. Where it is not feasible to effectively stabilise a stockpile, batter or embankment, such as areas being actively worked, ensure that sediment controls are installed and surface stormwater flows are managed such that erosion of stockpiles, batters or embankments is not caused by concentrated stormwater flows.
- (16) Measures ~~should~~ are to be taken to ensure sediment does not leave the site on the tyres of vehicles.

Work within waterways

- (17) Waterways, including perennial and permanent waterways, are not to be altered, nor riparian (including rehabilitated) vegetation disturbed without prior written approval of the relevant administering authority.
- (18) Work within waterways is to ~~only~~ be:-
- (a) ~~only~~ undertaken during the lower rainfall months;
- (b) promptly rehabilitated conforming to the natural channel form, substrates and riparian vegetation as far as possible; and
- (c) undertaken in accordance with *Best Practice Erosion and Sediment Control*, Appendix I – Instream works, Sections 14 and 16, (International Erosion Control Association, 2008).
- (19) Temporary vehicular crossings of waterways are to be designed and constructed to convey flows and remain stable for all rainfall events up to the 10% AEP event of critical duration.
- (20) ESCs are not to be constructed within the riparian zone, unless it is not feasible to site them elsewhere.

Effective stabilisation prior to plan ~~sealing~~ approval

- (21) Prior to the ~~sealing~~ approval of the plan of survey for the development, all site surfaces are to be effectively stabilised using methods that will continue to achieve effective stabilisation in the medium to long term. For the purposes of this requirement, an effectively stabilised surface is one that does not, or is not likely to, result in visible evidence of soil loss caused by sheet, rill or gully erosion, ~~or~~ lead to sedimentation, ~~or~~ ~~lead to~~ water contamination.
- (22) A site is determined to be effectively stabilised if at the time of the plan ~~sealing~~ approval inspection:-
- (a) methods of stabilisation are:-
- (i) appropriate for slopes and slope lengths; and
- (ii) ~~are~~ consistent with best practice environmental management practices such as in the *Manual for Erosion and Sediment Control* or the *IECA Manual*; and
- (b) stormwater runoff from the site is not currently, and is not likely to result in visible evidence of sedimentation or erosion, or lead to water contamination in the short, medium and long term.
- (23) If at the time of request for plan ~~sealing~~ approval the method of stabilisation has not achieved a stability that has a high probability of enduring in the medium to long term (for example, inadequate grass cover or permanent approved landscape works are incomplete), the following will be taken into consideration in determining whether the site is capable of achieving medium to long-term stability:-
- (a) evidence of soil amelioration having been adequately undertaken;
- (b) evidence of an adequate seed mix of annual and perennial grass species being applied at an adequate rate; and

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- (c) evidence that appropriate grass strike and growth has been achieved for the type of stabilisation method selected.

Note—while hydromulch can provide an immediate and effective stabilising cover to soils, the protective cover can be relatively short-lived if vegetation fails to establish before the thin layer of mulch decomposes. If hydromulch is selected as the method of temporary stabilisation, it is important that perennial as well as annual grasses are well established at the time of plan ~~sealing approval~~ to reduce the risk of instability of the site in the medium to long term.

Release limits

- (24) All releases of stormwater captured in a sediment basin, unless otherwise noted in this planning scheme policy, are not to exceed the following limits:-

- (a) 50 milligrams litre (mg/L) of TSS as a maximum concentration;
- (b) turbidity (NTU) value less than 10% above background; and
- (c) pH value ~~must is to~~ be in the range 6.5 to 8.0 except where, and to the extent that, the natural receiving waters lie outside this range.

Note—background refers to receiving waters immediately upstream of site waters entry points at the time of release.

- (25) The concentration of TSS released by dewatering may only exceed 50mg/L where it can be demonstrated and supported through documentation that:-

- (a) further significant rainfall is forecast to occur before the TSS concentration is likely to be reduced to 50mg/L;
- (b) releasing a higher concentration of total suspended solids will result in a better environmental outcome by providing storage for the capture and treatment of runoff from the imminent rainfall and runoff; and
- (c) flocculent has been applied and the concentration of TSS in the captured water has already significantly decreased.

- (26) For all other stormwater releases, flows and discharges from the site, the release limits prescribed in (24) above are not to be exceeded unless the development is in full compliance with **SC6.14.6.4 (Stormwater management programs and erosion and sediment control plans)**.

Note—it is recommended that a site specific relationship between turbidity and suspended solids is determined for each medium to large scale construction site. Once a correlation between suspended solids and turbidity has been established for a site, testing stormwater for compliance with release limits, prior to release, can be done on site with a turbidity tube. This has the advantage of providing immediate assessment rather than waiting for laboratory results to confirm concentration levels and compliance.

SC6.14.6.6 SC6.14.4.6 Guidelines

For the purposes of achieving compliance with ~~the relevant provisions of the Works, services and infrastructure code and~~ this section of the planning scheme policy, the following are relevant guidelines:-

- (a) *Queensland Urban Drainage Manual* (QUDM);
- (b) *Australian Rainfall and Runoff* (AR&R);
- (c) *Manual for Erosion and Sediment Control*, Sunshine Coast Council, 2008;
- (d) *Erosion and Sediment Control*, IECA, 2008; and
- (e) *Queensland Manual of Uniform Traffic Control Devices* (Department of Transport and Main Roads, Qld 2019).

Note—relevant guideline documents in existence or available over the life time of this planning scheme policy ~~should are to~~ be referenced and used where appropriate. The above list is not exhaustive and the use of locally based guidelines by a recognised authority or agency would take preference to those developed regionally or nationally.

SC6.14.5 Local parks

SC6.14.5.1 Purpose

The purpose of this section of the **Planning scheme policy for development works** is to:-

- (a) provide advice and guidance on the desired standards of service for local parks;
- (b) provide advice and guidance on the policy and standards required in relation to the provision of local parks for new development; and
- (c) provide an option for contributions in lieu, where development is physically unable to provide a local park in accordance with the planning scheme.

SC6.14.5.2 Application

- (1) This section of the planning scheme policy applies to assessable development which requires assessment against the **Reconfiguring a lot code**.
- (2) This section is structured as follows:
 - (a) **Sections SC6.14.5.1 to SC6.14.5.2** provide the framework;
 - (b) **Sections SC6.14.5.3 to SC6.14.5.6** provide the requirements and procedures for achieving the outcomes of the **Reconfiguring a lot code** and to achieve the purpose of this section of the planning scheme policy; and
 - (c) **Section SC6.14.5.7** contains guidelines for achieving compliance with this section of the planning scheme policy.
- (3) Compliance with the guidelines contained in this section will assist to deliver green spaces that define the local character, provide suitably embellished and functional local parks while also meeting Council's maintenance and life cycle cost requirements.

SC6.14.5.3 General

- (1) Local parks are primarily used for recreation, social, cultural and leisure activities. They connect people to the outdoors and may provide other complementary values such as landscape enrichment, biodiversity or cultural conservation. Local parks are small parks that cater for frequent visits and are located a short walk from home for people in the surrounding local community. They also provide amenity and visual relief from the built environment.
- (2) Local parks do not form part of the trunk network under **Part 4 Local Government Infrastructure Plan** of the planning scheme. In circumstances where development cannot meet the physical requirements for dedication and embellishment of local parks other contributions towards the provision of local parks will be necessary.
- (3) Council requires the dedication of an area of land for use as a local park in the following circumstances:-
 - (a) the development is for reconfiguring a lot; and
 - (b) where it is in the community interest to provide land for public park or recreation space considering the:
 - (i) demand generated by the proposed development;
 - (ii) opportunity to link local parks into the existing or future open space network;
 - (iii) opportunity to augment existing local parks to meet the desired standards of service for local parks;
 - (iv) usability of proposed land dedications for active or passive recreation in terms of size, configuration, accessibility and biophysical constraints;
 - (v) availability of existing parks or recreation space in the vicinity, and the existing and proposed demand for these parks or recreation space; and
 - (vi) maintenance costs to Council.

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(4) The provision of local parks set out in this policy aligns with the Desired Standards of Service outlined in the Sunshine Coast Council's *Environment and Liveability Strategy 2017 – Part C Network Plan* for local recreation parks.

(5) The dedication of an area of land for use as a local park may not be required in the circumstances where an infrastructure agreement is in place.

SC6.14.5.4 Local park provision rate

(1) Development is to provide local parks at a rate that achieves the outcomes of the Sunshine Coast Council's *Environment and Liveability Strategy 2017 – Part C Network Plan*.

(2) Any development exceeding 200 lots or dwellings (whichever is greater) and located within 500 metres of a future local park is to provide a minimum 0.5ha local park embellished in accordance with the Desired Standards of Service and Embellishment Tables within Part C of the *Environment and Liveability Strategy 2017* and in accordance with the Sunshine Coast Council *Open Space Landscape Infrastructure Manual* (LIM).

(3) In the circumstances where a development exceeds 40 lots or dwellings (whichever is greater) and cannot physically provide the required land and embellishments, a contribution in lieu will be considered through the negotiation of an infrastructure agreement.

SC6.14.5.5 Local park desired standards of service

Land suitability

(1) Land for a local park shall be suitable for its intended role and function. Suitable land includes land that:-

(a) is outside of the erosion prone area as defined by the *Coastal Management and Protection Act 2005*;

(b) lies above the 5% AEP (1 in 20) flood level;

(c) is developable under environment related restrictions such as the *Vegetation Management Act 1999*;

(d) is free of health and safety hazards and encumbrances (i.e. easements) and is unobstructed by existing infrastructure and utilities such as pump stations, electrical transformers and high voltage power lines);

(e) is relatively level with a natural slope less than 25%;

(f) is not required for:

(i) a buffer, esplanade or utility easement;

(ii) drainage purposes;

(iii) utility infrastructure or services;

(iv) storm water treatment or detention;

(v) underground infrastructure and services; and

(vi) future transport infrastructure or services.

(g) is outside land designated for road reserve and at least 50 metres from easements with conflicting purposes; and

(h) is uncontaminated.

(2) Exemptions may occur where a proposal can demonstrate the constraints are required or compliment the role and function of the open space area (i.e. amenity reserves and landscape corridors may protect vegetated areas, recreation trails are often located in areas that are otherwise constrained, or where slope may facilitate a recreational activity).

(3) Redevelopment of existing open space areas shall also consider the above requirements and seek to avoid or mitigate development in areas where land may be unsuitable.

Design outcomes

(4) Land for a local park shall:-

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- (a) provide a balance of diverse open space settings (e.g. passive or active) within local catchments;
 - (b) be strategically located to create safe and comfortable community gathering spaces and strengthen the character, identity, urban separation and local amenity; and
 - (c) utilise landform, vegetation and other natural elements in a way that helps reduce the requirements for constructed embellishments.
- (5) Table SC14.5.5 (Local park specifications) details Council requirements in the design and construction of local parks.

Table SC14.5.5 Local park specifications

Element	Requirements
Size, shape and frontage	<ul style="list-style-type: none"> • <u>Minimum 0.5 hectare (refer to standard land requirements).</u> • <u>Minimum width of 50 metres.</u> • <u>A regular and compact shape that can accommodate the intended role and function.</u> • <u>Minimum road frontage to two sides or 50% of perimeter.</u>
Topography and gradient	<ul style="list-style-type: none"> • <u>Communal recreational spaces (children's play areas/playgrounds) have a gradient of no more than 3%.</u> • <u>Key use areas provide for equitable access.</u>
Location and accessibility	<ul style="list-style-type: none"> • <u>Within 500 metres from residences in urban areas (generally a 5-10min walk).</u> • <u>Within a rural township.</u> • <u>Within 1 kilometre from place of work in industrial areas.</u> • <u>On a collector road or lower.</u> • <u>Linked to the recreation trails or pedestrian/bicycle network.</u>
Linkages	<ul style="list-style-type: none"> • <u>May provide a trailhead for recreation trails.</u> • <u>Internal pathways connecting to the street provided without conflicting with the primary use.</u>
Activities	<ul style="list-style-type: none"> • <u>Recreation and social gathering, play spaces.</u>
Functionality	<ul style="list-style-type: none"> • <u>Adequate natural shade that maximises user comfort and safety.</u> • <u>Utility functions not servicing the local park are to be located adjacent and not impact functions or amenity values of the park.</u>
Landscape and character	<ul style="list-style-type: none"> • <u>Distinctive qualities of the landscape character (formal to natural) strengthened through material selection, built form and planting design.</u> • <u>Existing trees retained and new trees planted at strategic locations to contribute to amenity.</u> • <u>Key viewpoints identified and protected.</u> • <u>Public art encouraged (may also be incorporated in play spaces as interactive play).</u>
Natural assets	<ul style="list-style-type: none"> • <u>A planting style that identifies with the character of the local area.</u> • <u>Where integrated, WSUD elements provided in addition to minimum land requirements and do not interfere with the function of the local park.</u>
Safety and security	<ul style="list-style-type: none"> • <u>CPTED principles applied.</u> • <u>Play spaces located in visible, safe areas.</u> • <u>Landscaping, vegetation or other measures used to deter unauthorised vehicle access.</u>
Flood immunity	<ul style="list-style-type: none"> • <u>Entire local park is to be above 5% AEP</u> • <u>Key infrastructure and communal recreational spaces (i.e. children's play areas/playgrounds/exercise equipment/picnic, bins, pathways, fencing, etc.) above 2% AEP.</u> • <u>Structures above 1% AEP.</u> • <u>Park layout designed so that stormwater/flood flows do not compromise function or safety in the park (e.g. land required for stormwater/flood storage/conveyance does not traverse a local park)</u>

SC6.14.5.6 Local park standard embellishments

- (1) Table SC6.14.5.8 (Local park embellishments) provides a broad list of embellishments required to be provided as part of the local park as well as including optional embellishments. The table also lists embellishments that are not suitable for a local park.

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Table SC6.14.5.8 Local park embellishments

Acceptability	Embellishments
Embellishments to be included in a local park	<ul style="list-style-type: none"> • <u>Dog on leash area and associated signage and associated excrement disposal facilities.</u> • <u>Bollards or other suitable vehicle restriction devices.</u> • <u>Retaining walls (if required to retain surface materials, prevent erosion or provide levelled recreation surfaces).</u> • <u>Bicycle racks and rails.</u> • <u>Bin/s.</u> • <u>Picnic tables and benches.</u> • <u>Seats.</u> • <u>Taps – maintenance.</u> • <u>Tap and drinking fountain – public access.</u> • <u>Handrails and balustrades (if required to comply with relevant safety legislation and/or standards).</u> • <u>Ramps and stairs (if required to provide safe access for all abilities).</u> • <u>Sealed footpath/bikeway (link to external network).</u> • <u>Sealed paths and trails (internal).</u> • <u>Garden edging.</u> • <u>Planting (landscape and re-vegetation).</u> • <u>Shade trees (both native and non-native species).</u> • <u>Flat well drained play area for kick and throw.</u> • <u>Signage – information, wayfinding and regulatory.</u> • <u>Earthworks (e.g. grading, levelling and grassing).</u> • <u>Shelter/s.</u> • <u>Vehicle access (emergency/maintenance).</u> • <u>Landscape drainage</u> • <u>Tactiles if required to comply with relevant safety legislation and/or standards).</u>
Optional embellishments that may be included	<ul style="list-style-type: none"> • <u>Multi-use space (sports and games) (if appropriate for the size, location and layout of the park).</u> • <u>Water access (e.g. ramp/jetty/pontoon) (if adjacent to the beach or waterway).</u> • <u>Exercise equipment (if appropriate for the size, location and layout of the park).</u> • <u>Showers (if adjacent to the beach or waterway accessed for water-based recreation activities).</u> • <u>Play spaces (including play equipment).</u> • <u>Beach access (if adjacent to the beach or waterway).</u> • <u>Smart technology.</u> • <u>Electricity supply.</u>
Embellishments that are not acceptable	<ul style="list-style-type: none"> • <u>Skate parks.</u> • <u>Toilets.</u> • <u>BBQs.</u> • <u>On site parking.</u> • <u>Shade sails.</u> • <u>Memorial plaques, structures or signs.</u> • <u>Entrance statements or displays.</u>

(2) Other optional embellishments may be included to increase the useability of the local park and the subsequent contribution to the amenity and useability of the area. Due to maintenance cost implications, Council will only accept limited additional/optional embellishments.

(3) A concept plan and/or detailed design plan demonstrating the location and type of embellishments to be included in the local park are to be provided at the RAL stage. Further detail (including design specifications, performance criteria and technical drawings) can be obtained in the LIM.

SC6.14.5.7 Guidelines

The following publications may provide additional guidance regarding local parks and open space infrastructure requirements:-

(a) Sunshine Coast Council *Environment and Liveability Strategy 2017*, and

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| [\(b\) Sunshine Coast Council Open Space Landscape Infrastructure Manual.](#)

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SC6.14.7.8SC6.14.6 Open space and ILandscaping infrastructure

SC6.14.7.7SC6.14.6.1 Purpose

The purpose of this section of the **Planning scheme policy for development works** is to:-

- (a) provide advice and guidance relating to landscape infrastructure, planting and street trees provided on land which is or is intended to be in the public domain; and
- (b) provide advice and guidance on the policy and standards required to meet the performance criteria for achieving the outcomes nominated in the development codes in relation to landscape infrastructure, open space planting, -street tree planting revegetation and habitat works, establishment of buffers, management of environmental weeds and invasive plants, landscape design, management and maintenance, safety and security and energy and water efficiency, pathways and access.

SC6.14.7.8SC6.14.6.2 Application

- (1) This section of the planning scheme policy applies to assessable development which requires assessment against the Biodiversity, waterways and wetlands overlay code, Landscape cCode and the Vegetation management code. Compliance with the guidelines contained in this section will assist to achieve coherency and maintain local distinctiveness throughout the region while also meeting Council's maintenance requirements.
- (2) This section is structured as follows:-
 - (a) **Sections SC6.14.76.1 and SC6.14.76.2** provides the framework;
 - (b) **Sections SC6.14.76.3 to SC6.14.28** detail Council's guidelines provide the requirements and standards procedures to facilitate compliance with the relevant provisions for achieving the outcomes of the **Biodiversity, waterways and wetlands overlay code, Landscape code** and the **Vegetation management code** and to achieve the purpose of this section of the planning scheme policy; and
 - (c) **Section SC6.14.76.29** contains guidelines for achieving compliance with this section of the planning scheme policy; and
 - (d) **Appendix SC6.14B14C to Appendix SC6.14D** contains NATSPEC Tree Inspection and Certification Form, Guide to industry best practice guide relating to landscape maintenance activities for road reserves and public open space areas and a Landscape Maintenance Checklist.
- (3) Compliance with the guidelines contained in this section will assist to achieve coherency and maintain local distinctiveness throughout the region while also meeting Council's maintenance requirements.

SC6.14.7.9SC6.14.6.3 General

- (1) The Sunshine Coast region contains a variety of landscape and urban settlement types, ranging from coastal urban, rural hinterland towns, rural village and villages, rural areas, and dramatic scenic landscapes to significant environmental reserves. The selection of appropriate landscape infrastructure elements in these guidelines seeks to:-
 - (a) provide functional and robust landscape infrastructure elements;
 - (b) reinforce the diverse character within coastal and hinterland regions; and
 - (c) reinforce the individual identity of the particular planning areas and suburbs/localities within those areas.
- (2) These guidelines have been developed in order to ensure ecological, recreational, amenity, social and economic values are protected and enhanced throughout the Sunshine Coast by promoting high quality and cohesive landscape infrastructure. The guidelines identify the preferred landscape infrastructure to be installed within the Sunshine Coast's parks, reserves, open space areas, streetscapes and urban spaces.

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- (3) Landscape infrastructure included in the guidelines has been selected on the basis that it is responsive to the local landscape character, robust, sensitive to the environment and vandal resistant.
- (4) The core value of such infrastructure ~~can be deemed~~ to provide public amenity and functionality to both public and private spaces, improve ~~or provide the basis for the~~ visual amenity of ~~these spaces~~ as well as improving and protecting both the community lifestyle and ecological value of ~~the~~ Sunshine Coast.
- (5) The ~~LIMSCC Infrastructure Guidelines and Standards~~ provides further guidance with regard to specifications for ~~open space and landscaping~~ infrastructure ~~in this section of the planning scheme policy~~.

SC6.14.7.10SC6.14.6.4 Retention of vegetation and topographic features in layout and design of landscapes

- (1) All existing vegetation and street trees within road reserves, trees located within ~~the~~ proposed development lots and neighbouring properties ~~should are to~~ be retained and protected ~~in accordance with AS4970 Protection of trees on development sites, as far as practicable~~, with the exception of *exempt vegetation clearing*, as defined in **Schedule 1** of the planning scheme.
- (2) All topographic features, including landform, watercourses, drainage paths and other attributes such as rocky outcrops, wetlands and soils ~~should are to~~ be retained and protected as far as practicable.
- (3) Where a development has the potential to impact upon mature vegetation providing ecological, character or visual amenity to the local area, an arboricultural management plan is required to be prepared to ensure no undue disturbance or loss is encountered. In the event that such vegetation is proposed for removal, the arboricultural management plan ~~must shall~~ provide appropriate justification for such removal.
- (4) The arboricultural management plan is to be prepared in accordance with *AS 4970-2009 Protection of Trees on Development Sites*. The management plan ~~must is to~~ be prepared by a suitably qualified and experienced arborist (minimum *International Society of Arboriculture (ISA)* certification or Diploma of Arboriculture ~~and with~~ a minimum of 3 years current experience in the field of arboriculture) ~~and~~.

(4)(5) The arboricultural management plan is to:-

(a) ~~nominate Council as an authorised recipient and confirm that Council is entitled to rely on the management plan;~~

(b)(a) provide the following information:-

- (i) tree survey plan to include location, species and trunk diameter of trees located on the site. The location of these trees ~~must shall~~ be overlaid and be easily compared with the proposed works;
- (ii) clearly identify and include photographs of all trees being retained;
- (iii) clearly identify and include photographs of any tree considered unsafe for retention along with the arboricultural justification; and
- (iv) a comprehensive outline of the tree protection measures required (including details of root pruning, hazard reduction, tree protection zones and tree protection fencing) prior to, during and post construction ~~and~~

(b) ~~include written certification by the project arborist in accordance with AS4970 Protection of trees on development sites of the following:-~~

- (i) ~~establishment of tree protection zones and implementation of tree protection measures prior to construction works commencing;~~
- (ii) ~~tree removal and pruning undertaken in accordance with approvals during construction;~~
- (iii) ~~maintenance of tree protection zones and tree protection measures during the construction;~~
- (iv) ~~adherence to tree protection hold points during construction; and~~
- (v) ~~tree condition on completion (post construction).~~

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~~(c) provide an arboricultural management plan Certification of Compliance form for completion by the project arborist at each identified stage of construction (prior to, during and post construction).~~

~~(5)(6) When development necessitates removal or modification of vegetation (including environmental weeds and invasive plants, woody and otherwise) or topographic features, appropriate measures for the protection of fauna, flora, habitat function, habitat connectivity, wildlife refuge, fire mitigation, site hydrology and landform to be retained are to be employed. To achieve the desired outcomes the following is required:-~~

~~(a) site planning and design isare to include:-~~

- ~~(i) habitat assessment by a qualified ecologist/environmental scientist/certified fauna spotter and catcher for all affected vegetation;-~~
- ~~(ii) ecological assessment of habitat function and connectivity impacted by the development;~~
- ~~(iii) identification of any environmental offset required as a result of impacts; and~~
- ~~(a)(iv) retention of suitable hollows and woody debris on site to provide habitat within contributed natural areas in consultation with council.~~
- ~~(i) habitat assessment by a qualified ecologist / environmental scientist / certified fauna spotter catcher for all affected vegetation;~~

~~(b) site management is to ensure:-~~

- ~~(i) all works are undertaken in accordance with the draft Queensland Code of Practice for the Welfare of Wild Animals Affected by Land Clearing (2009) and the Biodiversity, waterways and wetlands overlay code and Planning scheme policy for the biodiversity, waterways and wetlands overlay code planning scheme policy;~~
- ~~(ii) a certified fauna spotter and catcher undertakes pre-clearing inspections and subsequent works from findings, prior to the commencement of any development construction works;~~
- ~~(iii) all vacant hollows and nests are rendered unusable to prohibit fauna return during clearing works;~~
- ~~(iv) a certified fauna spotter and catcher is present for all clearing activities, and clearing techniques are consistent with the type of habitat and fauna protection requirements;~~
- ~~(v) all fauna is relocated or humanely dealt with by a certified fauna spotter and catcher during the pre-clearing inspections or during clearing; and~~
- ~~(vi) a certified fauna spotter and catcher is present for the removal or chipping of any stockpiled cleared vegetation.;~~

~~(c) where habitat cannot be retained compensatory habitat such as nest boxes offsets are to be provided in consultation with council, of appropriate design is provided at an agreed location prior to commencement of the clearance of any vegetation by a suitably qualified fauna spotter and catcher; and~~

~~(d) relevant authorities, affected neighbouring residents and businesses are appropriately notified in writing by the developer of the type and extent of approved clearing works, at least 5 business days prior to works being undertaken.~~

SC6.14.7.11SC6.14.6.5 Management of weeds

(1) Management of all environmental weed species and invasive plants is to be undertaken as part of the development works to assist retention and enhancement of endemic vegetation and natural characteristics including natural ground levels and form, aquifer and above ground hydrology and catchment.

~~(2) Environmental weeds and invasive plants Declared plants and environmental weeds should be cleared in an ecologically sustainable manner minimising weed regrowth and encouraging natural recruitment so that less than 2% weed cover is present prior to handover. Weed removal should be required to be staged throughout the maintenance period to maintain existing habitat values or and prevent erosion or slippage. Only Council approved herbicides shall be used.~~

~~(2)(3) Where weed management is undertaken in contributed natural area assets, a suitably qualified bush regeneration contractor shall be used and a regeneration works plan established for management of the site and a Bushland Operational Assessment undertaken prior to handover.~~

~~(3)~~(4) The removal and management of ~~declared plants and~~ environmental weeds and invasive plants are detailed in the following:-

- (a) ~~Biosecurity Act 2014~~the Land Protection (Pest and Stock Route Management) Act 2002 ~~Declared Plants Class 1,2 and 3;~~
- (b) *Invasive Naturalised Plants in South East Queensland* (Queensland Herbarium);
- (c) ~~the~~ Australian Government *National Alert List for Environmental Weeds*; and
- (d) ~~the~~ Sunshine Coast Council *Local Government Area Pest Management Plan 2012-2016*~~Biosecurity Plan 2017~~ prepared in accordance with the Biosecurity Act 2014~~Land Protection (Pest and Stock Route Management Act 2002)~~.

(4) Note—Some species ~~from both Declared Plants Class 3 and Invasive Naturalised Plants in South East Queensland~~ of locally significant invasive plants may be assessed as being suitable for use in highly urbanised areas where the risk of proliferation is minimised by the distance between the development and an ecologically important area.

SC6.14.7.12~~SC6.14.6.6~~ Landscape design

General

- (1) Council ~~encourages~~promotes the use of sub-tropical design that creatively engages with the local climate, landscape and culture ~~and uses the region's climate-derived character~~ to develop low-energy urban form and welcoming comfortable open spaces. Further information can be found in Refer to the Subtropical Design in Southeast Queensland produced by the Centre for Subtropical Design.

Good landscape design

- (2) Good landscape design:-
 - (a) includes the required elements identified in the applicable Local plan code;
 - (b) involves comprehensive ~~S~~site ~~A~~analysis as the first step to inform and guide the landscape design process. The site analysis ~~should~~ is to respond to and include the surrounding area as well as the local site attributes such as:
 - (i) existing uses, vegetation, views, natural and cultural features, incompatible uses and site elements and bushfire hazard;
 - (ii) streetscape character, aspect and orientation, privacy, security and land capability;
 - (iii) natural landform levels and drainage, solar access (summer shade and winter sun), soil type and conditions;
 - (iv) rainfall, prevailing breezes (cooling summer/ cold winter), climate and microclimate; and
 - (v) communal and private open spaces, pedestrian and vehicular circulation/ access, utility areas and services.;
 - (c) looks beyond the boundaries of the site and considers external influences such as character of the surrounding neighbourhood, existing vegetation, desirable and undesirable views, outlooks from neighbouring locations, noise sources such as busy roads and connectivity within the locality;
 - (d) protects native vegetation and vegetation of ecological, cultural, historic and amenity value and national, regional and local landscape values;
 - (e) respects the natural landform and minimises earthworks;
 - (f) improves amenity by creating attractive functional, well used spaces, that are welcoming, legible, robust and comfortable to use, with framing of views, vistas, landmarks and places of significance and screening of undesirable or incompatible features and land uses;
 - (g) has a minimum of half the landscape and recreation area covered by soft landscape (turf and planting areas);
 - (h) provides effective ~~utility through~~ visual and acoustic screening, solar shading and integration with storm water management features;

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Proposed Sunshine Coast Planning Scheme 2014 (Planning Scheme Policy Amendment) No. [to be inserted] -
Planning Scheme Policy for Development Works - Draft for Council consideration

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(i) provides safe and secure access and spaces for users of all abilities and adequate spaces for active and passive recreation activities;

(j) considers adjacent bushfire prone areas to allow for fire management activities and asset protection;

(k) is sustainable and cost effective to maintain and minimises potable water use for permanent irrigation; and

(l) is of an appropriate scale and type relative to the size and nature of the development and its surroundings and provides a unified theme throughout the development.

Landscape works

(3) Landscape works:-

(a) do not adversely affect existing underground or overhead infrastructure, services, buildings or overland flows;

(b) assist in integrating pedestrian circulation, car parking areas, driveways and roadways within the development by:-

- (i) highlighting entry points and enhancing way-finding within the development;
- (ii) distinguishing private driveways from public roads through the use of paving treatments and landscape;
- (iii) incorporating street trees and planting along newly created roadways; and
- (iv) ensuring landscaping is designed with appropriate consideration given to traffic visibility and safety and minimising maintenance within areas of high traffic flow;

(c) along and/or near retaining walls, long unbroken walls, blank walls, service areas, car parking areas and recreational areas comprise a combination of trees, shrubs and groundcovers.

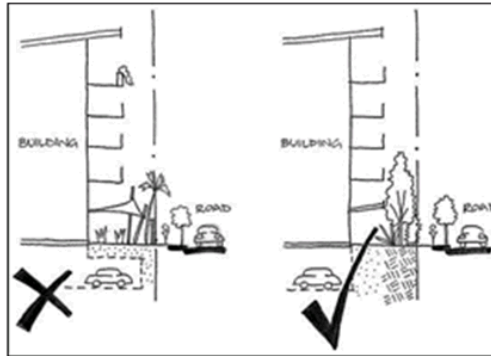
(4) Creditable landscape areas consist of vegetation that is established in sufficient natural ground deep planted and does not include:-

- (a) pavement;
- (b) services and infrastructure (including water treatment devices);
- (c) built form;
- (d) landscaping located over a basement;
- (e) landscaping located within an existing or proposed road reserve;
- (f) podium landscaping; or
- (g) built form overhang.

(5) Landscape works that do not meet these requirements do not contribute to the total site percentage of landscaping required by the relevant planning scheme code/s as shown in **Figure SC6.14.7A-6A (Acceptable landscape area)**.

Figure SC6.14.7A-6A Acceptable landscape area

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Landscape themes

- (6) The Sunshine Coast is characterised by its natural beauty and Council encourages/promotes the use of landscape themes that reflect, enhance and showcase these natural characteristics. Landscape planting should-is to be designed around a theme or style to create a cohesive and attractive appearance. In that regard, The SCC-Infrastructure-Guidelines-and-StandardsLIM provides a planting palette which provides-delivers performance criteria and standards for landscape planting.
- (7) Designers should-are to use the endemic ecology to inform their landscape design. Landscape species should-are to be selected based on their suitability for the local conditions, with a preference for species from the regional ecosystem specific to the site. Consideration should-is to be given to soil type, rainfall, ground water conditions, access to sunlight and other microclimatic factors. Taking the lead from the natural environment supports biodiversity &and native fauna as well as improving the likelihood of a successful landscape with lower maintenance requirements.
- (8) While the use of endemic species is highly desirable they are not always suitable for urban micro-climates. When selecting plants for these situations, plant form, flower, fruit, leaf colour and maintenance requirements should-are to also be taken into consideration. There are a number of hybrids/variegates of native species which have been developed to have more compact and reliable form and lower maintenance requirements. Care should be taken to select hybrids that are suitable for the local conditions. Hybrids/variegates should-are not be used in environmentally sensitive areas or for the purposes of environmental rehabilitation. Fire risk and weediness potential should also be considered, particularly when planting adjacent to bushland areas.
- (9) Creative use of ground covers and understorey plants is important to achieve an overall landscaped effect. The use of native grasses is encouraged particularly for developments in or adjoining natural areas. Consideration should-shall be given as to the most appropriate design outcomes to complement the space, amenity, user and environment. A graduated planting palette to reduce tree canopy intrusion into bushfire prone areas shall be considered.
- (10) Exotic turf grass species are best confined to passive and active recreation areas.

Landscape plan

- (11) Landscape documentation is to be prepared by consultants who are qualified and experienced in their specialist field to ensure all aspects of the design are addressed.
- (12) Acceptable qualifications for landscape consultants include certifications in the following fields of expertise:-
 - (a) landscape architecture-/landscape design;
 - (b) horticulture;
 - (c) arboriculture;
 - (d) ecology;

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- (e) environmental science;
- (f) fauna management; and
- (g) agronomy.

Bushland regeneration plan

(13) For contributed conservation, bushland and coastal reserve assets, a Bushland Regeneration Works Plan shall be prepared and implemented by a suitably qualified, locally experienced ecological restoration or bush regeneration consultant.

(14) Prior to handover of the site a Bushland Operational Assessment should be conducted in line with council procedures.

(13)(15) To assist timely assessment of landscape and bushland regeneration reports and plans, it is essential that all required information is included with the application for assessment. Dependant on the development requirements, applications may require part or all of the supporting documentation outlined in **Table SC6.14.7A-6A (Landscape documentation)** and **Table SC6.14.7B-6B (Plan styles, sizes and types)**.

Table SC6.14.7A6A Landscape documentation

Type	Detail required
Cartographic conventions	<ul style="list-style-type: none"> • Title, date, drawing number. • Scale. • North point. • Legend. • Details of author (name, qualifications-/experience).
Contextual information	<ul style="list-style-type: none"> • Easements and other encumbrances. • Adjoining land uses. • Street names. • Labeled contours and/or spot levels.
Existing conditions	<ul style="list-style-type: none"> • Soil types. • Vegetation. • Watercourses. • 1AEP flood event. • Drainage. • Services.
Extent of works	<ul style="list-style-type: none"> • New vegetation. • Existing vegetation protection and-/or removal. • Soft and hard surface materials. • Structures, fencing, retaining walls, entry walls, fixtures and furniture. • Associated elements.
Planting plan and schedule	<ul style="list-style-type: none"> • Locations of proposed plantings. • Dimensions of planting beds. • Botanic and common names. • Quantities and densities. • Planting sizes-/size index. • Canopy height and spread when mature.
Landscape specification	<ul style="list-style-type: none"> • A description of the overall scope of the landscape works. • A schedule of drawings to be read in conjunction with the specification. • A list of associated works detailed in other architectural or engineering documentation. • Details of standards and guidelines to be followed. • Description of site preparation measures including protection of existing vegetation, protection of existing site features, weed eradication and soil preparation and stockpiling.
As-constructed plans	<ul style="list-style-type: none"> • As-constructed plans supplied in electronic format <u>both AutoCAD and PDF along with ADAC XML using latest version approved by SCC, compatible with ArcGIS (such as ADAC Version 4 or later).</u>
Management plan	<ul style="list-style-type: none"> • Identification on a plan of all management areas and extent.

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Type	Detail required
	<ul style="list-style-type: none"> • A description of all maintenance zones based on the landscape type and maintenance intent. • All maintenance activities required within each maintenance zone. • Details of maintenance monitoring, inspection and reporting. • Proforma schedules for recording maintenance activities. • Specifications of products and processes required for each activity. • Annual budget costs for each activity across the site. • Minimum and maximum maintenance levels.
Visual impact assessment	<ul style="list-style-type: none"> • A description of the purpose and scope of the study. • Location of the site. • Assessment methodology. • Existing visual context and conditions. • Description of existing visual setting, visual character areas, visual catchment and visual sensitivity. • Photographs and photomontages indicating the visibility of the site and the visual impact of any proposed development. • Recommended measures to mitigate visual effects of the proposed development. • A visual integration strategy.
Scenic amenity assessment	<ul style="list-style-type: none"> • Refer to SC6.12 (Planning scheme policy for the scenic amenity overlay code) provides guidance for the preparation of a visual impact assessment report. • An explanation of the purpose and scope of the study. • A description of the scenic context and methodology and how this addresses the requirements of the south-east queensland guidelines. • A description of the public scenic preference of the study area and the region. • An inventory of viewing locations and the sensitivity of the landscape around viewing locations. • A calculation of the visual exposure of the study area and the region. • Preparation of scenic amenity mapping. • Assessment of the scenic amenity mapping results and recommendations for the protection and enhancement of the scenic amenity of the study area and the region. • An identification and analysis of regionally and locally significant view corridors.
Landscape character assessment	<ul style="list-style-type: none"> • Streetscape, urban centres – meaning of character, human influence over nature, indigenous, architecture, cultural plantings, pavements, furniture, historic. • A description of the purpose and scope of the study. • Location of the site. • Assessment methodology. • A description of the landscape context and any existing character designations in the region. • An assessment of the study area's physical features including topography, drainage, geology, soils, flora and fauna. • Photographs and photomontages indicating the landscape character of the site and the landscape impact of any proposed development. • Recommended measures to mitigate landscape effects of the proposed development. • A landscape integration strategy.
Heritage impact assessment report and conservation management plan Cultural heritage assessment	<ul style="list-style-type: none"> • Refer to SC6.10 (Planning scheme policy for heritage and character areas overlay code) provides guidance for the preparation of a heritage impact assessment report and/or conservation management plan. • A description of the purpose and scope of the study. • Location of the site. • Assessment methodology. • A description of the cultural context including the cultural influences and the significance of the place to the people who

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Type	Detail required
	<ul style="list-style-type: none"> use it and its historical content. The relationship of the place to other places in respect of design, technology, use, locality, origin. Document cultural values including vegetation (veteran trees), aesthetic, historic, scientific, social. An assessment of the effect of the development on cultural heritage values of the study area.
Bushfire hazard assessment report or bushfire management plan	<ul style="list-style-type: none"> Refer to SC6.7 (Planning scheme policy for bushfire hazard management overlay code) provides guidance for the preparation of a bushfire hazard assessment report or bushfire management plan. Vegetation assessment included in bushfire management plan – final composition of mature landscape plantings needs to be incorporated into the bushfire plan.
Rehabilitation/revegetation Bushland regeneration works plan and report	<ul style="list-style-type: none"> Prepared by a suitably qualified, locally experienced ecological restoration or bush regeneration consultant. A detailed site assessment to determine the most appropriate approach for rehabilitation/revegetation. List of environmental weeds and invasive plants and declared weeds present on the site, including details of weed control. Natural regeneration and assisted regeneration. Complete species list to be planted. Choice of species must is to reflect the regional ecosystem and forest structure. Planting strategy, such as soil preparation (soil amelioration requirements/-inoculation), spacing, planting schedule, size of stock, choice of fertilisers (if any), type and depth of mulch, planting techniques. Methods to be used to protect the areas, such as fencing, establishment of buffers. Monitoring techniques to assess the outcomes of the proposed rehabilitation/restoration works, such as permanent photo points, survival and growth rates of planted species. Ecological reconstruction including the installation of nest boxes on retained trees or poles, and forest floor habitat including logs, rock piles, temporary and permanent pools and ponds. Establishment/-maintenance schedule. Cost estimate for construction and establishment phases. Growth criteria summary.
Bushland Operational Assessment	<ul style="list-style-type: none"> Bushland Operational Assessment undertaken by suitably qualified and locally experienced consultant in accordance with council guidelines prior to site handover.
Soil/agronomist report	<ul style="list-style-type: none"> Location of the site. Existing soil /soil structure/-profile. Description of the native plant community /-(i.e. pre-clearing) to be restored. This should is to include a structural description, regional ecosystem or equivalent classification. A clear statement of the key aims and objectives and the intended outcomes (performance criteria) of the rehabilitation/restoration works. Assessment methodology (e.g. research, consultation, site inspection). Identification of fauna attributes of the site, such as tree hollows, habitat trees, logs, rocky outcrops, leaf litter etc. List of environmental and declared weeds present on the site, including:- <ul style="list-style-type: none"> details of weed control, work schedules, types of soil and/or drainage works etc; methods to be used to protect the areas, such as fencing, establishment of buffers etc; and monitoring techniques to assess the outcomes of the proposed rehabilitation/restoration works (e.g. permanent photo points).
Fauna spotter- and catcher report	<ul style="list-style-type: none"> Location of the site. Findings of pre-clearing inspection. Summary of works, including clearing times, monitoring during

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Type	Detail required
	clearing, sequencing of clearing, fauna protection, recovery procedures and inspections. <ul style="list-style-type: none"> Habitat compensation calculation. Fauna relocation and removal strategy. Provide a table / summary of spotter- and catcher works.
Arboricultural management plan	<ul style="list-style-type: none"> Prepared in accordance with AS-4970-2009 Protection of Trees on Development Sites. Prepared by a suitably qualified and experienced arborist (minimum ISA certification or diploma of Arboriculture and a minimum of 3 years current experience in the field of arboriculture). The management plan is to nominate Council as an authorised recipient and confirm that Council is entitled to rely on the management plan. Plan of subdivision to include location and name of trees located on the site. The location of these trees must-shall be overlaid and be easily compared with the proposed works. Clearly identify and include photographs of all trees being retained. Clearly identify any tree considered unsafe for retention along with the arboricultural justification. A comprehensive outline of the tree protection measures required (including details of root pruning, hazard reduction tree protection zones and tree protection fencing) prior to, during and post construction. An arboricultural management plan - Certification of compliance form for completion of works by the project arborist at each identified stage of construction (prior to, during and post construction).

Table SC6.14.7B6B Plan styles, sizes and types

Plan type	Required sheet size
Landscape Intent	A3 <u>Text and information detailed on plan sets are to be at a scale that is easily readable when printed on an A3 sheet.</u>
Detailed Landscape Plans	
Site Analysis	
Minor Earth Works	
Construction Details	
Plan type	Required scale
Landscape Site Analysis	1:1000
Statement of Landscape Intent	
Streetscape Plans	1:500
General / Detailed Landscape Plans	1:100 or 1:200
Construction Details	1:50 or 1:20

Note - text and information detailed on plan sets must be at a scale that is easily readable when printed on an A3 sheet.

SC6.14.7.13 SC6.14.6.7 Landscape management and maintenance

- (1) Landscape schemes **should-are to** be designed with simple maintenance requirements to achieve a better long-term result. Natural vegetation species are better suited to the local environment and therefore have lower maintenance requirements, especially during the establishment period.
- (2) Landscape maintenance is an integral component of landscape development and best practice long-term maintenance practices **must-are to** be integrated into the landscape design. This applies to both the vegetative landscape and built structures. It is important to consider Council's maintenance capabilities and programs when designing areas to be handed over to Council.
- (3) Prior to a landscape asset being handed over to Council, a sustainable maintenance regime (programmed and budgeted) is to be developed and implemented. The landscape **should-is to**

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be established, self-sustaining and in a state that requires an acceptable level of ongoing maintenance to maintain a high quality landscape.

- (4) Desirable characteristics of a low maintenance landscape design are:-
- (a) plant species that will retain their health, vigour and form without regular pruning;
 - (b) plant species that are resistant to pest, disease and fungal attack;
 - (c) plant species that will tolerate the local climatic conditions and dry periods;
 - (d) ~~the~~ use of canopy species that will form a long term vegetation framework;
 - (e) ~~the~~ careful preparation of garden beds, to ensure good soil health for plant growth;
 - (f) mass planting ~~of~~ garden beds with only two or three species ~~that~~ ensures a simpler watering program, with plants achieving a similar growth rate and an even cover of greenery;
 - (g) ~~the use of weed free mulchmulched~~ planting areas to retain water and suppress ~~environmental weeds and invasive plants;~~
 - ~~(h) —remulching at regular intervals, particularly in high use areas;~~
 - ~~(i)(h) the provision of~~ sufficient space and room to manoeuvre ride on mowers, with the use of smooth flowing lines to allow machinery to manoeuvre around assets;
 - ~~(i)(i) the use of~~ appropriate garden edging to minimise the need for spraying or edging and for ease of mowing;
 - ~~(k)(j) robust furniture, compliant with the LIM to that~~ withstands heavy use and vandalism;
 - ~~(l)(k) easily replaceable furniture items and elements;~~
 - ~~(m)(l) use of appropriate sealants and anti-graffiti coatings to enable easy washing;~~
 - ~~(n)(m) accessibility and safe access for maintenance, especially along roadways; and~~
 - ~~(o)(n) appropriate selection of plants with consideration of the appropriate size and form for the space, ensuring the plants are able to grow and mature without becoming overcrowded;~~
 - ~~(p)(o) planting that quickly creates a full canopy cover and/or groundcover to ensure effective establishment and reduce maintenance; and~~
 - ~~(q)(p) endemic native vegetation species should be used where appropriate, and where adjacent or connecting to natural bushland.~~
 - ~~(5) —The SCC Infrastructure Guidelines and Standards provide further guidance in relation to landscape design to minimise maintenance issues.~~
 - ~~(6)(5) Council officers will inspect the works as required and as requested by the developer for the purpose of "on maintenance" and off maintenance milestones.~~
 - ~~(7)(6) An inspection can be requested by writing to Council and attaching a completed landscape maintenance checklist and quoting Council's development application number.~~

Note ~~—~~ all documentation ~~should is to~~ be sent to:-
Sunshine Coast Council
Locked Bag 72
Sunshine Coast Mail Centre QLD 4560
or email: mail@sunshinecoast.qld.gov.au

- ~~(8)(7) Once Council has received all required documentation and certifications a minimum of five business days' notice is required for the intended date of Council inspection.~~

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SC6.14.7.14SC6.14.6.8 Safety and security

- (1) Council has legislative obligations with regard to the design of accessible public buildings and amenities, accessible footpaths, open space and road networks to increase accessibility. The relevant legislation that designers should are to be aware of includes:-
- (a) *Disability Discrimination Act 1992;*
 - (b) *The Disability Services Act 2006 (Queensland);*
 - (c) *Disability (Access to Premises-Buildings) Standards 2010;*
 - (d) *Building Code of Australia National Construction Code;*
 - (e) *AS1428.1 –Design for access and mobility –~~Part 1:~~ General requirements for access –
New building work;*
 - (f) *AS1428.2 –Design for access and mobility –~~Part 2:~~ Enhanced and additional
requirements – Buildings and Facilities;*
 - (g) *AS1428.4.1 –Design for access and mobility –~~Part 4.1.m~~Means to assist the orientation
of people with vision impairment – Tactile ground surface indicators; and*
 - (h) *Sunshine Coast Access and Inclusion Plan 2011-2016.*
- (2) General safety and security considerations/design principles for landscape works include the following:-
- (a) universal access – landscape works are to be designed and constructed to provide safe and secure access for users of all abilities and for maintenance vehicles and workers. Accessibility requirements include the following:-
 - (i) development provides universal access in accordance with AS1428: *Design for Access and Mobility;*
 - (ii) landscape design should to adopt inclusive principles;
 - (iii) continuous accessible paths of travel should be provided in accordance with universal access provisions;
 - (iv) ramps need to have gradual inclines, landings and handrails as outlined in accessibility standards;
 - (v) provision of tactile ground surface indicators to provide pedestrians who are blind or who have a vision impairment with warning information about features such as stairs, ramps or hazards including within the road corridor(SCC Infrastructure Guidelines & Standards apply within the road corridor); and
 - (vi) pedestrian surfaces to comply with AS4586 –*Slip resistance classification of new pedestrian surface materials* and AS3661 –*Slip resistance of pedestrian surfaces* and be stable and trafficable in all weather conditions.;
 - (b) other general safety considerations and requirements which include:-
 - (i) visibility at street corners, near pathways, entry points, throughout parking areas and driveways, with trees a minimum 1.8 metres clear trunk above the road pavement (and have adequate canopy to allow normal photosynthesis to occur) and groundcovers a maximum of 0.7 metre in height above the road pavement;
 - (ii) pedestrian and vehicle circulation routes separated and defined; and
 - (iii) retaining walls greater than 1 metre in height designed and certified by an RPEQ engineer, to include a fall barrier in accordance with **Section SC6.14.9 (Earthworks)** of this planning scheme policy, AS/NZS 1170.1 Structural design actions – Permanent, imposed and other actions and AS4678 Earth retaining structures;
 - (iv) consideration of fire management within landscape design for fire safety as a general principle; and
 - (c) safe work environment during landscape management, development is to comply with the MUTCD and the Workplace Health and Safety Act 2011.
- ~~(b)(3)~~ Crime Prevention Through Environmental Design (CPTED) –CPTED is a proven crime prevention approach which has been shown to reduce opportunities for crime and incivility. Aimed at enhancing opportunities for informal surveillance, so that antisocial behaviour or crime

related incidences might be discouraged, detected and prevented. (Refer to *CPTED Guidelines QLD*). CPTED principles ~~should are to~~ be adopted when preparing landscape plans and designs for both the public and private realm within the region. Some principles to employ include ~~the following~~:-

- (i)(a) ~~Landscape that~~ enables passive surveillance into, and visibility within, communal recreational spaces, children's ~~play areas~~/playgrounds, pathways and carparks;
 - (ii)(b) landscape ~~that~~ defines territory and ownership of public, common, semi-private and private space, and does not create ambiguous spaces adjacent to areas with security issues (such as public toilets and ATMs);
 - (iii)(c) the use of dense shrubby vegetation over 1.5 ~~metre~~ in height ~~is~~ minimised along street frontages and adjacent to open space areas where the vegetation prevents passive surveillance;
 - (iv)(d) security and pathway level lighting ~~is~~ provided to site entries, driveways, parking areas, building entries and pedestrian pathways; and
 - (v)(e) ~~protecting protection of~~ solid fences from graffiti by incorporating elements such as ~~landscape landscaping~~ (creepers), murals or vandal resistant paint.;
- (c) ~~general safety considerations and requirements include:~~
- (i) ~~to enable visibility at street corners, near pathways, entry points, throughout parking areas and driveways, trees should have a minimum 1.8 metres clear trunk above the road pavement (and have adequate canopy to allow normal photosynthesis to occur) and groundcovers should be maximum of 0.7 metres in height above the road pavement;~~
 - (ii) ~~pedestrian and vehicle circulation routes must be separated and defined;~~
 - (iii) ~~any retaining walls greater than 1.0m in height must be designed and certified by an RPEQ, be designed to include a fall barrier in accordance with Section SC6.14.10 (Earthworks) of this planning scheme policy and AS1926 and be in accordance with AS4678-2002 Earth retaining structures; and~~
 - (iv) ~~To ensure a safe work environment during landscape management, development should have regard to the Manual of Uniform Traffic Control Devices and the Workplace Health and Safety Act 2011.~~

SC6.14.7.15SC6.14.6.9 Energy efficiency

Designing to create comfortable environments is important to promote and support the outdoor lifestyle that is enjoyed on the Sunshine Coast. Careful selection and placement of tree species and landscape elements can provide shade during summer and allow for warming sunlight in winter. This not only provides for comfortable landscape environments, but landscape design can also enhance energy efficiency of buildings. Energy efficient design requirements ~~shall~~ include the following:-

- (a) tree planting ~~can be used to that~~ provides shade to ~~communal recreational spaces, children's play areas~~/playgrounds, seating, shelters, buildings, pathways and lawn areas to ensure that comfortable outdoor spaces are created for all to enjoy;
- (b) shelters ~~should be~~ designed and oriented to block the overhead sun in summer while letting in the slanting rays of the winter sun, selection of tall trees with straight trunks and wide bushy canopies will produce the same outcome;
- (c) landscape embellishments (primarily plantings) ~~are~~ located to keep summer sunshine (particularly western sun) off walls, windows, roofs and paved external areas;
- (d) landscape embellishments ~~located to~~ facilitate access of winter sun to living areas, north facing windows and to public spaces (including north-east winter morning sun);
- (e) landscaping, fences and walls ~~that~~ allow exposure of living and public areas to prevailing north-east to southerly summer breezes and minimises exposure to prevailing west to south-west winter winds;
- (f) landscape elements ~~that~~ do not shade solar collector devices during the middle 6 hours of the day; and
- (g) existing street and park trees ~~are to be~~ retained where solar collectors are installed.

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SC6.14.7.16SC6.14.6.10 Stormwater drainage and water conservation

- (1) Design and implementation of the landscape area is to successfully integrate with stormwater drainage and water sensitive design elements and also with street tree infrastructure and surrounding landscapes. Landscape areas must shall achieve multiple outcomes of visual amenity and water treatment. In regard to residential and commercial uses in particular, the provision of shade trees is a key factor in providing useable spaces and a comfortable living environment.
- (2) Landscape design is to incorporate measures to ensure adequate drainage and utilise water wise (conservation) design strategies, through appropriate plant selection and layout and by maximising opportunities for water infiltration. Measures to maximise conservation of water include the following:-
 - (a) plantings and lawn areas are designed to not require permanent irrigation except in high profile and high use landscape areas and sports grounds;
 - (b) permanent non-potable irrigation is only installed in designated high profile and high use landscape areas as agreed by Council;
 - (c) water features created purely for aesthetic purposes are avoided in low density areas, but integrally designed as part of urban spaces;
 - (d) naturally occurring waterways, waterbodies or WSUD devices are featured within the landscape design rather than created ponds or pools;
 - (e) solid roof landscape structures (such as shade shelters, toilet and change rooms) are to be designed to harvest water for re-use where appropriate;
 - (f) solid roof structure design to includes vandal resistant gutters, downpipes, storage tanks and fittings that complement the aesthetic of the existing and proposed landscape;
 - (g) non-potable water collection, storage and re-use within the landscape to meets work, health and safety requirements; and
 - (h) watering regimes during the establishment period should to be infrequent and deep, not regular and shallow.
- (3) Measures to maximise infiltration of water and stormwater drainage are to include the following:-
 - (a) drainage lines and water courses incorporate natural features and materials to create a natural appearance and where possible rehabilitate degraded areas;
 - (b) areas of the site are drained through the provision and/or treatment of swales, spoon drains, field gullies, subsurface drainage and stormwater connections;
 - (c) landscape works that do not restrict the flow of water along overland flow paths;
 - (d) the opportunities for water infiltration on site are maximised by:-
 - (i) draining portions of hard surfaced areas to permeable surfaces;
 - (ii) maximising areas of turf, garden beds and pervious paving types;
 - (iii) minimising the area of impervious surface finishes on the site; and
 - (iv) providing permeable surface treatments for spill-over car parking areas; and
 - (e) sediments and chemicals are prevented from entering the stormwater system.
- (4) There are requirements under the Permanent Water Conservation Measures (established under the *South East Queensland Water Strategy 2010*), for irrigation systems are required to be efficient and to be designed by accredited professionals. There are also requirements for water users to submit water efficiency management plans for approval by the local water authority. Prior to commencing irrigation design, it is recommended that a suitably qualified professional is engaged to prepare the appropriate documentation.
- (5) Council is committed to preserving minimising the supply-use of potable water in parks and open spaces and with the exception of sporting fields and some high profile areas is no longer irrigating parks and open spaces with potable water. New p Parks and landscape areas for future

Council management ~~should are to~~ be designed to survive without formal ongoing irrigation ~~where possible. Certain public uses such as sports fields, high profile and high use landscape areas may require permanent irrigation systems to maintain their desired function. In areas requiring permanent irrigation, efficient irrigation systems that utilise smart irrigation control and monitoring shall be utilised where practicable, these systems are to utilise non-potable water sources.~~

- (6) ~~Council encourages the use of non-potable water for landscape irrigation and establishment.~~ Non-potable water can include capture and storage of rainwater and storm water runoff and use of recycled water (treated effluent). Only collected and recycled water graded as suitable for human contact ~~should-is to~~ be used in public spaces.
- (7) For areas for future Council management, approval for installation of an ~~efficient~~ irrigation system that utilises ~~non-potable watersustainable and effective water sources~~ will be required. Where Council does not want to maintain such an irrigation system in the long term, it will need to be decommissioned to Council's satisfaction prior to hand over of the area to Council.

SC6.14.7.17SC6.14.6.11 Site stability and soil quality

Site Stability

- (1) In order to ensure that landscapes provide for the stability of soils and minimise potential for erosion, landscapes ~~must-are to~~ be sited and designed to respond appropriately to site specific conditions in accordance with an approved landscape plan which addresses the following:-
- (a) the removal of vegetation on steep, sensitive or unstable land, ~~so-as to~~ does not undermine the stability of the land or impact unnecessarily on downstream conditions, ~~where~~ ~~ww~~ where vegetation is removed outside ~~the building area, construction or project boundary,~~ it ~~mustshall~~ be reinstated; and
- (b) stabilising ~~of~~ plant species and supporting establishment materials ~~should-to~~ be utilised on erosion prone areas, such as batters, slopes and waterway and drainage line edges. Planting ~~should-is to~~ be at a sufficient density ~~and-to~~ support stability of the site and where soil is imported onto the site, soils used ~~should-shall~~ be ~~less-prone-to-erosionwell~~ ~~constructed and contain adequate organic material.~~

Soil Quality

- (2) The quality of the growing medium for ~~vegetation-plants~~ is of the highest importance for the success and longevity of the vegetation. ~~To assist achieving the desired best practice outcomes, the following should be required:-~~
- (a)(3) ~~natural ground soils-Local topsoil stripped from the site is favoured as it contains organic matter, beneficial microorganisms and mycorrhizal fungi which support plant life and is to be free from litter, weed propagules, contaminates and rocks larger than 25mm in diameter.~~
- (i) ~~use of site stripped local topsoil (i.e. soil found on the development site) is favoured where it can be removed from the top soil horizon. Natural ground topsoil is favoured as it contains organic matter, beneficial microorganisms and mycorrhizal fungi which support plant life;~~
- (ii) ~~natural ground soils must be free from litter, weed propagules, contaminates and rocks larger than 20mm in diameter, comply with AS4119 – Soils for landscaping and garden use and be suitable for the successful establishment of the selected plant species;~~
- (iii) ~~if the required quantity of local topsoil is unavailable, imported topsoil conforming with AS4419 Soils for landscaping and garden use is to be incorporated and blended with site topsoil to achieve a healthy and active growing medium. Imported topsoil must be similar to naturally occurring local topsoil and suitable for the establishment and ongoing viability of the selected vegetation, free of weed propagules and contaminants; and~~
- (iv) ~~local topsoil must be stored in such a way that the soils natural biology is retained;~~
- (4) ~~Imported topsoil, where the required quantity of local topsoil is unavailable, is to be incorporated and blended with site topsoil to achieve a healthy and active growing medium. Imported topsoil is to be similar to naturally occurring local topsoil and suitable for the establishment and ongoing viability of the selected vegetation, free of weed propagules and contaminants.~~

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- (5) Imported soils (and garden mulches) are to be obtained from suppliers with Nursery Industry Accreditation Scheme Australia (NIASA), from the Nursery and Garden Industry Queensland (NGIQ), or accreditation from Landscape Queensland.
- (6) All necessary measures are to be taken to prevent fire ants (or any stages of the fire ants life cycle) entering the work site. For further information, refer to the Queensland Government Department of Agriculture and Fisheries (DAF).
- (7) Podium and planter box soils for areas other than natural ground (e.g. roof top gardens) will be blends of mineral and organic compounds, and will generally have organic matter not greater than 30% by mass.
- (b) podium and planter box soils for areas other than natural ground (e.g. roof top gardens) will be blends of mineral and organic compounds, and will generally have organic matter not greater than 30% by mass;
- (c) soil tests:-
- (i)(8) Local and imported topsoil must are to be tested and proven to comply with AS4419 Soils for landscaping and garden use by an agronomist Certified Practicing Soil Scientist (CPSS) and/or a soil scientist who is eligible for membership with the Australian Soil Scientist Society (ASSS) with sampling to be carried out in accordance with AS4419 Soils for landscaping and garden use at a NATA registered laboratory;
- (d)(9) certifications-A CPSS and/or a soil scientist who is eligible for membership with the ASSS prior to requesting "on maintenance" inspection must-is to provide:-
- (i)(a) "on maintenance" a report providing detailed analysis of the sampled material along with recommendations of required ameliorants (refer Table SC6.14.7C (Soil depths));
- (ii)(b) a certification from the agronomist that all works have been carried out in accordance with recommendations, with the soils being suitable for their specified use and for the establishment and ongoing viability of the vegetation; and
- (iii)(c) certification and photographic evidence of the required soil depths for all planting areas.
- (10) Table SC6.14.6C (Soil depths) provides guidance in relation to soil depths.

Table SC6.14.7C6C Soil depths

Location	Subgrade cultivation depth	Ameliorated site topsoil or imported topsoil combined with ameliorated site topsoil depth
Street Trees	150mm	700mm
Garden Beds	300mm	500mm
Turf Areas	150mm	200mm
Trees	N/A	Tree planting pits are to be excavated to the depth of the rootball and cultivated to a width of 2-3 times the rootball diameter
Palms	N/A	Palm planting pits are to be excavated to twice the width of the rootball and the bottom of the pit is to be cultivated to a depth of 150mm
Mass planted areas	150mm	400mm
Turf areas	100mm	Minimum topsoil depth is to be 100mm
Tubestock	150mm	Minimum friable topsoil depth is to be 200mm

Note—subsoil and topsoil should shall be integrated prior to planting.

- (3) All necessary measures must be taken to prevent fire ants (or any stages of the fire ants life cycle) entering the work site. If fire ants are suspected, the developer must contact the relevant State Government department.

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SC6.14.7.18SC6.14.6.12 Planting technique, plant selection, stock size and quality

- (1) A thorough landscape specification is essential ~~to assist in~~ delivering sustainable and appropriate vegetation to landscape works.

Planting technique and preparation

- (2) In preparation and planting, the following ~~should is to~~ be undertaken ~~and/ or taken into consideration~~:-
- (a) all rubbish, rubble, ~~environmental weeds and invasive plants~~, grass and debris ~~must shall~~ be removed from planting areas prior to planting;
 - (b) all landscape gardens to turf interface areas associated with the turf verge ~~must are to~~ be delineated with a durable hard edge able to withstand brush cutters;
 - ~~(c) establish a minimum 100mm of composted forest mulch (which is a combination of leaf, timber and bark) to all garden areas immediately after planting, soil laden tub grindings will not be accepted;~~
 - ~~(d)(c) all necessary measures must are to~~ be taken to prevent fire ants (or any stages of the fire ants life cycle) entering the work site. ~~For further information, refer to the Queensland Government Department of Agriculture and Fisheries (DAF);~~
 - ~~(e)(d) landscaping must shall~~ not obstruct overland flow paths and ~~must is to~~ include adequate drainage to minimise ponding. Mulch or any floatable material ~~must shall~~ not be located in swales or overland flow paths;
 - ~~(f)(e) landscaping must shall~~ not encroach onto kerb and channel, footpaths, pedestrian or vehicular circulation areas during any stage of growth. Plants ~~should are to~~ be positioned with consideration to full height and width potential of the plant at maturity, with no requirement for constant pruning to prevent such encroachments;
 - ~~(g)(f) landscaping must shall~~ not restrict access to services. ~~Refer to appropriate utility service provider for any specific requirements and further guidance; and~~
 - ~~(g) do not plant during adverse weather conditions. Suspend excavation when the soil is wet and during frost periods;~~
 - ~~(h) appropriate plant spacings are to be provided to avoid establishment problems and plant failure due to over or under embellishment. Plant size at maturity is to be considered to ensure minimal or partial overlap of other plantings. Considerations are to be taken into account in regards to the species' spread and habit, to minimise undesirable issues. An over embellishment of plants in a small area forces plants to compete for nutrients, whereby they can struggle to establish; and~~
 - ~~(i) nursery stakes, ties and labels are to be removed after planting. Where appropriate and safe, nursery stakes may be required to remain for a longer period to provide ongoing support. These supports are to be removed by the end of the maintenance period.~~
 - ~~(h) nursery stakes, ties and labels must be removed after planting.~~

Turf supply and quality

- (3) Turf supplied shall have the following characteristics:-
- ~~(a) cultivated lawn turf (A and B grade) is to be supplied by an accredited Turf Accreditation Program (TAP) producer;~~
 - ~~(b) turf is to be of good quality, free from oxalis (Oxalis spp.), nut grass (Cyperus rotundus), paspalum (Paspalum spp.) (unless specified for salt tolerance), and other environmental weed and/or invasive plant species; and~~
 - ~~(c) turf is to be delivered within 24 hours of cutting.~~

Plant selection

~~(3)~~(4) Planting design within urbanised areas positively contributes to the amenity of the development and to the diverse subtropical character and ecology of the Sunshine Coast. Planting palettes are required to:-

~~(a)~~ ~~have regard to the SCC Infrastructure Guidelines and Standards;~~

~~(b)~~(a) suit the conditions and landscape character of the area and minimise use of potable water for irrigation;

~~(b)~~ ~~avoid plants which have high maintenance and irrigation requirements, are short lived or require regular replacement;~~

(c) provide shade and shelter to increase user comfort in public and semi-public spaces and provide suitable solar access;

(d) favour local and "cultivar" native plants with moderate use of suitable non-invasive exotic species ~~where function requires~~(refer LIM – Palettes – Planting Index). ~~The hierarchy of plant species (in preferred order) is as follows;~~

~~(i) Sunshine Coast natives;~~

~~(ii) Australian natives;~~

~~(iii) non-invasive exotic species; and~~

~~(iv) plants not included in the planting index that meet criteria set out in this section.~~

(e) be devoid of ~~plants with~~ large thorns or spines, ~~that are or~~ poisonous or ~~present a~~ severe allergy risk to the ~~community~~public;

~~(f)~~ ~~avoid environmental weeds or invasive plants;~~

~~(f)~~(g) use ~~of exotic~~ palms as an emergent rather than dominant landscape feature and use ~~of~~ species appropriate for the location, consistent with their natural character and occurrence;

~~(g)~~(h) provide visual interest through form, texture and variations in seasonal colour; and

~~(h)~~(i) provide compatibility with buildings, hard paved areas, overhead and underground services and scale relative to the size and nature of the development and its setting.

Plant stock size and quality

~~(4)~~(5) All tree stock used within the landscape works is to generally conform with the ~~stock selection~~ criteria outlined in ~~NATSPEC Guidelines: Specifying Trees AS2303 Tree stock for landscape use~~, with an understorey of shrubs and ground covers within edged and mulched garden beds. Stock ~~should shall~~ be healthy, vigorous and not pot bound.

~~(5)~~(6) The supervising landscape consultant is to submit ~~the NATSPECa~~ Tree Inspection & Certification Form (~~Appendix SC6.14B (NATSPEC tree inspection and certification form)~~example available from ~~AS2303 Tree stock for landscape use~~) to Council prior to request for "on maintenance".

~~SC6.14.7.19~~SC6.14.6.13 **Revegetation and habitat restoration works**

(1) The desired outcome of rehabilitation works is to return degraded natural areas to a representative and largely self-sustaining condition. At all stages works are to be undertaken in a manner that conserves and retains all endemic vegetation. Works to restore habitat are to be of a high quality, replicating topography and structure of ~~appropriate the~~ natural environments/~~(R)regional Eecosystems~~) and ecological linkages ~~and be undertaken by suitably qualified, locally experienced bush regeneration contractors~~. Landform, habitat and plant species of local native ~~provenance origin~~ are established where available, by appropriate methods to maximise environmental outcomes and minimise ongoing maintenance requirements.

(2) Self-sustaining ecosystems are created through successional planting and regeneration methods that include pioneer species to stabilise the site, whilst ~~encouraging allowing~~ longer term species ~~to establishment~~. Understorey shrubs and vines ~~relevant native~~ to the regional ecosystem ~~should are to~~ be used in high density edge plantings to effectively seal rehabilitation areas (including waterway/body edges) against degradation and weed infestation.

(3) Rehabilitation design and species selection ~~should are to~~ address:-

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- (a) landform, topography (in relation to context), ~~slowing of waterways~~;
 - (b) habitat, natural (logs, rocks, leaf litter) and non natural (nest boxes);
 - (c) fauna crossings (under and over) and traffic calming devices as required;
 - (d) fauna fencing, and fencing to exclude ~~human damage from vehicles~~, but allow for appropriate maintenance;
 - (e) specific species palette information;
 - (f) ~~matrix-/~~grids, densities, vegetation structure and closing mechanisms (i.e. vines and also Lomandra to waterway banks);
 - (g) reference to standards (regional ecosystems, ratios of pioneers);
 - (h) soil ~~info-type/~~amelioration-/inoculation;
 - (i) ~~weed management-/~~control;
 - (j) ~~fire management buffers and use of less flammable species along buffers~~;
 - (k) ~~regeneration works~~; and
 - (l) ~~performance criteria (height, canopies and understorey) and~~ maintenance periods.
- (4) ~~Should rehabilitation of plant species from recruitment be unlikely, supplementary Restoration and revegetation of the sites should be carried out with site-specific endemic species to replicate the surrounds and original Regional Ecosystem, as per the regeneration works plan with. If revegetation is deemed necessary, use of a full suite of site-specific plants from all strata at 1.5 metre centres minimum.~~

SC6.14.7.20SC6.14.6.14 Landscape design for wildlife

- (1) Design for wildlife habitat protection retains and enhances habitats and corridors for native wildlife by integrating environmental design and construction with development.
- (2) Wildlife habitat protection requirements include:-
 - (a) replicating adjacent remnant vegetation (regional ecosystem), including understorey vegetation and ground surface habitat logs, rock piles and melon holes;
 - (b) minimising adverse effects to wildlife such as koalas by planting and retaining appropriate fodder tree species and facilitating koala movement in koala habitat areas;
 - (c) siting landscaped areas to complement and enhance existing vegetation on the site and in the surrounding area;
 - (d) retaining/recreating landform, ephemeral pools, rocks and logs (ground habitat);
 - (e) retaining old trees (including dead trees) with hollows for local native fauna habitat where trees will not provide a public safety risk;
 - (f) providing artificial nesting sites and boxes;
 - (g) retaining/replacing natural leaf litter (forest floor habitat) where appropriate for local native fauna;
 - (h) creating or enhancing vegetation linkages between existing habitats and along waterways;
 - (i) ~~providing exclusion fencing to protect fauna from vehicles~~;
 - (j) ~~considering road strike issues from grazing fauna adjacent to roads~~;
 - (k) ~~selecting species that provide an all season range of foliage, fruit and flower suitable for local native fauna~~;

(j)(l) ~~considering the planting design to avoid establishment of flying fox food trees in conflict areas;~~

(k)(m) design in accordance with the *State Planning Scheme Policy 20132017*; and

(h)(n) ~~providing connectivity across roads via provision of, fauna bridges, ropeways, arboreal road crossings, fauna underpasses, traffic calming and associated signage.~~

Koala food trees

- (3) ~~Koalas predominantly feed on eucalypt tree species, but will also utilise other closely related species such as *Melaleuca* (paperbarks), *Lophostemon* (boxes) and *Corymbia* (bloodwoods) as a secondary source for supplementary food, shelter and resting. Landscape design and revegetation works within mapped koala habitat areas, wildlife corridors and urban areas known to support koalas, is to include local koala food and habitat trees (refer **Table SC6.14.7D6D (Koala food trees)**). ~~Koalas predominantly feed on eucalypt tree species, but will also utilise other closely related species such as *Melaleuca* (paperbarks), *Lophostemon* (boxes) and *Corymbia* (bloodwoods) as a secondary source for supplementary food, shelter and resting.~~~~

Table SC6.14.7D6D Koala food trees

Botanical name	Common name
Primary koala food trees	
<i>Eucalyptus tereticornis</i>	Queensland Blue Gum (Forest Red Gum)
<i>Eucalyptus microcorys</i>	Tallow Wood
<i>Eucalyptus propinqua</i>	Grey Gum
Secondary koala food trees	
<i>Eucalyptus acmenioides</i>	White Mahogany
<i>Eucalyptus bancroftii</i>	Tumbledown Gum
<i>Eucalyptus citriodora</i>	Spotted Gum
<i>Eucalyptus cloeziana</i>	Gympie Messmate
<i>Eucalyptus crebra</i>	Narrow-leaved ironbark
<i>Eucalyptus grandis</i>	Flooded Gum
<i>Eucalyptus pilularis</i>	Blackbutt
<i>Eucalyptus racemosa</i>	Scribbly Gum
<i>Eucalyptus resinifera</i>	Red Mahogany (Red Stringybark)
<i>Eucalyptus robusta</i>	Swamp Mahogany
<i>Eucalyptus seeana</i>	Narrow Leaved Red Gum
<i>Eucalyptus siderophloia</i>	Grey Ironbark
<i>Eucalyptus tindaliae</i>	Queensland White Stringybark
<i>Corymbia citrodora subsp variegata</i>	Spotted Gum
<i>Corymbia maculata</i>	Spotted Gum
<i>Corymbia gummifera</i>	Red Bloodwood
<i>Corymbia intermedia</i>	Pink Bloodwood
<i>Lophostemon confertus</i>	Brush Box
<i>Lophostemon suaveolens</i>	Swamp Box
<i>Melaleuca quinquenervia</i>	Swamp Paperbark

Note: ~~—~~ suitability of each species for a subject site will be ~~dependant~~dependent on the location, topography, soil type and existing or pre-existing vegetation communities.

- (4) Landscape design and selection of koala food and habitat trees ~~should~~shall:-
- give preference to primary species over secondary species;
 - select tree species endemic to the immediate local area;

- (c) select tree species suitable for the sites soil type and topography;
 - (d) locate trees to form corridors or connect to adjacent vegetation;
 - (e) locate trees to provide ~~stepping stones~~ accessibility and refuge points for koalas moving between areas;
 - (f) not locate individual food trees in isolation from other trees;
 - (g) only use taller species of eucalypts in large open areas;
 - (h) not locate koala food or habitat trees in close proximity to major roads; and
 - (i) not locate koala food trees under power lines or over underground infrastructure.
- (5) For further information on koala ecology, habitat, food trees, threats, mapping, planning issues, policies and legislation refer to the Queensland Department of Environment and Heritage Protection (DEHP) Science website.

SC6.14.7.21 SC6.14.6.15 Landscape buffers

- (1) Landscape buffers are required in certain development situations to mitigate impacts to and from adjoining uses. The following types of buffers may be required by an applicable use code, local plan code or overlay code ~~and~~ in the following circumstances:-
- (a) agricultural buffers, ~~—~~ where required by an applicable code in the planning scheme, ~~buffers are to be provided in accordance with the *Draft State Planning Policy - Guideline - State Interest guidance material - Agriculture*~~;
 - (b) industrial/ business and commercial buffers, ~~—~~ where not otherwise specified by another applicable code in the planning scheme, ~~are to be a 10 metres wide and landscaped buffer is to be provided~~, except where alternative measures, including high quality screen fences and acoustic barriers, allow the setback to be reduced;
 - (c) transport buffers ~~—~~ are required under the planning scheme in accordance with the DTMR Road Landscape Manual (Department of Main Roads) for developments adjacent to heavily trafficked roads, the North Coast Railway or other transport routes as required. ~~Where not otherwise specified by another applicable code in the planning scheme, a site adjoining heavily trafficked roads or the North Coast Railway provides a 60 metre wide buffer unless particular site circumstances (such as topography) mean that a lesser width would achieve the same level of acoustic and visual buffering. Heavily traffic roads include all existing major arterial, arterial, sub-arterial roads, the proposed Bells Creek arterial, proposed Multimodal Transport Corridor and proposed Caloundra to Maroochydore dedicated public transport corridor (CAMCOS)~~;
 - (d) environmental buffers, ~~—~~ where development adjoins an area of significant vegetation and/or adjoins land located within the Open space zone or the Environmental management and conservation zone, ~~—~~ ~~The buffer should~~ shall comprise plant species ~~common endemic to the adjacent habitat area and demonstrates compliance with ecological planting outcomes~~;
 - (e) ~~waterway and wetland buffers, —~~ where the site contains or adjoins land subject to the **Biodiversity, waterways and wetlands overlay code** (as identified on a **Biodiversity Waterways and Wetlands Planning Area Overlay Map**), ~~the landscape is~~ are to comply with buffer widths specified in the abovementioned code and include retention of existing native plant species and planting of additional local native plant species ~~suited endemic to the site~~;
 - (~~e~~)(f) ~~fire management buffers – establishment of fire management buffers to comply with SC6.7 (Planning scheme policy for bushfire hazard management overlay code)~~;
 - (~~f~~)(g) scenic route buffers, ~~—~~ where the site adjoins or is within 100 metres of a scenic route (as identified on the Scenic Amenity Overlay Map), ~~the landscape is~~ are required to contribute to the integrity of the scenic route by sensitively buffering new development, framing significant views and ensuring continuity of the existing streetscape and the character of the locality as specified in the **Scenic amenity overlay code** and ~~be~~ landscaped in accordance with the DTMR Road Landscape Manual (Department of Main Roads); and

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~~(g)(h) earth mounding –where earth mounds are incorporated as buffers, they are is to be planted with local native species except where ambient pollution levels warrant the use of higher pollution tolerant species. Mounding and landscaping is to be located entirely within the subject site and maintained by the property owner and provide no adverse flooding or stormwater drainage implications either on the site or on adjoining sites. Mounds should are to have a gradient of a ratio less than 15 degrees 1:4.~~

(2) Buffers may consist of:-

- (a) landscaped earth mounding;
- (b) dense screen planting which has foliage extending to the ground;
- (c) high quality fences/barriers combined with landscape screening to minimise acoustic and visual impact; and
- (d) multiple tiers of low dense plants and high branching taller trees used to screen larger objects.

~~(3) Where not otherwise specified by another applicable code in the planning scheme, a site adjoining heavily trafficked roads or the North Coast Railway provides a 60 metre wide buffer unless particular site circumstances (such as topography) mean that a lesser width would achieve the same level of acoustics and visual buffering.~~

~~(4)(3) The required density of screening vegetation within the landscape buffer is as follows detailed in Table SC6.14.7E 6E (Vegetative buffer densities).~~

Table SC6.14.7E6E Vegetative buffer densities

Vegetation type	Vegetation density
Large Trees	6 metre centres
Small Trees	2 metre centres
Shrubs	1 metre centres
Groundcovers	0.5-1 metre centres

~~(5)(4) The required height of screening vegetation relative to the width of the landscape buffer is as follows detailed in Table SC6.14.7F6F (Vegetative buffer heights).~~

Table SC6.14.7F6F Vegetative buffer heights

Height of vegetation	Width of buffer
> 8.0 metres	8.0 – 10.0 metres
8.0 metres	5.0 metres
5.0 metres	3.0 metres
Maximum 2.5 metres	2.0 metres
Maximum 1.2 metres	1.0 metre

SC6.14.7.22SC6.14.6.16 Landscape screening

- (1) Landscape screening differs from a landscape buffer due to its function of providing solely for visual screening purposes rather than for noise, odour, visual, and other impact mitigation. ~~Vegetative landscape works or appropriate fabricated screening are to provide complete or filtered screening to buildings, car parks, driveways, fences, utility / storage areas and incompatible uses in accordance with the requirements of the applicable planning scheme code.~~
- (2) ~~Vegetative landscape works or appropriate fabricated screening are to provide complete or filtered screening to buildings, car parks, driveways, fences, utility/storage areas and incompatible uses in accordance with the requirements of the applicable planning scheme code.~~
- (2)(3) Selection of suitable plants for landscape screening should shall give consideration to the available space to accommodate plants at maturity, with plantings allowing sufficient set back

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from paths and fences and access points to service utility infrastructure including electrical and telecommunications assets to minimise the need for pruning. Fire risk management is also to be considered in selection of suitable plants.

SC6.14.7.23SC6.14.6.17 Engineered planting

Engineered planting generally applies to vertical landscaping, which ~~is~~ includes (but is not limited to) podium planting and green walls. It assists in softening and maximising the visual amenity of built form and promoting a more attractive façade for multi-level buildings. It also serves to increase privacy between upper level balconies and units. Vertical landscaping ~~should~~ is to:-

- (a) be suited to the difficult conditions of exposure;
- (b) be able to be easily maintained, with adequate growing media, drainage and irrigation to ensure vigorous and sustainable plant growth without structural or drainage conflicts;
- (c) be given adequate space, with respect to podium planting. ~~Frontages~~ require deep natural ground to allow establishment and sustained healthy growth of larger trees;
- (d) be able to assist with further softening and privacy. Podium planting may be incorporated to private or public open space areas;
- (e) have appropriate structural support, irrigation, drainage and water proofing of planting containers; and
- (f) be carried out in accordance with the planning scheme.

SC6.14.7.24SC6.14.6.18 Streetscape landscapinglandscapes

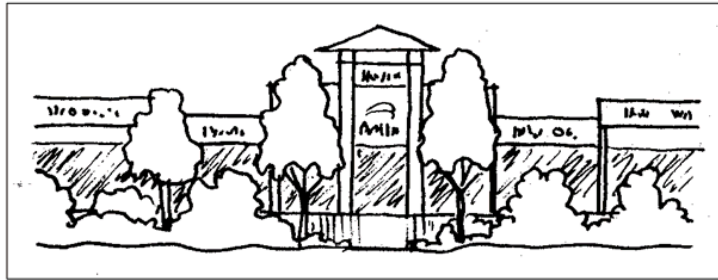
- (1) Continuity of the streetscape and frontage works provides for consistent character of existing and proposed streetscapes. Streetscape treatments are to be consistent with the applicable local plan area code or any relevant urban design or streetscape master plan.

Street Trees

- (2) Street trees are to be consistent with and complement the existing or proposed streetscape and/or natural landscape character and/or any environmental values. The Sunshine Coast Street Tree Master Plan provides guidance in relation to species selection and layout in the applicable local plan area.
- (3) Street trees shall provide continuous shade to active frontages, pathways and parking. ~~Where applicable and~~ practicable (shade trees are to be ~~area~~ provided at 8 metre centres and where coordinated with pathways, provided at 6 metre centres). The provision of shade and amenity to the streetscape receives high ~~is to take~~ priority when locating services, footpaths, driveways, carparking and buildings.
- (4) Street trees of a suitable growth height and effective dense canopy, shading form and stature are required to contribute to the existing tree line, skyline or backdrop effect created by existing vegetation in the locality.
- (5) Street trees and frontage planting are to be of an appropriate scale relative to both street reserve width, proposed adjacent building bulk (refer **Figure SC6.14.7B6B (Landscape solutions to lessen impact of building bulk)**), location of services and other structures.
- ~~(6) Landscape design and street tree planting contribute to reinforcing desired traffic speeds and driver behavior.~~

Figure SC6.14.7B-6B Landscape solutions to lessen impact of building bulk

Schedule 6



- (6) Landscape design and street tree planting contribute to reinforcing desired traffic speeds and driver behavior (refer Planning scheme policy for the transport and parking code).

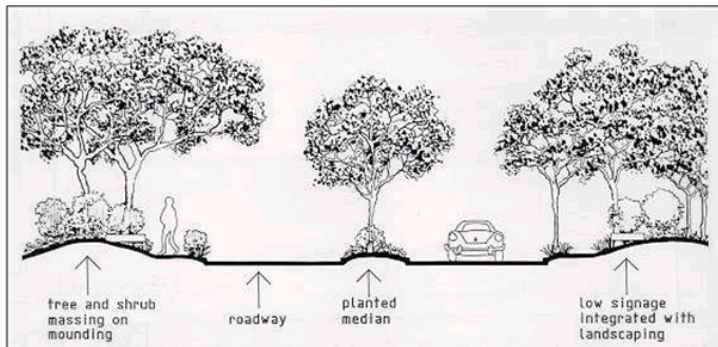
Fences and Walls

- (7) Fences, walls and landscaped frontages are to complement existing boundary treatments in the street in terms of scale and design.

Entry Entrance Statements

- (8) Entrance statements (refer **Figure SC6.14.7C-6C (Typical estate entrance)**) reflect a local character that features vegetation rather than built forms and ~~that~~ integrates with ~~an~~the overall landscape theme for the estate.

Figure SC6.14.7C6C Typical estate entrance



- (9) The Entrance statement is to contribute to legibility of the estate/ suburb, cultural values of local region and demonstrate environmental outcomes local plan area and reflect Sunshine Coast vernacular in the use of planting, materials and form. - This can be achieved through signage, artistic statements and interpretive elements. Entry statements with electrical elements such as lighting and water features are to be considered at time of application as to whether the installation meets industry and council standards and if it will remain in place post on maintenance inspection and if it has a continued community benefit.

SC6.14.7.25SC6.14.6.19 Provision of natural and built shade

- (1) The Sunshine Coast's climate is conducive to an active outdoor lifestyle. Responsible design should provide opportunities for people to sit, play and interact in a shady environment during the warmest part/highest risk hours of the day between 9am and 3pm, to lessen exposure to harmful UV radiation. Shade can be provided by fixed built structures, shade sails/awnings and appropriate tree planting.
- (2) The quantities and type of built or natural shade are to be provided in accordance with the Creating Shade at Public Facilities: Policy and Guidelines for Local Government (edition 2) prepared by the Australian Institute of Environmental Health, Queensland Health Promotion Council, Queensland University of Technology and Local Government Association of Queensland.

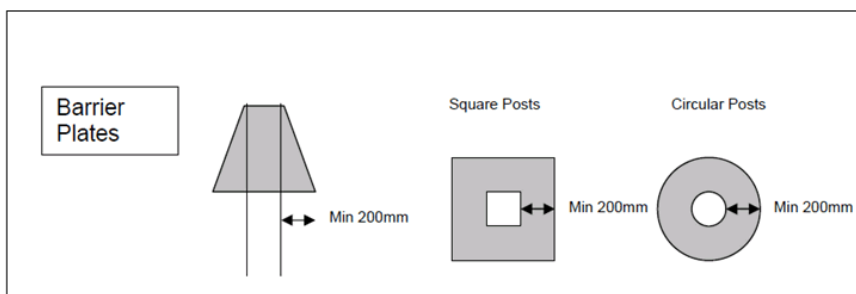
Schedule 6

- ~~(3) All fabric shade structures are to comply with current and relevant Australian Standards (i.e. AS/NZS1170.2 Structural design actions-Wind actions and AS4174 Knitted and woven shade fabrics) as well as the current National Construction Code requirements. All shade structures are to be built to a minimum wind rating of N3 (W50) or greater depending on the characteristics of the site and any recommendations specified within the development approval.~~
- ~~(2)(4) All pathways are to be designed to allow for maximum shade opportunities, through the provision of shade trees at 6 metre centres and/or awnings to achieve a shade level consistent with the subtropical climate. The aim is to provide continuous shade (target of 80% shade at tree maturity), which is defined by the trees achieving their mature height/spread with sufficient overlap of canopies.~~
- ~~(3)(5) All carparking areas are to be shaded by either shade trees at a maximum spacing of 1 shade tree per 4 parking bays or a constructed shade structure where set back from the street and where consistent with the character of the area. The Landscape code provides further acceptable outcomes in relation to shade tree planting requirements.~~
- ~~(4)(6) All public or communal barbeques, picnic table areas, children's play areas and playgrounds are to be shaded by a constructed shade structure and supplemented with trees. All picnic table areas, children's play areas/ and playgrounds are to be shaded by a constructed shade structure and supplemented with trees, with the long term vision to remove the structure when the trees provide sufficient shade. Shade created by trees is preferred in local parks. However, BBQs are to be shaded by a constructed shade structure.~~
- ~~(5)(7) As discussed above, shade can be provided by fixed built structures, shade sails/awnings and appropriate tree planting. Shade tree planting to the north and west of playgrounds, picnic areas, seats and other elements that attract high use is encouraged. Selection of fast growing, dense canopy trees with wide spreading foliage and a lifespan in excess of 15 years and minimal limb, leaf and fruit drop are desirable to provide maximum shade. Selection of species should also be suitable to the location, soil and drainage conditions. Trees are to be lift pruned as required to ensure clear surveillance sightlines as per CPTED guidelines.~~
- ~~(6)(8) Shade structures and sails should be designed to be non-climbable where possible. Children's play areas/Playgrounds should receive a minimum of 50% shade cover between 10am~~9am~~ and 3pm (EST) in summer and shade sails should be set a minimum of 3.0 metres above the highest point of any playground equipment. A diagram (shade modelling) is to be generated to illustrate the above. This will ensure the shade sail is appropriately oriented. The shade sail material should block out a minimum of 90% UV radiation and have a minimum structural warranty of 10 years. Where appropriate, multiple shade sails are to be used to reduce wind loads and maintenance costs.~~
- ~~(9) The shade sail material shall block out a minimum of 91% UV radiation and have a minimum structural warranty of 10 years. Shade and sun protection are to comply with AS4685 Playground equipment and surfacing.~~
- ~~(10) Shade structures and sails are to be designed and located to be non-climbable where possible. Anti-climb vandal barriers are to be installed on shade sail posts.~~
- ~~(11) The LIM provides further guidance in relation to the requirements for frame and rigging, membrane, heights and clearances, and footings, fixings and finishes.~~
- ~~(7) All fabric shade structures must comply with current and relevant Australian Standards as well as the current Building Code of Australia requirements. All shade structures are to be built to a minimum wind rating of N3 (W50) or greater depending on the characteristics of the site and any recommendations specified within the development building approval. The following requirements should be complied with:-~~
- ~~(a) frame and rigging:~~
- ~~(i) frame & steelworks to be hot dip galvanised after manufacture;~~
 - ~~(ii) all fasteners of 316 stainless steel;~~
 - ~~(iii) perimeter wire of 316 stainless steel;~~
 - ~~(iv) all tensioning devices to incorporate double lock nuts with spring washers on all threads;~~
 - ~~(v) all rigging etc to be "closed", (i.e. no hook/hook turnbuckles, S hooks, snap links etc.); and~~
 - ~~(vi) all attachment points to carry safety chains, chain and shackles rated to Australian Standards to SWL;~~

- (b) — membrane:-
- (i) — membrane to be of shade cloth;
 - (ii) — tear strength minimum Warp 172N Weft 196N;
 - (iii) — breaking force minimum Warp 799N Weft 2147N;
 - (iv) — 90%+ UV protection;
 - (v) — 10 years UV warranty on fabric;
 - (vi) — shall be fire retardant;
 - (vii) — 15 years UV warranty on stitching;
 - (viii) — perimeter wire pockets to be PVC reinforced;
 - (ix) — corners to be PVC reinforced, reinforcing concealed by shade cloth;
 - (x) — all reinforcing patches to be orientated to match the membrane;
 - (xi) — any webbing to be concealed by PVC offering 5 years UV warranty;
 - (xii) — perimeter wire to be tensioned and adjustable independently of fabric tension;
 - (xiii) — all membranes as sails, or structure covers, to be cut to "form", not stretch to "form"; and
 - (xiv) — wire exit points to be reinforced;
- (c) — heights and clearances:-
- (i) — all shade structures are to be installed at 3.0m above the highest point of the existing or installed playground equipment and should incorporate conical barrier plates (anti-vandal) 1.0m from the top of each supporting arm to discourage climbing of the framework and damage to the surface of the shade cloth; and
 - (ii) — any sail connection point shall be a minimum of 4.5m above ground level to limit access to the sail;
- (d) — footings, fixings and finishes:-
- (i) — all concrete work (footings etc) associated with the installation of shade structures must be at least 25MPa or as nominated by the project engineer;
 - (ii) — all fixings, finishes and fittings are to be vandal proof and designed to withstand salt spray and the corrosive environment; and
 - (iii) — all fixings are to be of the highest marine grade stainless steel to ensure longevity; and
- (e) — the developer is to supply technical specifications for each item of the shade sail and include though not limit to:-
- (i) — certified engineering drawings;
 - (ii) — specification of materials;
 - (iii) — barrier plates min 200mm (refer **Figure SC6.14.7D (Barrier plates)**);
 - (iv) — treatment of materials (e.g. galvanisation, powder coating, timber treatments);
 - (v) — installation manuals for items specified in the schedule of prices shall be supplied;
 - (vi) — the standard resistance to static electricity and ultra-violet radiation and their rating in relation to particular materials and colours used; and
 - (vii) — a sample of installation manuals.

Note—the provider shall supply catalogues and brochures of the shade structures specified.

Figure SC6.14.7D Barrier plates



Schedule 6

~~(8)(12) The developer is to provide~~ Council ~~is to be provided~~ with written certification that the finished shade structure installations are safe, suitable and fit for ~~the~~ purpose and complies with all current and relevant Australian Standards, Acts, WH&S requirements, National Construction Code~~Australian Building Codes~~ etc. relevant to WUC-Works under Contract and indemnifies the Principal in this regard. Unless otherwise specified, all materials, methods and workmanship shall be in accordance with the relevant Australian Standard or best practice industry standard where no Australian Standard exists.

~~Note—the provider shall supply installation manuals of the shade structures specified.~~

~~(9) — The quantities and type of built or natural shade is to be provided in accordance with the Creating Shade at Public Facilities: Policy and Guidelines for Local Government prepared by the Australian Institute of Environmental Health.~~

SC6.14.7.26SC6.14.6.20 Pathways and access points

(1) Public and communal pathways and access points are to be fit for purpose in terms of intended design, location, width and extent. As well as environmental, engineering, structural and stability requirements, pathways and access points ~~should~~ **shall** be constructed to ensure minimal ongoing maintenance and minimal disturbance to existing vegetation.

~~(2) — The SCC Infrastructure Guidelines and Standards provides guidance with regard to specifications for pathways and access points.~~

SC6.14.7.27SC6.14.6.21 Recreational equipment

Public exercise equipment

~~(1) — The provision of public exercise stations along pedestrian networks and in parks provide opportunities for people to exercise and interact socially in an outdoor setting. Public exercise stations can contain static/fixe equipment as well as dynamic equipment activated by body weight. Care needs to be taken in selecting and locating equipment to ensure that it is safe for all members of the community and robust enough to withstand climatic conditions (including avoidance of land subject to flooding) and wear of everyday use.~~

~~(2) — Installation and on-going maintenance of public exercise equipment include:-~~

- ~~(a) — six static designed exercise stations installed to manufacturer's specifications. Mechanical fitness equipment may be installed if an approvable risk assessment is submitted to Council. All equipment to meet safety standards and fall zone requirements of AS4685 and AS4422;~~
- ~~(b) — trowel finished rubberised softfall to meet AS4422, AS4685 and AS4486 softfall requirements and EHOE (fall heights) over a compacted base with adequate drainage installed under exercise stations;~~
- ~~(c) — vandal proof signage for exercise station use instructions; and~~
- ~~(d) — certification from the exercise station manufacturer that all equipment has been installed to their specifications and in accordance with AS4685, AS4486 and AS4422.~~

Children's play areas/Playground equipment

~~(3) — Playground design should be in accordance with the SCC Infrastructure Guidelines and Standards.~~

~~(4)(1) Playground design ~~should is to~~ respond to the local landscape character, demographics, demands and identity, through the choice of infrastructure and colour schemes. Playgrounds are to be safe, fun, interesting and inclusive to all users.~~

~~(5)(2) The following requirements apply to playground design and construction:-~~

- ~~(a) playground equipment and under-surfacing ~~must are to~~ comply with Workplace Health and Safety Act 2011 and regulations, Australian Standards AS4685 Playground equipment and surfacing~~ ~~Playground safety set and~~, AS4486.1 – Play spaces and play equipment and all other relevant statutory requirements, guidelines and standards (including ASNZS 4422 – Playground space surfacing – Specification, requirements and standards and test method, AS/NZS 1547 – On-site domestic wastewater management, the Electrical

Safety Act 2002 and regulations, National Construction Code Building Code of Australia and the SCC Infrastructure Guidelines and Standards (LIM);

- (b) ~~the SCC infrastructure Guidelines and Standards (*Open Space Landscape Infrastructure Manual*) provides comprehensive Council requirements for playspace design, including (but not limited to), requirements for play equipment, planting, shade, pedestrian gates and fencing, signage, seating, bins and pathways;~~
- (c)(b) ~~the playground must provide~~ a minimum of 2 seats adjoining the playground ~~is to be provided~~ under shade for supervision of play. ~~The playground must~~ One rubbish bin is also to be provided 1 bin adjacent to the playground;
- (d)(c) the playground ~~must is to~~ contain adequate subsurface and surface drainage to avoid water ponding / nuisance. ~~A drainage plan is to be submitted. A brass marker "D" should be fitted to each side of edging to indicate position of drainage pipes;~~
- (d) ~~markers are to be fitted to each side of the edging to indicate the position of all underground services (e.g. a brass marker "D" shall be fitted to each side of edging to indicate position of drainage pipes);~~
- (e) ~~the playground must have geo-fabric installed under softfall. When installing geofabric the matting must be secured with small cable ties or some other approved measures on all joints and around elements to ensure that the matting does not rise to the surface and create a trip hazard and ongoing maintenance issue;~~
- (f)(e) the assembly of all playground equipment using nuts and bolts ~~must is to~~ have thread lock compound applied so that bolts do not work their way loose and cause maintenance issues and damage to equipment;
- (f) ~~playground surfacing is to comply with the following:-~~
- (i) ~~surfacing depth in accordance with AS4422 *Playground surfacing – Specifications, requirements and test method* (Council specifies a minimum 400mm depth of loose fill surfacing material to allow for compaction and depletion);~~
- (ii) ~~consideration to be given regarding fall zone loose fill surfacing displacement under swings, fire poles and exit run-out for slides, rotating elements, carousels or spinning discs etc; and~~
- (g)(iii) the playground ~~must is to~~ have unitary surfacing (rubberised or synthetic soft fall surfacing) under play equipment where displacement of soft fall surfacing mulches is likely to occur. ~~Soft fall depth must comply with AS 4422. Consideration should be given regarding fall zone softfall displacement under swings, fire poles and exit run-out for slides, Spica and rotating elements, carousels or spinning discs etc;~~
- (h)(g) the playground ~~must is to~~ be surrounded with an edge treatment and have a minimum fall zone in compliance with AS4685 Playground equipment and surfacing and AS4422 Playground surfacing – Specifications, requirements and test method as a minimum or manufacturers recommendation if these exceed minimum requirements in Australian Standards. In cases where timber sleepers are used as footprint edging then a treatment of Synpave acrylic topcoat Terracotta non-slip/splinter containment paint ~~should is to~~ be applied to manufacturer's instructions, with a minimum of 2 coats. Concrete edging shall be 200mm deep and 150mm wide with reinforced rolled edge;
- (h) ~~any planting shall:~~
- (i) ~~comply with AS4685 *Playground equipment and surfacing relating to plant selection*;~~
- (ii) ~~comply with CPTED guidelines to maximise child safety and parent/carer supervision;~~
- (iii) ~~where shade trees are in close proximity at mature size, the developer is to ensure that the trees are adequately protected in accordance with AS4970 *Protection of trees on development sites* and ensure that three roots do not compromise the surfacing or create trip hazards in the fall zone or playground footprint; and~~
- (iv) ~~consult the services of a qualified arborist where required.~~
- (i) ~~where shade trees are in close proximity at mature size, the developer must ensure that the trees are adequately protected in accordance with AS4970 – *The protection of trees on development sites* and ensure that tree roots do not compromise the softfall or create trip hazards in the fall zone;~~

- (j)(i) ~~the developer must ensure that~~ slides are to be installed facing south to reduce the effect of direct sunlight onto the slide surface unless otherwise shaded;
- (k)(j) ~~swings should are to~~ be installed facing north-/south unless otherwise shaded;
- (l) ~~the developer must submit to Council certification that the playground equipment has been designed, constructed, and installed according to the manufacturers specifications and is compliant with Australian Standards. Certification must be provided by a certified playground audit or prior to on maintenance;~~
- (m)(k) the developer must is to inspect and maintain playground equipment during the 12 month "on maintenance" period to ensure they comply with Australian Standards. Maintenance operations including inspections must are to be carried out or be directly supervised by personnel with demonstrated qualifications, competency and experience. ~~For playgrounds and playground equipment, AS/NZS4486-1:1997 Playgrounds and playground equipment – Development, installation, inspection, maintenance and operation refers to the following three levels of inspections that are required to be carried out on all infrastructure playgrounds and playground equipment:-~~
- (i) comprehensive post-installation inspections verifying that the playground conforms with the requirements of the relevant parts of AS4685 Playground equipment and surfacing series and the impact-attenuating surfacing test in AS4422 Playground surfacing – Specifications, requirements and test method. This is to be carried out prior to public use;
 - (ii) routine visual inspections weekly for equipment subject to heavy use or vandalism, otherwise as per manufacturer's instructions or at least monthly ~~as per AS4486;~~
 - (iii) operational inspections every 2 months to be carried out regularly, on a monthly or quarterly basis for detailed inspection of the operation and stability of the equipment, especially for any wear on bearings and moving joints; and
 - (iv) comprehensive inspections immediately prior to "off maintenance" or minimum annually to establish the overall safety of the equipment, foundations and surfaces. This includes the structural integrity of items subject to effects of weather, corrosion and rotting;.
- (n)(l) the developer must is to provide maintenance instructions, parts and service manuals and manufacturers' guarantees for the playground equipment or any other documents or items to be handed over to Council (prior to acceptance "on maintenance");
- (o) ~~the developer must submit to Council a record of inspection and repairs to playground equipment undertaken between the "on and off maintenance" period prior to the acceptance of the works "off maintenance";~~
- (p)(m) the developer must is to provide to Council any construction or maintenance tools supplied with the purchase of the playground equipment prior to acceptance of the works "off maintenance", including any non-standard tools used;
- (q)(n) the developer must is to install a playground safety sign park activity entry sign adjacent to the playground prior to the acceptance of the works "on-maintenance" as per AS4685 Playground equipment and surfacing. The developer is to provide a sticker with developer contact details (over Council's details), during the on maintenance period. This sticker will be removed at off maintenance;
- (r)(o) the developer must is to submit to Council certification from a certified playground safety audit or prior to the acceptance of the works "on maintenance" that:-
- (i) the playground safety surface impact attenuation test for soft-fall as found on-site complying surfacing complies with AS4422 Playground surfacing – Specifications, requirements and test method; and
 - (ii) the design, construction and installation of the play equipment are constructed and erected to the manufacturers specifications and comply with AS4685 Playground equipment and surfacing;
- (s)(p) the developer must is to provide Council with records of incidents and accidents that occur in the playground prior to "off maintenance" handover along with particulars of any remedial actions, repairs or modifications to any playground equipment; ~~and~~
- (t)(q) fencing must shall not have any entrapment points that may present with a partially bound opening on the top rail. An example of a suitable top rail would be flat or cylindrical. Examples of Ssuitable fencing would be are commercial grade heavy duty aluminium;

posts timber look (preferred) or black powder coated, and black powder coated panels (balustrade). Gates are to be self-closing, child safe without footholds or any finger entrapments; and 19mm tube 40mm x 40mm top and bottom rail powder coated black.

- (r) the developer is to ensure the manufacturer has installed on the equipment (as per AS4685 Playground equipment and surfacing, the following:-
- (i) equipment identification (i.e. compliance plate); and
 - (ii) basic level mark (for surfacing).

Public exercise equipment

- (3) The provision of public exercise stations along pedestrian networks and in parks provide opportunities for people to exercise and interact socially in an outdoor setting. Public exercise stations can contain static/ fixed equipment as well as dynamic equipment activated by body weight. Care needs to be taken in selecting and locating equipment to ensure that it is safe for all members of the community and robust enough to withstand climatic conditions (including avoidance of land subject to flooding) and wear of everyday use.
- (4) Installation and on-going maintenance of public exercise equipment are to include the following:-
- (a) six static designed exercise stations installed to manufacturer's specifications. Mechanical fitness equipment may be installed if an approvable risk assessment is submitted to Council. All equipment is to meet safety standards and fall zone requirements of AS4685 Playground equipment and surfacing and AS4422 Playground surfacing - Specifications, requirements and test method;
 - (b) trowel finished rubberised surfacing to meet AS4422 Playground surfacing - Specifications, requirements and test method and AS4685 Playground equipment and surfacing and FHO (fall heights) over a compacted base with adequate drainage installed under exercise stations;
 - (c) erection of a park activity entry sign adjacent to the exercise equipment prior to the acceptance of the works on maintenance as per AS4685 Playground equipment and surfacing. The developer is to provide a sticker with developer contact details (over Councils details), during the on maintenance period. This sticker will be removed at off maintenance;
 - (d) vandal proof signage for exercise station use instructions; and
 - (e) certification from the exercise station manufacturer that all equipment has been installed to their specifications and in accordance with AS4685 Playground equipment and surfacing and AS4422 Playground surfacing – Specifications, requirements and test method.

Natural Activity Areas

- (5) Natural Activity Areas are to include the following:-
- (a) compliance with AS4685 Playground equipment and surfacing;
 - (b) dry creek beds to be located away from formal play space and safety surfacing areas as rocks can contaminate these areas. Where dry creek beds are in close proximity to formal play areas, rocks are to be secured in a concrete bed;
 - (c) logs secured to prevent rolling, have rounded edges, no splits, be certified stress graded and have a compliance certificate by an independent play space compliance engineer, and
 - (d) a risk assessment and/or risk benefit assessment (as appropriate) undertaken by the developer to identify suitability of elements. Signage may be required.
- (6) The LIM provides comprehensive Council requirements for materials to be used in all coastal locations (east of the Bruce Highway) and all hinterland locations (west of the Bruce Highway).

SC6.14.7.28SC6.14.6.22 Landscape structures

- (1) Landscape structures are to be an integral part of the open space landscape providing local identity and unique space for community and visitor gatherings.

- (2) Built structures, including shelters are required to be:-
- consistent with the relevant local planning area code and relevant building, engineering and electrical standards;
 - appropriately located within the landscape, being complementary to the immediate landscape and urban design;
 - constructed with impervious roofs that maximise rain and sun protection, where intended to provide shelter and for harvesting of rainwater where appropriate;
 - orientated to maximise shelter from sun, rain and wind; and
 - of construction that requires minimal maintenance and be fit for purpose, durable and safe.
- (3) ~~The SCC Infrastructure Guidelines and Standards provide further guidance with regard to specifications for landscape structures.~~

~~SC6.14.7.29~~ **SC6.14.6.23 Furniture and fixtures**

- (1) Landscape furniture (including, but not limited to, seats, benches, picnic tables, tree guards, bins and bin ~~surrounds~~enclosures, lighting and signage, bicycle racks/ and rails, ~~hand rails and~~ balustrades ~~and railings~~, bollards, ~~maintenance fences and gates, barbeque plates~~BBQs, taps, ~~and drinking fountains, and beach showers~~) ~~should shall~~ be selected or designed so that they are ~~appropriately located, fit for purpose, durable and safe, vandal resistant with parts that are easily replaceable, easy to maintain and comply with relevant standards.:~~
- ~~fit for purpose, appropriately positioned (installed on paved concrete or other hard surfaces) and accessible to uses of all abilities;~~
 - ~~made from materials that are durable and can be suitably protected from exterior elements, such as salt spray and UV exposure. Fixings are to be Grade 316 stainless steel unless otherwise stated. Furniture items are to come with a minimum 5 year warranty on materials and workmanship;~~
 - ~~robust and sturdy to withstand constant public use and be resistant to vandalism. Anti-tamper fittings shall be used and graffiti protection coatings applied;~~
 - ~~easy to maintain (with appropriate warranty and workmanship); and~~
 - ~~compliant with all relevant building, engineering, plumbing and electrical standards and development approvals.~~
- (2) Non-standard furniture where approved by Council for master planned areas or where Council desires a more unique character or style, ~~should is to~~ be designed and selected ~~to comply with the above guidelines, the following in mind:-~~
- ~~accessible to users of all abilities;~~
 - ~~comfortable and suitable for the average person;~~
 - ~~made from materials that will be durable and can be suitably protected from exterior elements, such as salt spray and UV exposure. Furniture items should come with a minimum 5 year warranty on materials and workmanship;~~
 - ~~robust and sturdy to withstand constant public use and be resistant to vandalism. Anti-tamper fittings should be used and graffiti protection coatings applied;~~
 - ~~easily replaceable if they become damaged or stop working. Products should be able to be sourced locally and use standard fittings. Reputable suppliers should be used who will have stock or parts in hand for the life of the product;~~
 - ~~use sustainable materials, although sustainability needs to be considered over the lifetime of the furniture; and~~
 - ~~installed on paved, concrete or other hard surfaces.~~

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- (3) Public artwork and community acknowledgements are to be provided where required by ~~the planning scheme~~Council and in accordance with the *Sunshine Coast Council Public Art Policy* and the *Memorials and Plaques Policy* and the *Memorials and Plaques Guidelines*. Artwork and community acknowledgements such as Indigenous recognition and memorial plaques are to be site specific and derived from the meaning of place. Any art work ~~should is to~~ include a maintenance management plan.

- ~~(4) The SCC Infrastructure Guidelines and Standards provide further guidance with regard to specifications for furniture and fixtures.~~

SC6.14.7.30SC6.14.6.24 PavementsHard sand areas

- (1) All hard surfacing areas are to comply with current Australian Standards for surface treatments. Hard surface areas that are subject to wetting are to comply with relevant Australian Standards for slip resistance.
- (2) All hard surfacing and areas external to building envelopes must are to be designed to provide appropriate stormwater management including a minimum cross fall of 1:50 away from built structures to a suitable collection point.
- (3) The selection and design of new hard surfacing must shall consider the following:-
- (a) ~~the~~ hard surfacing ~~is~~ capable of supporting the volume and weight of expected traffic;
 - (b) durability, such as the rate of wear and tear and susceptibility to discolouration;
 - (c) maintenance costs and long term maintenance requirements;
 - (d) resistance to heaving by tree roots, requiring additional reinforcing, deformable cushioning, rat walls, bridge beaming or flexible paving surfaces such as rubber epoxy compounds;
 - (e) porous pavements are to be mandatory when hard surfacing is required around existing trees to be retained. In high intensity urban areas, where trees are installed in hard surface areas, the use of porous pavement over gap-graded sub-grades is mandatory;
 - (f) for pedestrians, wheelchair users and people with mobility constraints, ~~require~~ a surface that is comfortable and functional;
 - (g) ~~all unit paving~~paved areas for units are to be restrained by a hard edge, preferably concrete and laid on a structural concrete subbase; and
 - ~~(h) in urban centres, all unit paving is to be laid on a structural concrete sub base; and~~
 - ~~(i)(h) where pavements are required adjacent to existing trees include proximity to existing trees and tree protection measures required to reduce potential impacts. (Refer to AS4970 – Protection of trees on development sites for tree protection measures when pavements are required adjacent to existing trees).~~
- ~~(4) The SCC Infrastructure Guidelines and Standards provide further guidance with regard to specifications for pavements.~~

SC6.14.7.31SC6.14.6.25 Fencing, walls and screening

- (1) ~~Where f~~encing, walls or screens are considered necessary and appropriate for a development, they must are to be constructed to a quality and life expectancy commensurate with the quality of the new building structures (i.e. be durable and vandal and graffiti resistant ~~where appropriate~~), and be appropriately located and integrated into the landscape, to ~~blending in~~ with the character of the local area. **Table SC6.14.7G-6G (Fence and screening type)** describes the minimum requirements of fences in various development applications.

Table SC6.14.7G-6G Fence and screening type

Type	Use	Characteristics
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Type	Use	Characteristics
Frontage fence	Dual occupancy	Solid fencing to street frontages must <u>shall</u> not exceed 6 metres in length without articulation, with a minimum 50% of the fence setback 1 metre from boundary.
	Business centre and design <u>activities</u>	Fencing to street frontages is a minimum of 75% visually and climatically permeable.
	Child care centres	Fencing to street frontages is a minimum of 75% visually and climatically permeable and conforms to <i>Queensland Development Code 2010</i> .
	Community uses <u>activities</u>	Fencing to street frontages is a minimum of 75% visually and climatically permeable.
	Industry uses <u>Industrial activities</u>	Fencing to street frontages is a minimum of 75% visually and climatically permeable, a maximum of <u>20 metres</u> in height and coloured black or a toning complimentary to the local environment.
	Multiple dwelling and Rooming accommodation buildings	Fencing to street frontages must <u>shall</u> not exceed <u>60 metres</u> in length without articulation, with a minimum 50% of the fence setback <u>1 metre</u> from boundary.
	Relocatable home park and Tourist facilities <u>park</u>	Fencing to street frontages is a minimum of 75% visually and climatically permeable.
	Residential care and Retirement facilities	Fencing to street frontages are not to exceed <u>6 metres</u> in length without articulation, with a minimum 50% of the fence setback <u>1 metre</u> from boundary.
	Rural uses	Fencing to street frontages is a minimum of 90% visually and climatically permeable and must <u>is to</u> be complimentary to the local environment.
	Service stations	Fencing to street frontages is a minimum of 75% visually and climatically permeable, a maximum of <u>2 metres</u> in height and coloured black or in a toning complementary to the local environment.
	Sport and recreation uses <u>activities</u>	Fencing to street frontages is a minimum of 75% visually and climatically permeable, a maximum of <u>2 metres</u> in height and coloured black or in a toning complementary to the local environment. Note—This characteristic does not address pool fence requirements should the pool be located adjoining <u>a</u> boundary.
Frontage fence	Telecommunications tower <u>facility</u>	Fencing to street frontages is a minimum of 75% visually and climatically permeable, a maximum of <u>2 metres</u> in height and coloured black or in a toning complementary to the local environment.
	Utilities <u>Utility installation</u>	Fencing to street frontages is a minimum of 75% visually and climatically permeable, a maximum of <u>2 metres</u> in height and coloured black or in a toning complimentary to the local environment.
Boundary fence	Developments adjoining parks and reserves	Fencing adjoining P <u>p</u> arks and R <u>r</u> eserves is to be designed to restrict domestic animals with a minimum of 75% visually and climatically permeable and a minimum height of <u>1.2 metres</u> .
Coastal fence	Development adjoining public use coastal areas	Fences and screens bordering public use areas are dog proof, a minimum of <u>1.2 metres</u> and maximum of <u>1.8 metres</u> in height, allow for casual surveillance opportunities and are designed to be complementary to the local environment.
	Development adjoining coastal protection areas	<u>Fences and screens bordering coastal protection areas are highly durable, a minimum of 1.5 metres and maximum of 1.8 metres in height and coloured to blend with adjacent landscape features.</u>

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Type	Use	Characteristics
Acoustic attenuation fences	Development assessed as requiring noise attenuation barriers	Acoustic fences are to be incorporated where buildings are unable to achieve appropriate noise attenuation. Acoustic fences are constructed in accordance with the requirements detailed in an approved acoustic report as part of the development conditions and incorporate vegetative screening and anti-graffiti measures. Acoustic fences must be wholly located within private land and set back to allow appropriate vegetative buffering in accordance with planning scheme requirements. Design and construction must be in accordance approved acoustic consultants recommendations. Fence heights must shall not exceed three 3 metres unless essential for attenuation and where a combination of landscaping and fencing does not meet noise attenuation requirements.
Security fence	Developments requiring security fences	Fencing to street frontages is a minimum of 75% visually and climatically permeable, a maximum of 2.4 metres in height and coloured black or a toning complementary to the local environment.
Fauna fences	Development including roads which adjoin:- <ul style="list-style-type: none"> • national park • nature refuge • environment reserve • conservation reserve • conservation covenant • bushland reserve • drainage reserve • natural open space 	An appropriate, <u>fire proof</u> fence to provide access or exclusion of fauna in accordance with approved fauna management plan. <u>Type 4 or 5 access trails to be established on both sides of fauna fences for fire management and vegetation maintenance purposes.</u>
Fire exclusion fence	Development adjoins <u>adjoining</u> bushfire prone land as identified on <u>the</u> respective <u>respective</u> overlay	Fence to provide fire relief in accordance with approved bushfire management plan.
Utility and storage area screens	Development contains:- <ul style="list-style-type: none"> • bin storage • wash down bay 	Areas must are to be screened from street frontages with use of 1.8 metres <u>metres</u> high solid fence.
Retaining walls	Development requires <u>land to be retained</u> retaining to create private lot/s	Retaining walls must are to be wholly built within the subject lot including all elements of the retaining wall, footings and construction access.
Pool fences	Development contains <u>a</u> pool, pond or water feature	Pool fences are in accordance with the requirements of the <i>Queensland Development Code 2012</i> , <i>AS1926 Swimming pool safety</i> and all subordinate regulations, legislation and <u>all other</u> standards at the time of construction.
Playground fence	Recreation equipment	Fencing surrounding playgrounds should shall be heavy duty aluminium 19mm tube 40mm x 40mm top and bottom rail with 3mm wall powder coated black with a self-latching gate with pool safety type lock.

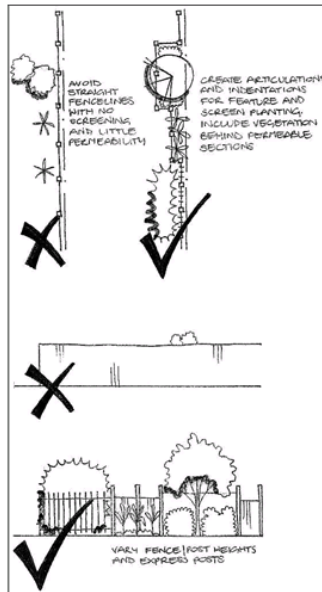
Note: ~~—~~ for fixings for fencing, walls and built screens refer to the SCC Infrastructure Guidelines and Standards L1M.

- (2) ~~Retaining walls where to create private property and acoustic fences are wholly located within private land.~~
- (3) ~~Fences and screens bordering coastal protection areas are of commercial grade pool type fence construction, a minimum of 1.5 metres and maximum of 1.8 metres in height and coloured to blend with adjacent landscape features.~~
- (4) ~~Fences and screens bordering public use areas are dog proof, a minimum of 1.2 metres and maximum of 1.8 metres in height, allow for casual surveillance opportunities and are designed to blend with adjacent landscape features.~~

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- (5) ~~Pool fences are in accordance with Australian Standards AS1926 Swimming pool safety and Council safety requirements.~~
- (6) ~~Acoustic fences are constructed:-~~
 - (a) ~~in accordance with the requirements detailed in the development Acoustic Report; and~~
 - (b) ~~to incorporate vegetative screening and anti-graffiti measures.~~
- (7)(2) Timber and fixings are to be of high quality and durable with Grade 316 stainless steel fixings for sites east of the Bruce Highway and hot dipped galvanised fixings for sites west of the Bruce Highway.
- (8)(3) Fencing and screening ~~should are to~~ avoid straight lines and instead create articulations and indentations for feature and screen planting (refer **Figure SC6.14.7E-6E (Screen articulation)**).
- (9) ~~The SCC Infrastructure Guidelines & Standards provide further guidance with regard to specifications for fences.~~

Figure SC6.14.7E-6E Screen articulation



SC6.14.7.32SC6.14.6.26 Lighting

- (1) Lighting of landscapes is important for areas that are to be used at night for both functionality, way finding and public safety reasons. Places that are lit at night will attract usage and activity so it is important to only light places where public activity at night time is expected and encouraged. Lighting of areas not intended for night time use and that are poorly supervised or in quiet neighbourhoods may attract vandalism and other unsociable behaviour.
- (2) Lighting of areas that are adjacent to foreshores where turtle nesting sites occur ~~should is not to~~ impact on turtle nesting or hatching movement. Compliance with the National Light Pollution Guidelines for Wildlife and SCC Lighting Conditions for Developments within 100m, 1.5km or 18km of Turtle Nesting Habitat must be met.
- (3) The relevant standards for lighting pedestrian areas are:-
 - (a) AS/NZS1158.3.1:2005 – AS/NZS1158 Lighting for R_oads and public spaces; and

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- (b) ~~AS4282-1997~~ Control of the obtrusive effects of outdoor lighting.
- (4) Lighting P categories are based on the level of activity, risk of crime and need to enhance prestige as well as the type of expected use. Council ~~should~~ is to be consulted on the level of lighting they require for public pathways or public open spaces. ~~An suitably qualified RPEQ electrical engineer or lighting consultant will be~~ is able to design ~~and certify~~ a lighting arrangement to meet ~~these P-category required-for-that-area requirements in consultation with the SCC Public Lighting Policy.~~
- (5) The maintenance of light fittings, poles and lighting elements is an ongoing cost to Council. ~~For this reason~~ Therefore a level of standardisation is required to reduce ongoing costs and simplify maintenance through the use of robust and effective lighting elements. Standardisation also assists in providing a uniform appearance ~~and ensures that robust and effective lighting elements are used. Refer to SCC Infrastructure Guidelines and Standards for existing palettes and for more information on appropriate light fittings.~~
- (6) High profile public areas allow for greater flexibility in lighting design and the use of creative lighting treatments enhances the aesthetics and provides visual interest to these areas. Lighting effects can also enhance, or of their own right be public art elements that add to the richness of a place. Lighting ~~should~~ is to complement and enhance the elements within a space and be incorporated into the overall design, rather than an add-on. ~~Refer to SCC Infrastructure Guidelines and Standards for decorative and architectural lighting standards.~~
- (7) Council and private consultants are encouraged to keep up to date with the latest advances to ensure that sustainable lighting options are considered. However, care should be taken to ensure that new fittings have the same or improved durability and service life expectancy.
- (8) Light fittings need to be appropriate for use in public spaces. Features to consider are shatter proof and cool to touch glass, durable materials such as stainless steel and brass, suitability for in-ground or exterior locations and impact resistance. In-ground fittings shall be non-slip and impact resistant. Where possible light fittings ~~should~~ are to be located to minimise the risk of damage, either on a pole, fixed into the ground or wall, fitted into a recess or placed on the underside of furniture.
- (9) Materials and works are to achieve a 20 year installation design life.
- (10) Prior to commencement of construction, an Operational Works development approval ~~must~~ is to be obtained for all electrical works.
- (11) Following construction, all electrical works ~~must~~ are to be certified in accordance with the requirements of the *Sunshine Coast Council Electrical, Services Standard Specification Lighting and Telecommunication Design and Construction Standards*.
- (12) ~~SCC Infrastructure Guidelines and Standards~~ The LIM provides guidance with regard to electrical installation and certification in open space areas. The LIM contains further information on palettes and appropriate light fittings and decorative and architectural lighting standards.

SC6.14.7.33SC6.14.6.27 Signage

- (1) Landscape signage is to be located in accordance with Council's planning scheme codes. Signs ~~should~~ shall be located in garden beds where possible.
- (2) ~~The use of~~ interpretive signing signage is intended to will reflect the cultural or natural values of the ~~precinct, area or district~~ individual localities.
- (3) Signs and sign poles, stands or bases are constructed from high quality materials that require minimal ongoing maintenance. Where multiple signs are required in the same location, the signs ~~should~~ are to be collocated on one structure where possible. Permanent signage of these types in the public estate is not to be utilised for advertising purposes.
- (4) Landscape signage includes although not limited to:-
- (a) park naming signs;
 - (b) estate entry signage;
 - (c) way finding signs ~~and~~ symbols;

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- (d) educational and interpretive boards;
- (e) warning/safety signs and information;
- (f) fauna crossing signs; and
- (g) playground usage signage.

SC6.14.7.34SC6.14.6.28 Roads, services and utilities

- (1) All landscape works are to maintain adequate safe distance from services and utilities both above ground and below ground to allow maintenance to be undertaken.
- (2) Services that constrain landscape areas are required to be identified on landscape plans. These include:-
 - (a) electrical substations;
 - (b) overhead powerlines;
 - (c) power poles and transformers;
 - (d) street and park lights;
 - (e) stormwater catchment pits;
 - (f) underground power;
 - (g) water;
 - (h) sewer, and
 - (i) ~~telephone, and~~telecommunication and fibre optic cables.
 - (j) ~~fibre optic cables.~~
- (3) For tree selection under overhead wires, refer to Appendix D of the *Energex Tree Clearing profiles, and endeavour to select trees are to be selected that:-*
 - (a) are small to medium sized on maturity and normally crown below the clearance zone height of LV-low voltage wires;
 - (b) are slow growing so that mature dimensions are not reached for many years and/or the specimen reaches its useful life prior to conflict with overhead wires;
 - (c) have a limited life span and could potentially be removed and replaced before their height reaches specified clearance distances;
 - (d) are decurrent (without a clear leading stem) or multi-branched in nature which are more tolerant of directional pruning techniques or can be effectively shaped while developing to minimise future conflict with overhead services;
 - (e) exhibit a framework of fine branching and are therefore tolerant of hedge type pruning undertaken at a higher frequency; and
 - (f) are responsive to formative pruning to provide acceptable line of site to satisfy engineering and CPTED requirements.
- (4) Do not select trees that:-
 - (a) are well documented as being undesirable for planting beneath wires due to their large size on maturity, spreading horizontal canopy, rapid growth rates, efficient epicormic response or vigorous regrowth following pruning, poor compartmentalisation and/or pruning response;
 - (b) have poor collar or target pruning point development (for example palm trees, Pandanus, Poinciana); and

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- (c) cannot be pruned without destroying the vegetation's character, amenity or utility.
- (5) In some situations, the planting of trees that normally may be considered undesirable for planting beneath wires may be necessary to:-
 - (a) retain the character of an area;
 - (b) buffer the built landscape;
 - (c) create entry and focal points;
 - (d) provide vertical interest and a sense of scale; and
 - (e) meet community expectations.

SC6.14.7.35SC6.14.6.29 Guidelines

- (1) For the purposes of achieving compliance with this section of the planning scheme policy, the following are relevant guidelines:-
 - (a) ~~AS/NZS 1158 – Public lighting (public walkways)~~ Lighting for roads and public spaces;
 - (b) ~~AS/NZS 1170 Structural design actions – Permanent, imposed and other actions~~
 - (b)(c) ~~AS 4282 – Control of obtrusive effects of outdoor lighting~~;
 - (c)(d) ~~AS 4373 – Pruning of amenity trees~~;
 - (d)(e) ~~AS 4970 – Protection of trees on development sites~~;
 - (e)(f) ~~AS/NZS 1428 – Design for access and mobility~~;
 - (f)(g) ~~AS 4419 – Soils for landscaping and garden use~~;
 - (g)(h) ~~AS 4454 – Composts, soil conditioners and mulches~~;
 - (h)(i) ~~AS/NZS 4586 – Slip resistance classification of new pedestrian surface materials~~;
 - (i)(j) ~~AS 1926 – Swimming pool safety~~;
 - (j)(k) ~~AS 4685:2004 – Playground Equipment Safety Set~~;
 - (k)(l) ~~AS/NZS 4422:1996 – Playground SSurfacing – Specifications, Rrequirements and Ttest Mmethod~~;
 - (l)(m) ~~AS/NZS 4486:1:1997 Playgrounds and Pplayground Eequipment – Ddevelopment, installation, inspection, maintenance and operation~~;
 - (m)(n) ~~AS 4678:2002 – Earth Rretaining Sstructures~~;
 - (n)(o) ~~Workplace Health and Safety Act 1995-2011 and Guide for Building and Construction Industry (Queensland Government Department of Industrial Relations Workplace Health & Safety)~~;
 - (o)(p) ~~Environmental Protection Act 1994~~;
 - (p)(q) ~~Soil Erosion and Sediment Control Guidelines (Institution of Engineers Australian (Queensland Division))~~;
 - (q)(r) ~~Road Planning and Design Manual (Department of Main Roads)~~;
 - (r)(s) ~~Subtropical design in South East Queensland – a handbook for Planners, Developers and Decision makers; and~~
 - (s)(t) ~~Energex Tree Clearing profiles (Appendix D)~~;
 - (u) ~~AS/NZS 3000 Wiring Rules; and~~

- (v) AS/ACIF S009:2006 – Installation requirements for customer cabling (Wiring rules).
- (2) The following publications provide additional guidance regarding open space and landscaping infrastructure requirements:-
- (a) Sunshine Coast Council Infrastructure Guidelines and Standards Open Space Landscape Infrastructure Manual (LIM);
- (b) Sunshine Coast Council Electrical, Lighting and Telecommunications Design and Construction Standards;
- (b)(c) Sunshine Coast Recreational Trails Construction Guidelines;
- (c)(d) Sunshine Coast Council Access and Equity Policy;
- (d)(e) Sunshine Coast Council Amenities Guidelines;
- (e)(f) Sunshine Coast Art Works – Sunshine Coast Public Strategy and Procedures Manual;
and
- (f)(g) Sunshine Coast Open Space Strategy; and
- (h) Sunshine Coast Street Tree Master Plan.

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Appendix SC6.14B - NATSPEC tree inspection and certification form

OPW ____/____/____

<u>Date / Location of inspection</u>			
<u>Pot sizes inspected</u>			
<u>Inspected by</u>			
	YES	NO	COMMENTS
General health and vigour			
Tree is true to type and pot size			
Pests and disease free			
Free from injury			
Self-supporting			
Stem structure			
Stem taper			
Apical dominance for excurrent form			
Crown symmetry			
Pruning to AS 4373			
Included bark / bifurcation?			
Root ball inspection conducted?			
If assessed in situ, have nursery stakes and ties been removed?			
If assessed in situ, tree planted as per FIGURE 4.8.3 rev A and decision notice conditions?			
If assessed in situ, is planting location as per approved plan?			
If assessed in situ, is mulch type and thickness as per decision notice conditions?			
<u>NATSPEC COMPLIANT</u>			
<u>REINSPECTION REQUIRED</u>			
<u>PASSED</u>			

Please note, certification is not effective until the consulting arborist can confirm that any additional works required to achieve NATSPEC compliance have been completed.

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Appendix SC6.14C Guide to industry best practice landscape maintenance activities for road reserves and public open space areas

- (1) Establishment and maintenance requirements where:-
- (a) to assist success of the landscape works, a regular maintenance schedule are-is to be specified to include although not limited to:-
- (i) watering as required to establish planting and turf;
 - (ii) regular mowing and edging of turf areas;
 - (iii) control of environmental weeds and invasive plants in turf areas;
 - (iv) topdressing turf areas to ensure even surface;
 - (v) control of environmental weed and invasive plant growth in garden areas;
 - (vi) control of insect or disease in plant materials;
 - (vii) pruning of trees in accordance with AS 4373-2007 Pruning of amenity trees;
 - (viii) pruning of shrubs and ground covers to maintain amenity and intent;
 - (ix) checking and adjustment of tree stakes and ties;
 - (x) replacement of dead or poorly performing planting;
 - (xi) removal of trees that may become hazardous;
 - (xii) top up of mulch materials to specified depths;
 - (xiii) removal of rubbish, litter or debris from the landscape;
 - (xiv) removal of graffiti if affected;
 - (xv) cleaning of barbequesBBQs;
 - (xvi) replacement of any vandalised or damaged items including all landscape infrastructure; and
 - (xvii) reapplication of timber preservatives and finishing oils.
- (b) for "on maintenance works in accordance with the development approval and the Planning scheme policy for development works":-
- (i) in accordance with the development approval and the Planning scheme policy for development works, the developer is required to request an "on maintenance" inspection with Council's delegate after all bonds and required certifications have been lodged, giving seven (7) working days advanced notice prior to the meeting being conducted;
 - (ii) once the landscape works within the road reserves and open space areas are accepted "on maintenance" by Council it is the developer's responsibility to maintain the works for 12 months (or as conditioned in the development approval); and
 - (iii) during the "on maintenance" period the developer is to maintain the landscape in accordance with the development approval and with best industry maintenance practices.
- (c) for off maintenance in accordance with the development approval and the Planning scheme policy for development works:-
- (i) in accordance with the development approval and the Planning scheme policy for development works, the developer is required to request an off maintenance inspection with Council's delegate after all required certifications have been supplied, giving seven (7) working days advanced notice prior to the meeting being conducted;
 - (ii) if the works are satisfactory they shall be accepted "off maintenance" and any bond monies returned; and
 - (iii) if works are unsatisfactory the maintenance period will be extended in 3 month increments until acceptable.
- (d) prior to acceptance of works "off maintenance" Council reserves the right to instruct the developer to remove/replant landscape works that are:-
- (i) not in accordance with conditions of approval;
 - (ii) not healthy, vigorous or performing their desired function;
 - (iii) causing sightline or visibility concern;
 - (iv) in conflict with service infrastructure or residential driveways; and
 - (v) in the event that the maintenance period is extended beyond the 12 months it is the developers responsibility to meet the capital and maintenance costs of any items that require refurbishment.

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(2) Rehabilitation and revegetation areas:-

- (a) ~~are to be established and maintained the rehabilitation and revegetation works~~ until achievement of growth criteria and weed control conditioned in the development approval is achieved. To assist success of the regeneration/revegetation works a regular maintenance and monitoring schedule is to be specified to include although not limit to:-
- (i) protection of regenerating seedlings;
 - (ii) initial watering of young stock to aid development;
 - (iii) replacement of dead or poorly performing stock every 3 months; ~~Where plants, trees or palms fail during the on maintenance period, it is the responsibility of the contractor to replace those plants as soon as practicable~~
 - (iv) regular weed control to minimise competition to desired species and reduce influx of weed species;
 - (v) removal of trees that may become hazardous;
 - (vi) top up of mulch to specified depths; ~~and~~
 - (vii) removal of rubbish, litter or debris from the landscape.;
- (b) ~~are to be for "on maintenance" in accordance with the development approval and the Planning scheme policy for development works with the developer required to request an on maintenance inspection with Council's delegate after all bonds and required certifications have been lodged, giving 5 working days advanced notice prior to the meeting being conducted;~~
- ~~(i) — in accordance with the development approval and the Planning scheme policy for development works, the developer is required to request an "on maintenance" inspection with Council's delegate after all bonds and required certifications have been lodged, giving five (5) working days advanced notice prior to the meeting being conducted;~~
 - ~~(ii)(c) once the rehabilitation/revegetation works are accepted "on maintenance" by Council, it is the developers responsibility to maintain the works for a minimum of 36 months 12 months (or as conditioned in the development approval); and~~
 - ~~(iii)(d) during the "on maintenance" period, it is the developers responsibility is to maintain the landscape in accordance with the development approval and with best industry maintenance practices using a suitably qualified contractor with local experience in ecological restoration works.~~

(3) Rehabilitation and Rrevegetation Wworks ~~are to comply with the following:-~~

- (a) the applicant ~~must is to~~ implement the rehabilitation and revegetation works as approved prior to the release of the plan of survey or bonded in accordance with Council policy;
- (b) the applicant ~~must is to~~ maintain sediment control treatment trains to prevent run-off and sediment from ~~the~~ future residential blocks and revegetation areas;
- (c) Council may reduce the 36 month establishment period once all off maintenance criteria is achieved;
- (d) in accordance with the development approval, the applicant ~~must is to~~ regularly maintain the rehabilitation and revegetation works to achieve the following performance criteria:-
 - (i) performance criteria for Year One: 12 months after the acceptance of the works "on maintenance";
 - (A) adherence to maintenance regime for rehabilitation and revegetation areas;
 - (B) no evidence of re-shooting from stumps or poisoned trees or the regrowth of cut stumps;
 - (C) no evidence of over-weeding or impact on non-target species;
 - (D) signs of indigenous recruitment in rehabilitation areas;
 - (E) weed infestation less than 10% of the rehabilitation areas;
 - (F) a minimum of 95% of planted stock has survived with all displaying ~~vigourous~~vigorous growth. Any plants that have died within the previous twelve-month period have been replaced and established;
 - (G) planted trees have achieved an average height of 1.0 metres;
 - (H) planted shrubs have achieved an average height of 0.4 metres;
 - (I) mulch layer or approved weed control method is effective in weed suppression; and

- (J) a report to Council is submitted, mapping the condition of the regeneration area, noting where works had been undertaken in the previous year and the percentage cover of indigenous recruitment;
- (ii) performance criteria for Year Two: 24 months after the acceptance of the works on maintenance;
- (iii) adherence to maintenance regime for rehabilitation and revegetation areas;
- (iv) no evidence of re-shooting from stumps or poisoned trees or the regrowth of cut stumps;
- (v) no evidence of over-weeding or impact on non-target species;
- (vi) signs of indigenous recruitment in rehabilitation areas;
- (vii) weed infestation less than 5% of the rehabilitation areas;
- (viii) a minimum of 95% of planted stock has survived with all displaying ~~vigourous~~vigorous growth. Any plants that have died within the previous twelve-month period have been replaced and established;
- (ix) planted trees have achieved an average height of 2.0 metres;
- (x) planted shrubs have achieved an average height of 1.0 metres;
- (xi) mulch layer or approved weed control method is effective in weed suppression;
- (xii) a report to Council is submitted, mapping the condition of the regeneration area, noting where works had been undertaken in the previous year and the percentage cover of indigenous recruitment;
- (xiii) performance criteria for off maintenance: 36 months after the acceptance of the works on maintenance or once all establishment criteria has been satisfied;
- (xiv) adherence to amended maintenance regime for rehabilitation and revegetation areas;
- (xv) no evidence of re-shooting from stumps or poisoned trees or the regrowth of cut stumps;
- (xvi) weed infestations less than 2% of the rehabilitation areas;
- (xvii) planted trees have achieved an average height of 3.0 metres;
- (xviii) planted shrubs have achieved an average height of 1.2 metres;
- (xix) the ground surface ~~must shall~~ not display any area devoid of vegetation greater than 1.0 m² within any 10.0 m² sample;
- (xx) mulch layer around trees and shrubs is a minimum of 100mm deep; and
- (xxi) a report to Council is submitted, mapping the condition of the regeneration area, noting where works had been undertaken in the previous year and the percentage cover of ~~indigenous recruitment~~ endemic plants.

Appendix SC6.14D Landscape Maintenance Checklist

OPW ____ / ____

Assessment undertaken by: (Name & Company)	Assessor Signature:		On date:
On behalf of developer: (Name & Company)	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u> (or N/A)
APPROVALS:			
Works comply with all approval conditions			
AMENITY TREES:			
Are of good health & form (NATSPEC) in accordance with AS2303			
Have been pruned in accordance with AS-4373			
That have not performed have been replaced with suitable species at 300mm pot size			
Have had all nursery stakes and ties removed (where not required for support)			
GARDENS:			
Are weed free			
Plants that have not performed have been replaced			
Plants have been pruned to shape and do not overhang private property, or impede road or footpath access			
TREE AND GARDEN EDGING:			
Is in good order or has been replaced			
MULCH:			
To trees and gardens has been reinstated to the minimum depth after settlement. Quality "Forest Blend" mulch or similar has been used			
To playground areas meets all Aust. Standards for safety			
TURF:			
Is 90% weed free (broad scale spray if necessary)			
Has achieved 100% cover			
Has been top dressed with washed river sand, sow with no trip hazard greater than 5mm			
STRUCTURES, FURNITURE & FIXTURES:			
Structures are sound and free of damage			
Street furniture, fixtures and play / exercise equipment are in good order and complete. Any vandalised or missing components have been replaced			
Switchboards, lighting and barbeques BBQs are in accordance with Council's requirements and in working order			
Water fountains and taps are in accordance with Council's requirements and in working order			
Play / exercise equipment comply with all relevant Australian Standards for safety			
	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u> (or N/A)
Structures, shelters, furniture, barbeques BBQs, bins, play / exercise equipment, fences, pathways etc. must are to be free of debris, mould, cooking residue, insect and bird nests etc.			
SERVICES:			
Must Shall not be obstructed by landscape works			
With a Any broken pit lids must are to be repaired by the relevant authority			
WATER SENSITIVE URBAN DESIGN:			
Landscape works meet the requirements of approval and SEQ Technical Design Guidelines for Water Sensitive Urban Design			
Landscape works co-ordinate with E engineering and H hydraulic requirements			

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REVEGETATION / REHABILITATION:		
Works meet the requirements of First Year Performance Criteria: <i>INSERT PERFORMANCE CRITERIA</i>		
OTHER:		
READY TO REQUEST OFF MAINTENANCE INSPECTION		

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SC6.14.8SC6.14.7 Coastal and waterfront structures

SC6.14.8.1SC6.14.7.1 Purpose

The purpose of this section of the **Planning scheme policy for development works** is to:-

- (a) provide advice and guidance on the design and construction standards applicable to waterfront structures (including revetment walls, jetties, pontoons, decks and boat ramps with a private use), which will ensure such structures are structurally sound and safe for their intended uses;
- (b) provide advice and guidance on the design and construction works of waterfront structures to not cause significant adverse impacts on waterways or public use of waterways; and
- (c) provide advice and guidance on the standards applicable to design and construction of non-tidal but navigable waterways.

SC6.14.8.2SC6.14.7.2 Application

- (1) In this section it is expected that a RPEQ would be experienced in the design of waterfront structures and may also be a specialist geotechnical engineer experienced in waterfront development. This section of the planning scheme policy applies to assessable development which requires assessment against the applicable development codes.
- (2) This section is structured as follows:-
 - (a) **Sections SC6.14.8.7.1 and Section SC14.8.7.2** which provides the framework;
 - (b) **Sections SC6.14.8.7.3 to SC6.14.8.7.6** which outline the guidelines and standards provides the requirements and procedures relating to design and construction of waterfront structures and associated works to achieve the purpose of this section of the planning scheme policy; and
 - (c) **Section SC6.14.8.7.7** contains guidelines for achieving compliance with this section of this the planning scheme policy.
- (3) In this section it is expected that a RPEQ engineer would be experienced in the design of waterfront structures and may also be a specialist geotechnical engineer experienced in waterfront development.

SC6.14.8.3SC6.14.7.3 Climate change impacts

The design of coastal and waterfront structures is to take into account the predicted effects of climate change (including sea level rise) in accordance with the *State Planning Policy Guideline - State-interest guidance material - Coastal environment* and the relevant provisions of the planning scheme.

SC6.14.8.4SC6.14.7.4 Coastal and waterfront structures which are prescribed tidal work

- (1) All works which are prescribed tidal work are to comply with all provisions of the IDAS Code for assessable development that is applications for prescribed tidal works (contained in Schedule 4A-3 of the Coastal Protection and Management Regulation 2017) and the requirements of this planning scheme policy.
- (2) All prescribed tidal works (e.g. pontoons) are to be located within the approved quay line, including all required setbacks, ensuring equitable access for neighbouring properties and public open space.
- (2)(3) Any coastal structure to service private property should that is private infrastructure shall be located wherever practical on private property is to be private infrastructure, with associated liability and ongoing maintenance and operation being the responsibility of the property owner to which it serves.
- (3)(4) The owner of the property associated with any approved coastal or waterfront structure is required to maintain the structure in a sound state of repair in accordance with the approved plans and the conditions of the development approval and any other approvals as required.

(5) Decks are to have a minimum clearance of 50mm between the top of the revetment wall and any part of the deck. The finished surface of any deck is to be no higher than:-

(a) 500mm above the top of the revetment wall, or

(b) an alternative height where written consent has been obtained from the owners of the immediately adjoining properties stating that the alternative height will not adversely impact on the amenity of their lot.

SC6.14.8.5SC6.14.7.5 Waterfront structures which are not prescribed tidal work

Application

- (1) The standards and guidelines detailed below apply to the design and construction of jetties and piers, pontoons, decks and boat ramps within non-tidal waterways (i.e. waterfront structures which do not constitute prescribed tidal work).
- (2) These standards and guidelines in this section of the planning scheme policy incorporate a number of key design considerations to endeavour to ensure that waterfront structures:-
 - (a) remain structurally sound throughout their design life;
 - (b) do not interfere with the structural stability of the waterway;
 - (c) do not restrict the maintenance, hydraulic and flood carrying capacity of the waterway;
 - (d) do not interfere with public access or usage of the waterway; and
 - (e) allow for navigation where necessary along the waterway.

Responsibility of owners

- (3) The owner of the property associated with any approved waterfront structure is required to maintain the structure (including bed profile) in a sound state of repair in accordance with the approved plans and the conditions of the development approval and any other approvals as required.

General requirements applicable to all structures

- (4) The following general requirements apply to the design and construction of any waterfront structure:-
 - (a) any lighting installed, other than lighting which is specifically to aid navigation, should shall not cause significant adverse amenity effects to nearby residents or properties;
 - (b) the works should are to be designed and constructed:-
 - (b)(i) so as to avoid significant adverse impacts on the availability of public access to the foreshore of the waterway;
 - (b)(ii) the works should be designed and constructed so as to avoid adversely impacting on the safety of members of the public using the waterway or accessing the foreshore of the waterway;
 - (b)(iii) the works should be designed and constructed to ensure they are structurally sound, having regard to relevant Australian Standards and having regard to the impacts of flooding and hydrodynamic changes;
 - (b)(iv) to ensure that access will be available for future remedial, repair or maintenance works on revetment walls and foreshore areas; and
 - (b)(v) to ensure the safety of users. Surfaces are not to be slippery or present trip hazards, and barriers or railings shall be provided in appropriate locations.
 - (e)(c) the proposed waterfront structure is not to place any additional load on existing revetment walls (a wall erected against an earth bank or rock face to protect it against erosion, or a

structural retaining wall at the waterfront edge) and is not to adversely affect the stability of the bed and banks of the waterway. Works constructed within private property behind an existing revetment wall (such as swimming pools, retaining walls, decks, etc.) are to be designed and constructed so that there will be no adverse impact on the structural stability of the revetment wall;

- (f) ~~the design and construction of the works is to ensure that access will be available for future remedial, repair or maintenance works on revetment walls and foreshore areas;~~
- (g)(d) materials which will have a long life in an aquatic environment ~~should be~~ are to be used in ~~the all~~ structures;
- (h)(e) the works are to be located clear of any existing stormwater outlet; and
- (i) ~~the structure is to be designed and constructed so as to ensure the safety of users. Surfaces are not to be slippery or present trip hazards, and barriers or railings should be provided in appropriate locations; and~~
- (j)(f) setbacks are to be (the shortest distance) measured horizontally from the outermost projection of the structure concerned to the vertical projection of the boundary of the allotment. The setback from a revetment wall is from the landside of the revetment wall.

Jetties and piers

- (5) Jetties and piers and their associated mooring systems are to be designed and constructed to sustain all relevant loadings including hydraulic pressure, berthing impact, wind, flood flows (including debris), live loads, and other loadings relevant to the structure as assessed by a RPEQ engineer. However, the design loads are in no case to be less than those applicable to a jetty or pier which is prescribed tidal work (as detailed in ~~the IDAS Code for development applications for prescribed tidal work~~ Schedule 3 of the Coastal Protection and Management Regulation 2017).
- (6) Jetties and piers and their associated shore abutments are to be designed and constructed so as not to impact adversely on the structural stability of the waterway and to be structurally independent of the revetment wall. RPEQ engineer certification is required that the works will not impose additional loads on existing revetment walls.
- (7) The deck level of the jetty or pier is not to be less than 300mm above the predicted peak water level in the waterway, for a 1% AEP event.
- (8) Low level landings below the predicted peak water level may be incorporated into the structure design but fender piles (a vertical structural member that protects part of a structure from impact, damage or abrasion) or other markers are to indicate their presence when under water.
- (9) The width of the deck of a jetty or pier is to be not less than 900mm and not more than 3.0 metres. Handrails are to be provided along both sides of the jetty stem.
- (10) Jetties and piers are to be designed not to interfere with navigation or the public usage of the waterway, and adjacent public open space, taking into account any vessel moored to the jetty or pier.
- (11) Where piling for jetties or piers is required to be installed through any rock revetment or rock protection, the rocks are to be removed and a neat cut/penetration made to the geotextile fabric under the rocks prior to installation of driven or screw piling, and the geotextile fabric and rock protection reinstated around the piles. The geotextile fabric is to be fastened around the pile with a stainless steel strap.
- (12) Jetties and piers are not to have roofed structures.

Pontoons

- (13) Pontoons are to be designed and constructed to sustain all relevant loadings including earth and hydraulic pressure, berthing impact, wind, flood flows (including debris), live loads, and other loadings relevant to the structure as assessed by a RPEQ engineer. However, the design loads are in no case to be less than those applicable to a pontoon which is prescribed tidal work (as detailed in the *IDAS Code for development applications for prescribed tidal work*).
- (14) Abutments for access walkways are to be structurally independent of the revetment wall (so as not to impose any additional loading on the revetment wall).

- (15) Pontoons are to be designed such that they can accommodate the rise in water level associated with a 1% AEP flood event, and still safely moor the "design" vessel.
- (16) In waterways which will convey flood flows, the flotation unit of the pontoon is to be moored by piles.
- (17) Access walkways are to extend a minimum distance of 500mm onto the pontoon's flotation unit.
- (18) Access walkways are to be constructed with a permanent non-slip surface and handrails along both sides.
- (19) Where piling for pontoons is required to be installed through any rock revetment or rock protection, the rocks are to be removed and a neat cut/penetration made to the geotextile fabric under the rock revetment prior to installation of driven or screw piling, and the geotextile fabric and rock protection reinstated around the piles. The geotextile fabric is to be fastened around the pile with a stainless steel strap.
- (20) Pontoons are not to have roofed structures.

Decks

- (21) Decks are to be designed and constructed to sustain all relevant loadings as assessed by a RPEQ engineer. However, the design loads shall in no case be less than those applicable to a deck which is prescribed tidal work (as detailed in the *IDAS Code for development applications for prescribed tidal work*). Decks must are to be able to withstand periodic total inundation.
- (22) The design and construction of the deck is to be such that it does not unreasonably restrict access for maintenance to the bank, foreshore, revetment wall, retaining wall or other infrastructure associated with the waterway.
- (23) Decks are not to extend more than 3.0 metres into the waterway, measured from the waterfront boundary of the lot connected to the deck.
- (24) Decks are not to extend any closer than 3.0 metres to the side boundary, or extended side boundary of the lot connected to the deck.
- (25) Access hatches of minimum size 200mm x 200mm are to be installed in a deck 300mm forward of the face of the revetment wall and located approximately every 4.0 metres and/or 2.0 metres from either side of the deck. These access hatches will be used for sand replenishment of the foreshore.
- (26) The finished deck surface is to be no higher than 500mm above the top of the revetment wall and is to have a minimum clearance of 50mm between the top of the revetment wall and any part of the deck.
- (27) All footings, piers, piles and the like associated with the deck are to be located no closer than 1.5 metres from the landside of the revetment wall and not be connected to or supported by the revetment wall.
- (28) Where piling for decks is required to be installed through any rock revetment or rock protection, the rocks are to be removed and a neat cut/penetration made to the geotextile fabric under the rock revetment, prior to installation of driven or screw piling and the geotextile fabric and rock protection reinstated around the piles. The geotextile fabric is to be fastened around the pile with a stainless steel strap.
- (29) Decks are not to have roofed structures.

Boat Ramps

- (30) Boat ramps are to be designed and constructed to sustain all relevant loadings and scour as assessed by a RPEQ engineer.
- (30)(31) Boat ramps in fully tidal locations are to account for local surface levels and associated surface level movements (e.g. localised sand migration).
- (34)(32) The top of each wall at the edge of the boat ramp is to be level with the surface of the land on which the boat ramp is located.

~~(32)~~(33) Side and edge walls of the ramp are to penetrate at least 600mm below natural surface level to prevent damage from scour.

~~(33)~~(34) The surface of the ramp across the foreshore of the waterway is to be no more than 200mm above the design surface of the foreshore.

~~(34)~~(35) Boat ramps are to have a minimum width of 3.6m for vehicular access.

~~(35)~~(36) Boat ramps ~~should are to~~ be designed and constructed with a gradient generally not steeper than 1(V):8(H). Ramps with slopes as steep as 1:6 may be acceptable provided the surface is appropriate. Steeper slopes will require operation by a winch. Proposals to construct ramps steeper than 1:8 are to be supported by a detailed assessment study that demonstrates the sustainability of the proposal.

~~(36)~~(37) To facilitate safe movement of vehicles and persons, the surface of a boat ramp is to be treated to prevent it from becoming slippery either by forming grooves 40mm wide and 20mm deep at a spacing of 150mm and at an angle of 70 degrees to the centre line of the boat ramp, or by an alternative surface treatment which will provide a similar non-slip surface.

~~(37)~~(38) Boat ramps are to be located a minimum of 1.5 metres clear of the side boundary and extended side boundary of the property.

SC6.14.8.6SC6.14.7.6 Non-tidal waterways and associated works

Application General

- (1) Guidance on the standards applicable to the major engineering components of non-tidal waterways (e.g. lake developments and associated facilities) is provided below.

Revetment walls

- (2) Revetment walls ~~must are to~~ be wholly built within the subject lot including all elements of the revetment wall such as footings.
- (3) Revetment walls are to be designed and constructed to ensure they are able to support all intended loads, but in any case ~~should shall~~ be designed to support a distributed live load of at least 3 kPa in addition to applicable soil loads, with factor of safety of no less than 1.5.
- (4) The level and design of the bottom edge of the revetment wall ~~should shall~~ be such that it is likely to prevent any adverse effects from erosion for at least 50 years.
- (5) The design and construction of the revetment wall ~~should shall~~ provide for ~~the relief of hydrostatic pressure adequate filter material behind the wall and sufficient drainage holes to relieve hydrostatic pressure.~~
- (6) Certification of the revetment wall design/construction by a RPEQ ~~engineer~~ is to be provided.
- (7) Maintenance of revetment walls is the responsibility of the owner and a minimum of 1.0 metre wide setback area behind the wall ~~mustis to~~ be provided to allow maintenance to be performed. Within this area no structure is to be built that would restrict maintenance activities. This area ~~should is to be~~ preferably ~~be~~ grassed, gravelled or loose-paved to allow monitoring of problems as they develop. If other surfacing is installed then it is to be easily removable should any maintenance be necessary.
- (8) Any structure built within the setback area is not to impose further loading on the revetment wall, and RPEQ ~~engineer~~ structural certification will be required that specifically states that the revetment wall will continue to remain structurally sound with the additional loading for its design life.

Foreshores

- (9) The foreshore profile is to be constructed for long term stability with due consideration to flood flows, boat wash, wind induced waves and stormwater discharges.
- (10) Suitable access is to be provided to the waterway to enable maintenance activities to be undertaken. A typical access way would consist of a maintenance boat ramp constructed within a waterfront parkland area ~~and appropriate access to an adjacent road.~~

Weirs

- (11) Structural design of weirs (a structure which separates a tidal waterway from a non-tidal waterway, e.g. man-made lake) is to take account the impact loading from debris and watercraft, as well as applicable hydrostatic and hydrodynamic loads. Certification is to be provided by a suitably qualified RPEQ engineer. The required design life will be 100 years.
- (12) Downstream scour protection shall be designed using appropriate hydraulic modelling techniques. Rock used for scour protection must-is to have characteristics and qualities which are appropriate for the application.
- (13) Maintenance and operations manuals are to be supplied by the developer upon handover along with as-constructed drawings.

Geotextile Fabrics

- (14) Geotextiles shall be non-woven, needle punched fabrics consisting of polyester or polypropylene polymers, having a strength and other characteristics suitable to the particular application.
- (15) Geotextile fabric shall be lapped 500mm minimum and keyed into all edges and ensure no horizontal joins.

Navigation Locks

- (16) Navigation locks, devices that allow boats to pass between bodies of water having different water levels, are to have a minimum design life of 50 years.
- (17) Navigation locks are to be designed to an 80 year design life and constructed to sustain all relevant loadings, berthing impact, wind, tidal and flood flows (including debris) and other loadings relevant to the structure as assessed by a RPEQ engineer.
- (18) Penstock gates to be Waterman 1300 x 1300 SS211 or equivalent, manufactured in quality 1 mild steel hot dip galvanized.
- (19) Actuators to be Auma SA14.5 – B3/180 or equivalent, gearboxes to be Auma 6K 10.2 – 2/A Level or equivalent.
- (20) Cathodic protection shall be designed as a sacrificial zinc anode system.
- (21) Painted, galvanised coating to fabricated handrails and miscellaneous steelwork including light poles is to be in accordance with **Table SC6.14.8-7A (Coating to handrails and steelwork)** below.

Table SC6.14.8A7A Coating to handrails and steelwork

Description	Reference	Dry film thickness microns	Volume solids %	Min. coverage rates l/sgm	Acceptable watty! product
Galvanizing	AS1650	NA	NA	NA	NA
Clean, degrease wash & dry	NA	NA	NA	NA	NA
Two pack epoxy primer	Ref 6 Table C1 AS2312-1994	50	57	11.4	Sigma-EP Universal Primer
High build E Epoxy	Ref 13 Table C1 AS2312-1994	200	87	4.4	Epiname! HSE 70Z
Two pack acrylic gloss	Ref 33 Table C4 AS 2312-1994	50	45	9	PAPACRYLIEC
Description	Reference	Dry film thickness microns	Volume solids %	Min. coverage rates l/sgm	
Galvanizing	AS/NZS4680		NA	NA	NA
Clean, degrease wash and dry	NA		NA	NA	NA
Two pack epoxy primer	Ref 6 Table C1 AS2312		50	57	11.4

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Description	Reference	Dry-film thickness microns	Volume solids %	Min.-coverage rates l/ sqm	Acceptable watty/ product
High build epoxy	Ref 13 Table C1 AS2312		200	87	4.4
Two pack acrylic gloss	Ref 33 Table C1 AS2312		50	45	9

(22) Operation of the lock is to be by an access card system to be set up through telemetry or phone line (depending on location) to allow administration of cardholder utilisation, with appropriate software to manage the operation.

(22)(23) While a remote access option can be included it must be supported by a manual swipe card access system.

(23)(24) Maintenance and operations manuals are to be supplied by the developer upon handover along with as-constructed drawings.

(24)(25) Concrete grades for the following are not to be less than:-

- (a) footings & base slabs - Grade N40;
- (b) vertical walls - Grade N50 or S40 as specified; and
- (c) suspended slabs - Grade N40.

(25)(26) Required cover to reinforcing steel for the following is not to be less than:-

- (a) faces of vertical walls and other surfaces exposed to tidal or splash action - 65mm;
- (b) sides and upper surfaces of footings and base slabs - 50mm;
- (c) undersides of footings and base slabs - 60mm; and
- (d) elsewhere - 45mm.

(26)(27) Ladders and brackets shall be fabricated from aluminium alloy 6061 to Temper T6 with:-

- (a) all welds 6mm continuous fillet using filter alloy 5356;
- (b) welding be in accordance with AS1665 Welding of aluminium structures;
- (c) bolts, nuts and washers Grade 316 stainless steel ~~type 316~~;
- (d) washers used under all bolt heads and nuts; and
- (e) slip resistant coating to be applied to all ladder rungs.

(27)(28) Inlet and outlet port screen and bulkhead details are:-

- (a) screen and port frame ~~are to be~~ constructed from Grade 316 stainless steel;
- (b) all welds butt with faces ground flush or fillet, all welds continuous unless shown otherwise; and
- (c) bulkhead gate to be hot dip galvanized after fabrication.

Tidal exchange systems

(28)(29) Tidal exchange systems, a system for maintaining a degree of salinity for suppressing growth of aquatic vegetation and providing continuing water exchange and/or maintaining constant water levels, may be approved by Council where it is demonstrated that is the most efficient means of maintaining appropriate water quality conditions in the proposed waterway (e.g. maintaining a salinity level which will inhibit aquatic plant growth in the waterway, etc.).

(29)(30) Tidal exchange units are to have a minimum design life of 50 years. Whole of life cycle costing will be considered by Council prior to approving any design and will be taken into account in determining an appropriate sinking fund contribution by the developer.

~~(30)~~(31) Detailed hydraulic modelling to demonstrate turnover rates is to be provided.

~~(31)~~(32) Where the exchange system involves an intake structure and pipe, the following applies:-

(a) any jetty associated with the inlet facility is to be constructed on reinforced concrete or double treated hardwood piles. All fasteners (bolts, nuts, etc.) are to be Grade 316 stainless steel, and all steelwork, brackets, etc. are to be hot dip galvanized with a minimum coating of 600gm/sqm; and

(b) the intake structure is to be submerged and only accessible by divers, and the safety grill is to be designed for easy removal for maintenance and is to be fabricated from gGrade 316 stainless steel.

~~(32)~~(33) A backup pump is to be provided as part of any tidal exchange system. The standby pump is to be collocated on a site in a suitable weather proof structure with good access for a suitable crane.

~~(33)~~(34) Any submersible pumps are to have the following features:-

- (a) high alloy stainless steel impellers and shafts;
- (b) marine grade epoxy paint system;
- (c) sacrificial zinc anode cathodic protection system;
- (d) anti-foul paint protection system; and
- (e) high density polyethylene pipe (fusion butt welded) is to be used for rising mains.

~~(34)~~(35) Maintenance and operations manuals are to be supplied by the developer upon handover along with as-constructed drawings.

Navigational Aids

~~(35)~~(36) Where required, navigational lights, buoys, markers and signs are to accord-comply with Maritime Safety Queensland's requirements.

SC6.14.8.7SC6.14.7.7 Guidelines

For the purposes of achieving compliance with this section of the planning scheme policy, the following are relevant guidelines:-

- (a) AS1141 -Methods for sampling and testing aggregates;
- (b) AS1428 -Design for Aaccess and Mmobility;
- (c) AS1604 -Treatment of pilesSpecification for preservative treatment;
- (d) AS1664.1 -Aluminium Sstructures-Code;
- (e) AS1665 -Welding of aluminium structures;
- (f) AS1170.1 Minimum design loads on structures (known as the SAA Loading Code) - Dead and live loads and 1170.2 -Loading-CodesMinimum design loads on structures (known as the SAA Loading Code) - Wind loads;
- (g) AS1650 -GalvanisingAS/NZS4680 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles;
- (h) AS1720 -Timber Sstructures-Code;
- (i) AS2159 -Piling-Code - Design and installation;
- (j) AS2239 -Galvanic (Ssacrificial) Aanodes for Ccathodic protection;
- (k) AS2312 -Two-Pack-Epoxy-PaintsGuide to the protection of structural steel against atmospheric corrosion by the use of protective coatings;

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- (l) AS2832.3 ~~-Guide to the~~ Cathodic protection of metals ~~- f~~Fixed immersed structures;
- (m) AS3500.3.2 ~~-Part 3.2, National plumbing and drainage -~~ Stormwater ~~D~~rainage ~~- A~~acceptable ~~S~~solutions;
- (n) AS3600 ~~-Concrete S~~tructures ~~-Code~~;
- (o) AS3700 ~~-Masonry S~~tructures ~~-Code~~;
- (p) AS3706 ~~-Geotextiles -~~ Methods of test;
- (q) ANZECC ~~-Australian and New Zealand~~ Guidelines for ~~f~~resh and Marine Water Quality;
- (r) AS4110 ~~-Steel S~~tructures ~~-Code~~; and
- (s) AS4133 ~~-Methods of T~~esting rocks for engineering purposes.

Note—Relevant guideline documents in existence or available over the life time of this planning scheme policy ~~should are to~~ be referenced and used where appropriate. The above list is not exhaustive and the use of locally based guidelines by a recognised authority or agency would take preference to those developed regionally or nationally.

Schedule 6

SC6.14.9SC6.14.8 Constructed waterbodies

SC6.14.9.1SC6.14.8.1 Purpose

The purpose of this section of the **Planning scheme policy for development works** is to:-

- (a) detail what will be considered when determining whether a constructed water body (CWB) proposal successfully demonstrates an appropriate function and need;
- (b) outline what will be considered when determining whether the proposed CWB can be reasonably decommissioned; and
- (c) outline minimum design and reporting standards.

SC6.14.9.2SC6.14.8.2 Application

~~(1) This section of the planning scheme policy does not provide a comprehensive treatment of acceptable or critical limits for CWB design, construction or maintenance but serves to identify what considerations are applicable to proposals and assessments. Reference is made to external guidelines where appropriate.~~

~~(2) In this section it is expected that a RPEQ would be experienced in the design of CWBs. Waterfront structures (including revetment walls, jetties, pontoons, decks and boat ramps with a private use) may also require a specialist geotechnical engineer experienced in waterfront development.~~

~~(1) This section of the planning scheme policy applies to assessable development which requires assessment against the **Stormwater management code**.~~

~~(2) This section is structured as follows:-~~

- ~~(a) Sections SC6.14.98.1 to SC6.14.98.3 provide the framework for this section of the planning scheme policy;~~
- ~~(b) Sections SC6.14.98.4 to SC6.14.98.10 outlines/provides the requirements and procedures for achieving the outcomes of the **Stormwater management code** and to achieve the purpose of this section of the planning scheme policy relating to the demonstration of function and need in addition to specific design and reporting requirements; and~~
- ~~(c) Section SC6.14.98.11 contains guidelines for achieving compliance with this section of the planning scheme policy.~~

~~(3) This section of the planning scheme policy does not provide a comprehensive treatment of acceptable or critical limits for CWB design, construction or maintenance but serves to identify what considerations are applicable to proposals and assessments. Reference is made to external guidelines where appropriate.~~

~~(4) In this section it is expected that a RPEQ engineer would be experienced in the design of CWBs. Waterfront structures (including revetment walls, jetties, pontoons, decks and boat ramps with a private use) may also require a specialist geotechnical engineer experienced in waterfront development.~~

SC6.14.9.3SC6.14.8.3 Process

- (1) CWBs may be:-
 - (a) required under a code; or
 - (b) required as a condition of development approval; or
 - (c) proposed by the applicant and demonstrated as satisfying all relevant planning scheme requirements, including the test of overriding public need contained within this policy.
- (2) The process for the design and implementation of a CWB is described as follows:-
 - (a) submission and approval of an EMP;

- (b) CWBs ~~are to be~~ designed in accordance with the standards and guidelines in **SC6.14.98.11 (Guidelines)**;
- (c) construction of CWBs in accordance with approval conditions; and
- (d) submission of a CWB Asset Management Plan ~~which~~ includes as ~~constructed~~ and maintenance plans and approved CWB on ~~maintenance~~ period submitted as conditioned in the development approval.

SC6.14.9.4SC6.14.8.4 General advice

- (1) CWBs are artificial waterways, such as:-
 - (a) artificial channels, lakes or other bodies of water (this CWB definition specifically exclude sedimentation basins, stormwater treatment wetlands, natural channel design solutions, water supply infrastructure and agricultural waterbodies); and
 - (b) canals connected or intended to be connected to tidal water and from which boating access to the tidal water is not hindered by a lock, weir or similar structure.
- ~~(2) CWBs are not considered as water treatment devices and as such inflows shall meet WQOs.~~
- ~~(3) This section is to be read in conjunction with the guidelines contained in Section SC6.14.98.11 (Guidelines).~~
- ~~(3) This section applies to the preparation and assessment of CWB proposals.~~
- (4) Most CWBs require approval from State agencies, in accordance with standards that may be higher than those given in this section of the planning scheme policy. It is advisable to check with the relevant State agencies in addition to Council, to ascertain requirements for loadings, dimensions, construction materials, navigation effects, aquatic vegetation protection, operational requirements and environmental performance in any particular case.
- (5) An EMP is required for all CWB proposals.

SC6.14.9.5SC6.14.8.5 Origins and purpose of CWBs

- (1) CWBs are typically proposed and constructed under the following circumstances:-
 - (a) Type 1 – where on site fill extraction voids are rehabilitated as CWBs (pit lake and saltwater canal and canal-like CWBs), and are associated with urban development of constrained, reclaimed or other land that is contiguous with the CWB. The rehabilitation of these voids as CWBs normally includes consideration of landscape and recreation values. Type 1 also includes CWBs that are not primarily associated with fill or resource extraction and are not able to be reasonably decommissioned;
 - (b) Type 2 – where resource extraction voids are rehabilitated as CWBs (pit lake fresh or saltwater CWBs), and are associated with extractive industry where the extracted resource is utilised offsite. The rehabilitation of these voids as CWBs normally includes consideration of landscape and recreation values;
 - (c) Type 3 – where a CWB's origins are not associated with the rehabilitation of significant voids and the CWB is able to be reasonably decommissioned and its hydraulic efficiency, dimensions and size relative to its catchment ~~is~~ ~~are~~ such that mechanical recirculation or destratification is not required to manage water quality. These CWBs are predominantly associated with delivery of landscape and recreation values or other policy objectives associated with the development of water sensitive communities as identified in ~~the a~~ Regional TWCM Plan; ~~and~~
 - (d) Type 4 – where a CWB's origins are predominantly associated with stormwater harvesting, being storage infrastructure and which may also be intended to provide landscape and recreation values. Type 4 waterbodies may be considered as water supply infrastructure.

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SC6.14.9.6SC6.14.8.6 Key guiding principles

- (1) The primary objective of this section is to ensure that decisions on CWB proposals are based on consideration of comprehensive quantitative information regarding the need for the CWB and associated cost, benefit, risk (including climate change contingencies), responsibility, function, sustainability and alternative measures.
- (2) Type 1 and Type 2 CWBs are to be directly integral to development that demonstrates an overriding need in the public interest (ONPI). The ONPI as referred to in this section of the planning scheme policy is to be established on quantitative information and also address specific site locational requirements for the proposed development.
- (3) Where a Type 1 or Type 2 CWB is proposed in association with a fill or resource extraction activity and the associated development has not demonstrated an ONPI, the CWB proposal itself is to establish the ONPI for the development of the CWB and take into consideration the significance of the associated (or main) development.
- (4) The efficient protection of WQOs, environmental and public health and the efficient management of drainage reserves and open space are the core policy objectives associated with CWBs and underpin this section of the planning scheme policy.
- (5) The amount of funding and revenue able to be raised to manage an asset in perpetuity, or until the specific time at which it shall be decommissioned sets the critical design point for financial sustainability assessment. Assets ~~should are to~~ be designed and funded accordingly. Economic viability is the test that determines whether a CWB may be considered able to be reasonably decommissioned.
- (6) A CWB proposal is to address/demonstrate key design considerations, including:-
 - (a) efficient delivery of a needed function that is identified under the Council endorsed TWCM plan; ~~and~~
 - (b) its physical dimensions, hydraulic efficiency and size relative to the catchment (100 to 200 m²/ha with a maximum depth of ~~3-0 metres~~) such that no mechanical recirculation or destratification is required to manage water quality; ~~and~~
 - (c) that the CWB is able to be reasonably decommissioned; or
 - (d) an overriding need in the public interest for the development of each new CWB;
 - (e) the CWB is demonstrated as being suitable for its intended use; and
 - ~~(f) CWBs are not considered as water treatment devices and as such inflows must meet the WQO; and~~
 - ~~(g)~~~~(f)~~ the CWB is demonstrated as not contributing to a decline in water quality based on reasonable maintenance levels.

SC6.14.9.7SC6.14.8.7 Overriding need in the public interest (ONPI)

- (1) The ONPI for the development of a CWB is to be demonstrated by the proponent and determined by Council.
- (2) ~~An~~ ~~The proponent/~~applicant ~~must is to~~ quantify and establish to Council's satisfaction the social, economic and environmental benefits of the CWB to the Sunshine Coast, taking into consideration:-
 - (a) adverse impacts upon the natural values of the site and the associated downstream, upstream, groundwater and other environments;
 - (b) the full lifecycle risk, cost and benefit attributable ~~to the Sunshine Coast, the general public and other parties;~~
 - (c) alternatives to deliver the same or similar benefits including alternative sites and opportunity costs; and
 - (d) not undertaking the proposed development.

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- (3) Council may determine that an ONPI has been demonstrated when:-
- (a) the proposal and associated development is compliant with all other provisions of the planning scheme and the need for the CWB is demonstrated as being of regional or State significance; and
 - (b) full cost-benefit analysis quantifies the benefits, adverse impacts, risks and lifecycle costs of the proposal and alternatives where:-
 - (i) significant adverse impacts are able to be mitigated and costs reconciled by significant benefits;
 - (ii) the level of cost and risk (i.e., responsibility) carried by Council and other parties **is are** commensurate with the significance of their respective benefits;
 - (iii) the integrity of the claimed functions and the extent to which the CWB is able to sustainably deliver such functions **is-are** demonstrated as being achievable under reasonable levels of maintenance in line with Council's asset management framework and policy with respect to service levels, risk and function;
 - (iv) lifecycle costs are assessed over the life of the associated development and sources of reasonably attainable revenue commensurate with these costs are identified; and
 - (v) cost benefit analysis is in line with the *Commonwealth Handbook of Cost-bBenefit Analysis*, 2006.
- (4) Example of a project that might demonstrate an ONPI is:- **a proposed use where an ONPI satisfies Council's land use planning requirements, and the development of the CWB demonstrates consistency with Section SC6.14.8.6 (Key guiding principles).**
- ~~(a) a proposed use for which there is an ONPI that satisfies Council's land use planning requirements, and the development of the CWB demonstrates consistency with Section SC6.14.9.6 (Key guiding principles).~~
- (5) Examples of projects that might be considered exempt from demonstrating an ONPI are:-
- (a) non-assessable development and stormwater harvesting schemes (Type 4 CWBs) that are demonstrated as needed under a significant programme or master plan endorsed by Council; and
 - (b) other small CWBs (Type 3 CWBs) (ponds 100 to 200 m³/ha catchment with a maximum depth of 3.0 metres) that are:-
 - (i) able to be cost-effectively maintained for a functional purpose and practicably decommissioned; and
 - (ii) identified in Council's TWCM Plan and *Open Space and Recreation Strategy* and other planning provisions.

~~SC6.14.9.8~~SC6.14.8.8 Consideration of beneficial uses and values / functions in demonstrating ONPI

- (1) The efficient protection of WQO and environmental/public health and the efficient management of drainage reserves and open space are the core policy objectives associated with CWB operations, although not necessarily justification for the creation of CWBs.
- (2) Most CWBs do not primarily exist to advance these policy objectives. Instead, once constructed, ongoing management interventions are required for their preservation.
- (3) Aside from the advancement of the core policy objectives there are other values or functions commonly associated with constructed water bodies, **such as**:-
 - (a) economic functions (construction/operational phase);
 - (b) resource extraction (e.g. sand/gravel extractive industry, fill for flood immunity and stormwater conveyance);
 - (c) improved marketability of waterfront property;
 - (d) navigation;
 - (e) stormwater harvesting;

- (f) social functions (rehabilitated/water body phase):-
 - (i) landscape; and
 - (ii) recreation.
- (g) environmental functions (rehabilitated/water body phase):-
 - (i) limited habitat of low ecological value; and
 - (ii) limited, inefficient water treatment functions due to disproportionate maintenance requirements.
- (4) Evaluation of the CWB need and management service (end use) is essential as resources **must are to** be used to maintain the service, which has obvious implications for maximising resource efficiency and minimising life cycle costs and risks.
- (5) The integrity of a value is relative to predevelopment conditions and the CWB delivery performance (i.e. net benefit) in light of alternative means to deliver the particular value. A claim to a particular value may not necessarily prove the importance or integrity of that value over other values, but **must-is to** be seen in the context of the full range of existing and potential future values. Further investigation may be required under cost-benefit analysis to determine the need and significance of net benefits for each CWB and the extent to which managing a CWB for these specific end purposes represents good value.
- (6) For a function or value to be considered applicable or beneficial, its effectiveness, efficiency (both resource/energy use and cost), reliability, and resilience **must-shall** be demonstrated, preferably **have-having** a strong economic, social or environmental dimension and minimal adverse impacts.

SC6.14.9.9SC6.14.8.9 **Commentary on specific CWB related values**

Stormwater conveyance / flood mitigation

- (1) Stormwater conveyance and the achievement of flood immunity **is-are** essentially an economic function. This is predominantly attributable to the channel, banks and control structures above the standing water level, or dry ground where no CWB exists. In many cases the fill that constitutes the elevated platforms and channels may have been sourced on site, creating a void that is rehabilitated into a CWB. However, the underlying reason for the conveyance of stormwater in this way is to allow for greater development through the use of fill. This is the economic function of the stormwater conveyance. The void created to produce the fill material for stormwater conveyance may be of comparatively negligible economic value.
- (2) Flood mitigation is predominantly provided by the capacity of a channel or basin above normal water level. It follows that a CWB is not absolutely necessary for flood mitigation; filling of land and creation of capacity in a channel or basin to a design event delivers a flood mitigation function. The cost benefit associated with the importation of fill **should-is to** be quantified when considering alternatives to on site activities that result in the creation of CWB.

Fill/resource extraction

- (3) Some water bodies are created as a by-product of resource extraction activities, typically on alluvial floodplains, where resources such as sand and gravel are extracted for use off site. As with extraction of fill for on site use in channels and platforms, the primary economic value is delivered during the extraction phase, with on going costs during the rehabilitated phase not being linked to a commensurate ongoing economic benefit.
- (4) The ability to reasonably decommission a CWB declines with increased volumes of extracted material. The main driver for large constructed water bodies is often the provision of fill or other resources. In such cases, the economic function does not continue into the rehabilitated phase where ongoing management costs are associated with the protection of core social and environmental policy objectives or values and not the continued economic activity, i.e. extraction of a resource.

Stormwater treatment

- (5) CWBs typically perform an inefficient stormwater treatment function, demanding higher relative maintenance and renewal costs than systems designed specifically for stormwater treatment (e.g. best practice sedimentation ponds, bioretention basins, and constructed wetlands).

- (6) CWBs typically exhibit volumes and depths that are not informed by the efficient removal of the critical particle size or other contaminant as required under the WQO. Removal of particles smaller than that required under the WQO may result in net downstream erosion and create unreasonable CWB health and maintenance issues.
- (7) Desilting of a CWB is a major undertaking and carries environmental risk. Additionally, the need for mechanical destratification and recirculation to avoid an increased risk of undesirable events (e.g. odour, algal blooms, release of poor quality water) poses additional environmental risk and economic costs that further undermine ~~claims to~~ treatment efficiency claims.

Landscape and recreation

- (8) CWBs and associated infrastructure can provide a range of social values including recreational opportunities (e.g. canoeing, model boating, walking, viewing wildlife) and landscape or scenic values (e.g. waterfront living). Local communities tend to value these local water bodies highly and expect service levels that support these values.

Habitat and ecology

- (9) ~~While iconic and other exotic or native species may utilise CWBs, these habitats are artificial, highly disturbed systems and are considered of low ecological significance. All CWB's shall be designed and maintained to ensure general biosecurity obligations are achieved over the longer term.~~
- (10) ~~Any proposed~~ In many CWBs shall ensure a, healthy habitat and a good diversity of plants and animals ~~for is are not practicably achievable in the long term, mainly due to the typical hydrological and increasingly nutrient-rich conditions conducive to high primary production and eutrophication. Opportunistic or pollution-tolerant species often dominate CWBs, and aquatic fauna can become partly domesticated due to hand-feeding.~~
- (11) Costs and benefits associated with management of CWBs as habitats must are to consider the relative priority and opportunity costs associated with other, competing biodiversity projects that seek to maintain or improve priority habitats of high ecological value.

Stormwater harvesting

- (12) Open water storages (lakes and ponds) can be a component of stormwater harvesting initiatives that assist in meeting urban water requirements. However, such initiatives must shall, among other requirements, be considered within the context of regional integrated water planning, be identified in a Council endorsed integrated water cycle management plan and demonstrate a good value and sustainable service delivery.

Asset management considerations

- (13) Council recognises CWBs as assets that are subject to principles of asset management planning. CWB proposals must are to identify and address the associated asset management implications, including:-
- (a) the preparation of an asset management and maintenance plan to professionally acceptable standards;
 - (b) establishment of a service need linked to Council's responsibilities;
 - (c) establishing that the proposed asset delivers or significantly contributes to satisfying the service need; and
 - (d) identification of maintenance requirements tailored to service delivery.

Funding considerations

- (14) Full lifecycle costs of proposed CWB assets are to include all immediately associated stormwater infrastructure on which the CWB is dependent. Costs are to include management (general and risk – including climate change contingencies), maintenance, renewals and identification of decommissioning requirements. Analysis is to cover the effective life of the development that the asset is integral to or services (about 80 yrs-years for urban development). This can equate to 2 to 5 CWB renewals.

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(14)(15) The funding model is to apply to all CWB associated lake infrastructure e.g. tidal exchange systems, lock & weirs, boat ramps etc.

(15)(16) The amount of funding, including contributions and revenue, able to be raised to manage the CWB in perpetuity, or until it is decommissioned at a certain time, determines what assets are financially sustainable.

(16)(17) Funding and revenue raising mechanisms may include a benefited area levy, general fund, sinking fund, or more innovative forms of generating income such as stormwater harvesting with fit for purpose potable source substitution.

SC6.14.9.10SC6.14.8.10 CWB design – minimum requirements

General requirements

- (1) All CWBs require approval, where applicable, in accordance with the *Sustainable Planning Act 2009* 2016, *Coastal Protection and Management Act 1995*, *Water Act 2000*, and the *Fisheries Management Act 1994*, and are to be evaluated and designed in accordance with the requirements of this section of the planning scheme policy and relevant codes of this the planning scheme.
- (2) Design, construction and operation of CWBs should are to be based on protection of ecosystem health, water quality objectives and the intended beneficial uses associated with the design intent.
- (3) CWBs must are to be designed and managed to maximise resource efficiency and minimise life cycle costs and risks, and n Natural design concepts should shall be a primary consideration.
- (4) A monitoring program is required to demonstrate the impact and performance of the CWB with respect to the WQO and other requirements.

Minimum design requirements for fresh and brackish/saltwater CWBs

- (5) The design and orientation of the proposed CWB is are to promote mixing and avoid stratification via passive means such as wind and adequate inflow. The following basic considerations should shall be fundamental to the design:-
 - (a) CWBs are to be designed to ensure adequate flushing (every 20 to 30 days);
 - (b) CWB depth (both maximum and average) and batters are to be designed to deter the growth of environmental weeds and invasive plants that promote avoid stratification;
 - (c) the length to width ratio is to be at least of 3:1; and
 - (d) CWBs should are to be designed so as to not be reliant on pumping or other mechanical intervention to protect ecosystem health, water quality objectives and the intended beneficial uses associated with the design intent.
- (d)(e) All CWB assets are to be restricted to secondary contact only and signage is to be installed accordingly. Signage to include warnings in relation to hazardous marine creatures.
- (6) Appropriate software is to be used to model the dynamics of each specific CWB, including hydrology and hydraulics, nutrient and other contaminant cycles, thermal and salinity stratification and other project specific considerations.
- (7) Adequate access provisions are to be made to facilitate maintenance activities;
- (8) Landscape design is to integrate open space requirements of Council or the development's endorsed master plans.
- (9) CWB design is to minimise public health risks associated with mosquitoes, midges, nuisance populations of birds and general risks to public safety.
- (10) Creation of islands is to be avoided.

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- (11) Engineering design and construction components are to be certified by a RPEQ engineer and other design elements crucial to the sustainability of a CWB is to be certified by an appropriately qualified person.
- (12) CWBs are to be designed so as to not require topping up by external water sources.
- (13) There is to be no net loss of public access to foreshores as a result of the proposal.

Special consideration for brackish/-saltwater CWBs

- (14) CWBs are not to be connected to coastal waterways that are intermittently or permanently closed to the sea.
- (15) Tidal interchange systems are required to achieve a tidal range greater than 0.300m.
- (16) The design is to demonstrate that there is no risk of saltwater intrusion into freshwater environments.
- (17) CWBs are not to contribute to increased tidal prisms that result in erosion due to increased tidal flow, such that river bank protection works are required.

CWB design and management reporting requirements

- (18) Where a CWB containing a permanent or semi-permanent body of water is proposed, detailed design documentation is required to support the application, which ~~should~~shall include a CWB design report as part of an integrated water management plan for each separate proposal for a CWB. The report ~~should~~is to incorporate the following information:-
 - (a) a summary of the rationale for and the objectives of the design, including whether the CWB is associated with fill, reclamation or resource extraction activity, stating volumes;
 - (b) a summary of any site-specific constraints relevant to the site, or the design, which may affect ongoing maintenance as detailed in the EMP;
 - (c) a summary of the design data and assumptions used for the hydrological study;
 - (d) a summary of the design flows, tidal exchange and predicted operating water levels and variations;
 - (e) a summary of hydraulic calculations for the design of all inlet and outlet structures;
 - (f) a summary of predicted water balance for each key stage of the development contributing to the CWB;
 - (g) details of water augmentation requirements and source (if required) during extended periods of drought;
 - (h) a summary of the design pollutant loadings and modelling assumptions used to derive the design pollutant loadings;
 - (i) a summary of the design performance criteria;
 - (j) a summary of the predicted water quality outcomes;
 - (k) a brief description and summary of the monitoring program, including sampling site locations, frequency, etc.;
 - (l) a summary of the planting details including areas, planting rates, establishment water levels and normal operating water level requirements;
 - (m) a summary of weed control strategies for common environmental weeds and invasive flora and faunaplants. Identify weed species by common name and scientific name and if possible include photographic evidence of the infestation;
 - (n) a summary of operating requirements for the variable water level controls available to the operator;
 - (o) details of any proposed sludge and sediment disposal sites;

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- (p) details of any special requirements for the handling and disposal of materials to be removed from the CWB during routine maintenance and corrective intervention; and
- (q) a summary of how work, health and safety aspects have been managed with respect to the construction and maintenance of the proposed CWB. These ~~should~~ shall include:-
 - (i) physical issues such as selection of batter slopes, depth and duration of ponding, and access to structures;
 - (ii) public health issues such as possible exposure to chemical and biological contaminants and vectors; and
 - (iii) work, health and safety issues related to the ongoing management and maintenance of the system.

CWB asset management plan report requirements

- (19) A CWB asset management plan is required for all CWBs. The applicant will need to provide a CWB asset management plan report prior to acceptance of the water body on ~~maintenance~~. The CWB asset management plan report ~~should~~ shall be self-contained and succinct. The document is to be presented in a form which allows ready and unambiguous interpretation and understanding by a wide range of users.
- (20) The operation and maintenance of the water level control structures and how they affect the weed management strategy needs to be taken into account.
- (21) The report is to contain the following:-
 - (a) a complete copy of the CWB design report revised to include changes made to the wetland during construction and operation;
 - (b) ~~as-~~constructed plans showing relevant details and levels for all components of the CWB;
 - (c) a summary of water quality test results obtained prior to hand over to Council;
 - (d) a brief comparison and discussion of the possible reasons for any difference between predicted and actual results of the water quality monitoring along with management recommendations to mitigate unacceptable results;
 - (e) briefing notes suitable for maintenance personnel sufficient to satisfy any known work, health and safety issues related to the ongoing management of the site;
 - (f) a summary checklist, including a timetable, for the routine inspection and maintenance of both the hard-scape and soft-scape elements of the water body; and
 - (g) a summary of staff, plant, minor and special equipment and costing information associated with the previous operation and maintenance of the CWB to allow budget preparation for future management and maintenance to be tailored to levels of service delivery.

SC6.14.9.11SC6.14.8.11 Guidelines

- (1) For the purposes of achieving compliance with this section of the planning scheme policy, the following are relevant guidelines:-
 - (a) Department of Environment and Resource Management Coastal Development Guidelines:-
 - (i) *Development involving an artificial waterway;*
 - (ii) *Activities in a watercourse, lake or spring carried out by an entity;*
 - (iii) *Reclaiming land under tidal water; and*
 - (iv) *Constructing tidal works.*
 - (b) Building Code of Australia National Construction Code:-
 - (i) BCA-NCC Vol 2 Part 3.1.2.0 – Drainage (AS 3500.3.2 National plumbing and drainage – Stormwater drainage – Acceptable solutions);
 - (ii) BCANCC Vol 2 Part 3.1.2.2 (d) – Excavation and Piling near Sewers and Drains for drains adjacent to existing footings; and
 - (iii) BCANCC Vol 2 Part 3.1.1 – Earthworks.

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- (c) State legislation:-
- (i) Coastal Protection and Management Act 1995;
 - (ii) Coastal Protection and Management Regulation 2003;
 - (iii) Environmental Protection Act 1994;
 - (iv) Environmental Protection Regulation 2008;
 - (v) Environmental Protection (Water) Policy 2009;
 - (vi) Fisheries Act 1994;
 - (vii) Local Government Act 2009;
 - (viii) Soil Conservation Act 1986;
 - (ix) State Planning Policy ~~Guideline~~, - ~~S~~state interest ~~guidance material~~ - ~~W~~water quality ~~July 2017~~;
 - (x) ~~Sustainable~~-Planning Act ~~2009~~~~2016~~;
 - (xi) Vegetation Management Act 1999;
 - (xii) Water Act 2000;
 - (xiii) State Policy Coastal Management;
 - (xiv) State Planning Policy ~~Guideline~~, - ~~S~~state interest ~~guidance material~~ - ~~c~~Coastal environment ~~December 2013~~~~July 2017~~; and
 - (xv) ~~Draft~~ State Planning Policy ~~Guideline~~, - ~~S~~state interest ~~guidance material~~ - ~~b~~Biodiversity ~~July 2017~~; and
- (d) Coastal and Engineering Manual (National Committee on Coastal and Ocean Engineering, Eng Aust. 2004);
- (e) ANZECC Australian Water Quality Guideline for Fresh and Marine Waters 2000;
- (f) AS3962 - Guidelines for design of marinas;
- (g) Design flow and RPS, 2010. Townsville Constructed Lakes Design Guideline; prepared for Townsville City Council;
- (h) Engineering Design Guidelines: Constructed Lakes (Mackay City Council, 2008);
- (i) Melbourne Water Constructed Shallow Lake Systems, Design Guidelines for Developers, Version 2, November 2005;
- (j) Dam Safety Management Guidelines (Queensland Department of Natural Resources and Mines, 2002);
- (k) SEQ Healthy Waterways WSUD Technical Design Guidelines for South East Queensland (2006);
- (l) Soil Management Guidelines in Queensland Acid Sulfate Soil Technical Manual 2002;
- (m) Draft Policy No. DC 1.8 - Canal estates and other artificial waterway developments (Western Australia Planning Commission, 1999);
- (n) Guidelines for Managing Risk in Recreational Waters (NHMRC); and
- (o) Handbook of Cost Benefit Analysis (Commonwealth Government, 2006).
- (2) The following publications may provide additional guidance regarding ~~open space and landscaping infrastructure requirements~~~~CWB design and management~~:-
- (a) Manual for Erosion and Sediment Control version 1.2 (Sunshine Coast Regional Council, 2009).

Note—relevant guideline documents in existence or available over the life time of this planning scheme policy ~~should~~ ~~are to~~ be referenced and used where appropriate. The above list is not exhaustive and the use of locally based guidelines by a recognised authority or agency would take preference to those developed regionally or nationally.

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SC6.14.10SC6.14.9 Earthworks

SC6.14.10.1SC6.14.9.1 Purpose

The purpose of this section of the **Planning scheme policy for development works** is to:-

- (a) provide ~~advice and~~ guidance on ~~policy and~~ standards applicable to earthworks operations associated with development approvals; and
- (b) ~~the guidance and standards outlined herein aim to~~ ensure that earthworks are undertaken in accordance with sound engineering practice and do not adversely or unreasonably impact on the environment nor the community, having regard to:-
 - (i) land stability;
 - (ii) contamination of land, roads or waterways;
 - (iii) flooding or drainage;
 - (iv) environmental values including water quality (surface and ground), water flows and ~~and~~ significant vegetation;
 - (v) utility services;
 - (vi) visual amenity or privacy;
 - (vii) traffic impact; and
 - (viii) air, noise and pollution emissions.

SC6.14.10.2SC6.14.9.2 Application

- (1) ~~This section of the planning scheme policy applies to assessable development which requires assessment against the Landslide hazard and steep land overlay code and applicable development codes.~~
- (2) This section is structured as follows:-
 - (a) **Section SC6.14.109.1** and **Section SC6.14.109.2** provide the framework;
 - (b) **Sections SC6.14.109.3 to SC6.14.109.13** ~~outlines the standards~~ ~~provides the requirements and procedures~~ relating to the various phases of earthworks operations ~~and to achieve the purpose of this section of the planning scheme policy;~~ and
 - (c) **Section SC6.14.109.14** contains guidelines for achieving compliance with this section of the planning scheme policy.

SC6.14.10.3SC6.14.9.3 Clearing

- (1) Clearing of vegetation occurs only on those areas permitted ~~either~~ by the development approval ~~or approval of Council and/or State legislation.~~
- (2) Vegetation protection zones are to be marked and protected in accordance with AS4970 *Protection of trees on development sites* prior to clearing operations commencing.
- (3) Spotters ~~and~~ catchers ~~should are to~~ inspect the area prior to clearing to sight, capture, and relocate wildlife, using appropriately qualified personnel (as licensed by the relevant State department). Spotter ~~and~~ catcher activities ~~should shall~~ be in accordance with the *Queensland Code of Practice for the Welfare of Wild Animals Affected by Land Clearing* (2009).
- (4) Clearing prior to filling includes grubbing to 300mm below the existing surface level to ensure removal of stumps and roots and include removal of all foreign material and vegetation.
- (5) All clearing of vegetation is confined to the limits of the approved clearing area and comply with the following guidelines:-

- (a) clearing within roadways is confined to the limits of approved extent of works area plus a sufficient lateral clearance to ensure that ~~the works are not interfered with by~~ trees or other vegetation ~~are not interfered with by the works~~. All vegetation to be retained ~~shouldis to~~ be protected in accordance with ~~AS4970-2009- The protection of trees on development sites~~;
- (b) allotment clearing is confined to the minimum areas required to safely construct services such as sewers and catchment drains, and the limits of approved extent of works area to allotments plus a sufficient lateral clearance to ensure ~~the works are not interfered with by~~ trees or vegetation ~~are not interfered with by the works~~. Vegetation ~~should-shall~~ only be removed where approved. All vegetation to be retained ~~should-is to~~ be protected in accordance with ~~AS4970-2009- The protection of trees on development sites~~;
- (c) no trees ~~except as directed~~ are to be damaged or removed from areas to be dedicated under the control of Council without prior written approval of Council;
- (d) dead, dying or dangerous trees or trees likely to be dangerous are to be removed as directed by Council;
- (e) trees in existing road reserves are not to be damaged or removed without the approval of Council. All trees on existing roads affected by the works are to be shown and details given of proposed protection, relocation methods or removal in accordance with ~~AS4970-2009-The protection of trees on development sites~~;
- (f) the removal of any trees and vegetation from crown land, trust land, reserves, road reserves and freehold land ~~may-is to~~ require approval under ~~other-relevant~~ state legislation;
- (g) where vegetation is cleared, vegetation waste is to be disposed of in the following order of preference:-
 - (i) milling;
 - (ii) chipping and mulching on site;
 - (iii) removed from site to an approved landfill site that accepts green wastes in suitable covered vehicles; or
 - (iv) another method approved of by Council;

Note—disposal of vegetative waste by burning is not an acceptable method of disposal.

- (h) identified hollow-bearing trees that provide a habitat for fauna that require a hollow for shelter or nesting ~~should-are to~~ be protected from development activities wherever possible;
- (i) all tree pruning works shall be in accordance with ~~AS4373-2007- Pruning of amenity trees~~;
- (j) no disturbance to the beds or banks of any waterway or to the riparian vegetation thereof is to be undertaken; and
- (k) where filling is proposed, topsoil (surface soil high in organic matter ~~and contamination by residual grass seeds and grass roots~~) may be removed and stockpiled for future spreading over the filled area. Removal of the topsoil from the site for use or sale elsewhere shall require separate approval.

SC6.14.10.4SC6.14.9.4 Earthworks generally

Earthworks ~~should-are~~ not to:-

- (a) cause land instability, land contamination, or adverse effects on the environment or human health;
- (b) exacerbate flooding or compromise existing drainage regimes;
- (c) cause adverse impacts on utility services;
- (d) reduce the visual amenity or privacy of surrounding residents; and
- (e) adversely impact on any area of nature conservation significance.

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SC6.14.10.5SC6.14.9.5 Excavation

- (1) Excavation within or adjacent to areas of potential slope instability is to be undertaken under the guidance of a suitably qualified geotechnical engineer.
- (2) The **Planning scheme policy for the acid sulfate soils overlay code** provides guidance on issues to be addressed where excavation works are proposed in areas containing acid sulfate soils.
- (3) The disposal of surplus or unsuitable materials ~~should~~shall require:-
 - (a) details of the ~~surplus or unsuitable~~ materials, as defined in AS3798 *Guidelines on earthworks for commercial and residential developments*, to be included in the relevant development application submitted to Council; and
 - (b) where disposal is proposed on road reserves or parkland, or where the volume of material exceeds 2500 m³ (loose), and transported over Council roads, determination of Council's requirements prior to lodgement of the relevant development application.

SC6.14.10.6SC6.14.9.6 Filling

- (1) Filling is not permitted on land subject to flooding unless approved by a development permit.
- (2) Filling within or adjacent to areas of potential slope instability shall be undertaken under the guidance of a suitably qualified geotechnical engineer.
- (3) The use of geotextiles and other proprietary products proposed to be installed as a separation layer is to be considered individually on their merit and may not be acceptable in all circumstances.
- (4) All materials proposed for use in filling and embankments, whether allotment, parkland or road, are to be suitable for the purpose. The fill material ~~should~~is to be solid clean earth free of putrescibles or refuse material, vegetation, acid ~~sulphate~~sulfate soils, building material, waste or other material or contaminants. Approval of the fill material is required from Council prior to any filling work commencing.
- (5) No person is permitted to fill any land where in the opinion of Council, such filling will detrimentally affect the area available in any natural or artificial watercourse for either present or estimated future flood flows or storage, or will detrimentally reduce the volume within a flood plain available for the storage of flood waters.
- (6) Filling of allotments is not permitted until a full assessment has been carried out by the applicant's engineering consultants to determine the effect of the work and the mitigation measures required having regard to the following:-
 - (a) local drainage patterns;
 - (b) existing drainage systems;
 - (c) effect on adjacent properties;
 - (d) retaining wall requirements;
 - (e) existing soil/land stability;
 - (f) effect on existing vegetation; and
 - (g) changes to existing groundwater levels and patterns.

SC6.14.10.7SC6.14.9.7 Haulage activity and amenity

- (1) Haulage of material to and from a site ~~must~~is to ensure minimal disturbance to neighbouring properties and properties along the haulage route and not adversely affect the integrity of the road pavement or the amenity of the roads by dust or debris contamination.
- (2) Where the volume of material to be imported to a site exceeds 1000 m³ (loose), the proposed source, volume, transport route, and truck frequency details ~~is~~are to be submitted to Council for approval prior to any works commencing.

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- (3) Council may impose a monetary bond of a sufficient amount to ensure that the intent of this clause is upheld, and may call upon the bond to rectify any damage, or carry out works to rectify any adverse impacts caused as a result of the haulage activities.

SC6.14.10.8SC6.14.9.8 Cut and fill batters

- (1) Cut and fill batter slopes for heights below 1.0 metre are to be generally 1 on 6 to enable ease of maintenance by conventional machinery.
- (2) Cut and fill batter slopes for heights above 1.0 metre are to be considered for their impact on the width of the road reserve/allotments.
- (3) In roadway situations where cut height exceeds 1.0 metre, cut batters may be provided up to 1 on 1 and fill batters 1 on 2, subject to maintenance considerations and stability assessment.
- (4) In roadway situations ~~and~~ where the visual amenity of the area will not be affected, cut batters in solid rock may be increased to 4 on 1 subject to geotechnical advice.
- (5) In roadway situations batters are to be provided with scour protection measures, topsoiled and revegetated except for cut batters in non-erodible rock.
- (6) All cut batters are to be benched to allow for the placement of topsoil and for revegetation.
- (7) Cut batters steeper than 1 on 1, fill batters steeper than 1 on 2 or batters higher than 4.0 metres will only be accepted with a geotechnical report prepared by a consulting geotechnical engineer.
- (8) The top of cut batters is to be at least 3.0 metres from the property boundary.
- (9) The bottom of fill batters are:-
- (a) ~~in~~ on roadways, ~~be~~ at least 3.0 metres from the property boundary to allow effective maintenance operations and provide adequate width for service authorities; and
- (b) on development sites, ~~be~~ located to enable maintenance of the fill batter to avoid amenity issues for adjacent property.
- (10) All batters are to be effectively stabilised immediately following earthworks ~~operations~~.

SC6.14.10.9SC6.14.9.9 Allotment earthworks

- (1) All allotment earthworks will be subject to Level 1 Inspection and Testing in accordance with AS3798 Guidelines on earthworks for commercial and residential developments.
- (2) Minimum allotment levels may be specified in a development approval and will be determined having regard to:-
- (a) relevant master drainage plans;
- (b) storm tide impacts;
- (c) river and stream flooding;
- (d) local area flooding; and
- (e) planning scheme requirements.
- (3) The slope of allotments is consistent with the following:-
- (a) allotments ~~should~~ shall preferably drain to the road;
- (b) where allotments or an area of an allotment drain to the rear or to an adjoining allotment, ~~then~~ a rear allotment drainage system is to be provided; and
- (c) minimum falls in allotments are to be:-
- (i) residential – 1:100; and
- (ii) commercial, industrial – 1:300.

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SC6.14.10.10 SC6.14.9.10 Access

- (1) ~~In new subdivisional developments, construction of accesses and driveways to building sites may be required on lots with steep slopes, on lot frontages with visibility constraints, on lots with less than 8 metres frontages and on access strips or access easements serving allotments.~~
- (1)(2) ~~Steepness of Driveway grades should-is to be limited for safety and amenity (refer AS-2890 Parking facilities).~~
- (2) ~~In new sub-divisional developments, construction of accesses and driveways may be required on lots with steep slopes to building sites, on lot frontages with visibility constraints, on lots with less than 8.0m frontages and on access strips or access easements serving allotments.~~
- (3) If required in the development approval, accesses are to be provided to all rural residential lots. The access is to be provided to the boundary and be located to provide the required sight distance. Accesses with gradients greater than 1:10 are to be paved and sealed or concreted.
- (4) Driveways are to be constructed in accordance with the IPWEAQ Standard Drawings ~~SEQ-RS-050 and/or SEQ-RS-056.~~

SC6.14.10.11 SC6.14.9.11 Topsoiling and stabilising

- (1) Immediately following completion of each section of earthworks, topsoil is to be spread on all cut, filled, exposed and disturbed areas to a minimum depth of 100mm. The areas to be topsoiled include all allotments, road reserves and development sites.
- (2) ~~Following completion of topsoil works for each section, all cut, filled, exposed and disturbed areas outlined in (1) above are to be immediately established by grass seeding, turfing, mulching, etc. Section SC6.14.4 (Site development management) of this planning scheme policy details standards for stabilisation works.~~
- (2)(3) Topsoil excavated from and stored on the site during the earthworks process is permitted to be used for topsoil on the site subject to the approval of Council.
- (3)(4) Imported topsoil is to be clean and certified ~~weed-free of environmental weeds and invasive plants~~ and meet Australian Standards.
- (4) ~~All cut, filled, exposed and disturbed areas outlined in (1) above are to be immediately established following completion of any topsoil works for each section. (e.g. by grass seeding, turfing, mulching, etc.) SC6.14.6 (Site development management) of this planning scheme policy details standards for stabilisation works.~~

SC6.14.10.12 SC6.14.9.12 Retaining walls

- (1) Retaining walls are to be ~~either~~:
 - (a) designed and certified fit for purpose by a RPEQ ~~engineer~~; or
 - (b) acceptable generic designs published by a recognised propriety manufacturer.
- (2) Retaining walls are to be fully located within the development site ~~allotments~~ and not on road reserve or park unless otherwise specifically approved by Council.
- (3) Walls which are retaining road or parkland are to be located within the road or parkland reserve.
- (4) Where walls are approved for construction on road reserves, the adjacent development site is to provide additional width of road reserve to ~~provide-ensure~~ a verge width suitable for pedestrians, infrastructure, maintenance requirements, services and/or clearances.
- (5) Safety ~~batters or child-proof fencing (depending on the height of the retaining wall)~~ barriers to ~~AS/NZS1170.1 Structural design actions – Permanent, imposed and other actions~~ are to be provided for retaining walls located on public land.
- (6) The maximum height of a retaining wall between adjacent allotments is to be ~~1.0 metre~~ unless otherwise approved by Council.
- (7) Retaining walls are ~~to be~~ designed to enhance and maintain local identity. Natural rock gravity walls or masonry faced walls are preferred.

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- (8) All retaining walls ~~should~~ shall have a demonstrated service life in excess of 50 years, ~~and~~ a durability classification ~~should~~ is to be provided for rock proposed for any retaining walls.

SC6.14.10.13 SC6.14.9.13 Footpath/verge crossfalls

All footpath/verges shall fall from the frontage property boundary to the adjacent kerb and channel with crossfalls in accordance with the details on Council's ~~s~~Standard ~~Engineering d~~Drawings.

SC6.14.10.14 SC6.14.9.14 Guidelines

- (1) For the purposes of achieving compliance with this section of the planning scheme policy, the following are relevant guidelines:-
- (a) ~~AS3798 – Guidelines on Earthworks for Commercial and Residential Developments;~~
 - (b) ~~Department of Transport and Main Roads Standard Specification MRS11.04 – General Earthworks Specifications MRTS04 General Earthworks;~~
 - (c) ~~AUSPEC Development Construction Specification C213 – Earthworks;~~
 - (d) ~~AS2890 – Parking facilities; and~~
 - (e) ~~AS4970 – Protection of trees on development sites; and~~
 - (f) ~~AS/NZS 1170.1 Structural design actions – Permanent, imposed and other actions.~~
- (2) Refer also to **Section SC6.14.64 (Site development management)** of this planning scheme policy in relation to erosion and sediment control provisions.

Note—relevant guideline documents in existence or available over the life time of this planning scheme policy ~~should~~ ~~are to~~ be referenced and used where appropriate. The above list is not exhaustive and the use of locally based guidelines by a recognised authority or agency would take preference to those developed regionally or nationally.

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SC6.14.11.1 SC6.14.10 Specifications and construction

SC6.14.11.1 SC6.14.10.1 Purpose

The purpose of this section of the Planning policy for development works is to:-

- (a) outline Council's specification, provide advice and guidance on the policy and standards required in relation to the construction of works and plan of subdivision approval to satisfy sealing guidelines for work which requires Council requirements approval with regard to its construction;
- (b) ensure compliance with conditions of the relevant development approval; and
- (c) accept on and off maintenance of works.

SC6.14.11.2 SC6.14.10.2 Application

~~(1) A typical development construction process is shown in Appendix SC6.14E.~~

~~(2)~~(1) This section is structured as follows:-

- (a) ~~Sections SC6.14.1110.1 to SC6.14.1110.3 provides~~ the framework;
- ~~(b) Section SC6.14.10.4 details Council's requirements for a prestart meeting prior to works commencing;~~
- ~~(b)(c) Section SC6.14.1110.45 outlines the inspection and testing standards which apply during construction and up to the completion of works;~~
- ~~(d) Section SC6.14.10.6 details Council's requirements for a civil works inspection and testing plan;~~
- ~~(c)(e) Section SC6.14.1110.7 outlines Council's bonding requirements;~~
- ~~(d)(f) Section SC6.14.1110.8 outlines Council's plan sealing-approval requirements;~~
- ~~(e)(g) Section SC6.14.1110.9 outlines the requirements to be met for as-constructed documentation;~~
- ~~(f)(h) Section SC6.14.1110.10 details Council's requirements for acceptance of works on and off maintenance; and~~
- ~~(g)(i) Section SC6.14.1110.11 contains guidelines for achieving compliance with this section of this planning scheme policy.~~

~~(2) A typical development construction process is shown in Appendix SC6.14E.~~

SC6.14.11.3 SC6.14.10.3 General

- (1) The aim of adopting standard specifications is to:-
 - (a) detail all acceptable materials for the construction of works;
 - (b) detail the quality compliance requirements for all acceptable materials to assure the standard and quality of the infrastructure being transferred to Council;
 - (c) detail the requirements for construction activities; and
 - (d) ensure that the standards for construction of works comply with Australian Standards, Sstatutory Aauthority Sstandards and sound engineering practice.
- (2) The standard specifications are written to form part of contract documents for construction. The specifications are also intended for works carried out by Council's own workforce.
- (3) The Council's role is detailed in this section and the Civil Works Inspection and Testing Plan (CWITP).

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SC6.14.11.4 Inspection and testing standards

General

- (4) ~~The supervising RPEQ engineer is to follow the CWITP, unless variations are approved and submit certification that the plan has been followed in accordance with the as constructed submission documentation~~
- (4)(5) Developers and their supervising RPEQ engineer or agents remain at all times responsible to ensure that all works are executed in accordance with principles of sound engineering design and construction and are in accordance with this planning scheme policy and relevant standards.
- (2)(6) It is the responsibility of the developer or supervising RPEQ engineer to arrange for all testing, inspections and certifications.
- (3)(7) Council will not deal directly with the contractor and all correspondence will be directed to the supervising RPEQ engineer.

Testing

- (4) ~~All testing to be undertaken in accordance with the requirements of the CWITP.~~

Certification

- (5) ~~To enable formal acceptance of the works "on maintenance" (a minimum 12 month period during which the developer will be responsible for maintenance of all contributed assets and the rectification of any defective works or defective materials incorporated into the works), the following certificates, certified drawings or other items are generally required to be supplied by the RPEQ engaged to supervise the works:-~~
- (a) ~~"on maintenance" inspection checklist;~~
 - (b) ~~engineering certification;~~
 - (c) ~~engineering certification checklist;~~
 - (d) ~~all test results required by the CWITP;~~
 - (e) ~~geotechnical and structural certificates (where applicable);~~
 - (f) ~~overland flowpath certification and supporting documentation/calculations;~~
 - (g) ~~as constructed plans including hard copy and electronic ADAC (refer section 11.8 as constructed for detailed requirements);~~
 - (h) ~~submission of a list and details of non-complying elements;~~
 - (i) ~~copies of all relevant test results;~~
 - (j) ~~maintenance security deposit – 5% of contract value;~~
 - (k) ~~payment of any outstanding private works accounts;~~
 - (l) ~~written clearances to be obtained for works carried out on land under other ownership, upon completion of the works;~~
 - (m) ~~any other documentation as may be required by Council; and~~
 - (n) ~~payment of any outstanding fees and permits.~~
- (6) ~~To enable formal acceptance of the works off maintenance (following expiration of the "on maintenance" period and when Council accepts and is responsible for the contributed assets) the provision of items as agreed to by Council at the time of formal acceptance of the works "on maintenance".~~

SC6.14.10.4 Prestart meeting

- (1) ~~A minimum 5 working days' notice is to be provided for a prestart meeting with Council;~~

- (2) A prestart meeting shall only be granted if the OPW approval has been issued and all relevant amendments have been approved and the appeal period has lapsed or has been waived by the applicant.
- (3) A joint prestart meeting is to be conducted between Council and key development project staff including the supervising RPEQ engineer and the principle contractor for the works.
- (4) Prior to holding a prestart meeting with Council, a prestart meeting is to be held between key development project staff and representatives of Unitywater. A joint prestart meeting may be held with Council and Unitywater by prior arrangement.
- (5) The following documentation is to be provided prior to the prestart meeting:-
 - (a) certificate of insurances;
 - (b) after hours contact list;
 - (c) traffic management plan/site management plan;
 - (d) program of works;
 - (e) copy of the bill of quantities;
 - (f) copy of ABNs for principle, supervising RPEQ engineer and principle contractor;
 - (g) vegetation clearing report, including spotter and catcher details; and
 - (h) SCC Design Certification – Erosion and Sediment Control.

SC6.14.10.5 Inspection and testing standards

InspectionsGeneral

- (7)(1) Council will carry out the following mandatory holdpoint inspections which are required to be attended by the supervising RPEQ engineer and principle principal contractor:-
 - (a) pre-start meeting;
 - (b)(a) stormwater drainage inspections;
 - (c)(b) subgrade inspections;
 - (d)(c) pavement inspections(prior to kerb and channel);
 - (e)(d) pre-seal inspections; and
 - (f)(e) WSUD sub-soil drainage; inspections.
 - (g) “on maintenance”; and
 - (h) off maintenance.
- (2) The on maintenance and off maintenance inspections are to be undertaken in accordance with the provisions outlined in **Section SC6.14.10.10 (On and off maintenance)**.
- (8)(3) The inspections will be undertaken in accordance with the details outlined below and in accordance with the requirements of the CWITP as outlined in **Section SC6.14.10.6 (Civil works inspection and testing plan)**:-
 - (a) generally, a minimum 5 working days notice is to be provided for a pre-start meeting;
 - (b)(a) generally, a minimum 24 hours' notice is to be given for all inspections;
 - (c) a pre-start meeting shall only be granted if the OPW approval has been issued and all relevant amendments have been approved and the appeal period has lapsed or has been waived by the applicant;

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~~(4)(b)~~ prior to all inspections the supervising RPEQ engineer is required to ensure that each element is ready for inspection by Council;

~~(e)(c)~~ the contractor is to ensure that suitably qualified staff and equipment are available at the allotted inspection time to assist with the inspection process; and

~~(f)(d)~~ random audit inspections will also be undertaken by Council from time to time as required.

~~(4)~~ All testing to be undertaken in accordance with the requirements of the CWITP.

Pre-start meeting

~~(9)~~ Prior to works commencing, a joint pre-start meeting is to be conducted between Council and key development project staff including the supervising RPEQ and the principle contractor for the works.

~~(10)~~ Prior to holding a prestart meeting with Council, a pre-start meeting is to be held with representatives of Unitywater. A joint pre-start meeting may be held with Council and Unitywater by prior arrangement.

~~(11)~~ The following documentation is to be provided prior to the pre-start meeting:-

~~(a)~~ certificate of insurances;

~~(b)~~ after hours contact list;

~~(c)~~ traffic management plan/ site management plan;

~~(d)~~ program of works;

~~(e)~~ copy of the bill of quantities;

~~(f)~~ copy of ABNs for principle, supervising RPEQ and principle contractor;

~~(g)~~ vegetation clearing report, including spotter catcher details; and

~~(h)~~ SCC Design Certification – Erosion and Sediment Control.

Stormwater drainage inspections

~~(12)(5)~~ All stormwater pipes and components are to be verified on-site for correct size and class prior to installation.

~~(13)(6)~~ All stormwater drainage is to be inspected in accordance with the requirements of the CWITP.

~~(14)(7)~~ All pits ~~should are to~~ be inspected by Council prior to installation of the stormwater roof components covers/lids.

~~(15)(8)~~ All pipes are required to be cleaned prior to inspection by CCTV. Any lines showing dirt sediment on the CCTV will be required to be cleaned and CCTV revised.

Subgrade inspections

~~(16)(9)~~ Pavement thickness and design shall include the following:-

(a) following after acceptance of the engineering drawings by Council, the supervising RPEQ engineer is to arrange for soil testing and submit a proposed pavement design to the Council for approval, in accordance with the pavement guidelines;

(b) subgrade CBR tests are required to be submitted to enable assessment to be made of the pavement design;

(c) Council shall advise in writing of the acceptance or otherwise of pavement designs and subgrade tests;

(d) approval of pavement designs is based on the tests being representative of the subgrade over the various lengths of road at the box pavement depth and is subject to confirmation by load testing upon inspection;

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- (e) the supervising RPEQ engineer is to verify on site that the subgrade tests are representative of that on which the pavement approval is based prior to requesting a box pavement inspection by Council; and
- (f) the subgrade inspection is to be limited to a visual and load test, with the load test using machinery/plant and personnel to be provided by the developer's contractor.

~~(17)~~(10) The visual test is used to:-

- ~~(a)~~ the visual test is used to:-
 - ~~(i)~~(a) confirm that the pavement excavation depth is in accordance with the approved depth;
 - ~~(ii)~~(b) ensure that the base of the box is even with correct crown and crossfall, and that the sides are vertical;
 - ~~(iii)~~(c) check that the subgrade material is consistent in type and colours with the tested material and nominated soil boundaries on which the design was based and that the subgrade material is uniform throughout the exposed section; and
 - ~~(iv)~~(d) ensure that the base is free from wet spots or any other visually defective areas, e.g. tree stumps and other organic/inorganic matter.
- ~~(b) string lines and tape with necessary personnel are to be provided by the principle contractor.~~

~~Note—string lines and tape with necessary personnel are to be provided by the principal contractor.~~

~~(18)~~(11) The load test is used to:-

- ~~(a)~~ Check for any area of the subgrade which might show signs of deflection (the material is to be as near as practicable to the optimum moisture content); and
- ~~(b)~~ Detect deflections in the subgrade indicating a weakness that will require remedial treatment under the supervising RPEQ engineer's direction.
- ~~(a)~~ for the load test a truck loaded to the legal limit (e.g. full water cart, pipe laden truck, or other acceptable rolling load) is to pass along the subgrade at a speed equivalent to a slow walk, i.e. about 2km/hr);
- ~~(b)~~ minimum loads on the rear single axle truck is to be eight (8) tonne;
- ~~(c)~~ the material should be as near as practicable to the optimum moisture content;
- ~~(d)~~ proof loading is normally required to check for any area of the subgrade which might show signs of deflection; and
- ~~(e)~~ deflections detected in the subgrade indicating a weakness in the subgrade will require remedial treatment under the supervising RPEQ's direction.

~~Note—for the load test a truck loaded to the legal limit (e.g. full water cart, pipe laden truck, or other acceptable rolling load) is to pass along the subgrade at a speed equivalent to a slow walk, i.e. about 2km/h, minimum load on the rear single axle truck is to be eight tonne.~~

~~(19)~~(12) Subgrade compaction testing (field density testing) is to be carried out at the frequency nominated in CWITP with:-

- ~~(a)~~ field density testing is to be carried out at the frequency nominated in CWITP;
- ~~(b)~~(a) all test results are to be available at the time of at the inspection; and
- ~~(c)~~(b) advice of remedial treatment is to be included with any failed test results.

~~(20)~~(13) Remedial treatments are required where subgrades are deemed to have failed any of the aforementioned tests. These remedial treatments may include, but are not limited to, the following:-

- ~~(a)~~ subgrades that are deemed to have failed any of the tests may require remedial treatments;

~~(b) — these remedial treatments may include, but are not limited to, the following:-~~

- ~~(i)(a) additional excavation to reach a sound subgrade stratum;~~
- ~~(ii) installation of side or mitre drains, if not already required to have been installed;~~

~~(iii)(b) placing free draining crushed rock (e.g. spalls, 75/100mm clean rock, with or without geofabric);~~

~~(iv)(c) stabilising the subgrade with cement or lime; or~~

~~(v)(d) stabilising the pavement material with cement or lime; and~~

~~(vi) — the supervising RPEQ is to provide details of the remedial treatment, and confirmation of its success with all other pavement test results prior to the pre-seal inspection.~~

~~Note—the supervising RPEQ engineer is to provide details of the remedial treatment, and confirmation of its success with all other pavement test results prior to the pre-seal inspection.~~

Pavement inspections

~~(21)(14)~~ A pre-kerb pour inspection may be called by Council in some instances, generally after the placement of the sub-base.

~~(22)(15)~~ This may occur where a load test may not be able to be undertaken at subgrade due to the sandy nature of the subgrade material.

~~(23)(16)~~ Other instances specific to any given project may also facilitate inspection at this level; such inspection will be called at Council's discretion.

Pre-seal inspections

~~(24)(17) Pavement compliance testing Pre-seal inspections are to ensure that the pavement material has been placed and compacted in accordance with the pavement design, that sufficient depth has been allowed for the placement of the required seal thickness and to a profile enabling the correct crossfall to be achieved.:-~~

~~(a) — the pre-seal inspections are to ensure that the pavement material has been placed and compacted in accordance with the pavement design, that sufficient depth has been allowed for the placement of the required seal thickness and to a profile enabling the correct crossfall to be achieved;~~

~~(b)(18) It~~ the pre-seal inspection with Council is limited to a visual and load test, with the load test using machinery/plant ~~and personnel supplied provided~~ by the developer's contractor;:-

~~(c)(19) It~~ the supervising RPEQ engineer is to arrange for the appropriate compliance testing of the compacted pavement material in accordance with the requirements of CWITP;:-

~~(d)(20) c~~ Compaction and pavement material property test results are to be provided prior to the pre-seal inspection; ~~and~~:-

~~(e)(21) it~~ is important that the pavement moisture content is satisfactory prior to carrying out bitumen priming. The following Degree of Saturation (DOS) methods may be used:-

~~(i) — Degree of Saturation (DOS):~~

~~(A)(a) the following maximum degree of saturation characteristics values are to be used:-~~

- ~~1-(i) sub-base – 70% maximum;~~
- ~~2-(ii) base – 60% maximum.~~

~~(B)(b) dry back period:-~~

- ~~1-(i) a minimum period of four days to be allowed from the final trimming of the pavement to the application of the seal to meet the requirements of DOS; and~~
- ~~2-(ii) advice of any remedial treatment directed by the supervising RPEQ engineer is to be included with any failed test results for any pavement layers or pavement materials.~~

~~(C)(c) material quality compliance tests:-~~

- ~~1-(i) one complete set of pavement material quality compliance tests is to be made for each project, unless there is a change in source of supply or additional testing is required by Council and provided prior to the pre-seal inspection;~~
- ~~2-(ii) quality compliance testing is to be carried out by an authorised registered laboratory;~~

- 3-(iii) testing for quality compliance is to be carried out in accordance with the applicable standard test procedures of DTMR and requirements of the CWITP; and
4-(iv) a certificate is to be prepared showing results of all material quality compliance tests.

Quality assurance testing

(25)(22) The date and time of the ~~sampling~~quality assurance testing is to be recorded with material testing to be carried out as required by the CWITP.

(26) ~~Material testing is to be carried out as required by the CWITP.~~

(27)(23) Additional testing of fines quality and tests of dry density and of moisture content from material in place in the pavement may be requested by Council at any time.

(28)(24) Grading analysis is to be submitted in graphical or tabulated form.

Non-compliance with material requirements

(29)(25) The responsibility for maintenance of acceptable material standards rests with the supervising RPEQ engineer and the nominated contractor.

(30)(26) Compliance of the pavement materials is to be covered by the supervising RPEQ engineer certification for the works.

(31)(27) Materials submitted for approval but not complying in full with the relevant specification requirements may be accepted or rejected at the discretion of Council.

Pavement depth verification

(32)(28) Pavement depth verification is to be carried out by means of stringline and tape taken from kerb pegs generally at nominal ~~20.0 metre~~ intervals. Should doubt exist by the inspecting Council officer, the contractor is to arrange for their surveyor to provide survey data at ~~10.0 metre~~ intervals to verify pavement depth.

Visual test

(33)(29) The visual test requires that:-

- (a) the pavement surface be even and have an acceptable crossfall (nominally 3%);
- (b) sufficient depth is available to place the required thickness of seal;
- (c) the surface is to be clean, coarse, tight, and stony;
- (d) the surface ~~should~~is to be power broomed prior to the application of the seal; and
- (e) the surface ~~should~~shall not be excessively wet; ~~and~~;
- (f) ~~stringlines, tape and necessary personnel are to be arranged by the principle contractor.~~

Note—stringlines, tape and necessary personnel are to be arranged by the principle contractor.

Load test

(34)(30) Load test (Proof loading) is normally required to check for any areas of the pavement which might show signs of excessive deflection and uses the same procedure as for subgrade inspections:-

- (a) ~~required to check for any areas of the pavement which might show signs of excessive deflection; and~~
- (b) ~~uses the same procedure as for subgrade inspections.~~

(35)(31) Deflections detected in this test may indicate a weakness in the underlying pavement materials or a weak sub-base and the supervising RPEQ engineer is to ensure appropriate remedial works are undertaken.

Pavement compaction testing

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~~(36)~~(32) Pavement compaction testing (F-field density testing) is to be carried out at the frequency nominated in CWITP.

Remedial works

~~(37)~~(33) Remedial works will be required for Pavements that are deemed to have failed any of the tests as outlined, will require These remedial treatments may include, but are not limited to, the following:-

~~(38)~~ These remedial treatments may include, but are not limited to, the following:-

- (a) excavation of pavement (and subgrade) to remove soft material and replace with suitable material;
- (b) the tye up and recompacting of materials; or
- (c) adjusting the moisture content.

~~(39)~~(34) The supervising RPEQ engineer is to provide details of remedial treatment and confirmation of its success, together with any outstanding pavement test results prior to the "on maintenance" inspection.

SC6.14.11.5—WSUD inspections

WSUD –bioretentioninspections

~~(4)~~(35) Inspection of any bioretention water treatment device is to be undertaken prior to the installation of the transitional and media layers. The inspection looks at any earthworks, high flow bypass arrangement, installed subsoil pipe network and drainage, transitional and filter materials prior to their installation. This is not a detailed inspection and should is to coincide with the installation of the subsoil pipe network. All media materials will need to be onsite for inspection at this time. The supervising RPEQ engineer is to be present for this inspection and fulfil the requirements as nominated by the *Construction and Establishment Guidelines for Swales, Bioretention Systems and Wetlands*.

~~(2)~~(36) The on maintenance inspection is to be undertaken in accordance with the provision as outlined in **SC6.14.11.10 (On and off maintenance)**.

~~(3)~~(37) The off maintenance inspection is to be undertaken in accordance with requirements as outlined in **SC6.14.11.10 (On and off maintenance)**.

SC6.14.11.6SC6.14.10.6 Standard cCivil works inspection and testing plan (CWITP)

- (1) The major inspections as outlined in **Section SC6.14.11.410.5 (Inspection and testing standards)** are listed in the CWITP. The listings are not intended to be exhaustive and Council may require inspection and testing of other items. During construction and up to the completion of works Council may conduct random audits and inspections, if considered necessary, with or without prior notification. The supervising RPEQ is to follow the CWITP, unless variations are approved and submit certification that the plan has been followed in accordance with the as-constructed submission documentation.
- (2) The following tables (**Table SC6.14.11A10A to Table SC6.14.11B10C**) provide guidance on the obligations of the supervising RPEQ engineer and procedures for the construction, checking and hand over of works in accordance with the requirements of the CWITP.

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Table SC6.14.11A10A General Obligations of supervising RPEQ engineer

Elements of works	Supervising RPEQ responsibility	Council's role
<u>Prestart meeting</u>	<p>Supervising RPEQ engineer is to:-</p> <ul style="list-style-type: none"> • Invite relevant staff incorporated with all facets of development to prestart from SCC. • Ensure contractor holds copy of approved design and specification. • Outline Performance and standard required. • Highlight critical aspects of the approved design. • Provide electronic copy of all final approved design plans accompanied by a "Document Transmittal Form". • Design Plans to include plan showing boundaries of future development stages. • All electronic plans to be in CAD format. Refer "Specification for the Supply of Digital Geo-referenced Data". 	<p>Council is to:-</p> <ul style="list-style-type: none"> • Outline performance and standard required. • Highlight critical aspects of the approved Design. • Complete project details on the Prestart meeting form. • Undertake minutes of prestart meeting to record any specific issues addressed during the meeting. DA representative shall be chairperson for the meeting. Details to be distributed to all key representatives from each unit within Council.
<u>Work, health and safety</u>	<p>Supervising RPEQ engineer and contractor are to ensure that compliance with the <i>Work Health and Safety Act 2011</i> and other relevant safety legislation, the MUTCD Part 3 and Council's Safety Policy and Manual is maintained throughout construction including specifically:-</p> <ul style="list-style-type: none"> • Correct signing on existing roads. • Approved safety clothing. • Adequate protection of the works. • Correct use of traffic controllers and other traffic control devices. • Approved construction plant and equipment. 	<p>Council is to periodically check the construction site for compliance with health and safety requirements and refer any non-compliance to the supervising RPEQ engineer and where necessary the contractor directly.</p>
<u>General control of the works during operation</u>	<p>Supervising RPEQ engineer and contractor are to ensure that updated copies of the approved design and all subsequent approved amendments are on site and available for use at all times during construction.</p> <p>Supervising RPEQ engineer shall be responsible for progressively checking the works for compliance with the approved design and for checking test results for compliance with the CWITP.</p>	<p>Council is to check the works for compliance with the approved design and approved amendments and refer any non-compliance to the Supervising RPEQ engineer for attention.</p>

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Table SC6.14.10B Specific obligations of supervising RPEQ engineer

Elements of works	Testing requirements			Supervising RPEQ responsibility	Council's responsibility
	Test	Standard	Frequency		
Pre-start meeting	Refer SC6.14.11.4 (Inspection and testing standards) Pre-start meeting			Supervising RPEQ is to: <ul style="list-style-type: none"> Invite relevant staff incorporated with all facets of development to prestart from SCC. Ensure contractor holds copy of approved design & specification. Outline Performance and standard required. Highlight critical aspects of the approved Design. Provide electronic copy of all final approved design plans accompanied by a "Document Transmittal Form". Design Plans to include plan showing boundaries of future development stages. All electronic plans to be in CAD format. Refer "Specification for the Supply of Digital Geo-referenced Data". 	Council is to: <ul style="list-style-type: none"> Outline performance and standard required. Highlight critical aspects of the approved Design. Complete project details on the Prestart Meeting Form. Undertake minutes of pre-start meeting to record any specific issues addressed during the meeting. DA representative shall be chairperson for the meeting. Details to be distributed to all key representatives from each unit within Council.
Work, health and safety	WH&S Act MUTCD SCC Safety Policy			Supervising RPEQ and contractor are to ensure that compliance with the <i>Workplace Health & Safety Act</i> and other relevant safety legislation, the <i>Roadworks Signing Guide</i> and Council's Safety Policy and Manual is maintained throughout construction including specifically: <ul style="list-style-type: none"> Correct signing on existing roads. Approved Safety clothing. Adequate protection of the works. Correct use of traffic controllers and other traffic control devices. Approved construction plant and equipment. 	Council is to periodically check the construction site for compliance with health and safety requirements and refer any non-compliance to the supervising RPEQ and where necessary the contractor directly.
General control of the works during operation				Supervising RPEQ and contractor are to ensure that updated copies of the approved design and all subsequent approved amendments are on site and available for use at all times during construction. Supervising RPEQ shall be responsible for progressively checking the works for compliance with the approved design and for checking test results for compliance with this CWITP.	Council is to where appropriate, check the works for compliance with the approved design and approved amendments and refer any non-compliance to the Supervising RPEQ for attention.

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Elements of works	Testing requirements			Supervising RPEQ responsibility	Council's responsibility
	Test	Standard	Frequency		
1. Roadworks, stormwater drainage, &and allotments works					
a. Allotment filling &and road embankments					
Quality of material	Visual/grading as required		Refer Table 5-18.1 –AS 3798	Make sufficient job visits to confirm quality of material and compaction procedures and to examine and endorse test results.	Visit site for random audit inspections if considered warranted. Check results are submitted at "on maintenance" inspection.
Allotment filling		AS3798Min- Level 1 responsibility		Level 1 supervision – Compliance with table 5.1 and clause 8.2 of AS 3798 provided by the supervising RPEQ.	
Other filling		AS 3798 Min-Level 2 responsibility		Ensure final levelling of Allotments for drainage purposes by Licensed Surveyor and fill quality and compaction testing by Geotechnical Engineer. Lodge test results with Council.	
Allotment filling	Visual/grading as required	AS3798 Min Level 1 responsibility	Refer Table 8.1 AS3798	Level 1 supervision – Compliance with table 8.1 and clause 8.2 of AS3798 provided by the supervising RPEQ engineer.	
Other filling	Visual/grading as required	AS3798 Min Level 2 responsibility	Refer Table 8.1 AS3798	Ensure final levelling of allotments for drainage purposes by licensed surveyor and fill quality and compaction testing by geotechnical engineer. Lodge test results with Council.	
b. Roads walls and retaining walls					
Location level	Survey/ measurement check	SCC Table of Construction Standards &and Tolerances	Each end and other locations as necessary	Inspect foundations and certify base materials and depth.	Visit site for random inspection including checking of works for compliance with approved design and referral to S supervising RPEQ engineer where necessary.
Design detail	Survey/ measurement check	SCC Standard Engineering Drawing or other subject to Council approval	Critical locations and others as necessary	Make sufficient job visits and checks to confirm profile, thickness, rock, backfill, seepage, drains, grouting, and that location and level comply with approved design. Holdpoint: Inspection report to be provided to Council prior to backfilling.	RPEQ Report to be sited prior to backfilling.
Backfill	Visual	Granular	Each wall and minimum 1 check per 50m ²	Holdpoint: Inspection report to be provided to Council prior to backfilling.	RPEQ Report to be sited prior to backfilling.
c. Stormwater drainage					
Location structures	Survey/ measurement check	SCC Table of Construction	Each	Inspect before backfilling and check to ensure compliance with approved design and specification and to examine and endorse all test results including survey.	Visit site for random inspection and testing if considered warranted including checking of works for compliance with approved design and
SL & IL at structures	Survey	Standards &and	Each		

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Elements of works	Testing requirements			Supervising RPEQ responsibility	Council's responsibility
	Test	Standard	Frequency		
Bedding material	Visual/grading as required	Tolerances SCC Standard Engineering Drawing	Each L ine or 1/200m ³	Lodge test results with Council.	concrete strength requirements and referral to S upervising RPEQ engineer where necessary.
Manholes/pits	Visual		Each		
Pipes	Visual CCTV	Confirmation of standard and performance	Each L ine		
Backfilling - quality	Visual/grading as required	Graded (max 75mm) or other subject to Council approval	Each L ine		
- Compaction	AS1289	95% S standard - residential 98% S standard - commercial	1 test per 40 linear metres per 600mm depth		
d. Allotment stormwater drainage					
Location of structures	Survey/ measurement check	SCC Table of Construction	Each	Make sufficient job visits and check to confirm that all structures and pipelines are constructed to approved design and to Council requirements.	Visit site for random inspection and testing if considered warranted including checking of works for compliance with approved design and referral to supervising RPEQ engineer where necessary.
IL at structures	Survey	Standards &and Tolerances	Each		
Bedding material	Visual	SCC Standard Engineering Drawing	Each L ine	Lodge test results with Council.	
Manholes/pits	Visual		Each		
Pipes	Visual	Straight and on line and grade	Each L ine		
Pipes	CCTV	Confirmation of standard and performance	Each L ine		
Backfilling	Visual	Granular or other subject to Council approval	Each L ine		
e. Road crossings					
Conduits	Visual	Service authority requirements	Each	Inspect before backfilling and check to ensure conduits are in locations and to depths in accordance with approved decision.	Visit site for random audit inspections if considered warranted including checking of works for compliance with approved design.
Markers	Visual	SCC Table of Construction Standards / Tolerances	Each		

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Elements of works	Testing requirements			Supervising RPEQ responsibility	Council's responsibility
	Test	Standard	Frequency		
Backfilling	Visual	SCC Standard <u>Engineering Drawings</u>	Each		
f. Kerb and channel					
Horizontal and vertical alignments	Survey / measurement check	SCC Table of Construction Standards/Tolerances	Each drainage structure, intersection and road low point <u>shall have 1 cross section per 20m, and at other critical locations 1 cross section per 50m for general control</u>	Inspect pegging and stringing before placement and check to ensure that kerb and channel is installed to dimensions as per approved design and in particular at drainage structures and connections to existing kerb and channel. Lodge test results with Council where applicable.	Visit site for random audit inspections and testing if considered warranted including checking of works for approved design and concrete strength requirements.
Concrete	Cylinder strength/ impact strength (Schmidt Hammer)	AS1012	1 test per 50m		
g. Concrete works					
General	Consistency comp strength	AS1012 Method 3 AS1012 Methods 8 <u>&and</u> 9	1/50m ³ 1 set of 3/50m ³	Lodge test with Council	Visit site random audit inspections
h. Sub-soil drains					
Pipe	AS2439 Part 1	SCC Table of Construction Standards <u>&and</u> Tolerances	Batch	Check compliance with approved design. Inspect and approve pipe and filter. Confirm bedding and surround, and general grade of the pipe. Ensure pipe is flowing prior to final inspection.	Visit site for random audit inspections and testing if considered warranted including checking of works for compliance with approved design
Filter material	Visual grading as required	Max 10mm screenings or other subject to Council approval	1 test each project or 100m ³ max		
Cleaning joints and markers	Visual	SCC Standard <u>Engineering Drawing</u>	Each	<u>Supervising RPEQ engineer</u>	

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Elements of works	Testing requirements			Supervising RPEQ responsibility	Council's responsibility
	Test	Standard	Frequency		
i. Roofwater					
Location of MHs & YJs	Survey	Inter-allotment drainage	Each	Engineer to make sufficient job visits to confirm generally that all structure and pipelines are constructed to Council tolerances.	Joint "on maintenance" inspection with <u>consulting-supervising RPEQ engineer</u> and <u>any</u> notify requirements, if any.
IL and OL at MHs & YJs	Survey	Inter-allotment drainage	Each		
Bedding materials	Grading	Stormwater D rainage	1 test per 200m ²		
Manholes	Appearance	Stormwater D rainage	Each		
Pipelines	Survey	Line and G grade	100m		
Backfilling	AS1289				
j. Subgrade					
Compaction Below – 300 mm	AS1289	95% Standard residential 100% Standard commercial	1 test per 100m carriageway or part thereof and minimum 2 tests	Make routine visits and checks to confirm construction to approved design. Undertake proof rolling and examine and endorse all test results level checks and cross-section geometry before joint inspection with Council.	Conduct joint inspection with Supervising RPEQ <u>engineer</u> (including proof rolling). Upon satisfactory testing approve placement of sub-base and base materials or select fill as applicable.
300mm to subgrade level					
CBR testing	AS1289 sample compacted at optimum moisture content or greater	100% standard	Representative each material layer and 1 test per 100m carriageway or part thereof min of 2 tests per project	Lodge test results with Council.	Check works for compliance with approved design and issue inspection memo to supervising RPEQ <u>engineer</u> where necessary.
Horizontal and vertical alignments	Survey				
Profile	String line or level survey	SCC Table of Construction Standards & and Tolerances Table 11.2 & and Tolerances	IP, TP, Centreline (20m) 2 check per 20m max		
k. Select fill/subgrade replacement					
Material quality	Grading and Atterberg degradation factor Q208B	Minimum CBR 15 Granular or other subject to Council approval	1 test per 500m ³ and minimum 1 test per project/stage and material type	Make sufficient routine visits to ensure quality of materials and that operations will achieve a sound compacted layer.	Conduct joint inspection with supervising RPEQ <u>engineer</u> (including proof rolling).
If forms part of pavement -lower sub-base		<u>Type 2.5</u>		Undertake proof rolling and examine and endorse all test results, level checks cross section geometry before joint inspection with Council.	Upon satisfactory testing approve placement of sub-base and base materials.
If forms part of pavement -lower sub-base	Grading and Atterberg	<u>Type 2.5</u>	<u>1 test per 500m³ and minimum 1</u>		

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Elements of works	Testing requirements			Supervising RPEQ responsibility	Council's responsibility
	Test	Standard	Frequency		
	<u>degradation factor Q208B</u>		<u>test per project/stage and material type</u>	Lodge test results with Council.	
Compaction (a) For o/s material	Proof rolling	No discernible movement	1 test per 100m carriageway or part thereof		
(b) For graded material	AS1289 and proof rolling	95% Modified and no discernible movement			
Profile and depth	String line or level survey	SCC Table of Construction Standards & Tolerances	1 check per 20m		
l. Sub-Base Layer					
Material quality	Grading and Atterberg, degradation factor Q208B	MRTS05	1 test per 500m ³ and minimum 1 test per project/stage	Make sufficient visits to ensure gravel quality and that operations will achieve a sound compacted. Undertake proof rolling and examine and endorse all test results, level checks and cross section geometry before placement of base material. Lodge test results with Council.	Visit site for random audit inspections and testing if considered warranted. Obtain periodic quality test results from suppliers as necessary.
Compaction	AS1289 and proof rolling	95% Modified and no discernible movement	1 test per 100m carriageway or part thereof (minimum 2 tests)		
Profile and depth	String line or level survey	SCC construction stds/ tolerances	1 test per 20m		
m. Base layer – pre-seal					
Material quality	Grading & Atterberg, degradation factor Q208B	MRTS05	1 test per 500m ³ and minimum 1 test per project/stage	Make sufficient visits to ensure gravel quality and that operations will achieve a sound compacted layer. Undertake proof rolling and examine and endorse all test results, level checks and cross section geometry before joint inspection with Council. Lodge test results with Council. Check to confirm construction complies with approved design.	Conduct joint inspection with supervising RPEQ <u>engineer</u> (including proof rolling). Inspect drainage. Upon satisfactory testing approve placement of surfacing material. Check works for compliance with approved design and issue inspection memo to supervising RPEQ <u>engineer</u> where necessary.
Compaction	AS1289 and proof rolling	98% Modified and no discernible movement	1 test per 100m carriageway or part thereof (minimum 2 tests)		
Horizontal and vertical alignments	Survey		1 cross section per 20m, at critical locations		

Elements of works	Testing requirements			Supervising RPEQ responsibility	Council's responsibility
	Test	Standard	Frequency		
			and 1 cross section per 50m for general control		
Profile	String line or level survey	SCC Table of Construction Standards/ Tolerances	1 test per 20m max		
n. Surfacing					
Material quality	Mix analysis	MRTS30	Min. 1 test per 100 tonne or 1500m ²	Confirm mix design and spray rates. Supervising RPEQ engineer to oversee surfacing operations and to endorse all test and level results.	Visit site for random inspection if considered warranted.
Compaction and thickness		AUS-SPEC or MRTS			
Profile	String line or level survey	Standards/ tolerances	As required		
o. WSUD					
Bioretention construction				Undertake inspections in accordance with Water by <i>Design Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands</i> and complete applicable forms.	Inspection conducted prior to the installation of the transitional and media.
Filter media	FAWB	FAWB	FAWB	Obtain and provide a certificate of compliance from media supplier or independent NATA laboratory	Media inspected prior to installation.
On or off maintenance	In-situ hydraulic conductivity	FAWB	FAWB	Obtain in-situ results in accordance with the standard prior to requesting either on or off maintenance	
p. Works Other					
All works prior to on-maintenance	Visual		As required	Ensure all works comply with approved design before arranging on maintenance inspection	Conduct joint on maintenance inspection with Supervising RPEQ engineer , check compliance with approved design and advise any requirements
Prior to acceptance on maintenance	As-constructed Drawings to be prepared and submitted to SCC I accordance part 8.1 Complete test	As-constructed Drawings to be prepared and submitted to SCC I accordance part 8.1 Complete I test	As-constructed Drawings to be prepared and submitted to SCC I accordance part 8.1 Complete I test	Lodge documentation as per testing requirements Lodge written request for on maintenance Lodge written request for bond refund/ reduction where applicable	Check documentation lodged by Supervising RPEQ engineer within twenty-eight (28) days and advise any requirement. When complete, reply to Supervising RPEQ engineer 's request for on maintenance.

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Elements of works	Testing requirements			Supervising RPEQ responsibility	Council's responsibility
	Test	Standard	Frequency		
	results to be compiled Supervision Certificate and Inspection and Testing Plan CWITP Check Sheet to be endorsed	R results to be compiled Supervision Certificate and Inspection and Testing Plan CWITP Check Sheet to be endorsed	R results to be compiled Supervision Certificate and Inspection and Testing Plan CWITP Check Sheet to be endorsed		
During maintenance period				Ensure all minor omissions and defects are rectified Examine and approve site prior to request for Off maintenance inspection	Advise supervising RPEQ engineer of any known defects or maintenance not being undertaken.
Bulb wattage check	Visual	ENERGEX Public Lighting Manuals	Each	Accompany Council Inspector and note any requirements. Arrange completion of requirements and check prior to further inspections.	Check works for compliance with approved design and issue inspection memo to supervising RPEQ engineer where necessary.
Road name check	Visual	Council Road Name approval letter	Each	Accompany Council Inspector and note any requirements. Arrange completion of requirements and check prior to further inspections.	Check works for compliance with approved Road Names and issue inspection memo to supervising RPEQ engineer where necessary.
2. As-constructed drawings					
In accordance with Council requirements as outlined in Section SC6.14.1110.108					

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Table SC6.14.11B10C Construction standards and tolerances

Element course	Minimum thickness	Minimum density/strength	Horizontal Alignment Tolerance	Vertical Alignment Tolerance	Thickness Tolerance	Shape/Slope Tolerance
General Earthworks Earthworks in Floodprone areas	N/A	Refer Table 5.1 AS3798	Limits on Plan	+100mm +100 -0	N/A	Min 1:100 general and over any 10 metres down contours No ponding over 50mm deep
Stormwater Pipes	N/A AS4058	Standard Drawings	+100mm	+25mm	N/A	Uniform pipe grade
Manholes / Pits	In situ 150mm	32MpaMPa	Lateral +100mm Along line +300mm	+50mm Width K & C +25mm	+100mm -0mm	Circular / Square / Rectangular and Vertical +50mm
Subgrade	N/A	100% Standard Compaction	+100mm Road width +200mm -50mm	+10mm -50mm	N/A	Design cross fall +0.5%
Select Fill / Subgrade Replacement Lower Sub-Base	100mm	95% Modified Compaction Min CBR15 Type 2.5	+100mm Road width +200mm -50mm	+10mm -50mm	+25mm	Design Crossfall +0.5%
Subsoil Drains	N/A	N/A	+100mm	Min 900mm Below kerb 1 metre	Width -25mm +100mm	Uniform pipe Grade 0.5% min
Conduits	Width 300mm	N/A	+300mm	Min 700mm & max 1000mm Below top of Kerb	N/A	Uniform grade And line
Markers	N/A	N/A	+100 from Conduit	N/A	N/A	N/A
Kerb and Channel	Invert 125mm	20Mpa	+100mm Road width +200mm -50mm	+25mm	Concrete +20mm -10mm	10mm in 3 metres max + 10% of design grade No ponding greater than 5mm
Sub-Base	100mm	95% Modified Compaction CBR 45 Type 2.3	+100mm Road width +200mm -50mm	+25mm	+50mm -20mm	25 min in 3 metres max and no ponding Design crossfall +0.5%
Rock Retaining Walls Brisbane City Council	N/A	N/A	+100mm	+100 +100 -0 Flood Areas		Surface finish +100mm of design slope No openings <100m
Base	100mm	98% Modified compaction CBR80 Type 2.1	+100mm Road width +200mm -50mm	+25mm	+25mm -10mm	15mm in 3 metres max Crossfall +0.5% design
Surfacing	30mm	92%	+100mm	+25mm	+15mm	7mm in 3

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Element course	Minimum thickness	Minimum density/strength	Horizontal Alignment Tolerance	Vertical Alignment Tolerance	Thickness Tolerance	Shape/Slope Tolerance
(Asphalt)	or design	Relative Compaction	Road width +200mm -50mm	+5mm 0mm from lip of channel	-0mm	metres max Design crossfall +0.5%
Road Verges	N/A	95% Standard compaction	+100mm	+25mm +25mm -0 from top of kerb	N/A	±10% of design crossfall
Top-soil and grassing	100mm	N/A	N/A	+100mm Road verges +25mm	+25mm	As for general earthworks
WSUD Elements	Minimum Thickness	Material Sizes	Material Type	Shape/Slope Tolerance	Thickness Tolerance	
Base Grade	N/A	NA	NA	Design + 0.5% Uniform Grade	N/A	
Drainage Material	200mm	4mm-7mm	Washed Gravel	N/A	+ 25mm (min 50mm cover over drains)	
Transitional Material	100mm	Average 2mm	Coarse Sand	N/A	+ 25mm	
Filter Media	300mm	FAWB Spec	FAWB Spec	N/A	+ 25-mm	
Subsurface Drainage Pipe	N/A	90mm or 100mm Diameter	PVC	Design + 0.5% Uniform Grade	N/A	
Stormwater Detention Height	NA	NA	NA	N/A		

SC6.14.11.7SC6.14.10.7 Bonding

Preliminary General

- (1) The purpose of this section of the planning scheme policy is to set out the circumstances and processes associated with Council requirements for:-
- accepting security for proposed operational works prior to commencement of construction;
 - accepting security for completion of operational works prior to on maintenance;
 - accepting security for defects and maintenance of contributed assets during the on maintenance period;
 - to cover all development construction works during the operations and maintenance period; and
 - to cover incomplete development obligations.

Note—development obligations refer to all conditions of approval relative to the development permit. This includes, but is not limited to, civil works, landscaping works, park improvements, provision of as-constructed information, test certificates, revegetation and rehabilitation and sediment and erosion control.

- (2) The submission of a financial security to Council by the developer may be used at Council's discretion.

Process

- (3) The following processes are to be completed in relation to bonding:-
- provide schedule of works, including maintenance, and value which are proposed to be bonded;

- (b) ~~substantiate~~ verify proposed timing for the completion of outstanding works;
- (c) payment of relevant fees; and
- (d) provide ~~approved bond~~ security ~~amounts~~ amount; as required by Council.

Form of bond security

- (4) The bond security given is to be in the form of either:-
 - (a) cash; or
 - (b) an unconditional, irrevocable bank guarantee; or
 - (c) such other security as Council may approve.

Uncompleted work bonds

- (5) Council's conditions of development approval will generally require that all conditions be complied with prior to Council ~~endorsing~~ approving the plan of survey. However, Council may, at its discretion, ~~agree to endorse~~ approve the plan of survey prior to completion of some non-essential infrastructure works (provided all essential infrastructure is completed), subject to lodgement by the developer of an appropriate security bond as guarantee that all outstanding works will be completed within an acceptable time period as prescribed herein.
- (6) Consideration will only be given to accepting uncompleted works bonds in instances where a Development Permit for Operational Works has been issued in relation to all works provided as a donated asset to Council.
- (7) Council will generally accept a bond for uncompleted works (to enable ~~endorsement~~ approval of the plan of survey) only in instances where the allotments which will be created when the plan of subdivision is registered are ready for use, that is all essential works ~~as follows~~ are completed ~~as follows~~:-
 - (a) allotment earthworks 100% complete;
 - (b) all required works within allotments (e.g. inter-allotment drainage, etc.) 100% complete;
 - (c) roadworks completed with pavement surfacing in place (including external roadworks required to provide access to the development). Road signage and line marking ~~is~~ are required to be completed where the safety of the road user warrants;
 - ~~(d) water and sewerage services completed and operational, including lodgement of as-constructed details where relevant and all works accepted "on maintenance" by Unitywater;~~
 - ~~(e)~~(d) ~~c~~ertificate of ~~s~~upply provided to Council in respect of power and telecommunications services;
 - ~~(f)~~(e) all major drainage works completed to a stage such that there will be no potential flooding or drainage impacts on any allotment;
 - ~~(g)~~(f) WSUD treatments where immediately needed such as road side swales;
 - ~~(h)~~(g) the site ~~should be~~ suitably stabilised/revegetated to prevent on site erosion and sediment transfer; and
 - ~~(i)~~(h) items as required to ensure the roadway can be lawfully and safely opened to the public for use.
- (8) Council will only accept a bond for uncompleted municipal works where such works are located on public land (i.e. land shown on the plan of survey as road reserve, esplanade, park reserve, drainage reserve, etc.).
- (9) Generally, uncompleted works which may be bonded will be restricted to amenity landscaping works on public land, and (possibly) pathway construction on public land. Amenity landscaping works do not include landscape works required for surface, swale/channel stabilisation or protection.

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- (10) Bonding of uncompleted private works (including on property which will form part of a community title scheme) is not regarded as appropriate and all such works ~~must are to~~ be completed prior to ~~endorsement approval~~ of the plan of survey.

Operating procedure

- (11) In instances where the developer wishes to seek Council's agreement to accepting an uncompleted works bond to enable early release of the plan of survey, the developer's RPEQ ~~engineer mustis to~~ provide a written submission which includes the following:-
- (a) fully priced schedule of all operational works required for the development (this schedule will form the basis of the determination of the maintenance bond which will be held by Council until acceptance of the development works off maintenance);
 - (b) details of the uncompleted works which are proposed to be bonded, with a fully priced schedule of these works (including the cost of any works to be carried out by Council for which payments have not been received); ~~and~~
 - (c) certification from an ~~suitably qualified engineer~~ (RPEQ ~~engineer or equivalent~~) that:-
 - (i) the completed works have been constructed on the correct alignments and to the required standards, in accordance with the conditions of the development approval; and
 - (ii) the information provided to Council in relation to completed and uncompleted works is correct, and that the uncompleted works have been scheduled for completion within 3 months of Council endorsing the plan of survey.
- (12) Should Council agree to accept an uncompleted works bond, the following ~~must shall~~ be lodged with Council prior to ~~endorsement approval~~ of the plan of survey:-
- (a) payment of the prescribed administration fee for an uncompleted works bond;
 - (b) payment of all outstanding rates and charges relating to the property being subdivided;
 - (c) the uncompleted works bond, the value of which ~~must is to~~ be ~~1.50% of times~~ the value of the uncompleted works;
 - (d) the maintenance bond for the development works; and
 - (e) signed letter of unconditional undertaking, guaranteeing that all uncompleted works (as defined in the RPEQ's ~~engineers'~~ certification) will be completed within 3 months of Council endorsing the plan of survey and ~~to~~ include a statement that the developer grants permission to Council to call up the said bond for uncompleted works if not completed by the expiration of the 3 month period and (where applicable) agreeing that the performance bond will be forfeited to Council if the uncompleted works are not completed within the required timeframe.

Release of uncompleted works bond and performance bond

- ~~(13) Upon satisfactory completion of all works, and acceptance of the works "on maintenance", the uncompleted works bond will be released by Council. In addition, provided the works have been completed within the required period and where applicable, the performance bond will also be released at this time.~~
- ~~(14) The minimum 12 month maintenance period for all municipal infrastructure will commence once all uncompleted works have been accepted "on maintenance" except as otherwise stated in conditions of approval (i.e. WSUD).~~

Maintenance security bond

- ~~(15)~~(13) A bond, being the greater of 5% of the contract value of the whole works or a minimum of \$3,000 ~~must shall~~ be lodged with Council to guarantee satisfactory maintenance of the works and rectification of defective works during the maintenance period.
- ~~(16)~~(14) For vegetation rehabilitation and vegetated WSUD devices, an amount of 1.5 times the value of all plants and maintenance costs for a 12 month period to be lodged with Council to guarantee satisfactory performance of the works and in recognition of the higher rates of plant failures associated with these types of works.

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~~(17)~~(15) The minimum 12 month maintenance period for all municipal infrastructure will commence once all uncompleted works have been accepted "on maintenance" except as otherwise stated in conditions of approval (i.e. WSUD).

Release of bonds

~~(18)~~(16) Uncompleted works bonds:- Upon satisfactory completion of all works, and acceptance of the works on maintenance, the uncompleted works bond will be released by Council. In addition, provided the works have been completed within the required period and where applicable, the performance bond will also be released at this time.

~~(a)~~ — upon satisfactory completion of all works, and acceptance of the works "on maintenance", the uncompleted works bond will be released by Council. In addition, provided the works have been completed within the required period and where applicable, the performance bond will also be released at this time.

~~(19)~~(17) The Maintenance bonds- will be released where the applicant has complied with requirements set out in Council's acceptance of works off maintenance.

~~(a)~~ — the maintenance security will be released where the applicant has complied with requirements set out in Council's acceptance of works off maintenance.

~~(20)~~ — Non-compliance:-

~~(a)~~(18) Council may, where the applicant has failed to comply with the terms of these bonding provisions, serve written notice on the applicant requiring the applicant within seven ~~(7)~~ days of the receipt of the notice to either comply with the terms of these bonding provisions or show cause why Council shall not call up the security bond and complete the works- ~~and~~.

~~(b)~~(19) Council may call up the security bond if the applicant has failed to comply with the notice served as stated above, and where in the interest of public safety, environmental health or structural failure, certain works are required to be undertaken by Council.

Construction performance bond for non-subdivisional works

~~(24)~~(20) Prior to commencement of the construction works, the developer may be required to lodge security in the form of a performance bond for construction activities not related to subdivisional works.

~~(22)~~(21) The bond is to be the greater of 1.5 times the value of the operational works or a minimum of \$5,000.

~~(23)~~(22) The bond is required to provide security to Council to ensure all works, including maintenance are carried out in accordance with development approvals and in the event that costs are incurred as a result of the following:-

~~(a)~~ — protection of on-street works, including landscape works, from damage by contractors, sub-contractors and suppliers;

~~(b)~~(a) repairs to on- street works, including landscape works, resulting from damage caused by contractors, subcontractors and suppliers;

~~(c)~~(b) protection and repair of existing Council services (i.e. sewerage connections, water connections etc.);

~~(d)~~(c) inadequate soil and water quality management during construction;

~~(e)~~(d) inadequate provision for traffic; and

~~(f)~~(e) urgent action required by Council to resolve unsafe construction or emergency repairs required to protect persons and/ or property from consequential damages, safety and environmental incidents.

~~(24)~~(23) Any costs incurred by Council in responding to the above circumstances will be recovered from the bond.

~~(25)~~(24) Upon all works being completed in accordance with the development approvals, the performance bond shall be returned to the developer or may be substituted for the maintenance bond if contributed assets are being handed over to Council.

SC6.14.11.8SC6.14.10.8 Plan of subdivision endorsement Plan approval requirements

IntroductionGeneral

- (1) A person who makes application for ~~the endorsement approval~~ of a plan of subdivision (~~plan sealing~~) is to make the application in the approved form and shall accompany such application with an application fee of an amount which is in accordance with ~~a scale~~ the schedule of fees ~~determined as decided~~ by Council, ~~and/or~~ subject to resolution as determined.

Prior to submission

- (2) Prior to the submission of the plan of subdivision with Council the person making the application is to lodge a completed checklist for endorsement approval of survey plans² together with a copy of the proposed plan of subdivision, ~~to allow Council to provide the file number for the plan endorsement submission and raise the relevant application fees & charges.~~ The checklist can be obtained from Council's ~~customer service centres~~ website.

Submission

- (3) The application for endorsement approval of the plan of subdivision ~~should is~~ not be lodged with Council until:-
- (a) all subdivision works have been completed to the satisfaction of Council and accepted ²on maintenance², unless otherwise bonded;
 - (b) all drawings detailing current as-constructed data excluding outstanding bonded works have been approved by Council; and
 - (c) all conditions of the related higher order development approval/s (RECRAL, MCU, OPW etc.) have been completed, including payment of all relevant fees, charges and relevant contributions.

Application requirements

- (4) The application made for sealing approval of the plan is to:-
- (a) be made in the approved form;
 - (b) be accompanied by the plan of subdivision suitable for deposit in the Titles Registry; and
 - (c) comply in all respects with relevant higher order approvals, the approval of the engineering requirements, drawings and specifications.
- (5) ~~Provide a~~ All relevant easement, covenant, building lot envelope, community management statement and any other documents as required in association with the plan of subdivision are to be provided. Where relevant, these are to be accompanied by:-
- (a) ~~accompanied by an approval of a list of approved~~ road names being created prior to the application for plan sealing approval;
 - (b) ~~accompanied by~~ the payment of all fees and development contributions and infrastructure charges in accordance with Council's requirements;
 - (c) ~~accompanied by~~ electronic files containing AutoCAD.DWG drawings, that contain only the allotment layout, street names and allotment numbers. The electronic file shall be accompanied by certification from the registered surveyor that the information provided is identical to that submitted to the relevant State Government department for registration;
 - (d) ~~where relevant,~~ a table listing the applicable 1:100 AEP flood levels appropriate to each lot is to be provided for Council's records. The table is to be accompanied by certification from a qualified person which certifies that the levels are based on the latest study referenced by Council's relevant development permits and incorporates all amendments; and
 - (e) ~~accompanied by~~ a detailed submission addressing compliance of all conditions of the related higher order development approval/s (RECRAL, MCU, OPW etc.).

Schedule 6

Plan Details

- (6) In no ~~case-instance~~ shall amendments be made that contravene the terms and conditions of Council's approval.
- (7) Council is to compare the plan of subdivision for ~~sealing approval~~ with the Council approved plan of subdivision.
- (8) Council is to compare any new road names shown on the plan of subdivision with the road name proposal approved by Council.
- (9) ~~If Council finds t~~The plan of subdivision conforms with the proposal plan as approved, and no material change, variation or alteration has been made, and all relevant conditions of the higher order approval/s (~~REC~~RAL, MCU, OPW etc.) have been complied with to Council's satisfaction, ~~endorsement approval~~ will be carried out.
- (10) Council, ~~is to~~ as part of the ~~endorsement approval~~ process, ~~is to~~ note its approval on the plan of subdivision and return the plan of subdivision to the applicant to be lodged at the ~~office of the Titles Registry~~Titles Registry Office.
- (11) In the event ~~of~~the Registrar of Titles, upon lodgement of the plan approved by Council, requires an alteration of any such plan in any particular way, the licensed surveyor who prepared the plan shall within a period of one ~~(1)~~month from the requested alteration, notify ~~the~~Council and forward ~~to Council~~ two ~~(2)~~amended copies.

SC6.14.11.9SC6.14.10.9 As-constructed documentation

General

- (1) This section of the planning scheme policy details Council's construction guidelines for work that requires Council's approval with regard to its construction, compliance, and acceptance. The submission includes:-
 - (a) as-constructed ~~submissions~~documentation; and
 - (b) ~~standard the~~ CWITP.
- (2) As-constructed plans serve three distinct functions:-
 - (a) checking - to enable a quantitative check of the as-constructed works against the approved design, so as to ensure design philosophies and criteria have been achieved;
 - (b) recording - to provide an accurate record of the as-constructed locations of underground services; and
 - (c) quantity - to provide record of quantity to understand scope of works for maintenance planning.
- (3) Information required for the checking function ~~must is to~~ be presented in a form which allows ready comparison between design and as-constructed data by experienced engineering and landscape staff, whereas information required for the recording function ~~must is to~~ be presented in a form which allows ready and unambiguous interpretation and understanding by a wide range of users including engineers, parks managers, landscape architects, maintenance and trades persons and the general public.

Prerequisites for submission

- (4) ~~It is Council's intention t~~To expedite the approval and checking process ~~by reducing the level of checking from rigorous detailed checking to checking on an audit basis. Compliance with these guidelines is essential. In particular,~~the following ~~points should~~shall be strictly adhered to in the supervision of development works and preparation of as-constructed drawings:-
 - (a) major departures (a change which varies the design intent) from approved designs ~~should are to~~ be approved by Council in writing before implementation and before submission of as-constructed drawings. ~~Refer also to the Statement of Compliance;~~

Schedule 6

- (b) construction is to generally comply with the approved design (as amended above, if required), within the tolerances cited in the CWITP or Council's approved specifications. ~~Refer also to the Statement of Compliance;~~ and
- (c) where tolerances are not stated in the relevant planning scheme policy or Council's standard specifications, tolerances shall be in accordance with the relevant Australian Standard and accepted engineering / landscape and horticultural practice.

Submission for approval

- (5) Except as specifically excluded below, every drawing included in the approved design, including stormwater calculation sheets and catchment plans, is to be submitted in certified as-constructed form. It is the responsibility of the developer to ensure all requirements associated with the Council as-constructed details are completed.
- (6) As-constructed details are required to help future works identify the real asset location and properties for future reference. Many details may differ during construction from that of the original design, and data records are to be maintained by the consultant during all phases of work.
- (7) As-constructed submission documentation is to be forwarded to Council prior to the acceptance of the works "on maintenance".
- (8) The as-constructed submission provides for the following activities:-
 - (a) checking;
 - (b) recording;
 - (c) compliance and acceptance;
 - (d) asset data capture and recording; and
 - (e) acceptance of works "on maintenance".
- (9) The as-constructed ~~information documentation~~ is to be presented in ~~hard copy plans as well as an~~ electronic format ~~as PDF and AutoCAD files~~ complying with the Asset Design and As Constructed (ADAC) standard for use and direct transfer to Council's geographic information system (GIS) and Asset Management Systems, ~~as follows:~~
 - (a) ~~the digital ADAC XML file must be a complete and detailed digital record of what was constructed, as this information is used by Council in the management of the asset;~~
 - (b) ~~it is essential that the ADAC XML file is created using complete and accurate information to correctly identify the assets and the locations being represented in the as constructed drawings; and~~
 - (c) ~~the ADAC XML file shall be produced using the most recent ADAC XML schema and is to be validated for compliance before being submitted to Council. Details in the data schema (attributes and required status) describing the asset classes and sub-classes to be addressed by the ADAC capture process are documented in the guidelines available on Council's website.~~

Statement of compliance – non-complying works

- (10) ~~A Statement of Compliance for non-complying works is required to be submitted in conjunction with the marked up as-constructed drawings.~~
- (11) ~~The Statement of Compliance is intended to place responsibility for identifying and reporting non-conforming works with the supervising RPEQ and to expedite Council checking and approval. The Statement shall:-~~
 - (a) ~~identify the nature and number of non-complying items;~~
 - (b) ~~nominate the supervising RPEQ proposals for rectification or Council acceptance; and~~
 - (c) ~~provide Council with a fixed time frame for completion of the rectification works.~~

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~~(12) It is expected that in many cases, a short, comprehensive and accurate Statement of Compliance will enable Council to grant immediate "on maintenance" provided all other requirements have been satisfied, including the supervising RPEQ certification of construction.~~

Properties

~~(13)(10)~~ Correct street names and lot numbers are to be shown on all relevant drawings.

Earthworks

~~(14)(11)~~ Certification of design plan(s) require that sufficient levels are provided to show that works have been constructed in accordance with the approval and conform to the level of tolerances as per the CWITP.

Roadworks

~~(15)(12)~~ Certification of design plan(s) is sufficient provided that as-constructed grade and cross-sectional information is confirmed in areas where roadway overland flow capacities are critical.

~~(16)(13)~~ Confirmation is required that permanent street, warning, and regulatory signs are placed in accordance with the approved drawings and standard locations. Accurate survey is not required.

~~(17)(14)~~ As-constructed pavement thickness and composition including minimum CBR values for the pavement materials are to be noted on the plans.

Stormwater drainage – minor and major flow systems

~~(18) Certification of design plan(s) are to be amended only where the tolerances are as detailed in the CWITP.~~

~~(19)(15)~~ As-constructed departures from design exceeding the above tolerances will be accepted where the consultant/applicant can demonstrate and certify that the design intent is not compromised.

~~(20)(16)~~ Only where the drainage systems have been constructed out of tolerance and they may be extended by future development either upstream or downstream and in exceptional circumstances such as incorrect pipe sizes and major out of tolerance construction are the design calculation sheets to be amended to reflect the as-constructed performance of the systems.

Stormwater drainage – major flow system

~~(21)(17)~~ Amend levels and sections to critical overland flow paths in roadways, pathways and parks to as-constructed.

~~(22)(18)~~ Confirm that critical overland flow paths perform to approved design criteria. Critical overland flow paths are those where design storm flows approach flow path's capacity.

Stormwater drainage – ~~detention-bioreten~~tion basins and WSUD devices

~~(23)(19)~~ Bioretention basins are to be constructed within tolerances as detailed in the CWITP, with profile and volume to be amended to as-constructed values, including the following details:-

- (a) sub-soil flush points;
- (b) high flow bypass weir;
- (c) low-flow outlet; and
- (d) all associated stormwater drainage infrastructure, pipes, pits etc.

~~Interlot Inter-allotment~~ drainage

~~(24)(20)~~ As-constructed roof water longitudinal sections are not required. As-constructed departures from design in excess of the tolerances nominated below will be accepted if the supervising RPEQ engineer/applicant certifies that Council's design criteria have been achieved.

~~(25)(21)~~ Information required for:-

- (a) manholes/pits are:-
 - (i) location (two ties);
 - (ii) surface level; and
 - (iii) invert level.
- (b) lines are:-
 - (i) diameter, class, type;
 - (ii) length;
 - (iii) grade; and
 - (iv) alignment.
- (c) house connections are:-
 - (i) location (two ties);
 - (ii) surface level; and
 - (iii) invert level.
- (d) tolerances are:-
 - (i) as per the CWITP; and
 - (ii) provided that such deviation does not result in conflict or interference with any other existing or proposed structure or service, including property boundaries.

Landscape works

- (26)(22) Certification of Landscape design plans require certification that landscape works, assets and infrastructure have been installed in accordance with approved specifications including but not limited to:-
- (a) approved plan(s);
 - (b) conditions of the decision notice; and
 - (c) compliance with all relevant environmental and horticultural standards requirements such as Australian Standards, national specifications and Council's Standard Engineering Drawings.

As-constructed documentationsubmission

- (27)(23) Development works will not be accepted "on maintenance", or as practically complete, until the following documentation, where applicable, has been submitted to, reviewed and approved by Council:-
- (a) current version ADAC XML file of the as-constructed plans – hardcopy and electronic;
 - (b) marked up design drawings with as-constructed;
 - (c) inspection and testing certification by the applicant(s)/supervising RPEQ engineer;
 - (d) certification of all landscape works by either a qualified landscape architect, horticulturalist, environmental scientist, ecologist contractor, and/or arborist;
 - (e) certification of foundation conditions by the applicant(s)/supervising RPEQ engineer(when applicable);
 - (f) certification of major structural elements by the applicant(s)/supervising RPEQ engineer(when applicable);
 - (g) certification of overland flow paths and supporting documentation/calculations by the applicant(s) supervising RPEQ engineer(when applicable);
 - (h) certification of electrical, lighting and telecommunication services documentation/calculations by the applicant(s) supervising RPEQ engineer (when applicable);

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~~(i)~~ certification of electrical, lighting and telecommunication services construction work by the responsible electrical worker/contractor (where applicable) via certificate of compliance form and copies of associated test results supplied to council;

~~(h)(j)~~ all operation and maintenance manuals e.g.: water supply and sewerage pumping equipment, SQIDs, playground equipment, wetland management reports, landscaping;

~~(i)(k)~~ as-constructed data for electrical wiring diagrams for pumping stations, etc.;

~~(i)(l)~~ manufacturers details and maintenance procedure for GPTs; and

~~(m)~~ wiring diagrams for traffic lights.;

~~(n)~~ a separate and dedicated electrical site plan denoting electrical site features, including but not limited to switchboards and sub boards, poles, lights, pits, conduit and cable runs and other associated equipment; and

~~(k)(o)~~ a separate and dedicated telecommunications infrastructure site plan denoting Council owned or donated Telecommunications infrastructure, including but not limited to switchboards and cabinets, conduit runs, pits, sensors and other associated equipment.

~~(28)(24)~~ Copies of test results are to be supplied for the following:-

- (a) compaction of fill;
- (b) subgrade CBR;
- (c) subsoil drain filter media grading;
- (d) base, subbase and subgrade replacement course material quality;
- (e) base, subbase, subgrade and subgrade replacement course compaction;
- (f) prime or primer seal spray and application rates;
- (g) AC core tests;
- (h) playground soft fall impact attenuation tests;
- (i) soil for horticultural purposes;
- (j) Unitywater's test requirements and clearance;
- (k) any concrete testing required by the technical specifications; and
- (l) any other job-work specific testing carried out or required by Council if used.

~~(29)(25)~~ Should any of the above test results fail to meet specification, the applicant is to include in the submission to Council details of retesting rectification carried out.

~~(30)(26)~~ The documentation ~~should is to~~ be presented in electronic format, a logically assembled and bound document including a table of contents confirming completeness.

Plan format

~~(31)~~ All plans are to be provided in signed hardcopy format and also in electronic ADAC format.

Legibility of paper plans

~~(32)~~ As all as-constructed drawings are imaged, line work and lettering are to be of suitable thickness and clarity to be legible when imaged typically 0.25mm black lettering.

~~(33)(27)~~ Numerical amendments on the design drawings are usually denoted as a diagonal line through the design value with the as-constructed value noted adjacent. Other amendments are usually denoted by encircling with a notated cloud.

Electronic plans

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~~(34)~~(28) Electronic plans are to be supplied for the following:-

- (a) ~~as-~~constructed plan of subdivision of lot layout and all civil works; and
- (b) ~~full set of~~ amended approved design plans showing all as constructed changes.

~~(35)~~(29) All electronic plans supplied to Council ~~must are to~~ be accompanied by a document transmittal form.

~~(36)~~(30) All electronic data supplied ~~in the form of Computer Aided Drafting (CAD) files must comply to the specifications in the document Specifications for the Supply of Digital Georeferenced Data. Copies of this document are available from Council's Customer Service Centres is to comply to the specifications in the following documents available on council's website:-~~

- ~~(a) SCC Design Documentation Details;~~
- ~~(b) SCC Drafting and Design Presentation Standards; and~~
- ~~(c) Guidelines for Creation and Submission of ADAC.~~

~~As-~~ constructed drawings

~~(37)~~(31) ~~As-~~ constructed drawings for road works and drainage are to be submitted on completion of the works.

~~(38)~~(32) ~~It is strongly recommended that as-constructed~~ ~~As constructed~~ information ~~is to~~ be collected and checked as the works progress to identify construction errors as early as possible so that their rectification or the seeking of Council's approval for the change does not delay granting of on maintenance.

~~(39)~~(33) Prior to release of the plan of survey and/ or acceptance of the works "on maintenance", the supervising RPEQ engineer is to supply an ~~an~~ AutoCAD DWG Drawing file (at a scale of 1:500) of the final lot layout and any external works, including approved street names, lot numbers and landscaping, complete with the engineer's title description of the development.

~~(40)~~(34) In the case of subdivisional works, the data is to be accompanied by written certification that the submitted information is identical to the plan of subdivision lodged with Council for plan ~~sealing approval~~. If the submitted plan of subdivision is altered, a copy of the amended information in DWG Format ~~must is to~~ be forwarded to Council within 7 days.

~~(41)~~(35) Development works will not be accepted "on maintenance" until such time as all of the ~~as-~~constructed drawings have been received, checked and approved.

SC6.14.11.10SC6.14.10.10 On and off maintenance

General

- (1) This section defines the requirements to be applied prior to "on maintenance" approval and off maintenance asset handover by Council.

Acceptance of works "on maintenance"

- (2) To enable formal acceptance of the works on maintenance, the developer will be responsible for maintenance of all contributed assets and the rectification of any defective works or defective materials incorporated into the works for a minimum period of 12 months.
- (3) The following certificates, certified drawings or other items are generally required to be supplied by the supervising RPEQ engineer:-
 - (a) on maintenance inspection checklist;
 - (b) engineering certification;
 - (c) engineering certification checklist;
 - (d) all test results required by the CWITP;
 - (e) geotechnical and structural certificates (where applicable);

- (f) ~~overland flowpath certification and supporting documentation/calculations;~~
- (g) ~~as constructed plans including hard copy and electronic ADAC (refer Section SC6.14.10.9 as constructed for detailed requirements);~~
- (h) ~~submission of a list and details of non-complying elements;~~
- (i) ~~copies of all relevant test results;~~
- (j) ~~maintenance security bond – 5% of contract value, or \$3000, whichever is the greater;~~
- (k) ~~payment of any outstanding private works accounts;~~
- (l) ~~written clearances to be obtained for works carried out on land under other ownership, upon completion of the works;~~
- (m) ~~any other documentation as may be required by Council; and~~
- (n) ~~payment of any outstanding fees and permits.~~

~~(2)(4)~~ Council will accept operational works "on maintenance" on completion of those works to an acceptable standard, for a minimum period of twelve months. However, longer periods may be required for WSUD elements and compliance with any conditions of the development permit which may include:-

- (a) completion of works in accordance with the requirements and conditions of the development permit;
- (b) submission of all as-constructed documentation;
- (c) payment of any ~~headworks or~~ other contributions or charges specified in the development permit or levied by Council;
- (d) submission of ~~RPEQ~~ engineer's certification that the works have been undertaken in accordance with the approved plans and specification and to Council's requirements;
- (e) submission of all test results required by ~~an approved inspection and testing plan~~ the ~~CWITP~~;
- (f) submission of location and AHD values of PSMs installed in the subdivision;
- (g) landscaping maintenance programs submitted; and
- (h) submission of an agreed maintenance security bond.

~~(3)(5)~~ Prior to acceptance of any works "on maintenance", it will be necessary for the works to be inspected.

~~(4)(6)~~ In the event of the works being unacceptable, a reinspection fee may be charged for subsequent inspections.

~~(5)(7)~~ Following a satisfactory "on maintenance" inspection and acceptance of the as-constructed drawings and documentation, the applicant is to submit a written request for acceptance of the works "on maintenance" and release or reduction of any uncompleted works bond within seven ~~(7)~~ days.

~~(6)(8)~~ Council will, upon confirming that the maintenance security bond amount has been approved and received, and all other relevant fees and charges paid, confirm acceptance of the works "on maintenance" and arrange for release or reduction of any uncompleted works bond held.

~~(7)(9)~~ During the on maintenance period the applicant is to pay the full cost of any necessary maintenance and repairs to roadworks, drainage and associated works, ~~water and sewerage reticulation, pump stations and associated equipment. The costs are also to cover all required reoccurring maintenance and testing to satisfy the Council's requirements and for the developer to prove development criteria set out in the original submission.~~

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~~(8)~~(10) If necessary, Council may advise ~~the~~ applicant or the applicant's agent or representative ~~will be advised~~ of works required during the on maintenance period and a time in which repairs ~~must are~~ to be completed.

~~(9)~~(11) The applicant is responsible for maintenance works during the on maintenance period and advising Council of any ~~significant-rectification~~ works.

~~(10)~~(12) Should a safety issue of either a technical or operational perspective be identified during the maintenance period, it is ~~the~~ responsibility of the developer to attend to the issue immediately to ensure public safety is maintained. If the issue cannot be addressed immediately, emergency temporary works to ensure the safety of the site are to be carried out within 24 hours and appropriately signed until repairs can be undertaken. Advice of all operations shall be provided to Council.

~~(11)~~(13) Should ~~the make safe attendance~~ the above described works not be carried out by the developer or nominated representative within 24 hours, Council is to complete the required safety works and all costs are to be borne by the developer ~~of concern~~ from the security bond.

~~o~~ On maintenance" inspections

~~(12)~~(14) At time of inspection, ~~the~~ supervising RPEQ engineer is to arrange for representatives from the principal contractor to be present ~~in conjunction with a representative from the key nominated divisions from Council~~.

~~(13)~~(15) A loaded water cart is to be present on site for the purposes of flow testing the kerb and channel. Failure to do so may result in cancellation of the inspection and/or the charging of a reinspection fee.

~~(14)~~(16) Notwithstanding the above, the works will not be formally accepted "on maintenance" until the maintenance security deposit has been lodged and ~~as~~ constructed drawings and documentation have been submitted and approved.

Acceptance of works "off maintenance

~~(15)~~(17) On completion of the on maintenance period the applicant may request release of the maintenance bond.

~~(16)~~(18) Prior to final acceptance of the works off maintenance by Council it will be necessary for the works to be inspected and RPEQ engineer certification submitted that certifies the works are performing as designed, are in sound condition and the works will achieve their design life.

~~(17)~~(19) Should the works require refurbishment due to an extended maintenance period, the cost is to be borne by the applicant (ie i.e. landscape areas have reached their useful life and require replacement).

~~(18)~~(20) The applicant is to be responsible for ensuring that all Council requirements are satisfied prior to requesting an off maintenance inspection.

~~(19)~~(21) In the event of the works being unacceptable, a reinspection fee may be charged for ~~subsequent~~ inspections.

~~(20)~~(22) Following a satisfactory off maintenance inspection the applicant is to submit a written request for acceptance of the works off maintenance and release of the maintenance security bond.

~~(21)~~(23) Council will upon confirmation that no outstanding accounts arising from the development are due to Council, confirm acceptance of the works off maintenance and arrange for the release of the maintenance security bond.

~~(22)~~(24) Should the applicant wish to maintain the works beyond the on maintenance period, a separate agreement shall be entered into between the applicant and Council.

~~(25)~~ To enable formal acceptance of the works as off maintenance (when Council accepts and is responsible for the contributed assets), items must be provided as agreed by Council at the time of formal acceptance of the works as on maintenance.

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SC6.14.11.11 SC6.14.10.11 Guidelines

- (1) For the purposes of achieving compliance with this section of the planning scheme policy, the following are relevant guidelines:-
- (a) Queensland Aus-Spec, Development Specification Series (Construction), listed in **Table SC6.14.11C-10C (Queensland Aus-Spec development specifications)**; and
 - (b) Queensland Department of Transport and Main Roads (DTMR), Standard Specifications for Roadworks including earthworks, pavement drainage and protective treatment, pavement bituminous surfacing/spray seals or asphalt, road furniture, line-marking and street lighting. DTMR specifications are available on [the DTMR website http://www.tmr.qld.gov.au/Business-and-Industry/Technical-standards-and-publications/Standard-specifications-roads.aspx](http://www.tmr.qld.gov.au/Business-and-Industry/Technical-standards-and-publications/Standard-specifications-roads.aspx);
 - (c) *MUTCD- Manual of Uniform Traffic Control Devices (Queensland)*;
 - (d) *WSUD Technical Design Guidelines for South East Queensland (Healthy Waterways, 2006)*;
 - (e) *Guidelines for Filter Media in Bioretention Systems (Version 3.01) June 2009 (FAWB)*;
 - (f) *Standard Water Sensitive Urban Design Drawings Guidelines (Institute of Public Works Engineering Australia Queensland)*;
 - (g) *Construction and Establishment Guidelines for Swale, Bioretention Systems and Wetlands (Water by Design, 2009)*; and
 - (h) *Practice Note 1: In Situ Measurement of Hydraulic Conductivity (FAWB, 2008)*.
- (2) A full list of Council civil works Standard Engineering Drawings can be obtained from:-
- (a) Standard Drawings <http://www.sunshinecoast.qld.gov.au/sitePage.cfm?code=standard-eng-drawings#index>Council's website; and
 - (b) Institute of Public Works Engineering Australia Queensland Standard Water Sensitive Urban Design Drawings, including; WSUD-001, WSUD-003, WSUD-005, WSUD-006, WSUD-008, WSUD-009, WSUD-010, WSUD-011, WSUD-012).

Note—relevant guideline documents in existence or available over the life time of this planning scheme policy **should** be referenced and used where appropriate. The above list is not exhaustive and the use of locally based guidelines by a recognised authority or agency would take preference to those developed regionally or nationally.

Table SC6.14.11C-10C Queensland Aus-Spec development specifications

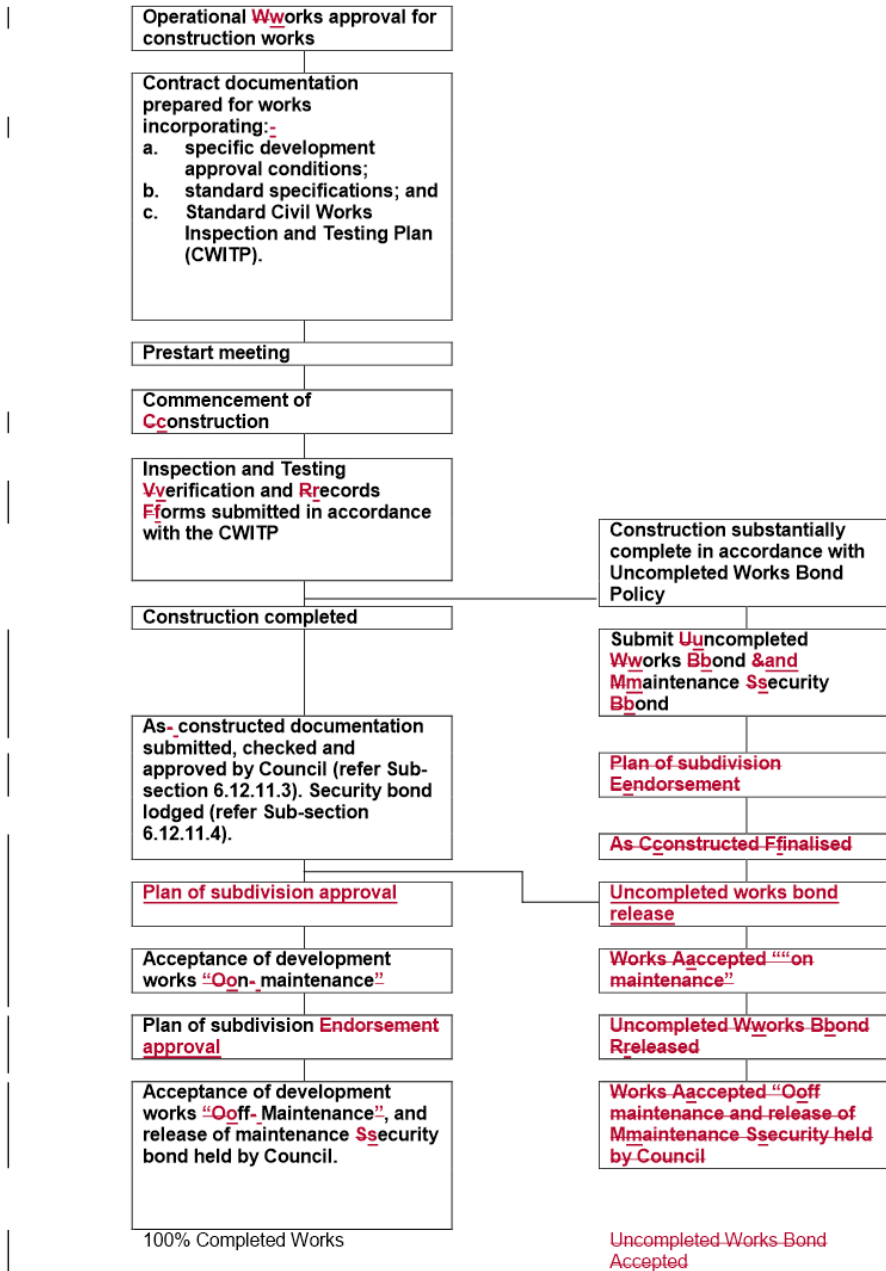
Specification No.	Specification Title
CQS	Quality System Requirements
CQC	Quality Control Requirements
C101	General
C201	Control of Traffic
C211	Control of Erosion and Sedimentation
C212	Clearing and Grubbing
C213	Earthworks
C220	Stormwater Drainage – General
C221	Pipe Drainage
C222	Precast Box Culverts
C223	Drainage Structures
C224	Open Drains including Kerb &and Gutter (Channel)
C230	Subsurface Drainage – General
C231	Subsoil and Foundation Drains
C232	Pavement Drains
C233	Drainage Mats
C241	Stabilisation
C242	Flexible Pavements
C244	Sprayed Bituminous Surfacing
C245	Asphaltic Concrete
C247	Mass Concrete Subbase
C248	Plain or Reinforced Concrete Base

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Specification No.	Specification Title
C254	Segmental Paving
C255	Bituminous Microsurfacing
C261	Pavement Markings
C262	Signposting
C263	Guide Posts
C264	Non-Rigid Road Safety Barrier Systems (Public Domain)
C265	Boundary Fencing
C271	Minor Concrete Works
C273	Landscaping
C501	Bushfire Protection (Perimeter Tracks)
DQS	Quality Assurance Requirements for Design
D1	Geometric Road Design (Urban and Rural)
D2	Pavement Design
D3	Structures/Bridge Design
D4	Subsurface Drainage Design
D5	Stormwater Drainage Design
D6	Site Regrading
D7	Erosion Control and Stormwater Management
D8	Waterfront Development
D9	Cycleway and Pathway Design
D10	Bushfire Protection

Schedule 6

Appendix SC6.14E Typical development construction process



Schedule 6