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PLANNING SCHEME POLICY 3—GENERAL WORKS

PART 1—STANDARDS FOR DESIGN OF ROADWORKS

Division 1—Site and Road Layout

NOTE 1.1A

- (1) The ideal site and road layout will result from consideration of the social, environmental and traffic factors, the development layout and engineering constraints.
- (2) Engineering constraints include drainage overland flow paths, vertical alignment, horizontal alignment, reasonable access to allotments, etc and the road layout is to accommodate these constraints.
- (3) Prior to preparing the development layout plan, it should be ascertained if a layout already exists for the area in question and to ensure that the road network proposed will generally conform with the overall road hierarchy and open space plan envisaged by the Local Government.
- (4) Streets are to be designed in accordance with the general parameters outlined in Appendices D, E, F and G of the Reconfiguring a Lot Code.
- (5) It is essential that full and accurate topographical information be available at the roadworks design stage, to enable an accurate assessment of the suitability of the proposed road locations.
- (6) Where a conflict or inconsistency occurs between cited manuals, the manual with the latest publication date is to take precedence.

1.1.1 Design Criteria

- (1) Except as specifically varied hereafter, the design of Arterial and Sub-Arterial Roads is to be based on Ipswich City Council Standard Drawings, Department of Transport and Main Roads (DTMR) design manuals and Austroads Guides to Traffic Management, Guides to Road Design and Guides to Road Safety.

- (2) Except as specifically varied hereafter, the design of Access Streets, Access Places, Local Industrial Streets, Collector Streets, Major Collector Streets and Industrial Collector Streets is to be based on the Ipswich City Council Standard Drawings and associated technical guidance.
- (3) Superelevation is to be provided on all Roads and Streets classified as Major Collector.
- (4)
 - (a) The minimum grade for all Roads which will ultimately include kerb and channel is to be 0.5%;
 - (b) The minimum grade for all Roads which will ultimately have earth table drains, is to be 1.0%.

NOTE 1.1.1A

Roads constructed without kerb and channel, completely in embankment may have zero grade.

- (5) A vertical curve, of parabolic form, is to be provided at every change of grade, where the algebraic change of grade exceeds, for—
 - (a) Access Places, Access Streets, Collector Streets - 1.0%
 - (b) Major Collector, Sub Arterial, Arterial, Major Arterial - 0.6%

NOTE 1.1.1B

Every effort should be made to provide vertical curves as long as possible, for improved appearance.

- (6)
 - (a) A minimum 10 metre vertical curve is to be provided where a side road joins a through road at three way intersections.
 - (b) The tangent point of a vertical curve in the side road is to be located at, or outside of the kerb line of the through road.
 - (c) A crest vertical curve that masks the commencement of a horizontal curve is to be avoided.
- (7)
 - (a) All sealed pavements and shoulders are to have crossfalls of 3.0%.
 - (b) The maximum cross-fall on grassed medians on divided roads is to be desirably 1 in 6 with an absolute maximum of 1 in 4.



- (c) At median openings, the pavement crossfall is not to exceed 5%.

NOTE 1.1.1C

The longitudinal grade should also be considered in relation to high vehicles turning through an intersection.

- (8) Provision for cyclists is to be included on all sub-arterial and arterial roads, irrespective of whether off-road bicycle or shared bicycle/pedestrian facilities are also provided on an adjacent verge.

NOTE 1.1.1D

In the case of roads, cyclist facilities are generally provided by means of marked bicycle lanes or wide kerbside lanes/parking lanes/road shoulders, conforming to the requirements of Austroads Guide to Traffic Management, Guide to Road Design and Guide to Road Safety.

- (9) Carriageway cross-sections for Roads are to conform to the requirements of Standard Drawings Nos. SR.04 and SR.05.
- (10) Carriageway cross-sections for Streets are to conform to the requirements of Appendices D, E, F and G of the Reconfiguring a Lot Code and Standard Drawings Nos. SR.02 and SR.03.
- (11) All street lighting design is to be in accordance with the Australian Standard 1158.3.1 series for Pedestrians.
- (12) For large lot residential streets, street lighting spacing exception is minimum 120m interval.
- (13) Street lighting is to be installed on the same side as the concrete footpath.

NOTE 1.1.1E

Split level roads/streets should be avoided.

1.1.2 Truncations

- (1) Truncations of the real property boundaries are to be provided at speed restriction devices, bends and intersections in accordance with Part 12, Division 5 of the Reconfiguring a Lot Code. Roadway and footpath widths are to be maintained at the minimum specified widths at any point.

1.1.3 Pavement Tapers

- (1) (a) Pavement tapers to existing construction is to be designed in accordance with the Austroads Guide to Traffic Management, Guide to Road Design and Guide to Road Safety based on the design speed of the road.
- (b) Tapers are to be constructed to the same standard as the proposed full road pavements.

1.1.4 Frontage Streets/Roads

- (1) Where the street/road frontage to a development is unsealed or unformed at the time of development approval, it is to be constructed to a standard specified in the conditions of approval or where not specified in the conditions of approval no less than the greater of one half of the full width/road or 6 metres from the nominal kerb line to the bitumen edge.
- (2) An existing sealed frontage street/road to a development is to be reconstructed to one half of the full width of the street/road unless the existing pavement is adequate for the ultimate design conditions, in which case the pavement shall be widened only with kerb and channel provided at the nominated alignment.
- (3) The development frontage roadworks are required to connect to existing road network and infrastructure (including drainage).
- (4) Concrete kerb and channel and footpath verge are to be reinstalled in accordance with Council's Standard Drawings for any redundant crossover.
- (5) Concrete footpaths and kerb ramps are required in accordance with Section 1.1.10 and Section 1.1.12 (9).

1.1.5 Intersections

- (1) Intersections on roads are to be designed in accordance with the current Department of Transport and Main Roads "Road Planning and Design Manual" and Austroads Guide to Traffic Management, Guide to Road Design and Guide to Road Safety.

NOTE 1.1.5A

The design criteria is to be nominated by the Local Government.

- (2) All new intersections of Access Places, Access Streets, Collector Streets, Major Collector Streets, Rural and Industrial Roads are preferably to be designed as a three way intersection.
- (3) Where unavoidable, four way intersections are to be designed as roundabouts in accordance with Section 1.1.6 Roundabouts and Standard Drawing No. SR.29, having particular regard to the needs and safety of pedestrians and cyclists.
- (4) Four way intersections are to be designed at the junctions of Arterial and Sub Arterial Roads or Major Collector Streets only where signalisation (preferred) or roundabouts are proposed.



NOTE 1.1.5B

- (1) Warrants for the provision of channelisation at intersections will be traffic volumes and intersection layout.
- (2) In general, channelisation will normally be required to be provided—
 - (a) at all arterial to arterial intersections;
 - (b) at all arterial to sub-arterial intersections;
 - (c) at most major collector to arterial intersections;
 - (d) at occasional collector to collector intersections.

- (5) All channelisation is to be designed in accordance with the current Department of Transport and Main Roads “Road Planning, and Design” Manual and Austroads Guide to Traffic Management, Guide to Road Design and Guide to Road Safety to accommodate a Design Semi Trailer, providing a clearance of not less than 0.6 metres between the outer wheel track and the kerbs at all points.
- (6) All arterial intersections are required to be designed to the B Double Semi-Trailer Turning Path.
- (7) Traffic islands are to be designed in accordance with the current Department of Transport and Main Roads Design Manuals and Austroads Guide to Traffic Management, Guide to Road Design and Guide to Road Safety.

NOTE 1.1.5C

Particular attention is to be given to sight distance when commencing islands at horizontal and vertical curves.

- (8) All traffic islands are to be signed and delineated in accordance with the requirements of the Department of Transport and Main Roads “Manual of Uniform Traffic Control Devices” (MUTCD).
- (9) Where a marked exclusive bicycle lane is not required, the pavement of a left turn auxiliary lane is to be preferably 3.7 metres wide and, in restricted locations, not less than 3.0 metres wide.
- (10) Where barrier kerb is used these widths, where practicable, are to be increased by at least 0.3 metres and preferably 0.6 metres.
- (11) Where practical, similar widths apply for right turn auxiliary lanes.
- (12) On major collector streets, median openings should be provided at all intersections except at intersections with access places.

- (13) On sub-arterial and arterial roads, the minimum spacing of median openings should be approximately 400 metres.
- (14) All intersection threshold treatments shall be constructed of concrete in accordance with Standard Drawing No. SR.28 and shall be highly visible in accordance with the MUTCD.
- (15) Threshold treatments should only be provided where a change to the speed environment or intersection priority movement exists.
- (16) The design of traffic signals is to be in accordance with the DTMR *Standard Drawings Road Manual – Part 15: Traffic Signals* and Standard Drawing 1425 for rectangular loops at intersections.
- (17) The traffic signals must be connected to STREAMS traffic signal network.
- (18) The field processor cables and additional power points are to be provided within the electrical controller.
- (19) The traffic signals must be installed by a contractor who is accredited by DTMR.

NOTE 1.1.5D

Necessary permits are to be obtained from Council prior to undertaking works that affect the operation of existing traffic signals.

1.1.6**Roundabouts**

- (1) The parameters in the table below are to be used for design purposes –

Street Type	Access	Collector	>Collector
No. of approach lanes	1	1 or 2	2 max
Approach speed km/h	Design speed of street / road		
Speed through roundabout km/h	20 max	25 max	50 max
Min radius of centre island ⁽¹⁾	8	8	In accordance with Austroads Guidelines
Stopping sight distance – 1.15m to zero	45	45	

Notes: ⁽¹⁾ Subject to the required design vehicle for the road hierarchy.



- (2) The design of a roundabout is to be in accordance with the Austroads Guide to Road Design Part 4B: Roundabouts and Standard Drawing No. SR.29.

NOTE 1.1.6A

The needs of pedestrians and cyclists are to be addressed at the design stage.

- (3) The design shall accommodate the design and checking vehicles as well as the recommended radii in accordance with the Austroads Design Vehicles and Turning Path Templates Guide.
- (4) Sub Arterial Roads are to have the same design and checking vehicle as well as the radii as that of an Arterial Road within the Austroads Design Vehicles and Turning Path Templates Guide.
- (5) The extended centrelines of the last 20m of approach roadways must pass through the centre point of the roundabout.
- (6) The minimum sight distance requirements are to be in accordance with Austroads Guide to Road Design Part 4B: Roundabouts: for Criteria 1, 2 and 3. Criterion 3 is mandatory for Sub-arterials and Arterial Roads and does not apply to Access and Collector Streets.
- (7) Central islands of 15m radius or greater (or similar area) shall drain to an internal system and not direct sheet flow of stormwater onto the circulating roadway.
- (8) Cycle lanes are to be provided up to and through roundabouts for all roads where cycle lanes have been provided.
- (9) The minimum verge width at roundabouts shall be in accordance with the design standards for each class of road or street.
- (10) Full details of any landscaped islands, together with the associated drainage/irrigation system shall be provided.
- (11) Maximum planting height in visibility areas is to be 400mm above pavement unless otherwise approved by Council.
- (12) The design of any landscaping for roundabouts is to also ensure that the sight distance requirements are also achieved - refer to the *Ipswich Streetscape Design Guideline* for landscaping requirements.

1.1.7 Culs-De-Sac – Turning Areas

- (1) Standard Turning Areas at the head of residential culs-de-sac are to be based on the typical manoeuvring areas for Council's design garbage truck.
- (2) The turning area is to be capable of accommodating most vehicles with a single movement turn.

- (3) Circular turning heads are preferred and "T" and "Y" shaped turning heads are generally not to be used.

- (4) Where a full turning circle is provided the minimum kerb radii is to be—

- (a) approach curve tangential to the turning circle- 20m
- (b) the turning circle- 9m

- (5) Turning areas at the ends of culs-de-sac in industrial developments are to be full turning circles with the following minimum kerb radii—
- (a) approach curve tangential to the turning circle- 30m

- (b) the turning circle- 12.5m

- (6) "No Through Road" signs shall be erected at the entries to all culs-de-sac and terminating roads.

1.1.8 Access to Allotments**NOTE 1.1.8A**

- (1) Steep sideslope of the natural surface can result in difficulty in providing vehicular access to allotments fronting the road.
- (2) Driveway grades should be limited for safety and amenity.

- (1) The maximum driveway grades are to be as follows—

	Maximum Driveway Grades	Desirable	Absolute
(a)	Residential	16.6% (1 in 6)	25% (1 in 4)
(b)	Industrial	10% (1 in 10)	16.6% (1 in 6)

NOTE 1.1.8B

Standard footpath profiles are to be maintained.

- (2) The construction of the concrete driveway strip (e.g. handle to hatchet lots) is to conform to Standard Drawings No. SR.12, SR.13, SR.14.

- (3) Where the works are not supervised by a registered engineer (RPEQ) then the concrete works are to be undertaken by an appropriately licensed Queensland Building and Construction Commission (QBCC) Trade Contractor.

- (4) The Licensed Trade Contractor must at completion of works provide certification to Council certifying that the works have been undertaken in accordance with applicable Standard Drawings No. SR.12, SR.13, SR.14.



NOTE 1.1.8C

- (1) For subgrade preparation, all topsoil, debris and tree stumps should be removed and the area appropriately levelled to provide a uniform platform for the driveway pavement.
- (2) Any poor, saturated, highly compressible or otherwise weak areas should be removed and replaced with suitable subgrade or roadbase material adequately compacted with a plate compactor or small roller.
- (3) If heavy loads are anticipated, such as heavy vehicles used for building construction, the ability of the subgrade to adequately support the loads without excessive deflection and cracking of the pavement needs to be considered.

1.1.9 Verges

- (1) The cross-section of the verge (i.e. that portion of the road reserve between the kerb and the property alignment), is to conform to Standard Drawings.
- (2) Where the construction of concrete footpath paving is required, it is to be 1.5 metres in width or 2.0/2.5 metres where required as a shared footpath/bikeway and located in accordance with Standard Drawing No. SR.19.
- (3) Services and utilities are to be in accordance with Standard Drawings Nos. SR.22 and SR.23.

NOTE 1.1.9A

Where Energex, Telstra or other Service Providers share a joint user trench, conduits are to be located in accordance with the current policies of those Service Providers.

1.1.10 Pathways

- (1) The minimum width of land for a pathway is to be 10.0 metres.
- (2) Concrete paving is to conform to Standard Drawings Nos. SR.19 and SR.30.
- (3) The concrete pavement within a pathway is to be constructed to the adjacent kerb and channel together with a kerb ramp.
- (4) A 1.8 metre high screen fence is to be constructed on both sides of the pathway.
- (5) Bollards are to be installed to restrict vehicular access at the ends of pathways but are to be located and delineated so as not to create a hazard for pedestrians and cyclists.

1.1.11 Bikeways

- (1) The minimum width of land for a bikeway is to be 5.0 metres to accommodate a 2.5 metre wide concrete paved bikepath.
- (2) The design is to be carried out in accordance with AS 1742.9-1986, Austroads Guide to Traffic Management, Guide to Road Safety and Guide to Road Safety, and the Department of Transport and Main Roads "Manual of Uniform Traffic Control Devices" (Part 9, Bicycle Facilities).
- (3) Bikeways located in Parks are to be constructed above the flow of a storm event with an ARI of 1 year.

1.1.12 Kerb and Channel

- (1) Concrete kerb and channel is to be provided on both sides of all streets.
- (2) For roads, refer to the relevant applicable Standard Drawing to determine if concrete kerb and channel is required.
- (3) The standard kerb and channel for streets is to be mountable type, Type M1 in accordance with Standard Drawing No. SR.11. Where development is infill, the kerb and channel is to match the existing connecting road kerb profile unless another kerb type is required for a particular purpose.
- (4) Barrier type kerb and channel with 450mm channel (type B1) in accordance with Standard Drawing No. SR.11 is to be used in the following cases—
 - (a) in streets adjacent to parks;
 - (b) industrial streets, where heavy duty barrier type is to be used (i.e. standard barrier type, increased to minimum 200mm);
 - (c) Shopping Centres and in locations where high pedestrian volumes are likely or for greater pedestrian safety, e.g. on the frontage of schools, major sporting facilities and parks.
- (5) Semi-mountable type kerb is to be used in the following cases—
 - (a) at Medians and Traffic Islands, semi-mountable or low profile kerb type SM3 for concrete infilled treatments and type SM5 for landscaped treatments in accordance with Standard Drawing No. SR.11;
 - (b) at Roundabouts, kerb type M5 on the outer island and type SM4 on the centre island in accordance with Standard Drawing No. SR.11.



- (6) Where proposed construction adjoins existing kerb and channel the new construction is to be tapered smoothly to the existing kerb and channel.
- (7) The grading of kerb and channel is to conform to the road centreline grading, although at locations where the kerb and channel grading diverts from the centreline grade, such as at intersections or on superelevated curves, the minimum channel grade is to be 0.45%.

NOTE 1.1.12A

Every endeavour is to be made to improve the appearance, by providing vertical curves of as long a length as possible, at all changes of grade.

- (8) At all changes in horizontal alignment, kerbs and kerb and channel are to be constructed with horizontal curves.

NOTE 1.1.12B

To improve appearance where small deflections occur (e.g. on tapers), horizontal curves shall be as long as possible.

- (9) Kerb ramps are to be provided at all kerb returns and at park entrances and where linking footpaths to the existing footpath network.

1.1.13 Signs and Road Markings

- (1) Permanent signing and road marking are to be in accordance with the Department of Transport and Main Roads "Manual of Uniform Traffic Control Devices" (MUTCD) and other relevant, Department of Transport and Main Roads design manuals and guidelines.
- (2) The removal of pavement marking must be carried out in such a manner as to minimise damage to pavement surface and avoid ambiguous or confusing delineation.
- (3) Acceptable methods include high pressure water blasting, grinding and strip sealing.
- (4) 'Blacking out' a pavement marking is only suitable as a temporary measure.
- (5) Street name signs shall be manufactured and erected in accordance with Standard Drawing No. SR.26 at each intersection.

NOTE 1.1.13

- (1) All signs and pavement markings shall be adequately dimensioned to ensure accurate setting out.
- (2) "No Stopping" signs or yellow lines are not required for zones that are already prohibited by road rules.
- (3) A combination of yellow lines and "No Stopping" signs is not recommended.

- (4) "No Stopping" signs should only be provided where there is no kerb and channel.
- (5) Where there is kerb and channel, then yellow lines only should be applied.

1.1.14 Road Edge Guide Posts and Safety Barriers

- (1) Road edge guide posts are to be provided at all locations where concrete kerb and channel is not constructed e.g. half road construction; tapers; ends of roads; etc.

NOTE 1.1.14

- (1) For the warrants and locations of safety barriers, refer to the current Department of Transport and Main Roads "Road Planning and Design Manual".
- (2) It is to be confirmed in writing by the designer that the proposed safety barriers are in accordance with the abovementioned design manual and that the safety barrier site selection criteria have been addressed.
- (3) The Local Government may request the installation of road edge guide posts at the top of embankments where safety barriers are not installed.

1.1.15 Bus Stops

- (1) Unless otherwise specified, bus stops must be positioned, designed and constructed in accordance with Ipswich City Council Standard Drawings.

Division 2—Flexible Pavement Design**NOTE 1.2A**

- (1) This section is intended to facilitate the checking and approval of proposed pavement designs for roadworks associated with reconfigurations and building development works.
- (2) This section is not intended to be used in lieu of design manuals.

1.2.1 Determination of Subgrade Strength

- (1) A design CBR is to be determined for each identifiable unit defined on the basis of topography, geological and drainage condition of the site.
- (2) The four day soaked CBR at a compaction of 100% Standard compaction is to be the standard test.



- (3) Tests are to be carried out in a NATA registered laboratory.

NOTE 1.2.1A

- (1) Test results and pavement design are to be submitted to the Local Government for acceptance prior to a request for subgrade box inspection.
- (2) For design purposes, it should be assumed that sub-soil drainage will be required at all locations where the bottom of the pavement is below the natural surface.

- (4) The sampling is to be randomly located within each length of the proposed roadway with constant subgrade material.
- (5) For less than five results the Design CBR shall be the least estimated insitu CBR result.
- (6) For five or more results, the Design CBR shall be the 10th percentile of all estimated insitu CBR results.
- (7) The samples shall be taken generally in the position of the outer wheel path on both sides of the proposed road.
- (8) The frequency of testing required is to be in accordance with the specifications outlined in Table 1.2.1.

Table 1.2.1: Frequency of Testing for Subgrade

Testing Type	Roads < 120 M	Roads > 120 M
LABORATORY	Sample at 2 sites	Sample at 1 site every 60 to 100 m
Soaked CBR's and Routine Soil Tests	Lab tests on all relevant materials	Lab tests on all relevant materials
FIELD	3 tests on subgrade	1 test on subgrade every 50m
Dynamic Cone and Field Moisture Content	routine soil tests on sub-grade from 1 of these	routine soil tests on subgrade from 1 site in 3

1.2.2 Pavement Materials

- (1) Pavement materials are to be in accordance with the requirements of Department of Transport and Main Roads Specification "MRTS 05 Unbound Pavements".
- (2) Pavement types are to be as defined in accordance with Table 1.2.3 – "Minimum Pavement Course Thickness".

- (3) Pavement materials are to be Type 2 in accordance with Department of Transport and Main Roads Specification "MRTS 05 Unbound Pavements".

1.2.3 Determination of Design Traffic

- (1) Design traffic loadings for the various road classifications are to be as outlined in Table 1.2.2.

Table 1.2.2: Design ESA's by Road Class

Description	Road Class	ESA's
Access Place	A (30 Lots Max.)	5×10^4
Access Street	A1 (75 Lots Max.)	1.0×10^5
Collector	B (300 Lots Max.)	2.0×10^5
Major Collector	C (1000 Lots Max.)	1.0×10^6
Industrial	D	7.0×10^6
Sub-Arterial & Arterial	E	DTMR Design Standards

1.2.4 Minimum Pavement Thickness

- (1) Pavement and asphaltic concrete course thicknesses are to be as set out in accordance with Table 1.2.3. The minimum total design pavement depth is 225mm (excluding asphalt).
- (2) If the Design CBR determined for the subgrade is less than the minimum CBR given in Table 1.2.3 (i.e. CBR less than 3) and the subgrade is expected to be of sufficient strength to allow pavement construction to proceed (ie. the subgrade does not exhibit visible signs of deformation or instability under proof rolling).
- (3) The designed pavement thickness is to be determined as follows—
- CBR 2 = 100mm + design depth based on a design subgrade CBR of 3;
 - CBR 1 = 200mm + design depth based on a design subgrade CBR of 3.



Table 1.2.3: Minimum Pavement Course Thickness

Minimum Total Course Thickness					
Road Class	A	A1	B	C	D
Asphalt	As required in accordance with DTMR Specification 'MRTS30' for AC10			As required in accordance with DTMR Specification 'MRTS30' for AC14	
Base Course Type 2.1 (Min CBR80)	125	125	125	125	150
Upper Sub Base Type 2.3 (Min CBR45)	100	100	100	100	150
Lower Sub Base Type 2.5 (Min CBR15))	For CBR3 or greater as required to obtain minimum thickness (100mm minimum layer thickness) in accordance with Austroads Guide to Pavement Technology Part 2: Pavement Structural Design for design traffic and pavement with thin bituminous surfacing. Refer to Section 1.2.4 (4) for working platform requirements where CBR is less than 3.				

Notes for Table 1.2.3—

- (1) CBR is the 4 day soaked CBR value.
- (2) If upper sub-base course minimum thickness cannot be achieved, then base course material is to be used for full pavement depth.
- (3) Kerb and Channel shall be in accordance with section 1.1.11.
- (4) AC surfacing thickness is to be added to the gravel thickness to determine the total box depth.

- (4) For subgrades that are expected to be at, or near, the design strength at the time of construction (i.e. will not support a loaded water cart without deformation), the material should be treated as a soft subgrade and one of the following measures is to be adopted—
 - (a) some form of working platform is to be provided (minimum depth 300mm, CBR 15 material);
 - (b) use of geofabric sheeting;
 - (c) stabilise the soil by use of a mixture of cement or lime.

NOTE 1.2.4A

- (1) For design purposes, the subgrade improvement or working platform should be ignored and a CBR 3 used for the subgrade for all road classifications.
- (2) The thickness of the working platform or depth of stabilisation is not part of the designed pavement thickness.
- (3) Before any of the methods outlined in section 1.2.4 is adopted, approval must be obtained from the Local Government and any submission for its use is to be supported by technical information from the manufacturer or a recognised geotechnical testing authority.



Division 3 — Electrical Reticulation and Street Lighting

1.3.1 Design Criteria

- (1) All lighting design is to comply with the provisions of Australian Standard 1158.1 and AS1158.2.
- (2) The minimum street lighting Category is P4.
- (3) Road street lighting poles and luminaires must be supplied at "Rate 3" tariff.
- (4) A pedestrian underpass or tunnel must be lit in accordance with Austroads.
- (5) All cross road conduits for electricity shall be at an angle between 45 degree and 90 degree to the road centreline.
- (6) Where cross-road electricity conduits are located parallel to other services or conduits, those services and conduits shall be separated by at least 1.0m, except where prior approval is granted by the relevant authority.
- (7) The design form outcome is to maintain consistency and uniformity in terms of luminaire type, lamp type, wattage, mounting height, outreach size and spacing.
- (8) Outreach of 4.5m length should be avoided where practical.
- (9) All poles and outreaches must be hot dipped galvanised.
- (10) The use of coloured poles and outreaches must be limited to heritage and decorative types, specifically "Nostalgia" and "Avenue".
- (11) All coloured poles and outreaches must be powder coated and uniform black colour only.
- (12) The desired design outcome is to minimise the lighting intrusion on existing and future dwellings to be no greater than an analysed reading of 1 lux vertical illumination at 1.5m height on adjacent windows (using a maintenance factor of 0.7). Siting of any future dwellings shall generally be determined as 4m offset from the property boundary.
- (13) Shields, covers or shrouds are not an acceptable form of reducing the effects of obtrusive lighting.
- (14) Where lighting is proposed within a 6 kilometre radius of an airport then aeroscreen based lenses must be used so that there is no upward light projection in accordance with civil aviation regulation.
- (15) All luminaires are to be Light-emitting Diode (LED) type light source.
- (16) The Luminaire must be included on the Australian Energy Market Operator (AEMO) Load Table for Rate 3 unmetered public lighting.

- (17) The luminaire performance must satisfy the specifications provided in Table 1.2.4.
- (18) Any protective circuit equipment must not have any residual current protection element installed.
- (19) All equipment shall be designed and installed in accordance with the requirements as detailed in Standard Drawings Nos. SL.01 – SL.07.
- (20) Where pits for underground cable installation are to be used the bottom entry of conduits to pits is not permitted.

Table 1.2.4: LED Luminaire Performance Specifications

Criteria	Performance
Material	No polycarbonate elements unless UV stabilised
Thermal Endurance	Cooling system shall consist of a heat sink only and shall be resistant to debris build up to maintain heat dissipation performance.
Design Life	Luminaires – minimum service life of 20 years Lamp – 50,000 hours to achieve a lamp lumen maintenance factor of L90 or higher (based on 4560 hours per annum to exceed 12 years for a lamp replacement cycle).
Lumen depreciation	After 50,000 hours, when tested in accordance with Clause 5.7 of AS1158.6 shall be greater than or equal to L90.
Correlated Colour Temperature (CCT)	Nominal CCT shall be 4000 (K).
Colour Render Index (CRI)	Colour Rendering Index to be between 70 and 100 at full lumen output.
Luminaire control	Local photo electric (PE) cell. Fitted with NEMA 7 pin socket and wired to the LED driver for monitor and remote control Where NEMA 7 pin plug is not installed then a weather resistant cover is to be installed to prevent material ingress to socket.



**Table 1.2.4: LED Luminaire
Performance Specifications cont...**

Criteria	Performance
Environment Conditions	Must be suitable to operate within South East Queensland temperature ranges and climatic conditions.
Component connections	Spigot fixing sizes in accordance with Clause 4.10 AS1798. Depth of spigot as specified in Table 2.2 AS1158.6. Capable of wireless control. Fitted with NEMA 7 contact pattern photocell receptacle base and matching shorting plug.
Safety	Electrical interference must not exceed limits prescribed in AS CISPR 15.
Mass weight	No greater than 7.2kg for P Category lighting schemes and 15kg for V Category lighting schemes.
Power system and quality	Minimum power factor is 0.9. Harmonic distortion and flicker shall satisfy electrical entity specifications.
Warranty	Warranty must be provided for full replacement of the luminaire due to failure for minimum 10 years. Includes the LED light engine and power supply and driver. Failure is deemed where there is less than 70% light output from the LED module.

NOTE 1.3.1A

- (1) The installed lighting should where practical reduce and minimise installation, operational and maintenance cost.
- (2) This can be achieved by:
 - (a) maximising lighting offsets, thereby minimising the quantity of luminaires; and
 - (b) selection of appropriate luminaire type and wattage.

1.3.2

(1)

Street Lighting Pole Location

In general, lighting poles are to be located:

- (a) on the same side as the constructed concrete footpath for residential access streets;
- (b) in line with property side boundaries; and
- (c) to facilitate maintenance access by an authority service vehicle.



PART 2—STANDARDS FOR DESIGN OF STORMWATER DRAINAGE WORKS

Division 1—Design Criteria

2.1.1 Design Parameters

- (1) Design parameters are to be in accordance with the criteria listed in the Reconfiguring a Lot Code, Queensland Urban Drainage Manual (QUDM) and Ipswich City Council Standard Drawings, except as amended by this Planning Scheme Policy.

NOTE 2.1.1A

- (1) The design of the proposed drainage system is to ensure that the upstream drainage is not adversely affected and that the downstream drainage system is capable of adequately catering for the discharge of the additional flow produced as a result of the development.
- (2) If the downstream system is not capable of carrying the increased discharge, measures are to be proposed to ensure the downstream system is capable of carrying the increased discharge or the stormwater is to be detained on the site.
- (3) Measures are to include, but not be limited to, investigation for upgrading the existing downstream system.
- (4) The design of the proposed drainage system is to accommodate both existing and future developed flows from upstream catchments.
- (5) Drainage Reserves over downstream drainage paths or written approval from the affected property owners is required from the development site to the point of discharge.
- (6) The minor drainage system is to be piped throughout the development.

2.1.2 Gullies/Access Chambers

- (1) Gully pits are to be designed and constructed in accordance with Standard Drawing No. SD.04.
- (2) The grate and frame details are to be in accordance with Standard Drawing No. SD.07.
- (3) The stormwater line from structure to structure is located beneath the kerb and channel (verge side outer edge of the pipe to be directly beneath the back of the kerb and channel).
- (4) Stormwater lines under the road pavement are to be kept to a minimum, and no access covers are permitted in the road pavement.

- (5) The stormwater pipe is not to be located behind the back of the kerb.
- (6) Gully pits are to be located on straights wherever possible.
- (7) Gully pits are to be located to reduce the likelihood of conflict with future driveway locations.
- (8) Overland flow paths are to be provided at all sag points.
- (9) Anti ponding gullies in curves are to be side entry type, chamber and grate only and are to be avoided wherever possible.
- (10) Gully pits in excess of 1.5 metres deep are to be constructed as a gully pit/access chamber structure.
- (11) Access chambers are to be designed and constructed in accordance with Standard Drawing No. SD.02.

NOTE 2.1.2A

Non-standard structures are to be fully detailed in the Engineering Drawings.

- (12) Step irons are to be installed in all access chambers and gully pits in excess of 1.2m deep.

2.1.3 Detention Basins

- (1) Detention basins are to be designed in accordance with QUDM to criteria nominated by the Local Government for specific applications.

NOTE 2.1.3A

- (1) The Local Government is to be consulted prior to proceeding with the design of detention basins.
- (2) Refer to Ipswich City Council Implementation Guideline No. 24 – Stormwater Management.

2.1.4 Risk Assessment

- (1) Risk assessment is to be conducted in accordance with QUDM to develop the risk profile for stormwater systems including all culverts, detention basins and inlet structures.



2.1.5 Easements

- (1) Easements with a minimum width of 4.0m are to be provided over proposed or existing stormwater drains (375mm diameter or greater) and overland flows from a storm event with an Annual Exceedence Probability (AEP) of 1%, where located within private property.
- (2) The easements are to be centrally located over the pipe alignment and are to be granted free of cost to or compensation payable by Council.

Division 2—Roofwater and Interallotment Drainage Systems

NOTE 2.2A

The provisions of a piped drainage system, within allotments to receive roof and allotment runoff may be necessary in the following circumstances—

- (a) where lots fall away from the street;
- (b) where the proportion of impervious area within a development is such that surface runoff is likely to be intolerably high, e.g. within industrial and multi-unit lots; or
- (c) where the construction of buildings up to side or rear boundaries may be permitted thus blocking or concentrating natural flow paths.

2.2.1 Design Criteria

- (1) The design is to comply with the Reconfiguring a Lot Code and the Queensland Urban Drainage Manual (QUDM), except as amended by this Planning Scheme Policy.
- (2) For residential development the roofwater and inter-allotment drainage must be minimum Level III in QUDM.

2.2.2 Pipe Size

- (1) The minimum pipe size is to be 225 mm diameter, and the maximum pipe size is to be 375mm diameter.

2.2.3 Location of Pipe

- (1) The main "line" is to be located 0.6 metres from rear boundaries and 1.2 metres from side boundaries.

2.2.4 Access Chambers

- (1) Access chambers are to be provided at the following locations—
 - (a) change of grade;
 - (b) change of pipe size;
 - (c) change of direction;
 - (d) end of line.

2.2.5 Branch Connections

- (1) At least one connection point is to be provided on the main line for each property.

2.2.6 Outlets

- (1) All interallotment roofwater drainage systems are to discharge into a suitably located stormwater pit or access chamber in the street.
- (2) Where the design of the street drainage system is such that up to a maximum of two (2) properties are so isolated from a stormwater pit or access chamber that their private drainage system could not be reasonably expected to connect, discharge into the kerb and channel will be allowed subject to a hydraulic analysis as to the existing road flows and capacity of the roadway for the increased discharge.

2.2.7 Design Discharge

- (1) Mannings Equation with a minimum 'n' value of 0.11 is to be used to determine pipe sizes.
- (2) The minimum pipe grade is 0.35 percent dependant upon the diameter of the services.
- (3) Pipes may be graded "obvert to overt" provided that the following minimum falls are provided through pits and access chambers—
 - (a) 0 - 30 degrees – 0.02m;
 - (b) 30 - 60 degrees – 0.04m;
 - (c) 60 - 90 degrees – 0.08m.



Division 3—Water Quality Control

NOTE 2.3A

- (1) The Local Government is committed to minimising erosion and sedimentation, and the degradation of surface and groundwater quality which can result from development, both during and after construction.
- (2) Effective water quality control involves—
 - (a) implementation of Stormwater Quality Best Management Practices;
 - (b) integration of water quantity, water quality and waterway corridor issues into the design of both permanent and temporary water quality control measures;
 - (c) staging and programming of works to minimise erosion potential; and
 - (d) a commitment to the monitoring and maintenance of water quality control measures.
- (3) Water Quality Control measures can be divided into two categories—
 - (a) Temporary Water Quality Control—
 - (i) These measures are required to control and filter the runoff from areas disturbed during construction.
 - (ii) These are typically erosion and sediment control measures and should preferably be the first items constructed when work begins.
 - (b) Permanent Water Quality Control—
 - (i) These works are to be implemented to control runoff water quality beyond the initial construction and maintenance stages.

2.3.1 Temporary Methods of Water Quality Control

- (1) Temporary methods of water quality control, which comply with this division, are to be included in the development.

2.3.2 Permanent Methods of Water Quality Control

- (1) Permanent methods of water quality control, which comply with this division, are to be included in the development.

2.3.3 Stormwater Quality Management Strategy

- (1) Development applications must be submitted with a Stormwater Quality Management Plan that details the temporary and permanent methods of water quality control that are to be included in the development.
- (2) The Stormwater Quality Management Plan must detail the temporary and permanent methods of water quality control that are to be included in the development.

NOTE 2.3.3A

Stormwater Quality Management Plan

- (1) A Water Quality Management Plan is a document which combines—
 - (a) engineering drawings of the proposed methods of water quality control;
 - (b) discussion and calculations/modelling which demonstrate how the proposed water quality control methods will achieve the relevant Water Quality objectives;
 - (c) a maintenance plan, setting out how the proposed methods of water quality control are to be maintained and addressing such issues as—
 - (i) inspection frequency;
 - (ii) likely clean-out frequency;
 - (iii) dewatering and waste disposal procedures;
 - (iv) access;
 - (v) consumables (e.g. oil absorbing pillows);
 - (vi) staff training and equipment needs;
 - (vii) occupational health and safety requirements;
 - (viii) likely annual maintenance costs; and
 - (ix) performance monitoring.



Asset Hand-Over

- (2) Under certain circumstances the Local Government may agree to accept responsibility for a large, regionally significant structural water quality control method as part of the development's stormwater infrastructure.
- (3) To hand-over such an asset to the Local Government, the developer is to provide the following information and undertaken the following actions—
 - (a) clear agreement at the development approval stage on the timing and terms of asset hand-over;
 - (b) provision of an adequate Maintenance Plan prior to hand-over;
 - (c) provision of accurate costing to support the Maintenance Plan prior to hand-over; and
 - (d) provision of a well maintained asset prior to hand-over (i.e. the asset is in a condition that is consistent with the relevant development conditions, the commitments made in the development application and the Maintenance Plan).

Water Quality Monitoring

- (4) Water Quality monitoring will give an indication as to whether the design predictions were accurate, the pollutant removal performance of the water quality control methods and whether alternative or additional stormwater quality management practices may need to be employed.
- (5) The approved Water Quality Management Plan will nominate whether water quality monitoring is required for the proposed development.

- (3) Water Quality Objectives for temporary and permanent methods of water quality control shall be in accordance with Table 2.3.1 and Table 2.3.2 and shall be identified on the Stormwater Quality Management Plans.

Table 2.3.1: Water Quality Objectives

Indicator	Reduction in the average annual pollutant load discharging from site
Total Suspended Solids	80%
Total Nitrogen	45%
Total Phosphorous	60%
Gross Pollutants	90%

Table 2.3.2: Pollutants Typically Generated During the Construction Phase

Pollutant	Sources
Litter	Paper, construction packaging, food packaging, cement bags, off-cuts.
Sediment	Unprotected exposed soils and stockpiles during earthworks and building.
Hydrocarbons	Fuel and oil spills, leaks from construction equipment.
Toxic materials	Cement slurry, asphalt prime, solvents, cleaning agents, wash waters (e.g. from tile works).
pH altering substances	Acid sulfate soils, cement slurry and wash waters.

2.3.4 Temporary Methods of Water Quality Control

- (1) Temporary water quality control methods and techniques (excluding devices which divert or concentrate runoff) are to be in accordance with the QUDM and the Institution of Engineers, Australia (Qld) "Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites".

2.3.5 Permanent Methods of Water Quality Control

- (1) The design of the permanent water quality control methods is to be in accordance with the QUDM and the Institution of Engineers, Australia (QLD) "Soil Erosion and Sediment Control" Engineering Guidelines for Queensland Construction Sites and the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland (Healthy Waterways - Version 1 June 2006 or current adopted version) or in the case of bioretention systems the Bioretention Technical Design Guidelines (Water By Design – Version 1 2012 or currently adopted version).



- (2) The following specific standards apply in the design of bioretention basins:
- (a) Underdrainage pipes must be slotted uPVC and must not be wrapped in sock or geofabric.
 - (b) Coarse sediment forebays and trash racks must be constructed in accordance with Council's Standard Drawings SD.16 and SD.17.

NOTE 2.3.5A

- (1) In cases where the QUDM and the Institution of Engineering, Aust (Qld) "Soil Erosion and Sediment Control", Engineering Guidelines for Queensland construction sites, does not provide direction in relation to the proposed methods of water quality control, guidance should be sought from the following references—
- (a) Brisbane City Council and GeoEng Pty Ltd, 1999. *Draft Design Guidelines for SQIDs*. Brisbane City Council, Brisbane.
 - (b) Cooperative Research Centre for Catchment Hydrology, 1997. *Best Practice Environmental Management Guidelines for Urban Stormwater (Report 97/7)*. Cooperative Research Centre for Catchment Hydrology, Melbourne.
 - (c) Victoria Stormwater Committee, 1999. *Urban Stormwater. Best Practice Environmental Management Guidelines*. CSIRO, Melbourne.
 - (d) NSW EPA, 1997. *Treatment Techniques: Managing Urban Stormwater*. EPA, NSW.
 - (e) Hunter, G.J. April 1999. *Evaluation of Some Readily Available Stormwater Quality Control Technologies*. Waterfall Journal: p.16. Stormwater Industry Association Inc., Sydney.
 - (f) Hunter, G.J. 1999. *Stormwater Treatment Devices*. Workshop Proceedings, 8th International Conference on Urban Stormwater Drainage. Stormwater Industry Association Inc., Sydney.
- (2) Devices which divert or concentrate runoff will generally not be approved by the Local Government.



PART 3—STANDARDS FOR DESIGN OF PARKS AND STREETSCAPES

3.1.1 Design Criteria

- (1) The design of parks is to comply with the desired standards of service for the different types and levels of open space (park) settings outlined in Part 13—Local Government Infrastructure Plan, Tables 3.1.1 to 3.1.4 of PSP3, Implementation Guideline No. 27 – Guidance on Recreation Range and Opportunity Outcomes Arising from Establishment of Public Parks, Ipswich City Council Standard Drawings and associated technical guidance.
- (2) The design of streetscapes is to comply with the *Ipswich Streetscape Design Guideline*, Ipswich Regional Centre Strategy Streetscape Materials Specification 2012 or Implementation Guideline No. 17 – Springfield Lakes Design Manual.

NOTE 3.1.1A

- (1) Where parkland is to be dedicated or constructed, a Landscape Plan is to be submitted with the Operational Works Application providing the following information—
 - (a) existing contours;
 - (b) existing vegetation to be retained/removed;
 - (c) existing/proposed services;
 - (d) location of proposed facilities;
 - (e) proposed planting;
 - (f) proposed surface treatment;
 - (g) proposed earthworks and finished levels;
 - (h) hardscape and softscape details (including those outlined in the Standard Drawings); and
 - (i) irrigation strategy.
- (2) In addition to the Landscape Plan, a Certificate of Design Compliance – Landscape Works in accordance with Appendix 1 is to be submitted to the Local Government.
- (3) The Certification of Compliance – Landscape Works is required to confirm that the detailed Landscape Plan complies with the desired standards of service for the relevant park setting outlined in Part 13—Local Government Infrastructure Plan and the following Tables 3.1.1 to 3.1.4.
- (4) Where a bushland management plan is required the following detail must be included:

- (a) A schedule of plant species including the plant's botanical and common names, planting size and mature size, quantities and densities.
- (b) Planting at a minimum of one (1) plant per square metre taking into consideration existing native vegetation.
- (c) Location and specifications of stormwater infrastructure must be identified on appropriately scaled plans and any specific revegetation if required in these areas.
- (d) Any staging and a schedule of rehabilitation works and proposed maintenance regime.
- (e) Proposed vehicle access in rehabilitation areas, necessary for conducting works, maintenance, mowing/slashing (as necessary for weed control) before installation of supplementary plants.
- (f) Identified rocks and logs to be retained where possible, and where areas are disturbed, the plan must make provision for the placement of rocks and logs (which can be relocated from cleared areas), into the rehabilitation area to compensate for the loss of any fauna habitat.
- (5) Monthly logs, including photographic monitoring with GPS referencing, of all rehabilitation works and chemical use logs must be maintained with copies provided to Council.
- (6) All photographs must be in either jpeg or gif format.

3.1.2 Guiding Principles for Variations to the Standards of Service

- (1) Where a design detail does not comply with the desired standards of service outlined in Part 13—Local Government Infrastructure Plan, Tables 3.1.1 to 3.1.4 and the Standard Drawings, a Certifier is to use the guiding principles outlined in 3.1.2(2) as a means of justifying any non-standard design issues.



- (2) All non-standard details or design elements should—
- (a) be appropriate to the character of the park;
 - (b) assist people in using the park efficiently;
 - (c) encourage and promote use of the park and its facilities;
 - (d) demonstrate ease of maintenance;
 - (e) be functional;
 - (f) be durable;
 - (g) be sustainable;
 - (h) address public liability risks for the Local Government;
 - (i) address relevant safety requirements;
 - (j) satisfy any Environmental Duty of Care;
 - (k) address drainage and water quality outcomes;
 - (l) satisfy structural performance requirements; and
 - (m) where selecting plants, be appropriately selected to achieve the required growth outcomes, in terms of plant siting, eventual size, horticultural requirements and lifespan etc.

NOTE 3.1.3A

- (1) The installed lighting should where practical reduce and minimise installation, operational and maintenance cost.
- (2) This can be achieved by:
 - (a) maximising lighting offsets, thereby minimising the quantity of luminaires; and
 - (b) selection of appropriate luminaire type and wattage.

3.1.4**Pathway Lighting Pole Location**

- (1) In general, lighting poles are to be located:
- (a) at the entrance to each pathway (may be an existing or new street light);
 - (b) at every bend or significant change of alignment; and
 - (c) at every obstruction or hazard.

3.1.3 Park and Linear Pathway Lighting Design Criteria

- (1) Lighting poles and luminaires must be supplied and maintained at standard "Rate 3" tariff".
- (2) All lighting design is to comply with the provisions of Australian Standard 1158.
- (3) Lighting to pathways and bikeways should be minimum Category P4.
- (4) The light spill on corridors which provide for the movement of fauna must be no greater than 1 lux vertical, measured at ground level for the outer extents of the corridor (light with low colour rendering properties, such as high pressure sodium lamps, are preferred in areas near fauna corridors).
- (5) All luminaires are to be Light-emitting Diode (LED) type light source.
- (6) The Luminaire must be included on the Australian Energy Market Operator (AEMO) Load Table for Rate 3 unmetered public lighting.
- (7) The luminaire performance must satisfy the specifications provided in Table 1.2.4: LED Luminaire Performance Specifications.



Table 3.1.1: Desired Standard of Service for: Sportsgrounds/Courts

DEVELOPMENT LEVEL	OPEN SPACE AND LINKS	RECREATION RANGE & OPPORTUNITY	ANCILIARY SITE WORKS
CITY WIDE EXISTING EXAMPLE(S) <ul style="list-style-type: none"> Redbank Plains Recreation Reserve Limestone Park Ivor Marsden Park 	<p>ACCESS: Preferably on or within 250 metres of an arterial road or within 400 metres of a railway station or bus stop serviced by regular public transport. Preferably located on or within 250 metres of the bikeways network. At least two sides and 50% of the perimeter length of the park has direct frontage to a public road with an additional 25% of the perimeter length of the park having direct frontage to a road or a public place.</p> <p>AREA AND TOPOGRAPHY: Dependent of sport being accommodated, but generally 10 ha – 15 ha (desirably larger to enable expansion) and regular in shape. The site area should exclude land below the Q20 flood level unless such land can be filled to the Q20 level and is made useable and stable. The site should also include adequate land above the Q100 design flood level for the location of clubhouses and other expensive facilities. The site should be principally flat land, 3% gradient or less so that site development should not entail major cut/fill or drainage construction.</p> <p>DISTRIBUTION: Ensure only one (1) 'headquarters facility' for each sport within the City. Ideally, close to major adjoining recreation area of non-structured nature, (e.g. recreation or waterside parks) and sited generally within or adjacent to major urban areas except where use dictates an alternative location. Ensure maximum traveling time of 20 – 30 minutes for most residents to at least one sportsground reserve.</p> <p>BENCHMARK: Approximately 1:16000 persons (urban areas).</p> <p>For the town of Marburg, the sportsground and courts reserve will also service the surrounding rural and rural residential areas. However, unlike the larger and more expensive citywide parks within the urban areas, the township sports reserve is only planned to have a level of facilities generally that of a local sportsground and courts facility.</p>	<p>FACILITIES (urban areas excluding township areas): Generally, citywide sporting venues should provide facilities capable of holding regional level competition.</p> <p>Adjacent to the main field, oval or court, provide pavilion or earthbank/tiered seating (shaded by trees or structure) and club house (painted/coloured block construction with custom orb roof, including: two change rooms, first aid room, referee room, meeting room, canteen, store room and public amenities incorporating 5 x cubicles (unisex and disabled) each with toilet and washbasin).</p> <p>All fields, courts and wickets are to be capable of a north/south orientation.</p> <p>Constructed pathway (2200mm wide concrete) circuit incorporating distance markers to park perimeter integrated with bikeway/pathway network. Internal pathway (2200mm wide concrete) connection providing access to major activity areas (to follow contours if possible or minimum 1:20 grade).</p> <p>4 x rectangular fields 140m x 70m capable of providing 2 cricket ovals 68.6m radius centre of pitch (lit to 250 lux) or 1 premier field or oval (AFL size 173m x 143m) including training field (lit to 250 lux). For at least one citywide facility in each district, incorporate an athletics track around perimeter of field or oval.</p> <p>8 x multipurpose courts (concrete with synpave over). Associated infrastructure: perimeter or inter court fencing, nets or goal posts, line marking, lighting to 250 lux.</p> <p>1 x Double Practice Wicket (netted)</p> <p>1 x Freestanding Public Amenities Building incorporating 5 x cubicles (unisex and disabled) each with toilet and wash basin.</p> <p>1 x Play space (nominal size: 20 x 15m) on either a flat (1:50 maximum grade) or terraced site incorporating: a range of play equipment for children aged 2 – 12; shade structure and soft-fall.</p> <p>3 x paved concessionary areas (nominal size each area: 5m x 8m) adjacent to internal roads in close proximity to activity areas or as extension to carpark.</p> <p>3 x Drinking fountains (Disabled Compliant)</p> <p>CAR PARKING: Minimum 500 car spaces on site, split if necessary to reduce visual impact.</p> <p>Sealed internal road network providing access to clubhouse and parking areas.</p> <p>Parking areas for at least 250 x cars (to incorporate disabled car spaces) and 4 x coaches to be paved, line-marked and signed.</p> <p>Grassed overflow parking areas for an additional 250 cars to be provided adjacent to formal parking areas. This number of spaces can be reduced by the number of on-street parking bays provided on streets adjacent to the sportsground/site.</p> <p>Installation of 'access control' barrier to all accessible park boundaries/frontages (i.e. bollards @ 1.5m centres).</p> <p>SIGNAGE: Park entry information signage at main entries to include site layout plan. (Refer to Ipswich City Council Parks and Reserves Signage Manual).</p> <p>LIGHTING: All internal roads, parking areas and primary pedestrian paths to be lit to provide security and functionality.</p> <p>Power Box (external) – 3 Phase power</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$9,897,642 each park (for township areas refer to Local Facilities and Cost)</p>	<p>PLANTING: Internal shade tree planting to oval/field surrounds.</p> <p>Shade trees around playground areas and carpark.</p> <p>Street tree planting to all park/road frontages, internal roads and pathways. Species compatible with local street planting. If adjoining creek or environmental areas – native planting only.</p> <p>Accent planting/feature garden at park entry point/s and major activity nodes with in-ground automatic irrigation system (recycled water to be used where possible). Consideration to drought tolerant species.</p> <p>DRAINAGE: On-site detention (i.e. collect drainage from sportsfields) with discharge through natural filter (e.g. wetland) to river or creek. All drainage away from adjoining residential areas or direct discharge to creek or adjoining bushland. Minimum Q20 design flood level for ovals and fields and Q50 design flood level for courts (Q100 design flood level if courts fenced). All buildings or playgrounds to be located above the Q100 design flood level.</p> <p>VIEWS: Retain attractive middle and distant views where possible/relevant.</p> <p>SCREENING: Minimise impact on surrounding residents through screening facilities, particularly for night lighting.</p> <p>NB. Screening must not obscure views into park.</p>



DEVELOPMENT LEVEL	OPEN SPACE AND LINKS	RECREATION RANGE & OPPORTUNITY	ANCILIARY SITE WORKS
DISTRICT	Not applicable – refer to Citywide or Local Sportsgrounds and Courts		
LOCAL EXISTING EXAMPLE(S) <ul style="list-style-type: none"> Stallard Park Bob Gibbs Park 	<p>ACCESS: On or close to distributor road/major collector street and within approximately 10 minutes walk from bus stop or railway station. Preferably located on or close to bikeways/pathways network. At least 50% of the perimeter length of the park has direct frontage to a public road with an additional 25% of the perimeter length of the park having direct frontage to a road or public place.</p> <p>AREA AND TOPOGRAPHY: Generally 5ha and regular in shape. The site should be principally flat land, 3% gradient or less so that site development should not entail major cut and fill. The site area should exclude land below the Q20 flood level unless such land can be filled to the Q20 level and is made useable and stable. The site should also include adequate land above the Q100 design flood level for the location of clubhouses and other expensive facilities.</p> <p>NUMBERS AND DISTRIBUTION: Adequate coverage throughout Citywide for maximum 10 minute drive or 20 minute cycle ride. Where possible these facilities are to be in close proximity to proposed neighbourhood centres or close to major recreation areas (e.g. district recreation parks or waterside parks).</p> <p>BENCHMARK: Approximately 1:9000 persons (urban areas)</p> <p>Within the town of Marburg, the Citywide sportsground and courts reserve will also serve as the local sporting reserve</p> <p>NOTE</p> <p>Benchmark standards only provide a guide to the provision of sports facilities. The actual provision of sportsground and courts should take into account the conclusions of any Facilities Study or comments from the individual sporting associations.</p>	<p>FACILITIES (including township areas): All fields, courts and wickets are to be capable of a north/south orientation.</p> <p>Constructed pathway (2200mm wide concrete) circuit to park perimeter integrated with bikeway/pathway network. Internal pathway (2200mm wide concrete) connection providing access to major activity areas (to follow contours if possible or minimum 1:20 grade).</p> <p>2 x rectangular fields 140m x 70m capable of providing 1 cricket oval 68.6m radius centre of pitch (lit to 250 lux).</p> <p>4 x multipurpose courts (concrete with synpave over. Associated infrastructure: perimeter or inter court fencing, nets or goal posts, line marking, lighting to 250 lux).</p> <p>1 x club house (painted/coloured block construction with custom orb roof, including: two change rooms, first aid room, meeting room, canteen, store room, and public amenities building incorporating 5 x cubicles (unisex and disabled) each with toilet and wash basin).</p> <p>1 x Play space (nominal size: 20 x 15 m) on either a flat (1:50 maximum grade) or terraced site incorporating: a range of play equipment for children aged 2 – 12; shade structure and soft-fall.</p> <p>1 x Drinking fountain (Disabled compliant)</p> <p>CAR PARKING: Minimum 150 on site car spaces with sealed internal road access to clubhouse.</p> <p>Parking areas for at least 100 cars (to incorporate disabled car spaces) and 4 coaches to be sealed, line-marked and signed.</p> <p>Grassed overflow parking areas for an additional 50 cars to be provided adjacent to formal parking areas. This number of spaces can be reduced by the number of on-street parking bays provided on streets adjacent to the sportsground/site.</p> <p>Installation of 'access control' barrier to all accessible park boundaries/frontages (i.e. bollards @1.5m centres).</p> <p>LIGHTING: All internal roads, parking areas and primary pedestrian paths to be lit to provide security and functionality.</p> <p>Power Box (external) – 3 Phase power.</p> <p>SIGNAGE: Park entry information signage at main entries to include site layout plan. (Refer to Ipswich City Council Parks and Reserves Signage Manual).</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$3,405,893 each park</p>	<p>PLANTING: Internal shade tree planting to oval/field surrounds.</p> <p>Shade trees around playground areas and carpark.</p> <p>Street tree planting to all park/road frontages, internal roads and pathways. Species compatible with local street planting. If adjoining creek or environmental areas – native planting only.</p> <p>Accent planting/feature garden at park entry point/s and major activity nodes with in-ground automatic irrigation system (recycled water to be used where possible). Consideration to drought tolerant species.</p> <p>DRAINAGE: On-site detention (i.e. collect drainage from sportsfields) with discharge through natural filter (e.g. wetland) to river or creek or street stormwater system. All drainage away from adjoining residential areas or direct discharge to creek or adjoining bushland. Minimum Q20 design flood level for ovals and fields and Q50 design flood level for courts (Q100 design flood level if courts fenced). All buildings or playgrounds to be located above the Q100 design flood level.</p> <p>SCREENING: Minimise impact on surrounding residents through screening facilities (inc. screen planting) particularly for night lighting.</p> <p>NB. Screening must not obscure views into park.</p> <p>VIEWS: Emphasise location by distinctive street-front planting. Retain attractive views where possible.</p>



Table 3.1.2: Desired Standard of Service for Recreation Parks
(including formal parks and gardens, play and picnic parks, plazas, squares and other hard urban spaces)

DEVELOPMENT LEVEL	OPEN SPACE AND LINKS	RECREATION RANGE & OPPORTUNITY	ANCILIARY SITE WORKS
CITY WIDE EXISTING EXAMPLE(S) <ul style="list-style-type: none"> Queens Park Ipswich City Mall/Darcy Doyle Place Ipswich Botanic Gardens (Kholo) 	<p>ACCESS: On or close (min 400 metres) to arterial road on major bus route or railway station or within or adjoining a Town Centre. Located on or close to bikeways network. At least three sides and 75% of the perimeter length of the park has direct frontage to a public road or public place.</p> <p>AREA AND TOPOGRAPHY: Minimum 10ha except for CBD plazas, parks and other hard surfaced areas, which are to be determined by primary use needs. Topography to avoid major cut and fill and to provide about 30% of area at 5% gradient or less, with topographic variation to provide for a range of play and user interest.</p> <p>NUMBERS AND DISTRIBUTION: To be located within the Ipswich City Centre, Springfield, Ripley and Goodna Town Centres and the Ipswich Botanic Gardens. Preferably, these parks will have linkages with other park settings (e.g. sportsgrounds, waterside parks, linear parks or other recreation parks).</p>	<p>FACILITIES (urban areas): Constructed pathway (2200mm wide concrete) circuit to park perimeter integrated with pedestrian/cycle network. Internal pathway (2200mm wide concrete) connection providing access to major activity areas at minimum 1:20 grade.</p> <p>12 x shaded picnic areas incorporating tables and bench seats ranging in size to accommodate both small (8 x 1 Table and 2 bench seats) and large groups (4 x 4 Tables and 8 bench seats). 50% of picnic facilities to be in close proximity to car-parking areas.</p> <p>6 x BBQ areas (sheltered single BBQ only) with watering points (taps) located in close proximity to sheltered picnic areas.</p> <p>1 x Café/kiosk (nominal size: 7m x 10m) with adjacent area to accommodate bicycle/equipment hire activities.</p> <p>1 x large kick-a-bout area (nominal size: 50 x 70m)</p> <p>2 x small kick-a-bout areas (nominal size: 30 x 40m)</p> <p>1 x enhanced natural or constructed water feature (example lake/creek feature) with formal edge treatments to the perimeter.</p> <p>Identity, directional and interpretative signage.</p> <p>1 x themed adventure playground (nominal size: 100 x 100m) on either a flat (1:50 maximum grade) or terraced site incorporating: a range of play equipment for children aged 2 – 12; shade structure; seating (2 x 1 Table and 2 bench seats); soft-fall; 1 drinking fountain and fenced toddler play area.</p> <p>Child cycle circuit</p> <p>3 x Drinking fountains (Disabled compliant)</p> <p>2 x Public Amenities Building incorporating 5 x cubicles (unisex and disabled) each with toilet and wash basin.</p> <p>3 x Concessionary Hardstand Area (nominal size each area 5m x 8m to accommodate a mobile food van) with adjacent water and power supply points.</p> <p>Designated area/s for public art installations; war memorial/cultural marker, etc.</p> <p>CAR PARKING: Minimum 150 cars on site, split if necessary to reduce visual impact.</p> <p>Sealed internal road network providing access to key points of visitor interest or concessionary areas.</p> <p>Parking areas for at least 150 x cars (to incorporate disabled car spaces) and 4 x coaches to be paved, line-marked and signed.</p> <p>Installation of 'access control' barrier to all accessible park boundaries/frontages (i.e. bollards @ 1.5m centres)</p> <p>LIGHTING: All internal roads, parking areas and primary pedestrian paths to be lit to provide security and functionality.</p> <p>SIGNAGE: Park entry information signage to main entries to include site layout plan. (Refer to Ipswich City Council Parks and Reserves Signage Manual)</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$5,518,885 each park</p>	<p>PLANTING: Use of native species to achieve 40% site coverage (excluding plazas, squares and other hard urban spaces).</p> <p>Street tree planting compatible with local street planting.</p> <p>Feature/avenue shade tree planting using native species or deciduous/exotic species.</p> <p>Re-vegetation areas to use native tree and groundcover species.</p> <p>Accent planting/feature garden at park entry point/s and major activity nodes with in-ground automatic irrigation system (recycled water to be used where possible). Consideration to drought tolerate species.</p> <p>DRAINAGE: Where possible drain into feature lake or creek through natural filter (e.g. wetland) or street stormwater system. All drainage away from adjoining residential areas or direct discharge to creek or adjoining bushland. Except where the intrinsic character of the park or location makes it impractical (e.g. adjacent to a watercourse) all these parks are to be located above the Q100 design flood level. In all circumstances, areas containing buildings or playgrounds are to be located above the Q100 design flood level.</p> <p>SCENIC QUALITY: Attractive and interesting for children and appealing to family groups.</p> <p>Provide some intimate areas.</p> <p>Opportunity for seasonal colour using variations in planting.</p> <p>Protect all natural features.</p> <p>VIEWS: Frame views both within and into the park and retain attractive views beyond the park</p> <p>HERITAGE: Retain and refurbish historic features/buildings/structures, etc.</p> <p>Protect heritage trees and program replacement planting if necessary.</p> <p>Explain history of park through interpretive signage.</p> <p>SCREENING: Minimise impact on surrounding residents through screening facilities without limiting casual surveillance opportunities.</p>



DEVELOPMENT LEVEL	OPEN SPACE AND LINKS	RECREATION RANGE & OPPORTUNITY	ANCILIARY SITE WORKS
DISTRICT EXISTING EXAMPLE(S) <ul style="list-style-type: none"> Browns Park Cameron Park Spring Lake Park 	<p>ACCESS: On or close to distributor road or major collector street and near (e.g. within 400 metres) a bus stop or railway station. Preferably located on or close to bikeways network. Regular public transport should service the site. At least three sides and 75% of the perimeter length of the park has direct frontage to a public road or a public place.</p> <p>AREA AND TOPOGRAPHY: Minimum 4ha except that for parks in the Commercial zones, areas are to be determined by primary use needs. Topography to avoid major cut and fill and to provide about 30% of area at 5% gradient or less, with topographic variation to provide for a range of play and user interest.</p> <p>DISTRIBUTION: Ensure access about 15-20 minutes drive in private car or 30 minutes by public transport (non-peak hour) from all areas within the planning districts. Ideally, close to major adjoining recreation area of non-structured nature, (e.g. linear or waterside parkland) and sited generally within urban areas.</p> <p>BENCHMARK: Approximately 1:10,000 persons (urban areas).</p> <p>NOTE</p> <p>Benchmark standards only provide a guide to the provision of recreation parks. The actual provision of such parks has taken into account the development of existing unused reserves and the construction of additional facility development on existing reserves.</p>	<p>FACILITIES (urban areas): 6 x shaded picnic facilities incorporating tables and bench seats for both small (4 x 1 Table and 2 bench seats) and large groups (2 x 4 Tables and 8 bench seats). 50% of picnic facilities to be in close proximity to car-parking areas.</p> <p>3 x BBQ areas (sheltered single BBQ only) with watering points (taps) located in close proximity to sheltered picnic areas.</p> <p>1 x kick-a-bout area (nominal size: 50 x 70m) plus 1 x multi-purpose ½ court with hoop and backboard or 1 x rebound wall and court.</p> <p>Constructed pathway (2200mm wide concrete) circuit to park perimeter integrated with pedestrian/cycle network. Internal pathway (2200mm wide concrete) connection providing access (1:20 maximum grade) to the major activity area.</p> <p>1 x themed adventure playground (nominal size: 60 x 40m) on either a flat (1:50 maximum grade) or terraced site incorporating: a range of play equipment for children aged 2 – 12; shade structure; seating (2 x 1 Table and 2 bench seats); soft-fall; 1 drinking fountain and fenced toddler play area.</p> <p>Identity, directional and interpretive signage.</p> <p>1 x Public Amenities Building incorporating 5 x cubicles (unisex and disabled) each with toilet and wash basin.</p> <p>1 x Concessionary Hardstand Area (nominal size 5m x 8m to accommodate a mobile food van) with adjacent water and power supply points.</p> <p>2 x Drinking fountains (Disabled compliant)</p> <p>Designated area for public art installations; war memorial/cultural marker, etc as appropriate.</p> <p>CAR PARKING: Minimum 50 on site car spaces, split if necessary to reduce visual impact.</p> <p>Parking areas to accommodate 50 x cars as well as 1 x coach.</p> <p>The parking areas are to be sealed, line-marked and signed and incorporate disabled car spaces.</p> <p>Installation of 'access control' barrier to all accessible park boundaries/frontages (i.e. bollards @ 1.5m centres)</p> <p>LIGHTING: The primary pedestrian paths to be lit to provide security and functionality.</p> <p>SIGNAGE: Park entry information signage to main entries to include site layout plan. (Refer to Ipswich City Council Parks and Reserves Signage Manual).</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$2,481,750 each park</p>	<p>PLANTING: Use of native species to achieve 20% site coverage.</p> <p>Street tree planting compatible with local street planting.</p> <p>Feature/avenue shade tree planting using native species or deciduous/exotic species.</p> <p>Re-vegetation areas to use native tree and groundcover species.</p> <p>Accent planting/feature garden at park entry point/s and major activity nodes with in-ground automatic irrigation system (recycled water to be used where possible). Consideration to drought tolerant species.</p> <p>Preference for planting along creeks and as shade for paths and activity areas.</p> <p>DRAINAGE: Where possible drain into water feature or creek through natural filter (e.g. wetland) or street stormwater system. All drainage away from adjoining residential areas or direct discharge to creek or adjoining bushland. Except where the intrinsic character of the park or location makes it impractical (e.g. adjacent to a watercourse) all these parks are to be located above the Q100 design flood level. In all circumstances, areas containing buildings or playgrounds are to be located above the Q100 design flood level.</p> <p>SCENIC QUALITY: Attractive and interesting for children and appealing to family groups.</p> <p>Provide some intimate areas.</p> <p>Opportunity for seasonal colour using variations in planting.</p> <p>Protect all natural features.</p> <p>VIEWS: Frame views both within and into the park and retain attractive views beyond park.</p> <p>HERITAGE: Retain and refurbish historic features/building/structures, etc.</p> <p>Protect heritage trees and program replacement planting if necessary.</p> <p>Explain history of park through interpretive signage.</p> <p>SCREENING: Minimise impact on surrounding residents through screening facilities without limiting casual surveillance opportunities.</p>



DEVELOPMENT LEVEL	OPEN SPACE AND LINKS	RECREATION RANGE & OPPORTUNITY	ANCILIARY SITE WORKS
LOCAL EXISTING EXAMPLE(S) <ul style="list-style-type: none"> Numerous Suburban Parks 	<p>ACCESS: In urban areas, short walk, 5 mins from each dwelling. Ideally located on collector street or major collector street. Preferably located on or close to bikeways network. The perimeter length of the park has direct frontage to a public road or a public place (i.e. a road or public land is to front all park boundaries). Within towns, located adjacent or within the 'township area'. For large lot residential areas located near intersections servicing the majority of the development.</p> <p>AREA AND TOPOGRAPHY: 5000m² – 1ha (see note ¹). Topography to avoid major cut and fill to provide about 50% of area at 5% gradient or less, with topographic variation to provide for a range of play and user interest.</p> <p>NUMBERS AND DISTRIBUTION: Distribution so as to meet access requirement i.e. within 500m of most (i.e. 90%) houses. Ideally, part of or adjacent to waterside or linear parkland or sports grounds and courts.</p> <p>BENCHMARK: Approximately 1:1000 persons although the pedestrian catchment concept of a park within 500 metres of most dwellings is the preferred benchmark.</p> <p>NOTE</p> <p>The above benchmarks are to be used as a guide rather than prescriptive targets. The process of determining the need for additional parks should take into account the amount of parkland already existing in the area; whether access could be improved to existing parks; any barriers to access; spatial location of future urban growth; and, relative distance of parks from the surrounding areas.</p>	<p>FACILITIES (urban areas): 1 x shaded picnic facility incorporating 1 table and 2 bench seats.</p> <p>1 x play space (nominal size 20 x 15m) on either a flat (1:50 maximum grade) or terraced site incorporating: a range of play equipment for children aged 2 – 12; shade and soft-fall.</p> <p>Constructed pathway (2200mm wide concrete) circuit to park perimeter integrated with pedestrian/cycle network.</p> <p>1 x kick-a-bout area (nominal size: 30 x 20m) plus 1 x multi-purpose ½ court with hoop and backboard or 1 x rebound wall and court.</p> <p>1 x Drinking fountain (Disabled compliant)</p> <p>SIGNAGE: Park name sign.</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$481,336 each park</p> <p>CAR PARKING: No formal parking on site. Ensure room for on street parking along park frontage.</p>	<p>PLANTING: Street tree planting compatible with local street planting.</p> <p>Feature shade tree planting using native species.</p> <p>Re-vegetation areas to use native tree and groundcover species.</p> <p>Formal/informal tree planting to provide shade and amenity and enable good visual access both to and within the park setting. Consideration to drought tolerant species.</p> <p>DRAINAGE: Where possible drain into creek through natural filter (e.g. wetland) or street stormwater system. All drainage away from adjoining residential areas or direct discharge to creek or adjoining bushland. Except where the intrinsic character of the park or location makes it impractical (e.g. adjacent to a watercourse) all these parks are to be located above the Q100 design flood level. In all circumstances, areas containing buildings or playgrounds are to be located above the Q100 design flood level.</p> <p>SCENIC QUALITY: Attractive and interesting for children and appealing to family groups.</p> <p>VIEWS: Clear views into park from street and frame views within the park.</p> <p>HERITAGE: Retain and protect any features of cultural heritage significance.</p> <p>SCREENING: Minimise impact on surrounding residents through screening facilities, without limiting casual surveillance opportunities.</p>

Note ¹ Provided topography is suitable to include all required facilities the minimum land area can be 5000m². However, where the topography is such that additional land is required to achieve the required recreational facilities and setting, the land area can be increased up to 1 hectare. In these circumstances the land value is taken to be the cost @ 5000m² (i.e. there is no additional cost attributable for the additional land as this is required to achieve the required recreational facilities and setting).



Table 3.1.3: Desired Standard of Service for: Waterside Parks

DEVELOPMENT LEVEL	OPEN SPACE AND LINKS	RECREATION RANGE & OPPORTUNITY	ANCILIARY SITE WORKS
CITYWIDE EXISTING EXAMPLE(S) <ul style="list-style-type: none"> Colleges Crossing 	<p>ACCESS: Where possible, on or close to (i.e. within 400 metres) of an arterial or distributor road and a regular bus route and bus stop.</p> <p>Located on or close to bikeways network.</p> <p>Where practicable, the perimeter length of the park has direct frontage to a public road or a public place.</p> <p>AREA AND TOPOGRAPHY: Min 10ha. Topography suitable for waterside walking trail and boat/canoe launching opportunity, with minimal areas of cut and fill to achieve an area no less than 30% of the site which is of a gradient 10% or less, with some topographic variation to provide interest. N.B. In some instances a boardwalk may be required as a substitute for a constructed pathway.</p> <p>DISTRIBUTION: About 20 minute drive in private vehicle or 30 minute bus ride from most areas of the City. These parks are to adjoin a substantial permanent water body or navigable section of the Brisbane or Bremer Rivers.</p>	<p>FACILITIES (urban areas): 1 x boat ramp including boat trailer turning/washdown area (ensure adequate depth of water for launch/recovery) or canoe launch area.</p> <p>Constructed pathway (2200mm wide concrete) circuit for the length of the park (preferably adjacent to water body) integrated with pedestrian/cycle network. Internal pathway (2200mm wide concrete) connection providing access to major activity areas at minimum 1:20 grade.</p> <p>12 x shaded picnic areas incorporating tables and bench seats ranging in size to accommodate both small (8 x 1 Table and 2 bench seats) and large groups (8 x 4 Tables and 8 bench seats). 50% of picnic facilities to be in close proximity to car-parking areas.</p> <p>6 x BBQ areas (sheltered single BBQ only) with watering points (taps) located in close proximity to sheltered picnic areas.</p> <p>1 x Café/kiosk (nominal size: 7m x 10m) with adjacent area to accommodate bicycle/boat/canoe hire activities.</p> <p>2 x kick-a-bout areas (nominal size: 50 x 70m)</p> <p>1 x enhanced water frontage area incorporating lit boardwalk, promenade or jetty located near café/kiosk.</p> <p>1 x themed adventure playground (nominal size: 100 x 100m) on either a flat (1:50 maximum grade) or terraced site incorporating: a range of play equipment for children aged 2 – 12; shade; seating (2 x 1 Table and 2 bench seats; soft-fall; 1 drinking fountain and fenced toddler play area.</p> <p>Identity, directional and interpretive signage.</p> <p>2 x Public Amenities Building incorporating 5 x cubicles (unisex and disabled) each with toilet and wash basin.</p> <p>2 x Fish cleaning tables with water taps.</p> <p>3 x Drinking fountains (Disabled compliant)</p> <p>VEHICULAR ACCESS AND PARKING: Sealed internal road network providing access to key points of visitor interest.</p> <p>Parking areas for at least 150 x cars (to incorporate disabled car spaces), 20 x trailers and 4 x coaches to be paved, line-marked and signed. Parking areas may need to be split to reduce visual impact.</p> <p>Grassed overflow parking areas for an additional 100 x cars to be provided adjacent to formal sealed parking areas.</p> <p>Installation of 'access control' barrier to all accessible park boundaries/frontages (i.e. bollards @ 1.5m centres).</p> <p>SIGNAGE: Park entry information signage at main entries to include site layout plan. (Refer to Ipswich City Council Parks and Reserves Signage Manual).</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$5,512,250 each park</p>	<p>PLANTING: Use of native species to achieve 30% site coverage. Group of feature trees visible from watercourse.</p> <p>All planting predominantly local excepting feature trees as native or exotic. Shrub and native grass species on boundaries. Consideration to drought tolerant species.</p> <p>DRAINAGE: 'Soft' engineering constructions with natural filter (e.g. wetlands) to river. Where possible, buildings and playgrounds are to be located above the Q100 design flood level. In all instances, buildings or playgrounds are to be located above the Q20 design flood level.</p> <p>SCENIC QUALITY: Modified riverbank at key locations only (e.g. adjoining boat/canoe launch point) with balance of riverbank left in natural state.</p> <p>VIEWS: Retain and frame all long distance views. Ensure waterfront planting does not obscure views.</p> <p>HERITAGE: Protect and interpret relevant features.</p> <p>SCREENING: Minimise impact on surrounding residents through screen plantings (ensure views are not obstructed) without limiting casual surveillance opportunities.</p>



DEVELOPMENT LEVEL	OPEN SPACE AND LINKS	RECREATION RANGE & OPPORTUNITY	ANCILIARY SITE WORKS
DISTRICT EXISTING EXAMPLE(S) <ul style="list-style-type: none"> Joseph Brady Park 	<p>ACCESS: Where possible, on or close to (i.e. within 400 metres) of a major collector street/collector street and bus route.</p> <p>Located on or close to bikeways network.</p> <p>Where practicable, the perimeter length of the park has direct frontage to a public road or a public place.</p> <p>AREA AND TOPOGRAPHY: Min 5ha. At navigatable sections of waterside parks topography suitable for boat/canoe launching opportunity. For non-navigatable waterbodies topography must be suitable for waterside walking/cycling route. N.B. In some instances a boardwalk may be required as a substitute for a constructed pathway.</p> <p>DISTRIBUTION: Accessible within 10-15 minute drive from any suburb/locality within the nominated district. These parks are to adjoin a permanent water body or the Brisbane or Bremer Rivers.</p>	<p>FACILITIES (urban areas): 1 x boat ramp including boat trailer turning/washdown area (ensure adequate depth of water for launch/recovery) or canoe access point.</p> <p>6 x shaded picnic facilities incorporating tables and bench seats for both small (4 x 1 Table and 2 bench seats) and large groups (2 x 4 Tables and 8 bench seats). 50% of picnic facilities to be in close proximity to car-parking areas.</p> <p>3 x BBQ areas (sheltered single BBQ only) with watering points (taps) located in close proximity to sheltered picnic areas.</p> <p>1 x kick-a-bout area (nominal size: 50 x 70m)</p> <p>Constructed pathway (2200mm wide concrete) circuit for the length of the park (adjacent to water body) integrated with pedestrian/cycle network, including access (1:20 grade maximum grade) to the major activity node.</p> <p>1 x enhanced water frontage area incorporating boardwalk, promenade or jetty located near concessionary hardstand area.</p> <p>1 x themed adventure playground (nominal size: 60 x 40m) on either a flat (1:50 maximum grade) or terraced site incorporating: a range of play equipment for children aged 2 – 12 years; shade; seating (1 x 1 Table and 2 bench seats); soft-fall; 1 drinking fountain and fenced toddler play area.</p> <p>Identity, directional and interpretive signage.</p> <p>1 x Public Amenities Building incorporating 3 x cubicles (unisex and disabled) each with toilet and wash basin.</p> <p>1 Concessionary Hardstand Area (nominal size 5m x 8m to accommodate a mobile food van and bicycle/boat/canoe hire activities) with adjacent water and power supply points.</p> <p>2 x Fish cleaning tables with water taps.</p> <p>2 x Drinking fountains (Disabled compliant)</p> <p>VEHICULAR ACCESS AND PARKING: Parking areas to accommodate 50 x cars (minimum), 1 x coach and 10 x trailers (where boat ramp provided).</p> <p>The parking areas are to be sealed, line-marked and signed and incorporate disabled car spaces.</p> <p>Installation of 'access control' barrier to all accessible park boundaries/frontages (i.e. bollards @ 1.5m centres).</p> <p>SIGNAGE: Park entry information signage at main entries to include site layout plan. (Refer to Ipswich City Council Parks and Reserves Signage Manual).</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$2,975,336 each park</p>	<p>PLANTING: Use of native species to achieve 20% site coverage.</p> <p>All planting native and predominantly local planting. Consideration to drought tolerant species.</p> <p>DRAINAGE: All 'soft' engineering with natural filter to river. Where possible, buildings and playgrounds are to be located above the Q100 design flood level. In all instances, buildings or playgrounds are to be located above the Q20 design flood level.</p> <p>SCENIC QUALITY: Modified riverbank at key locations only (e.g. adjoining boat/canoe launch point). Natural riverbank throughout remainder.</p> <p>VIEWS: Retain and frame all long distance views. Ensure waterfront planting does not obscure views.</p> <p>HERITAGE: Protect and interpret relevant features.</p> <p>SCREENING: Minimise impact on surrounding residents through screen plantings (ensure views are not obstructed) without limiting casual surveillance opportunities.</p>



Table 3.1.4: Desired Standard of Service for: Linear Parkland

DEVELOPMENT LEVEL	OPEN SPACE AND LINKS	RECREATION RANGE & OPPORTUNITY	ANCILIARY SITE WORKS
CITYWIDE <i>EXISTING EXAMPLE(S)</i>	<p>ACCESS: Close (i.e. within 400m) to collector streets and located on or close to bikeways network. Where practicable, the perimeter length of the park has direct frontage to a public road or a public place.</p> <p>AREA AND TOPOGRAPHY: Varies depending on land availability, flooding characteristics and topography. Parkland to be a minimum of 30 metres in width. No criteria for topography except that it must be capable of accommodating walking/cycling path and maintenance access (preferably vehicular).</p> <p>DISTRIBUTION: These parks are to adjoin the Brisbane and Bremer Rivers, Woogaroo, Opossum, Mountain, Goodna, Six Mile, Bundamba and Deebing Creeks. Also, this category of parkland includes the City Centre Rail Trail (incorporating the North Ipswich wetlands).</p>	<p>FACILITIES (urban areas): Opportunity to provide for where applicable:</p> <p>Constructed pathway (2200mm wide concrete) for the length of the park (preferably adjacent to river or creek) integrated with pedestrian/cycle network. Minimum 1:20 grade for pathway.</p> <p>Provision of 1 Park Table and bench seats every hectare.</p> <p>Provision of 2 x bench seat adjacent to pathway every hectare.</p> <p>Provision of 1 drinking fountain (disabled compliant) adjacent to pathway every hectare.</p> <p>Identity, directional and interpretative signage.</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$155,846 /ha</p> <p>CAR PARKING: No formal parking on site. Ensure room for on street parking along park frontage.</p>	<p>PLANTING: Use of native species to achieve 50% site coverage. All planting native and predominantly local planting. Consideration to drought tolerant species.</p> <p>DRAINAGE: 'Soft' engineering constructions with natural filter.</p> <p>SCENIC QUALITY: Shade the majority of creekbank as tree canopy, whilst exploiting any attractive water views.</p> <p>VIEWS: Exploit all mid to long distance views.</p> <p>HERITAGE: Protect and interpret relevant features.</p>
LOCAL <i>EXISTING EXAMPLE(S)</i>	<p>ACCESS: Adjoining collector or access streets with the perimeter length of the park having direct frontage to a public road or a public place, where practicable.</p> <p>AREA AND TOPOGRAPHY: Varies depending on land availability, flooding characteristics and topography. Linear parkland to be a minimum of 15 metres in width. No criteria for topography except that it must be capable of accommodating walking/cycling path and maintenance access (preferably vehicular).</p> <p>DISTRIBUTION: Nominated tributaries and local linkages and only as opportunities arise to secure land.</p>	<p>FACILITIES (urban areas): Opportunity to provide for where applicable:</p> <p>Constructed pathway (2200mm wide concrete) for the length of the park (preferably adjacent to creek) integrated with pedestrian/cycle network. Minimum 1:20 grade for pathway.</p> <p>Provision of 1 x bench seat adjacent to pathway every 500 metres.</p> <p>Provision of 1 x drinking fountain (disabled compliant) adjacent to pathway every 2 kilometres.</p> <p>Identity, directional and interpretative signage.</p> <p>ESTIMATED EMBELLISHMENT COST (Planning Scheme Policy 5 – Infrastructure): \$88,625 /ha</p> <p>CAR PARKING: No formal parking on site. Ensure room for on street parking along park frontage.</p>	<p>PLANTING: Use of native species to achieve 50% site coverage. All planting native and predominantly local planting. Consideration to drought tolerant species.</p> <p>DRAINAGE: 'Soft' engineering constructions with natural filter.</p> <p>SCENIC QUALITY: Shade the majority of creekbank as tree canopy, whilst exploiting any attractive water views.</p> <p>VIEWS: Exploit all mid to long distance views.</p> <p>HERITAGE: Protect and interpret relevant features.</p>



PART 4—STANDARDS FOR PROVISION OF EARTHWORKS

4.1.1 General Standard

- (1) The standards for the provision of Earthworks are to be in accordance with Australian Standard AS 3798-1996 “Guidelines on Earthworks for Commercial and Residential Developments”, modified to suit local conditions and practices.

4.1.2 Materials for Filling

- (1) The following materials are considered unsuitable as structural fill—
- (a) organic soils;
 - (b) silts;
 - (c) materials prone to dissolving or which undergo physical or chemical changes on exposure to moisture;
 - (d) contaminated soil.
- (2) Such material except for (1)(d) should be confined to non-critical areas, e.g. parkland.

NOTE 4.1.2A

- (1) Structural fill is any filling which will, or may be required to support structures or pavements or for which it is intended time dependent settlement will be restricted.
- (2) Most naturally occurring earth, soil and rock, with the exceptions noted in section 4.1.2(1), are capable of being compacted to form a homogeneous mass to support commercial and residential developments and associated infrastructure.
- (3) Special measures will need to be undertaken if the following materials are proposed to be used for structural fill—
 - (a) Natural Material—
 - (i) clays of high plasticity which may be reactive and need to be selectively placed within the filling and under strict moisture and density control;
 - (ii) material which, after compaction, contains large particles and may lead to difficulties in the excavation of trenches for footings or services or driving of piles or drilling of piers if this is necessary;
 - (iii) overwet materials, as may be encountered in low lying areas;

- (iv) single-sized or gap graded gravels or rock fill which will not break down upon compaction, leaving voids into which finer material may subsequently migrate;
- (v) saline, chemically aggressive, or polluted soils; and
- (vi) carbonate soils where acid dispersal may occur.
- (b) Waste Material—
 - (i) waste material such as building and demolition material may be accepted as structural fill if the supply, placement and compaction is fully specified and supervised by the Consulting Engineer or Geotechnical Consultant; and
 - (ii) level 1 supervision as set out in Appendix B of AS 3798 will be required if waste material is to be used as structural fill.

4.1.3

Compaction

- (1) For areas of structural filling the minimum relative compaction values are to be those outlined in Table 4.1.1.



Table 4.1.1: Earthworks – Guidelines for Minimum Relative Compaction

Item	Project	Minimum relative compaction, percentage	
		Minimum dry density ratio (Cohesive Soils) (See Note 1)	Minimum Density index (Cohesionless soils) (See Note 2)
1	Residential Lot fill	95 ⁽³⁾	65
2	Commercial, fills to support minor loadings	98 ⁽⁴⁾	70
3	Roads embankments		
	(a) > 0.3m below pavement subgrade	95	65
	(b) < 0.3m below pavement subgrade	100	80

Source: adapted from Table 5.1 – AS 3798-1996

Notes for Table 4.1.1—

1. All dry density ratios relate to AS 1289.E4.1 or AS 1289.E7.1 and standard compaction energy input (see AS 1289.E1.1 and AS 1289.E1.2).
2. Density index as a means for control of achieved relative compaction may be difficult to use and interpret. Local correlations with other methods may exist and can be used where these are well established.
3. Developments on this fill will be restricted to single and some double storey free standing houses with floor slab average loadings not exceeding 20 Kpa, and strip or pad footings not exceeding bearing pressures of 100 Kpa. Residential developments other than these are considered as commercial. A minimum dry density ratio of 98% or higher may need to be considered if collapse on saturation, excessive settlement, or dispersive soils are likely to occur. Not applicable where differential settlement is likely to occur.
4. Commercial developments are likely to impose loads on fills which will have a more severe effect than those of free-standing houses, even when contact pressures are limited. The engineer must assess the load carrying capacity and associated deformations associated with proposed filling to ensure the fill can perform its required function. Where highly loaded fills are proposed, the minimum relative compaction may need to be increased.

4.1.4 Construction

- (1) Earthworks are to be carried out in accordance with AS 3798 Section 6.

NOTE 4.1.4A

All fill over 500mm in depth is to be certified by an RPEQ that it has been placed in accordance with the level required under AS3798.

- (2) For normal types of compaction equipment, the fill is to be compacted in layers not exceeding 300mm.

NOTE 4.1.4B

- (1) Dust generated from the site and from earthworks is to be controlled so as not to adversely affect adjoining properties.
- (2) Water carts should also be provided on non-working days where it is necessary to control dust problems.
- (3) During and immediately following periods of rain, measures are to be undertaken to ensure that mud from the development site is not deposited on to existing roads by construction traffic.
- (4) Mud deposited onto existing roads is to be removed immediately so as not to affect the safety of traffic.

4.1.5 Testing

- (1) The frequency of testing fill for adequate compaction is to be in accordance with the requirements outlined in Table 4.1.2.

NOTE 4.1.5A

- (1) The Local Government will not give blanket approvals to any consulting body to carry out geotechnical testing at a particular level ie Levels 1, 2, or 3 as set out in Appendix B of AS 3798.
- (2) The level of testing will vary with the nature of the project and the locality.



Table 4.1.2: Earthworks – Guidelines to Frequency of Field Density Test

Scope of Earthworks	Minimum Frequency of Tests (See Note 2)
Large scale operations (e.g. subdivisions, large industrial lots, road embankments)	Greatest of— (a) 1 test per 500m ³ distributed reasonably evenly throughout full depth and area; or (b) 1 test per layer per material type per 2500m ² ; or (c) 1 test per 200mm thickness per material type per 2500m ² ; (d) 1 test per lot
Small scale operations (e.g. residential lots)	Greatest of— (a) 1 test per 200m ³ distributed evenly through full depth and area; or (b) 1 test per layer ⁽³⁾ per 1000m ² ; or (c) 1 test per 200mm thickness ⁽³⁾ per 1000m ² ; or (d) 1 test per lot.
Concentrated operations (e.g. filling of gullies, farm dams, etc)	Greatest of— (a) 1 test per 100m ³ distributed reasonably evenly throughout full depth and area; or (b) 1 test per layer ⁽³⁾ per 500m ² ; or (c) 1 test per 200mm thickness ⁽³⁾ per 500m ²
Confined operations filling behind structures ⁽⁴⁾	1 test per 2 layers per 50m ² ie test every second layer once per 50m ²
Trenches under pavements and structures	1 test per 2 layers per 40 linear m ie test every second layer once per 40m

Notes for Table 4.1.2—

- These guidelines refer to the determination of relative compaction using a direct method. However, where an indirect method is used, eg Perth sand penetrometer (AS 1289.F3.3), some interpretation of the guidelines may be required.
- Tests in visually doubtful areas, and retests of failed areas should be carried out and are additional to the testing recommended in this table.
- Where the geotechnical testing authority has been engaged at level 2 or level 3 as set out in Appendix B of AS 3798, it may be acceptable to test more than one layer per site visit by excavating to the test level.
- Implies hand operated or small equipment.
- All test locations are to be shown on a sketch plan.

4.1.6 Erosion and Sedimentation Control

NOTE 4.1.6A

Controls are required to avoid the siltation or erosion of adjoining lands, streams, watercourses, and downstream piped drainage systems during both the construction phase and the maintenance phase of a development.

- (1) During both construction (including vegetation clearing) and operational (maintenance) phases of the development the Erosion and Sedimentation Control is to be carried out in accordance with the recommendations contained in the “*Best Practice Sediment and Erosion Control*, International Erosion Control Association”.

NOTE 4.1.6B

- (1) It may not be possible to identify beforehand all the situations where and when erosion will occur, especially during the construction phase.

(2)

- (2) When any erosion or siltation does occur, immediate action is required to rectify the situation and repair any damage, including the removal of silt.
- (3) During the construction phase, temporary measures that may be accepted include—
- contour banks;
 - hay bales;
 - sand bags;
 - sedimentation basins and traps;
 - channel lining such as rip rap;
 - energy dissipaters;
 - geotextile or matting on slopes;
 - proprietary methods.

During construction—

- (a) vegetation above and below the cut and fill areas is to be retained to stop runoff water coming onto the site and into the excavation and to prevent soil leaving the site;



- (b) all excess material is to be removed immediately after excavation to prevent bogging and soil washing away;
- (c) soil stockpiles are to be stored within areas of the site nominated on the approved erosion and sediment control plans;
- (d) cut-off drains are to be provided where necessary above and below the cut and fill area to minimise water coming into the excavation;

NOTE 4.1.6C

To limit the amount of excavation and clearing at any one time, the staging of works should be considered.

- (e) trenches are to be backfilled within twenty-four (24) hours of inspection and approval;
 - (f) soil erosion control measures are to be placed above and below the excavated site to prevent soil movement during periods of rainfall; and
 - (g) the erosion control measures are to be maintained throughout the progress of the work.
- (3) All unpaved areas where earthworks have been undertaken are to be grass seeded to achieve sufficient grass cover to prevent both rill and sheet erosion.
- (4) Following the placing and spreading of topsoil to a minimum depth of 75mm won from the site or imported, the footpaths, parks, allotments and other disturbed areas are to be seeded.
- (5) Seeding is to consist of dehusked couch seed mixed with other seeds and fertilisers in accordance with the following criteria—
- (a) the seed is to be thoroughly mixed with fertiliser and loam in the following proportions—
 - (i) 200g, dehusked couch seed;
 - (ii) 10kg, super phosphate fertiliser or equivalent; and
 - (iii) 12kg, loam;
 - (b) the resultant mixture is to be spread evenly over the surface at the rate of 21kg of mixture to 100 square metres; and
 - (c) the mix is to also include a nursery grass (e.g. millet).

NOTE 4.1.6D

- (1) The type of nursery grass and the rate of application will be dependent on the season.

- (2) Immediately prior to the spreading of the seed mixture the areas are to be thoroughly watered to promote seed germination.
- (3) After seeding, the areas seeded are to be kept moist by watering until the grass is “established”.
- (4) Such watering is to be continued throughout the maintenance period to ensure the continued growth of the grass.
- (5) Grassing is deemed to be “established” when vigorous green growth is in evidence from the planted seeds and cover will prevent both rill and sheet erosion.

4.1.7**Material Exportation**

(1)

Site access treatment measures must be implemented to prevent soil or mud being transported from the construction site and deposited on public roads.

4.1.8**Batters and Earth Retaining Structures**

(1)

No proposed fill or cut is to have a deleterious effect on the visual amenity of the adjoining property.

(2)

Batters are not to exceed 1:6.

(3)

The toe of any fill batter or top of any cut batter is to be a minimum 300mm clear of the boundary line with an adjoining property.

(4)

There is to be no ponding or nuisance from stormwater runoff on adjoining properties.

(5)

All batters or walls abutting existing or proposed road reserves are to be contained within the proposed allotments and not encroach on the road reserve.

(6)

Boulder type walls 1.0m high or greater are required to be set back a minimum 1.0m from road reserves.

(7)

Retaining structures shall have:

- (a) minimum 5kPa design surcharge load;
- (b) bridge footing where applicable so as to not impose any additional loading upon municipal underground services;
- (c) subsoil drainage, with connection to legal point of discharge;
- (d) approved backfill drainage material contained within a geo-fabric wrap;
- (e) moulded concrete V-drain;
- (f) approved safety fence where located in public area and are 1.0m or greater in height;
- (g) for boulder type gravity walls constructed of “A” grade saw cut rock.



PART 5—GENERAL CONSTRUCTION ISSUES, PROCEDURES AND STANDARDS

Division 1—General Approach to the Construction of Public (Municipal) Works

NOTE 5.1A

- (1) The Local Government's philosophy in the adoption of construction standards embraces the following values—
 - (a) serviceability;
 - (b) performance;
 - (c) safety;
 - (d) aesthetics and the environment; and
 - (e) recognition of codes of practice.
- (2) Where this planning scheme policy does not address particular issues, the Local Government will return to these basic values to determine its requirements.
- (3) Serviceability relates to the quality, durability and practicality of the constructions intended to be handed to the Local Government.
- (4) In general the capital costs of items will be in inverse ratio to the ownership cost in perpetuity to be assumed by the Local Government.
- (5) For this reason, the Local Government will normally place a greater priority on the ownership costs.
- (6) For instance, where a small premium is involved in obtaining significant durability advantages, the higher standard will be sought.
- (7) Specification of equipment of Australian manufacture will generally be favoured unless demonstrably inferior to an imported alternative.
- (8) Performance is the ability of the facility to accommodate the likely loading in its design lifetime; be it hydraulic, structural, mechanical or traffic volumes.
- (9) These will be specified, often in company with limiting minimum criteria for materials and dimensions.
- (10) Safety aspects are to be a consideration in the construction and operation of all aspects of the built environment.
- (11) This includes the future maintenance staff as well as the public.
- (12) The design and construction is to pay regard to the finished appearance of the project, following established aesthetic principles.
- (13) The environment created should be capable of ready and economical maintenance after construction (for example, elaborate labour-intensive landscaping solely to enhance the marketability of a project is generally unsustainable in the long term).

- (14) Every attempt has been made to incorporate national codes of practice and State Government standards in the design and construction requirements.
- (15) This should minimise the opportunity for dispute or confusion.
- (16) Local requirements have been added to satisfy local conditions or ensure conformity to a narrower standard, so as to limit spare parts inventory and delays in supply.

5.1.1 Inconsistencies

- (1) Where any provision of Codes of Practice, manuals or other technical documentation (e.g. QUDM, Austroads, DTMR Manuals etc) does not accord with this Planning Scheme Policy (including the Ipswich City Council Standard Drawings), the provisions of the Planning Scheme Policy (including the Ipswich City Council Standard Drawings) are to take precedence.

5.1.2 Alteration to Public Utilities

- (1) The cost of any alterations to public utility mains, services or installations, necessitated by a development, are the responsibility of the developer.

5.1.3 Construction Hours

- (1) Hours of construction are—
 - (a) Monday to Saturday from 6.30 a.m. to 6.30 p.m.; and
 - (b) construction is not to be undertaken on the premises outside the above hours or on Sundays or Public Holidays.

5.1.4 Fauna Management

- (1) All vegetation clearing must be undertaken under the supervision and direction of a licensed fauna spotter catcher.

5.1.5 Disposal of Cleared Vegetation

- (1) Cleared vegetation is either—
 - (a) mulched and used on site; or
 - (b) removed to an approved off-site location.
- (2) Declared or environmental weeds are not mulched for re-use on site and must be removed to an approved off-site disposal location.



NOTE 5.1.5A

Specific regard should also be had to the clearing of vegetation provisions for the relevant zone in which the site is located to ensure compliance and that required approvals are obtained prior to vegetation removal.

5.1.6 Concrete

- (1) All concrete is to be manufactured, specified and supplied in accordance with the Australian Standard "The Specification and Manufacture of Concrete".

5.1.7 Street Lighting

- (1) Street lighting is to be installed, by the Developer, in accordance with Australian Standard AS 1158.
- (2) All street lighting associated with a development is to be certified by a RPEQ.
- (3) Wherever possible, street lighting is to be installed on the same side as concrete footpaths.

5.1.8 Electricity Reticulation

- (1) Except where specifically varied hereafter, all electricity reticulation shall be constructed in accordance with the Ipswich City Council Standard Drawings and this Planning Scheme Policy.
- (2) Council's standard requirement for the provision of electricity to new development involves underground reticulation.

Division 2—Requirements for the Construction of Public (Municipal) Works

5.2.1 General

- (1) The Engineering Consultant or Landscaping Consultant who designs and supervises Municipal works is independent and is not an employee or associate of the developer or the contractor carrying out the works.
- (2) The works are to be undertaken by a nominated Principal Contractor experienced in the construction of Public (Municipal) Works.

NOTE 5.2.1A

The Local Government may request evidence of the Principal Contractors competency in the construction of Public (Municipal) Works.

(3)

Certification of such works is to include the submission of copies of all relevant test results and certificates as may be required by Part 9—Compliance with Standards for Reconfiguration and Site Development Works of this Planning Scheme Policy.

(4)

Certification of such works is to also include the submission of "As Constructed" information surveyed by a Licensed Surveyor in accordance with the Local Government's "Infrastructure 'As Constructed' Standards" (refer Planning Scheme Policy No. 2).

5.2.2**Prerequisites**

(1)

Following operational works approval but before construction work may commence the Local Government requires the following—

- (a) Notification by the Consulting Engineer and the Consulting Landscape Architect of the—
- (i) contractor(s) and landscape sub-contractor on-site and after hours telephone number;
 - (ii) supervising engineer(s) and landscape supervisor office and after hours telephone numbers;
 - (iii) date of commencement of works;
 - (iv) program of works showing major components;
 - (v) a sediment and erosion control plan that details the staging of erosion and sediment control devices through the progression of construction; and
 - (vi) evidence of possession of site by contractor and demonstration of indemnity required in accordance with 5.2.5.

NOTE 5.2.2A

Such notification is to be given at least three (3) working days prior to the Date of Commencement of works.



- (b) An invitation to attend the prestart conference.
- (c) For any Public (municipal) works associated with developments or for external works concerning reconfiguration of land, the provision of a bank guarantee or cash bond equivalent of not less than 10% (minimum \$2,000) of the value of those works as security for the performance of the various construction obligations (including the provision of engineering certification and "as constructed" information).
- (d) The provision of Erosion and Sediment Control (E&SC) bank guarantee or cash bond equivalent of not less than 3% (minimum \$20,000) of the value of the works as security for performance of restoration works concerning contaminants (as defined by the *Environment Protection Act*) which originate from the subject site and are deposited external to the development.
- (e) The provision of sign/s which display the business and relevant after hours contact phone numbers of the applicant, supervising engineer, landscape architect and contractor as well as the relevant operational works application number in accordance with the following requirements:
 - (i) The dimensions of the signage is not less than 900mm high and 1200mm wide;
 - (ii) The signage is placed:
 - (A) a minimum 300mm above ground level;
 - (B) within 1500mm of the property boundary of the development site; and
 - (C) at every location where the development site fronts onto a formed road;
 - (iii) The signage is made of weatherproof and durable materials; and
 - (iv) All details are to be displayed with a minimum lettering height of 40mm and in bold text (approximately 147 point Arial bold font).

NOTE 5.2.2B

- (1) All bonds are to be accompanied with a completed Bond and Licence Deed.
- (2) The 10% works bond is to be reduced to an amount not less than 5% of the value of the works upon formal acceptance of the works "On Maintenance" which is retained by the Local Government during the maintenance period as security for the performance of the maintenance obligations.
- (3) All bonds are to be returned upon formal acceptance of the works "off maintenance".
- (f) The consent of property owners affected by the approved works, as required by any development approval conditions.
- (g) Any amended drawings signed by a RPEQ demonstrating compliance with development permit conditions of approval.
- (h) Amended drawings are required to be accompanied by a revised Engineering Certificate – Appendix 3.1.
- (i) Completion of the Evidence of the Possession of Site Form and submission to Council.
- (j) Evidence of indemnity in accordance with Section 5.2.5.

5.2.3**Inspections**

- (1) During construction, joint inspections are to be made as required by Part 9, "Compliance with Standards for Reconfigurations and Site Development Works" of this Planning Scheme Policy.
- (2) The Local Government requires notice of all such joint inspections.
- (3) Test results, application rates and other relevant information is to be made available as required at or prior to the relevant inspection.
- (4) Audit inspections of the works may be undertaken at all reasonable times during the construction period.



5.2.4 Alteration to Approved Design

- (1) All changes to the approved design affected during construction is to be subject to the approval of the Local Government.
- (2) If during construction inadequacies of the design are discovered, the Consulting Engineer is to resubmit amended plans to the Local Government and rectify any works accordingly.
- (3) Where a non-approved discrepancy occurs between the design and the Local Government's standards, then the Local Government's standards are to apply.
- (4) If there are errors, omissions or insufficient detail on the plans for the purpose of construction, these deficiencies are to be made good during construction.

5.2.5 Indemnity

- (1) The owner, contractor or consultant engineer is to indemnify the Local Government against any claim, action or process for damage or injury which might arise during the progress of the works for the full construction period.
- (2) No work is to commence unless the developer has in place the following insurances—
 - (a) Public Liability Insurance to a limit of indemnity of not less than \$20,000,000 with a notation with the Local Government as an Insured Party; and
 - (b) Workers' Compensation Insurance.
- (3) The developer is to take steps to ensure that all contractors employed by them are also covered in relation to the above insurances and that they in turn ensure that all sub contractors employed on the job are covered in relation to the abovementioned insurances.

5.2.6 Traffic Safety

- (1) The contractor is to provide all signage and delineation as required by the MUTCD.
- (2) Where required, a Permit to Open a Road or Temporarily Close a Road to Traffic is to be obtained from the Local Government and Police prior to commencement of works.

5.2.7 Inconvenience/Nuisance to Local Residents

- (1) The contractor is to ensure that at no time works inconvenience or cause nuisance to adjacent residents.
- (2) Dust or smoke associated problems are not to occur when earthworks are being carried out.

5.2.8 Pre-Start Meeting**NOTE 5.2.8A**

The general requirements to be met and general points of discussion to be raised at the pre-start meeting for reconfigurations and developments involving public (municipal) works are as follows—

- (a) Prior to arranging the pre-start meeting, the Local Government is to have approved plans and construction specifications (including priced Schedule of Quantities).
- (b) A bond has been provided in accordance with section 5.2.2(1)(c).
- (c) The relevant information as outlined in section 5.2.2, is to be presented prior to, or at the pre-start meeting.
- (d) Tree retention, fencing of Tree Protection Zones (TPZ) and other environmental aspects.
- (e) Tree Protection Zone (TPZ) fences.
- (f) Permit to Open a Road – including any permit from Police and provision of adequate traffic safety measures.
- (g) Permit to Draw Water for construction purposes.
- (h) Fire Permit – if burning off, required from the Fire Brigade and the Local Government.
- (i) Arrangements for Private Works in respect to Local Government connections, i.e. Water Reticulation, Sewer Reticulation, Other (reinstatement of road crossing, etc.).
- (j) Obligation to obtain consent letters prior to entry into private property. (A clearance letter is required upon completion of works).
- (k) Any coordination required with Service Authorities, Local Government, Department of Transport and Main Roads, etc.
- (l) Any anticipated changes to the approved design to be effected during construction.
- (m) Local Government inspection requirements, in particular noting that for Roadworks the CBR Results and Proposed Pavement is to be submitted for Approval by the Local Government prior to the subgrade inspection.



Division 3—Construction Phase Inspection Requirements

5.3.1 Joint Inspections

- (1) The inspection requirements for reconfigurations and developments involving public (municipal) works are as follows—
- (a) pre-start meeting (refer to Note 5.2.8A);
 - (b) pavement subgrade;
 - (c) preseal (base course) inspection;
 - (d) final inspection “On Maintenance” (refer to Part 10 of this Planning Scheme Policy);
 - (e) Bio-filter drainage layer inspection;
 - (f) final inspection “Off Maintenance” (refer to Part 10 of this Planning Scheme Policy); and
 - (g) others (when specific engineering problems arise).

5.3.2 Random Audit Inspections

- (1) In addition to the joint inspections, the following random audit inspections are to be undertaken to ensure adequate quality control is being employed—
- (a) pavement construction;
 - (b) allotment fill compaction;
 - (c) stormwater and roofwater installation;
 - (d) conduit installation;
 - (e) landscaping; and
 - (f) asphalt/bitumen surfacing applications.



PART 6—STANDARDS FOR CONSTRUCTION OF ROADWORKS

Division 1—Standards

6.1.1 General

NOTE 6.1.1A

- (1) All work is to be supervised by a Registered Professional Engineer (Qld) competent in roadworks and undertaken by a nominated Principal Contractor experienced in the construction of Public (Municipal) Works.
- (2) The Local Government may request evidence of the Principal Contractors competency.
- (3) On the completion of the works a certificate is to be submitted to the Local Government from the supervising engineer certifying that the works have been completed in accordance with the approved plans and specifications.
- (4) Certification is to include the submission of "as constructed" plans and copies of all relevant test results.
- (5) Works involving State Controlled Roads must be referred to the Department of Transport and Main Roads for approval.

- (1) Road construction methods and practices accord with those specified in—
 - (a) DTMR "Standard Specifications Roads";
 - (b) DTMR "Pavement Design Manual";
 - (c) DTMR "Urban Road Design Manual" Volumes 1 and 2;
 - (d) DTMR "Manual of Uniform Traffic Control Devices";
 - (e) the Ipswich City Council "Standard Drawings"; and
 - (f) the relevant Austroads Guides when dealing with construction methods and practices not covered in the manuals or Ipswich City Council Standard Drawings specified in paragraphs (a) – (e).
- (2) Where there is an inconsistency between the specified Manuals and the Ipswich City Council Standard Drawings, the Standard Drawings are to take precedence to the extent of the inconsistency.

Division 2—Rural Roadworks and Access

6.2.1 Physical Access

NOTE 6.2.1A

Physical access is defined as the entry from the lot onto a Local Government maintained road from the property boundary to the road shoulder.

- (1) Access onto a gravel road requires—
 - (a) a gravel invert crossing if situated on the crest of a road; or
 - (b) the installation of a concrete stormwater pipe/s placed within the invert of the table drain with concrete headwalls, wingwalls and apron in accordance with Standard Drawing No. SR.16.
- (2) A road base material with a minimum CBR 45 is to be used as cover pavement material and is to comply with those pavement material properties specified in this division.

6.2.2 Roadworks

- (1) If a maintained gravel road finishes short of the proposed development then roadworks across the full frontage of the lot and back to the existing Local Government road within the road reserve are to be carried out in accordance with Standard Drawings.
- (2)
 - (a) The wearing course gravel pavement is to be a minimum depth of 100mm but may increase depending on the soil strength (CBR) of the subgrade material.
 - (b) Where the subgrade material is unsatisfactory with respect to the soil strength (CBR) one of the following measures is to be undertaken—
 - (i) replacement of the deficient pavement to a minimum depth of 300mm with a material of CBR 15 or higher;
 - (ii) use of geofabric;
 - (iii) stabilise the soil by use of a mixture of cement and/or lime; or
 - (iv) increase wearing course depth.



- (3) The wearing course pavement material is to be well graded, gravel-sand mixtures with a small proportion of clayey fines with the following properties—
- fines to sand ratio between 0.2 and 0.4;
 - Plasticity Index range between 4 to 15;
 - Linear Shrinkage range between 2 to 8; and
 - a minimum CBR 45 for the material.
- (4) The Grading Limits for the wearing course pavement material are to be as outlined in Table 6.2.1.

Table 6.2.1: Grading Limits

AS Sieve Size	37.5 mm	19.0 mm	9.50 mm	4.75 mm	2.36 mm	425 µm	75 µm
% by Mass Passing Sieve Designated	100	55-90	40-70	28-55	20-45	10-25	4-15

NOTE 6.2.2A

- The Developer is to submit to the Local Government a certificate from a NATA registered laboratory indicating conformity with the pavement requirements.
- The pavement material may be supplied ex-quarry or delivered to site and the supplier is to have in place a quality system ensuring the quality of the material.
- A certificate indicating conformity with the pavement requirements is to accompany the pavement material.

6.2.3 Pre-Start Meeting/Inspections**NOTE 6.2.3A**

- Prior to any gravel road construction occurring, the Developer is to contact the Local Government for an on-site meeting to discuss the intended road construction process.
- Prior to the Developer organising the meeting with the Local Government, the Developer is to have submitted the Certificate of material conformity and received confirmation from the Local Government that any material to be used in the construction process has been approved.
- The following inspections/meetings are to be undertaken as a minimum by the Local Government—
 - Pre-Start Meeting;
 - Subgrade Inspection;
 - Pavement Inspection;
 - “Final Inspection”.

- (4) On completion of all roadworks a final inspection will be undertaken to determine whether the Local Government will accept the road into the gravel road maintenance program.

6.2.4 Setting Out and Compaction of Subgrade

- The subgrade is to be set out and formed so that the centre line or crown of the road is centrally aligned within the road reserve.
- The longitudinal gradient of the formation is to be no greater than 10 % although limited sections not exceeding 100m, may have a maximum gradient of 20%.
- Where grades exceed 10%, sections are to be bitumen sealed.
- The subgrade is to be trimmed to the same crossfall tolerances as specified for the wearing course pavement so that any depth deficiencies are not made up of pavement material.
- The subgrade is to be compacted generally in layers no deeper than 150mm, where filling is required, by a vibrating steel drum roller.
- The material is to be compacted at or close to Optimum Moisture Content (OMC) so that the workability of the material is increased to facilitate easier compaction and ultimately a higher dry density.

6.2.5 Placement and Compaction of Pavement Material

- Prior to the placement of pavement material the subgrade is to be trimmed to the required crossfalls, the formation centrally aligned within the road reserve, the in-situ moisture content uniform, and any suspect areas of poor material treated in accordance with those methods outlined in section 6.2.2.

NOTE 6.2.5A

- The inspection of the subgrade by the Local Government will be limited to a visual test and proof rolling.
- Proof rolling is required to check for any area of the subgrade which might show signs of deflection indicating a weakness in the sub-strata.
- There is to be on site at the time of inspection the rolling equipment to undertake proof rolling.
- Pavement materials are not to be used until the Local Government has received the Certificate of compliance for this material as indicated in section 6.2.2, and approval for its use has been given by the Local Government.



- (2) Pavement materials are to be placed on the exposed subgrade at intervals sufficient to accommodate even spreading to achieve the approved pavement thickness (minimum 100mm).
- (3) Pavement materials are to be compacted at OMC by either a vibrating or non-vibrating steel drum roller and is to be undertaken from the outside edge of the formation to the centre line or crown of the road.

NOTE 6.2.5B

- (1) A forward pass and reverse pass shall be made over the same section of pavement before moving to the adjacent section.
- (2) It is important to check that this is undertaken as close as possible to the edges of the pavement.
- (3) Any change in direction of the roller should be such that the roller is on the previously compacted section.
- (4) Each pass of the roller should overlap by up to 500mm of the previous pass to ensure complete coverage.

6.2.6 Table Drains

- (1) As part of the road construction suitable table drains and cross road drainage are to be constructed.
- (2) Table drains are to run parallel to the road surface and adjoining slopes.
- (3) The drains are to be placed in cut sections and at grade sections.
- (4) Table drains are to be constructed with either flat or angled beds and unlined unless there is a potential scouring problem in which case lining works are to be undertaken.
- (5) Table drains on the low side of the road are to be diverted to side drains or cut off drains so that runoff does not pool near the road formation.
- (6) Table drains on the high side of the road are to be diverted to cross road culverts.

6.2.7 Cross Road Drainage

- (1) Cross road drainage is to be constructed in accordance with one of the pipe sizes outlined in Table 6.2.2 'Indicative Pipe Sizes for Rural Catchment Areas'.

NOTE 6.2.7A

If the catchment contributing to the culvert is larger than 15 hectares the Developer will be required to obtain a design from a Registered Professional Engineer (Qld) (RPEQ) indicating the required treatment to be undertaken.

- (2) The cross road drainage is to be constructed with the obvert of the pipe culvert a minimum of 300mm below the finished road level, and the pipe is to have concrete or stone pitch concrete headwalls, wingwalls and aprons on both the inlet and outlet of the culvert.
- (3) The minimum pipe size to be used for any cross road culvert is 300mm diameter.
- (4) Culverts are to be laid with a minimum fall of 100mm across the width of the road.
- (5) The inlet and outlets to the culverts are to be clear, flat and unobstructed for a distance of 1.5m.
- (6) The grade of any earth batters leading into or out of the culvert are to have a maximum slope of 1 in 6.
- (7) Two (2) timber or tubular steel delineator posts are to be installed on either side of the culvert structure on both sides of the road in accordance with DTMR Standard Drawing for Roadworks No. 1356.
- (8) The delineator posts are to be installed with the inside face of the post in line with the shoulder of the road.
- (9) Delineator posts are to be installed so that the red delineator is on the left side and the white delineator is on the right side of the road in both directions.

Table 6.2.2: Indicative Pipe Sizes for Rural Catchment Areas

Rural Catchment Area (Ha)	Pipe Size Required (mm)	Discharge (m ³ /S)
1.5	300	0.15
2.0	375	0.20
3.0	450	0.30
5.0	525	0.45
7.0	600	0.60
9.0-11.0	2 x 525	0.80
12.0	2 x 600	1.00
15.0 to 100	RPEQ Engineer Design Required	RPEQ Engineer Design Required

NOTE 6.2.7B

All proposed cross road drainage treatments are to be approved by the Local Government before any roadworks are undertaken by the Developer.



6.2.8 Conduits and Road Crossings for Services

- (1) In all cases, services and accommodating conduits shall be placed across roads and the backfill thoroughly compacted no later than subgrade stage
- (2) Beam deflections and compaction testing of trenches greater than 300mm in width to confirm the stability of the trench are required at the subgrade stage.

- (6) A water service conduit is to be installed approximately every 80 metres, with a minimum of one service per median.
- (7) Where the fall across an island is greater than 1 in 4, the island is to be surfaced with brushed or stencilled concrete.
- (8) Sub-soil drainage (connected to an underground drainage system) is required in all islands where the surface treatment is other than concrete.

NOTE 6.3.3A

- (1) An irrigation system may be required if specified by the Local Government.
- (2) A minimum carriageway width of 3.2m shall be maintained through traffic calming devices.

Division 3—Urban Roadworks and Access

6.3.1 Vehicular Crossings

- (1) Where applicable, all vehicular footpath crossings (together with any necessary adjustments to the kerb and channel) are to be constructed in accordance with Standard Drawing Nos. SR.12, SR.13 and SR.14.

6.3.2 Roadworks

- (1) All urban roads are to be constructed with concrete kerb and channel and asphaltic concrete surfacing, together with associated works for the full length of all property frontages.

NOTE 6.3.2A

Refer to Planning Scheme Policy 5—Infrastructure for further details regarding Connecting Works, Internal Works and External Works.

6.3.3 Traffic Islands

- (1) Traffic islands are to be indicated by raised kerb islands.
- (2) Islands may include channelling (or directional) islands, roundabouts, median islands, medians, separators, pedestrian refuge islands and are to be classified in accordance with the DTMR "Manual of Uniform Traffic Control Devices (Qld)".
- (3) Raised kerbed islands less than 12.0m² or less than 2.0 metres in width between kerb faces are to be constructed with a minimum 100mm thickness N25 reinforced concrete on a compacted sand base.
- (4) The surface treatment for these islands is to be brushed or stencilled concrete.
- (5) Raised kerb islands greater than 12.0 m² and wider than 2.0 metres are to be grassed or landscaped in accordance with the approved landscape drawings.

6.3.4 Verges

- (1) Verges are to be covered full width with topsoil to a depth of not less than 50mm lightly compacted and seeded with grass, or 100mm lightly compacted and turfed.

6.3.5 Bus Stops

- (1) Bus stops (including indented bus bays) are to be located on arterial, sub-arterial, major collector and collector roads as outlined in the Reconfiguring a Lot Code.
- (2) Where bus bays front any lot on a collector road, a driveway is to be constructed for each affected lot not within the bus set down area but within the tapers of the bus bay or outside the bus bay area.

6.3.6 Line Marking

- (1) All transverse markings (with the exception of chevron markings) are to be treated with an anti-skid material at application.
- (2) Continuity lines and transverse markings across intersections (where required) are to be completed in a long life material such as thermoplastic materials.



Division 4—Pavement Construction

6.4.1 General

NOTE 6.4.1A

- (1) Each pavement course is not to be commenced until the previous course (i.e. subgrade, subbases, base or existing pavement) has been inspected and approved and certified by the consultant with respect to compaction, finished levels and texture of finish.
- (2) Compaction tests of each layer are required and consultants are to ensure that all tests are satisfactory before proceeding to the next layer.
- (3) All test results are to be provided to the Local Government prior to asphalt surfacing.

- (1) Subgrade is to be trimmed to an even surface free from loose material and graded to be free-draining.
- (2) Unsuitable material such as organic matter is to be removed.
- (3) Subgrade affected by rainfall after final trimming is not to be accepted until appropriate drying out treatment has been affected.
- (4) Unbound pavement course material is to be placed only on underlying layers maintained at the correct moisture content.
- (5) Prepared subgrades and preceding layers of base course are to be moistened immediately prior to spreading the next course.
- (6) Pavement materials are to be maintained at the specified moisture content prior to and during spreading.
- (7) The leading edges of the pavement material are to be kept moist.
- (8) Minimum compacted layer thickness is to be 100 millimetres with the maximum compacted thickness not exceeding 150mm.

6.4.2 Compaction Testing

- (1) Determination of the compaction performance of the subgrade and pavement gravel materials (i.e. laboratory reference density, field density, optimum moisture content, field moisture content) is to be carried out in accordance with AS1289 Methods of Testing Soils for Engineering Purposes, in particular the E series tests.

- (2) The laboratory reference density is to be as follows—
 - (a) Subgrade 100% Standard Maximum Dry Density (MDD); and
 - (b) Pavement 95% Modified Maximum Dry Density (MMDD).
- (3) The minimum frequency of testing is to be as follows—
 - (a) 1 per 200m³;
 - (b) 1 per layer per 1000m²;
 - (c) 1 per 200mm thickness per 1000m²;
- (4) A minimum of 3 tests per project are to be undertaken.

NOTE 6.4.2A

A sketch plan showing the location of the tests is to be submitted to the Local Government with the test results.

- (5) All tests are to be distributed reasonably evenly through the full depth and area of pavement.
- (6) The testing frequencies are to be based on a "not one to fail" basis.

NOTE 6.4.2B

- (1) Failure of material quality tests will require removal of the material or further "insitu" testing.
- (2) Failure of compaction tests will require—
 - (a) re-testing at the same depth and location if the failure is minor, e.g. localised single failure by 1% - 3%; or
 - (b) removal of, or reworking of material, if the failure is significant or widespread.

- (7) Subgrade and base courses are to be compacted to the following densities—
 - (a) Natural Subgrade 100% MDD; and
 - (b) Base Courses 95% MMDD.

NOTE 6.4.2C

- (1) Any failed test results on any layer together with the remedial treatment undertaken at the Consultant's directions are to be submitted with other test results prior to the preal inspection.
- (2) Testing for material quality compliance and allowable tolerances for pavement construction are to be as set out in Part 9 "Compliance with Standards for Reconfigurations and Site Development Works, of this Planning Scheme Policy.



6.4.3 Pavement Depth Verification

- (1) Pavement depths are to be verified by the provision of "as constructed" levels of the subgrade and top of asphalt surfacing at a frequency of 3 levels (RHS, centre and LHS) every 50 metres.
- (2) The surveyed information is to be provided in a tabulated format and is to be certified by both the surveyor and consulting engineer.
- (3) A copy of the certified results are to be submitted with the Engineer's certification of the works.

6.4.4 Construction Tolerances

- (1) Pavement and compacted asphalt layers are to be constructed to the tolerances as outlined in Table 6.4.1.

Table 6.4.1: Construction Tolerances

Pavement Layer	Construction Tolerance (mm)	Shape
Subgrade	+15mm to -15mm	Shows no sign of instability or deformation under proof rolling
Subbase	+10mm to -10mm	The surface of the subbase should not deviate from a 3m straight edge laid in any direction by more than 20mm
Basecourse	+10mm to -10mm	The surface of the base course should not deviate from a 3m straight edge laid in any direction by more than 15mm
Compacted Asphalt Pavement Surfacing/ Wearing Course	In accordance with DTMR Specification MRTS30 Table 12.3.3.2	The finished surface should not deviate from a 3m straight edge laid in any direction by more than 7mm.

Division 5—Pavement Surfacing

6.5.1 Asphaltic Concrete Surfacing

- (1) Asphaltic concrete surfacing of the road pavement is to be carried out to the width specified in the Standard Drawings for the appropriate road type and in accordance with the construction requirements outlined in the Department of Transport and Main Roads "Standard Specifications Roads".

NOTE 6.5.1A

- (1) Asphaltic concrete surfacing is not to be commenced until the Consultant and the Local Government have inspected the substrata (either as a base course or existing surface) and the Consultant certified that it is suitable for the laying of asphaltic concrete surfacing.
- (2) Before issuing the required certification, the Consultant is to consider the quality of the finished levels, compaction and texture finish.

- (2) The surface of all asphaltic concrete is to be finished true to grade and profile with smooth joints and a neat finish around manholes and other road surface fittings.
- (3) The finished compacted thickness of asphaltic concrete is to be as specified in Table 1.2.3: "Minimum Pavement Course Thickness" for the appropriate road type.
- (4) Prime must be applied a minimum of 48 hours prior to asphalt being laid. Primer seals must be laid a minimum of three (3) months prior to asphalt being laid.
- (5) The supplier must be on the TMR Transport Infrastructure Project Delivery System (TIPDS) Contractor Prequalification list (current at time of application) with a Minimum Prequalification Level of A3 or A4.
- (6) The contractor enlisted to place the asphaltic concrete must be on the same list with A1 or higher (A2, 3 or 4) prequalification.

6.5.2 Spray Surfacing

- (1) Bitumen surfacing is to be hot sprayed bitumen.
- (2) Bitumen surfacing of the road pavement is to comprise the construction of a bitumen surface coat to the width specified in the Standard Drawings for the appropriate road type and in accordance with the construction requirements outlined in the Department of Transport and Main Roads "Standard Specifications Roads".

NOTE 6.5.2A

- (1) Bitumen surfacing is not to commence until the Local Government approves the proposed roadworks.
- (2) All necessary precautions are to be taken to prevent binder, aggregate, or other material used on the work from entering or adhering to kerb and channelling, gratings, hydrant or valve boxes, manhole covers, bridge or culvert decks or similar road fixtures.



Division 6—Traffic Control Devices and Provision for Traffic

6.6.1 General

- (1) Street signs, road line-marking and road furniture shall be designed, located, constructed and erected in accordance with the Department of Transport and Main Roads "Manual of Uniform Traffic Control Devices" and the relevant Standard Drawings.
- (2) All permanent signs in concrete paved areas are to be sleeved and bolted.
- (3) Vandal proof bolts and fittings are to be used on all permanent signing.
- (4) The Developer is to provide a list of at least three names (and name meanings) to the Local Government for each new road to be opened.
- (5) The list of road names is to be submitted as early as practicable to allow the Local Government to approve the names in time for sign manufacture and erection prior to the opening of the new roads.
- (6) For major subdivisions, a theme may be used for road names if this is considered appropriate.

6.6.2 Traffic Control Devices

- (1) Traffic control devices (including temporary or construction signing and road marking) are to conform and be placed to the requirements of the DTMR "Manual of Uniform Traffic Control Devices".

NOTE 6.6.2A

- (1) All traffic control devices are to be maintained in an effective and clean condition whilst used at the roadworks.
- (2) Devices which are damaged or worn, or which do not conform to MUTCD are not to be used at the roadworks.

6.6.3 Detouring of Traffic

NOTE 6.6.3A

- (1) If traffic is to be detoured away from the roadworks via existing roads, the Contractor is to liaise with and make all necessary arrangements with the Local Government.

- (2) The arrangements are to include making provision for the issuing of public notices in respect of the detour, any repair or upgrading work on the roads concerned which may be required prior to the detouring of traffic, maintenance of the roads concerned during the detour period, and any restoration work which may be necessary following cessation of the detour period.
- (3) The Consultant is to provide the Local Government with details of the arrangements made for detouring of traffic.
- (4) Such details are to be approved by the Local Government prior to commencement of detouring.
- (5) Should existing traffic flow be affected, all necessary arrangements to adequately control traffic affected by the works are to be provided.

6.6.4

Entrances to Private Properties

- (1) Roadworks are to be carried out in a manner so that existing entrances to private properties affected by the roadworks operations are either—
 - (a) maintained in a useable condition during the period of construction of the roadworks; or
 - (b) alternative entrance arrangements are made with the property owners concerned.

NOTE 6.6.4A

The Contractor is to make good any damage to entrances to private properties which result from the Contractor's operations during construction of the roadworks.

6.6.5

Dust Control

- (1) The Contractor is to minimise any dust problems which may occur during the construction of the roadworks and which may affect the safety and general comfort of the travelling public and surrounding residences.
- (2) As a minimum, the Contractor is to carry out regular applications of water or other palliative measures along the sections of the roadworks and side-tracks traversed by the travelling public.



6.6.6 Protection of Traffic and Pedestrians Adjacent to Works

NOTE 6.6.6A

- (1) Works are not to be commenced without the prior approval of the Local Government and the procurement of a Road Opening Permit from the Local Government in accordance with the Local Government Act and a Permit from the Police in accordance with the Traffic Act.
- (2) Prior to commencement of construction, a traffic management plan, setting out the safety measures, signs and personnel involved in maintaining the protection of traffic and pedestrians for the duration of the works is to be supplied to the Local Government.

6.6.7 Urgent Repairs and Protective Works

- (1) If by reason of any circumstances arising in connection with the work, any urgent remedial, protective, repair or other work is necessary to prevent damage to the work or to provide protection for pedestrians and traffic and the Contractor is unable or unwilling to do such work, the Local Government may do such remedial work.
- (2) The Local Government is to determine the reasonable costs incurred in carrying out the works and the amount so determined is to be paid by the Contractor to the Local Government, no later than prior to acceptance of the works "on maintenance".

Division 7—Sub-Soil Drainage of Pavements

6.7.1 Location of Sub-Soil Drains

- (1) Where kerb and channel has been or is to be constructed, the sub-soil drains are to be constructed immediately below the back of the kerb as outlined in Standard Drawing Nos. SR.20 and SR.21.
- (2) Sub-soil drains shall be extended to interface and connect with existing sub-soil system and legal point of discharge.
- (3) Where the road shoulders are unsealed, the sub-soil drains are to be placed as outlined in the approved Engineering Plans, except where kerb and channel is to be constructed in the future, in which case the sub-soil drain is to be located as outlined in sub-section (1) above.

6.7.2 Order of Construction

- (1) Sub-soil drains are to be constructed after placement of the lower sub-base material (CBRI5) or after preparation of the pavement box on minimum depth pavements.

NOTE 6.7.2A

The Local Government may, when conditions are suitable, approve the construction of the sub-soil drains prior to placement of subgrade replacement material or lower sub-base material subject to the bedding/filter material being brought to the underside of upper sub-base level.

6.7.3 Excavation of Drains

- (1) Trenches for pipe drains are to be excavated to the required line to a depth of at least 900mm below the finished pavement surface level and to the gradients as outlined on the approved Engineering Plans (minimum 1%).
- (2) Trenches are to be a minimum 100mm wider than the nominated pipe outside diameter.

6.7.4 Type of Pipe

- (1) All sub-soil drainage pipes are to be Humes "Draincoil" or similar perforated plastic drainage pipe complying with AS 2439 - Part 1 1981 - Perforated Plastics Drainage Pipe and Fittings.
- (2) Perforations shall not exceed 0.7mm diameter or width.

NOTE 6.7.4A

- (1) Joints are to be constructed in accordance with the manufacturer's recommendations.
- (2) Where approved by the Local Government, strip drains may be used.
- (3) Strip drains are to be a proprietary product comprising a regular patterned cusp - shaped plastic core of nominal thickness not less than 40mm encased by a non-woven geotextile.
- (4) The plastic core is to permit the passage of high volume water flows and have a crush strength not less than 100 kPa.

6.7.5 Pipe Size

- (1) The minimum pipe size is 100mm outside diameter.

6.7.6 Bedding and Filter Materials

- (1) The pipe is to be bedded on a minimum of 50mm of graded filter material in accordance with Standard Drawing No. SR.20.



6.7.7 Pipe Laying

- (1) All sub-soil drainage pipes are to be laid on a prepared filter or sand bed to ensure a uniform grade.

6.7.8 Outlets

- (1) All sub-soil drainage pipes are to be connected to gully pits, as outlined in Standard Drawing No. SR.21 or open channels below the edge of the road shoulder or at the edge of an embankment.
- (2) For outlets not connected into gully pits, a concrete headwall is to be provided to the outlet.
- (3) The headwall is to be at least 100mm thick and is to extend for a minimum of 150mm on all sides of the pipe.
- (4) The outlets to the pipes are to be fully enclosed by vermin proof flaps.

6.7.9 Clean Outs

- (1) Clean-outs as outlined in Standard Drawing No. SR.21 are to be located at the head of the sub-soil drain and at subsequent spacings not exceeding 90 metres.
- (2) Clean outs located at gully pits are to be constructed with caps or plugs as outlined in Standard Drawing No. SR.21.
- (3) A marker is to be installed in the kerb adjacent to clean out points (refer Standard Drawings Nos. SR.21 and SR.24).

6.7.10 Joining

- (1) Sub-soil drains are to be joined in accordance with the manufacturer's recommendations.
- (2) Clean out pipes are to be joined to the sub-soil drains using oblique tee connections.

6.7.11 Flushing

- (1) After the drains are constructed they are to be flushed out.
- (2) Flushing is to continue until the outlet water is clean and flows consistently.

6.7.12 Treatment of Islands and Speed Control Devices

- (1) For islands and speed control devices a mitre drain is to be constructed to drain sub-surface water from these structures into the nearest gully box or access chamber.
- (2) Landscaped islands are to have perimeter sub-soil drainage discharging into the nearest gully box or access chamber.



PART 7—STANDARDS FOR CONSTRUCTION OF STORMWATER DRAINAGE WORKS

Division 1—General

7.1.1 General

NOTE 7.1.1A

- (1) All work is to be supervised by a Registered Professional Engineer (Qld) competent in stormwater drainage works.
- (2) The works are to be undertaken by a nominated principal contractor experienced in the construction of Public (Municipal) Works.
- (3) The Local Government may request evidence of the principal contractors competency in the construction of stormwater drainage works.
- (4) On the completion of the works a certificate is to be submitted to the Local Government from the Consultant to the effect that the works have been completed in accordance with the approved plans and specifications.
- (5) Certification is to include the submission of “as constructed” plans and copies of all relevant test results.
- (6) Removal of all sand, silt and debris in the pipelines is the responsibility of the Contractor and all sand, silt and debris is to be removed before the works will be accepted on and off maintenance.

- (1) All stormwater drainage works are to be in accordance with the Ipswich City Council Standard Drawings, and this Planning Scheme Policy.

Division 2—Construction Requirements

7.2.1 Pipework

- (1) Pipes are to conform in all respects to Australian Standard AS. 4058.
- (2) Reinforced concrete pipes are to be subjected to the Load and Absorption Test as specified in Australian Standard AS 3725, with the load being the three edge bearing method.
- (3) Other flexible or semi-rigid pipework may be used where approved and included in Council's Product Manual.
- (4) With the exception of inter-allotment drainage systems, the minimum pipe size is 375mm diameter.

- (5) Pipes up to and including 600 mm diameter are to be rubber ring jointed.
- (6) Pipes larger than 600 mm diameter are to be internal flush jointed with pipe manufacturers proprietary external bands.
- (7) The class of pipe is to be as specified or as shown on the engineering drawings in accordance with the strength requirements of pipes in roadways, or in deep trenches or under fills.
- (8) Where the class of pipe is not specified it is to be a minimum of Class 2.

NOTE 7.2.1A

- (1) Pipes damaged as an apparent result of handling and cracked in one or more places so as to show clearly visible cracks (exceeding 0.10 millimetres) inside or outside are to be rejected.
- (2) Pipes showing clearly visible shrinkage cracks inside or outside with openings more than 1.25 millimetres for a length of 300 millimetres or more on either inside or outside, are to be rejected.
- (3) Pipes showing only internal cracks or only external cracks may be accepted, provided such cracks do not visibly penetrate full thickness or do not exceed 0.10 millimetres opening for 300 millimetres or more of length.

7.2.2

Pipe Laying

- (1) Pipes are to be laid true to line, grade and level to the following tolerances and are to be free draining and firmly bedded—
 - (a) invert levels + 50 mm, - 50 mm; and
 - (b) structure locations within 1.0 m of the approved engineering design.
- (2) Pipes are to be laid from the discharge end upstream.
- (3) Circular pipes with elliptical reinforcement (which are supplied marked “TOP” and “BOTTOM” to indicate the correct position when laid) are to be laid correctly according to the marking.
- (4) Pipes are to be bedded as shown on Standard Drawing No. SD.11 (Type 3 Roadworks, Type 2 Elsewhere) on course clean sharp river sand, or other bedding material approved by Council prior to the material being brought to site.
- (5) Minimum bed depth is to be 100mm.
- (6) Minimum clear cover is to be 600mm.



- (7) The minimum vertical and horizontal clearance between a stormwater pipe and any other pipe or service conduit is to be 300mm.
- (8) Pipe laying is to be in accordance with the recommended pipe laying practice as set out in the current Australian Standard Specification.
- (9) All pipework is to be inspected post construction using CCTV.
- (10) CCTV operations and equipment must give accurate chainage, pipe grade and permit site locations and comments to be recorded.

7.2.3 Jointing Pipes

- (1) Spigot and socket pipes are to be joined by rubber ring joints.
- (2) Rubber joint rings are to be in accordance with AS1646.
- (3) When flush jointed pipes are used, the first pipe (downstream) is to be bedded to establish line and grade with the groove upstream.
- (4) The external band is to be installed after the joint is made, in accordance with manufacturers recommendations.

7.2.4 Laying and Jointing of Box Culverts

- (1) Box culverts are to conform to Australian Standard 1597.
- (2) All precast box culverts are to consist of a separate invert slab and a single invert u-shaped section forming the deck and the two walls.
- (3) The base of the box culvert is to be laid true to line and grade to the tolerances specified in section 7.2.2(1) and free draining before the upper portion of the box culvert is laid.
- (4) The top of the culvert shall be joined to the base with cement mortar.
- (5) Joints between lengths of box culverts, tops and sides are to be covered outside by a mortar band not less than 150 mm in width and a minimum of 20 mm thickness.
- (6) Mortar bands are to be reinforced with chicken wire for a minimum width of 130 mm.

NOTE 7.2.4A

Approved jointing tape, applied in accordance with the manufacturer's instructions, may be substituted for mortar bands.

7.2.5 Backfilling

NOTE 7.2.5A

Backfill is not to be placed until the pipe drain or box culvert has been inspected and approved by the Local Government.

- (1) All backfilling is to be spread in 150 mm layers and compacted as follows—

(a) Under Proposed Pavements—

- (i) The backfill material used for backfilling to a point 300 mm above the crown of the pipe or culvert is to be the approved bedding material.
- (ii) The trench above the approved bedding material to subgrade level is to be backfilled with approved subgrade replacement material with a minimum of CBR15, placed in layers not exceeding 250 mm loose and compacted until the dry density is not less than 95% Modified Maximum Dry Density (refer to Standard Drawing No. SD.11).

(b) Under Existing Pavements—

- (i) The edges of the trench are to be cut with a clean, straight line prior to excavation.
- (ii) The trench is to be backfilled to a level 350 mm below finished pavement level with the approved bedding material.
- (iii) The trench above the bedding material is to be backfilled with 300 mm of lean mix concrete.
- (iv) The top 50 mm of the trench is to be filled with asphaltic concrete.
- (v) The surface is to be restored to a condition at least equal to that of the original pavement.

(c) Under Footpaths and Allotments—

- (i) Backfilling is to be carried out using selected material from excavations.
- (ii) The material is to be placed in layers not exceeding 250 mm loose in depth and is to be compacted to a minimum consolidation of 95% Standard Compaction.

7.2.6

Drainage Structures

Access Chambers and Inlet Pits

- (1) Inlet pits and access chambers are to be constructed to the form and dimensions shown on the approved plans or Standard Drawings.
- (2) The thickness of walls of inlet pits and manholes shown on the approved plan or on the Standard Drawings is to be the minimum adopted when inner and outer forms are used.



NOTE 7.2.6A

Where the ground is solid, the Local Government may permit the use of only the inner forms in the construction of unreinforced access chambers and pits (the concrete being placed against the earth) provided that the thickness of the wall of such inlet pit or manhole is increased by 75 mm to provide an absolute minimum 50 mm extra cover for reinforcing steel.

- (3) Formwork is to be substantially constructed and braced to ensure that there is no visible deflection of the formwork and that the concrete can finish accurately to the dimensions shown on the approved plans or Standard Drawings.

NOTE 7.2.6B

Formwork shall remain in position for at least twenty-four (24) hours prior to stripping.

- (4) Provision is to be made in the walls of pits and access chambers for weep holes to drain the pipe bedding and surrounds.
- (5) Provision is to be made where required in the walls of manholes and pits for the entry of sub-soil drainage lines.
- (6) Concrete in manholes and inlet pits is to be placed continuously without any construction joints other than the base and the top of the walls.
- (7) At any construction joints, the concrete is to be well roughened to ensure a good bond.

NOTE 7.2.6C

- (1) A coat of mortar with or without additives is to be spread over the contact surfaces after which the concrete is to be put in position and well rammed and worked so as to make a thoroughly bonded and water tight joint.
- (2) Concrete is to be well rodded and sliced or vibrated to ensure maximum density and good surface finish.
- (3) No foreign material is to enter the forms during placing of concrete, and concrete is not to be placed unless the excavation has been properly cleaned out and dewatered.
- (4) Concrete surfaces are to be protected from drying out for at least seven (7) days after placing.

- (8) Step irons are to be installed in all access chambers and gully pits in accordance with Standard Drawing No. SD.10 and shall be down one continuous structural face.
- (9) The concrete used in the construction of the floors and walls of the unreinforced access chambers and inlet pits is to be grade N25 in accordance with AS 1379 and AS 3600.

- (10) The concrete used in the construction of reinforced access chambers and inlet pits is to be as shown on the Standard Drawings or as detailed on the approved engineering drawings.

- (11) Cement rendering is to be undertaken on all construction joints and rough surfaces.

- (12) The bottoms of inlet pits and access chambers to at least the height of the half diameter of the highest pipe connecting thereto and such other concrete surfaces as shown on the plans are to be benched with cement mortar.

- (13) Special benching may need to be undertaken using N20 concrete in large access chambers and at angle junctions in pipe lines.

Access Chamber Covers and Frames

- (14) Cast iron access chamber covers and frames are to be of the best quality cast iron, free from cracks, flaws and porous spots.

NOTE 7.2.6D

The access chamber covers are to be approved by the Local Government before placing.

- (15) All cast iron surfaces are to be coated with hot bitumen before being placed in the works.

- (16) Covers and frames are to comply with the details shown on the Standard Drawings.

- (17) The initials SW are to be clearly visible on all access chamber covers.

- (18) The covers are to be cast iron where access chambers are situated within the road boundaries or other trafficable areas and concrete infilled elsewhere.

- (19) Frames are to be cast in the reinforced concrete access chamber toplabs.

- (20) The toplabs are to be bedded on a maximum of 12 mm cement mortar on top of the concrete collar of the manhole so that the top of the cover is flush with the finished pavement or ground surface.

- (21) The concrete used in the construction of the access chamber lid is to be grade N32/10 in accordance with AS 1379 and AS 3600.

Inlet Pit Grates and Backstone

- (22) The grate and frame for the standard inlet pit is to be Class D to AS3996 and is to be hot dip galvanised to AS1650.

- (23) The precast backstone is to be of an approved type as shown on the Standard Drawings or approved Engineering Plans.

Inlet and Outlet Structures

- (24) Headwalls and embankment walls and aprons are to be constructed in accordance with the relevant DTMR Standard Drawing for reinforced concrete headwalls, walls and aprons.



- (25) The inlet and outlet headwalls, embankment walls and aprons are to be constructed to produce a smooth transition of stormwater flowing in the open drain into the pipe and culvert inlet or out of the pipe or culvert into the open drain in order to reduce energy loss and reduce upstream backwater.

- (26) Energy dissipaters and scour protection, where required, are to be constructed in the locations as shown on the approved Engineering Plans.

NOTE 7.2.6E

The final form of all inlet and outlet structures is to be subject to on-site determinations with the Local Government and in accordance with any Water Quality Management Plan.

- (27) Precast headwalls may be used provided they are constructed to the following criteria—
- Precast headwalls are to be laid on a clean stable foundation and bedded in a minimum 200 mm deep layer of grade N25 concrete which is to be sluiced, pumped or vibrated in place to ensure no voids are present in the completed work.
 - Apron cut-off walls extend below the edge of the apron by a minimum of 600 mm and are constructed of minimum grade N25 concrete.
 - The headwalls are backfilled with approved free draining material.

NOTE 7.2.6F

- All headwalls are to be constructed with adequate protection so as to prevent scouring occurring behind or around the headwall.
- “Stone pitching” or the use of “no-fines” concrete, where used, is to be a minimum depth of 150 mm.

- Weepholes are provided to drain the bedding material.

Division 3—Kerb and Channel Construction

7.3.1 Kerb and Channel Foundation

- The foundation is to comply with the requirements of the approved Engineering Plans.
- Where no requirements are set out in the approved Engineering Plans, the depth of approved foundation material will be at least 100 mm thickness of material with a minimum soaked CBR of 45% which is to be compacted by watering and rolling or tamping until 95% of the maximum dry density (as determined by the modified A.A.S.H.O. test method) has been obtained.
- The foundation is to extend at least 150 mm behind the back of the kerb.

NOTE 7.3.1A

No concrete is to be placed until the foundations have been approved by the Local Government.

7.3.2 Concrete Works

- The concrete used in kerb and channelling work and vehicle crossings is to be Grade N25 concrete and conform in all respects with the Standard Drawings and approved Engineering Plans.
- Concrete is to be placed true to line and grade to the depths, thicknesses and dimensions as shown on the Engineering Plans and Standard Drawings.
- The channel is to be shaped in true conformity with the Standard Drawings.
- The invert of the channelling is to be finished in true grade and alignment.

NOTE 7.3.2A

Any kerb and channel not true to line or with noticeable kinks, bends or other faults or not of the required dimensions is to be condemned and is to be broken out and removed from the site.

NOTE 7.3.2B

- No channelling will be accepted by the Local Government in which water is found to pond.
- Channelling that ponds water and surfaces that are chipped, cracked or otherwise damaged are to be cut away to a clear surface and rendered 12 mm minimum thickness.



- (5) The concrete kerbing and channelling is to join neatly and transition smoothly with existing kerb and channel or be finished so that it will join neatly with channelling to be constructed.
- (6) Where kerbing and channelling joins inlet pits, the width of channel is to be uniformly widened as shown on the Standard Drawings to join neatly with the pit.
- (7) Kerb Ramps are to be constructed at all street intersections as shown on Standard Drawing No. SR.18 and as required to connect cycleways and footpaths.

7.3.3 Kerb and Channelling Forming

Hand Formed and Finished

- (1) Forms are to conform to the profile specified in the Standard Drawings and be rigid, true to line and grade and well braced.
- (2) Back forms are to be used on the footpath side of the full depth of the kerb back.

NOTE 7.3.3A

- (1) In the carrying out of this work, the whole of the water channel is to be cast simultaneously.
- (2) The casting of invert and kerb at different times is not acceptable to the Local Government.

- (3) Concrete is to be well rodded and sliced or vibrated during placing to ensure maximum density and a dense surface finish.
- (4) Immediately following the casting of the kerb and channel, the top of the kerb and channel is to be finished with an approved steel finishing tool.
- (5) The arris and invert are to be formed with approved steel finishing tools.
- (6) The front board of the kerb is to be stripped within twenty-four (24) hours of casting and the kerb face immediately bagged using a damp hessian bag and cement mortar.
- (7) The concrete kerb and channel is to be placed in 3 metre sections and provision made at the joints to prevent the binding of the concrete at the joint.
- (8) Joints are to be finished square and at right angles to the section of the water channel and show a neat joint line on the kerb face and top truly at right angles to the length.

Machine Formed and Finished

- (9) Kerb and channelling may be cast by approved machines provided that the kerb and channelling conforms to the profile specified in the Standard Drawings and the following additional requirements—

- (a) The minimum slump is to be 12 mm.
- (b) Concrete is to be thoroughly compacted.
- (c) Exposed faces and edges of kerbs are to be finished with a steel tool to the true shape of the kerb.
- (d) Grooves are to be cut with a suitable grooving tool to a depth of at least 100 mm in the channels and inverts at equal intervals of 3 metres.
- (e) Grooves are to be at right angles to the length and perpendicular.
- (f) Adjacent concrete is to be finished to a smooth, level surface.
- (g) Concrete is to be supplied ready-mixed and placed within 30 minutes of delivery on site.

NOTE 7.3.3B

Any concrete not placed within this time is to be removed from the site.

7.3.4

Curing of Concrete

- (1) Concrete kerbing and channelling, vehicle crossings and other concrete work is to be cured by the use of a curing compound consisting of waxy constituents cut back with a volatile solvent, resulting after application in a film of microcrystalline petroleum wax.

NOTE 7.3.4A

Curing compounds comprising a bituminous emulsion base or a varnish or other resinous base are not to be used and plastic (p.v.a.) based compounds used only if approved by the Local Government.

- (2) The curing compound is to be pigmented white.

NOTE 7.3.4B

Other pigment colours are acceptable provided they disintegrate or leach off the surface within a reasonable time.

- (3) The curing compound is to be applied evenly, at the rate recommended by the manufacturer, over all exposed surfaces immediately on completion by either spraying or brushing and is to be protected from mechanical damage for at least seventy-two (72) hours.

NOTE 7.3.4C

If it becomes necessary to carry out repairs and add render to surfaces to which a curing compound has been applied, such surfaces are to be scabbled back at least 25 mm.



Division 4—Roofwater and Interallotment Drainage Systems

7.4.1 Pipe Size

- (1) The minimum pipe size is to be 225mm diameter, and the maximum pipe size is to be 375 mm diameter.

7.4.2 Pipe Types

- (1) The following pipe types are to be used—
- (a) uPVC, sewer Class SN6 Solvent Welded AS 1260; or
 - (b) FRC, Class 2 Rubber ring jointed AS 4139; or
 - (c) RC Class 2 Rubber ring jointed AS 1342.
- (2) Standard manufacturers fittings are to be used in all cases.

NOTE 7.4.2A

Site fitted saddles are not acceptable to the Local Government.

7.4.3 Flexible Joints

- (1) Flexible joints in the form of a short pipe 600 mm maximum at the junction of all stormwater drainage structures are to be provided.
- (2) For uPVC systems—
- (a) flexible joints are not necessary however rubber ring jointed connections are to be provided at all drainage structures to accommodate expansion or contraction; and
 - (b) all pipes are to have sanded ends suitable for bonding to concrete.

7.4.4 Access Chambers

- (1) Access chambers are to be Type 1 - Cast Insitu in accordance with Standard Drawing No. SD.12.
- (2) Access chamber dimensions are to be as follows—
- (a) 600mm diameter pit for a maximum depth to 750mm; or
 - (b) 900mm diameter pit for a depth ranging between 750mm and 1500mm; or
 - (c) 1050mm diameter manhole where depths exceed 1500mm.
- (3) Access chambers are to be provided at the following locations—
- (a) change of grade;
 - (b) change of pipe size;

- (c) change of direction; and
- (d) end of line.

(4) Covers to cast-in-situ access chambers—

- (a) are to be a standard concrete infilled access chamber cover and frame;
- (b) are to be embossed roofwater;
- (c) are to have infill concrete at grade N25; and
- (d) are to match the finished surface ground slope and sit 50mm proud.

NOTE 7.4.4A

Grate installations may be permissible in certain instances where surface flows are to be directed into the system and the system has been designed for these additional flows.

- (5) Access chambers are to be benched in a similar manner to that required for sewer installations.

7.4.5 Branch Connections

- (1) At least one connection point is to be provided on the main line for each property.
- (2) The connection is to be in the form of a Slope Junction installed in the line with the property branch line diameter being a minimum of 50mm (I.D.).
- (3) An inspection opening is to be located at the end of the property branch line similar to a sewer house connection branch.
- (4) The connection point is to terminate 0.5 metres past any adjacent sewer.
- (5) Stormwater marking tape is to be tied to the cap of the inspection opening and extend vertically to be tied to a wooden peg at finished surface level.

7.4.6 Outlets

- (1) (a) All interallotment roofwater drainage systems are to discharge into a suitably located lawful point of discharge; or
- (b) (i) where the approved Engineering Plan permit discharge into the kerb and channel, such discharge is to be via an appropriate number, not less than two, of galvanised steel rectangular hollow sections (75mm maximum height) exiting from an access chamber located 0.5m inside the property across the footpath into the kerb and channel; and
- (ii) the rectangular hollow sections are to have adaptors and kerb adaptors installed in accordance with Standard Drawing SR.17.



- (2) A minimum of two roofwater kerb adaptors shall be provided for each allotment that drains predominately to street drainage.
- (3) A kerb adaptor shall be located:
 - (i) 0.5m from the property side boundary; or
 - (ii) if the allotment drains predominately to one side boundary, then locate both kerb adaptors (0.5m apart) 0.5m in from the lower side boundary.

7.4.7 Minimum Cover and Easement

- (1) In private property the minimum cover is to be 450mm.
- (2) Where discharge into kerb and channel is allowed, it may be necessary to vary this requirement over the last section (i.e. from the last access chamber to the property boundary).
- (3) In private property where the pipe size is 375mm an access and maintenance (minimum 4m wide) easement is to be provided and centrally aligned.

7.4.8 Where Concrete Footpaths are Provided

- (1) For lots discharging to kerb and channel where a concrete footpath/cycleway is provided in the verge, a roofwater drainage connection point is to be provided at the lowest corner of the lot, i.e. a minimum of 2 100mØ (or RHS) lines discharging to kerb and channel via approved kerb adaptors.

Division 5—Water Quality Control

7.5.1 Permanent Methods of Water Quality Control

- (1) The construction of permanent erosion and sediment control structures is to be in accordance with QUDM and Best Practice Erosion and Sediment Control, International Erosion Control Association for Queensland Construction sites.

7.5.2 Temporary Methods of Water Quality Control

- (1) Temporary erosion control devices (excluding devices which divert or concentrate runoff) are to be constructed in accordance with the Best Practice Erosion and Sediment Control, Erosion and Sediment Control Association, for Queensland Construction Sites.

NOTE 7.5.2A

- (1) The Contractor is to maintain all sediment control measures outlined on the approved erosion and sediment control plan.
- (2) It is emphasised that no matter which measures are selected and implemented they are to be properly maintained by the Contractor to ensure that they adequately fulfil their function.
- (3) Where the development involves trenching or other ground disturbance within 10 metres of existing downstream or downhill properties, turfing of the disturbed areas is required for protection of the downstream properties.
- (4) Gully inlet protection works are to be maintained until contributing catchments have stabilised.
- (5) Construction works should, wherever possible, be programmed to minimise the areas exposed to erosion at any one time and to stabilise the disturbed areas before moving to fresh areas.
- (6) To stabilise batters, drains and swales, vegetative treatments may be used.
- (7) Maintenance is to include inspection after any storm event to—
 - (a) repair breaches; and
 - (b) remove accumulated silt/debris when 50% of the design capacity of the measures is lost.
- (8) The removal of the sediment is to be done in such a manner so as not to damage the sedimentation structure.
- (9) Any damage to either permanent or temporary water quality control structures or devices is to be immediately rectified at the contractor's expense.



PART 8—STANDARDS FOR CONSTRUCTION OF PARKS AND STREETSCAPES

8.1.1 Standards

- (1) All parks and streetscapes are to be constructed in accordance with the specifications contained in the *Ipswich Streetscape Design Guideline*, Ipswich Regional Centre Strategy Streetscape Materials Specification 2012, Implementation Guideline No. 17 – Springfield Lakes Design Manual, Implementation Guideline No. 27 – Guidance on Recreation Range and Opportunity Outcomes Arising from Embellishment of Public Parks, the Ipswich City Council Standard Drawings and this Planning Scheme Policy.
- (2) NATSPEC certification is required for all planting stocks.

- (6) Certification is to include the submission of “as constructed” plans and copies of all relevant warranties, instruction manuals and Structural Engineering Certification/Building Approvals for any structures.

NOTE 8.1.1A

- (1) All work is to be supervised by a Registered Professional Engineer (Qld) or Landscape Architect competent in parks construction.
- (2) The works are to be undertaken by a nominated principal contractor experienced in the construction of Public (Municipal) Works.
- (3) The Local Government may request evidence of the principal contractors competency in the construction of parks.
- (4) In association with the lodgement of the streetscape or park landscaping plans, a Certificate of Design Compliance – Landscape Works in accordance with Appendix 1 of this document is to be submitted to the Local Government from the authorised Landscape Architect certifying the proposed landscaping works have been designed in compliance with the applicable development approval conditions and the landscape assessment codes and standards.
- (5) Prior to the practical completion inspection of the Municipal landscaping works a Certificate of Completion Compliance – Landscape Works in accordance with Appendix 2 is to be submitted to the Local Government from the Authorised Landscape Architect to the effect that the works have been completed in accordance with the approved plans and specifications and that the appropriate standards of construction methods and materials have been used.



PART 9—COMPLIANCE WITH STANDARDS FOR RECONFIGURATIONS AND SITE DEVELOPMENT WORKS

Division 1—General

9.1.1 Aim

- (1) The aim of this Part is to provide the requirements of the Local Government for the inspection and certification of any works which will become part of the Local Government's infrastructure, i.e. Roadworks, Stormwater Drainage, Sewer Reticulation, Streetscape and Park Landscaping Works.

9.1.2 Need for Quality Assurance

- (1) The infrastructure works and other elements of a subdivisional estate and other types of developments will become a part of the Local Government's infrastructure.
- (2) Responsibility for the on-going maintenance of this infrastructure will lie with the Local Government and, thus, the ratepayers.
- (3) Compliance with the requirements of this General Works – Planning Scheme Policy needs to be assured through a process of testing, inspection, and certification before work may be accepted Off Maintenance and full responsibility for the works transferred to the Local Government.

NOTE 9.1.2A

It is the aim of the Local Government that there be progression over time toward a Quality Assurance approach of Certification by the Consultants rather than detailed inspections and checking by the Local Government.

Division 2—Compliance Procedures

9.2.1 General

- (1) Developers and their consultants or agents remain at all times responsible to ensure that all works are executed in accordance with principles of sound engineering or landscaping design and construction and are in accordance with this Planning Scheme Policy.
- (2) It is the responsibility of the developer or consultant to arrange for all testing, inspections and certifications.

9.2.2

(1)

Testing

The testing requirements as detailed in this part are summarised for ready reference in Appendix 3.5 – "Compliance Requirements for Public (Municipal) Works".

(2)

Appendix 3.5 indicates when the test results are to be supplied to the Local Government.

9.2.3

(1)

Certification

To enable formal acceptance of the works "On Maintenance", the following certificates, certified drawings or other items are generally required to be supplied by the Consultant engaged to supervise the works—

- (a) pre-inspection checklist (refer Appendix 3.4);
- (b) engineering certification (refer Appendix 3.1);
- (c) geotechnical and structural certificates (where applicable);
- (d) "as constructed" plans;
- (e) copies of all relevant test results;
- (f) maintenance Security Deposit (refer Section 10.1.3 (7));
- (g) payment of any outstanding Private Works accounts;
- (h) written clearances to be obtained for works carried out on land under other ownership, upon completion of the works;
- (i) any other documentation as may be required by the Local Government;
- (j) payment of any outstanding Fees and Permits; and
- (k) completed copies of the Water Sensitive Urban Design construction and any outstanding establishment sign-off forms.

(2)

To enable formal acceptance of the works "Off Maintenance" the provision of items as agreed to by the Local Government at the time of formal acceptance of the works "on-maintenance".

9.2.4

(1)

Inspections

The Local Government will carry out inspections outlined in section 9.2.4(3) which are to be attended by the Consultant.



NOTE 9.2.4A

- (1) Local Government officers will not deal directly with Contractors.
- (2) The Consultant is expected to undertake all other inspections on drainage, roadworks, earthworks, sewer reticulation, water reticulation works and landscaping works etc., as are necessary to ensure that the finished product conforms to standards and is "fit for its intended purpose".

- (2) Random/Audit inspections are to be undertaken by the Local Government Officers to ensure adequate quality control is being employed.
- (3) The minimum notice required for any inspection or meeting to be attended by the Local Government Officers is as follows—
 - (a) Pre-Start Meeting 3 working days
 - (b) Pavement Subgrade 24 hours
 - (c) Preseal Inspection 24 hours
 - (d) Plant stock inspection 24 hours
 - (e) On Maintenance (provided all documentation is available) 5 working days
 - (f) Off Maintenance 10 working days

NOTE 9.2.4B

- (1) The inspection or meeting lead times should not be an imposition on Consultants if a reasonable level of job control is in place.
- (2) These lead times may be reduced by the Local Government wherever possible.
- (3) The Local Government will not normally carry out inspections of civil works or internal landscaping works associated with Community Title Schemes, Multiple Residential or Similar Developments etc (i.e. works which are to remain the property of the owner).
- (4) The Consultant is expected to undertake inspections as necessary to ensure the finished product conforms to standards and is "fit for its intended use".
- (5) Planting stock equivalent to a 100 litre bag size or greater is required to be inspected prior to planting.

Division 3—Pre-Start Meeting**9.3.1 General**

- (1) Prior to construction work commencing, the Local Government's representative is to attend the pre-start meeting.
- (2) The information requested in section 5.2.2(1)(a) of this Planning Scheme Policy is to be forwarded to the Local Government prior to the above meeting.

Division 4—Subgrade Inspections**9.4.1 Pavement Thickness**

- (1) Following acceptance of the engineering drawings by the Local Government, the Consultant is to arrange for soil testing and submit a proposed pavement design to the Local Government for approval, in accordance with Part 1, Division 2—Flexible Pavement Design.
- (2) Subgrade CBR tests as required in section 1.2.1 of this Planning Scheme Policy are required to be submitted to enable assessment to be made of the pavement design.
- (3) The Local Government will advise in writing of the acceptance or otherwise of pavement designs and subgrade tests.
- (4) Approval of pavement designs is based on the tests being representative of the subgrade over the various lengths of road at the box depth.
- (5) This is subject to confirmation by load testing upon inspection as per section 9.4.3.

NOTE 9.4.1A

- (1) The consultant 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 inspection by Local Government representatives.
- (2) The subgrade inspection is to be limited to a visual and load test, with the load test using machinery/plant to be provided by the Developer's Contractor.

9.4.2 Visual Test

- (1) The visual test is used to—
 - (a) confirm that the pavement excavation depth is in accordance with the approved depth;
 - (b) ensure that the base of the box is even with correct crown and crossfall, and that the sides are vertical;



NOTE 9.4.2A

String lines and tape with necessary personnel are to be provided by the Consultant.

- (c) check that the subgrade material is consistent in type and colours with the tested material on which the design was based and that the subgrade material is uniform throughout the exposed section; and
- (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.

9.4.3 Load Test

- (1) For the Load Test a 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.
- (2) Minimum loads on the rear wheels are to be eight (8) tonne.
- (3) The material should be as near as practicable to the optimum moisture content.

NOTE 9.4.3A

- (1) Proof loading is normally required to check for any area of the subgrade which might show signs of deflection.
- (2) Deflections detected in the subgrade indicating a weakness in the sub-strata will require remedial treatment under the Consultant's direction.

9.4.4 Subgrade Compaction Testing

- (1) Field density testing is to be carried out at the frequency nominated in section 6.4.2 of this Planning Scheme Policy.
- (2) All test results are to be available at the inspection.
- (3) Advice of remedial treatment is to be included with any failed test results.
- (4) The minimum acceptable density is 100% Standard Maximum Dry Density and this is to be achieved at or near to the Optimum Moisture Content.

9.4.5 Remedial Treatments

- (1) Subgrades that are deemed to have failed any of the tests as outlined in this division 4 may require remedial treatments.
- (2) These remedial treatments may include, but are not limited to, the following:
 - (a) additional excavation to reach a sound subgrade stratum;

- (b) installation of side or mitre drains, if not already required to have been installed;
- (c) placing free draining crushed rock (e.g. spalls, 75/100mm clean rock, with or without geofabric);
- (d) stabilising the subgrade with cement or lime; or
- (e) stabilising the pavement material with cement or lime.

NOTE 9.4.5A

The Consulting 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.

Division 5—Preseal Inspections**9.5.1 Pavement Compliance Testing****NOTE 9.5.1A**

- (1) 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.
- (2) The pre-seal inspection by the Local Government is limited to a visual and load test, with the load test using machinery/plant supplied by the Developer's Contractor.

- (1) The Consulting Engineer is to arrange for the appropriate compliance testing of the compacted pavement material in accordance with the requirements of this division, Part 1, division 2 and Part 6 of this Planning Scheme Policy.
- (2) Compaction and pavement material property test results are to be provided prior to the pre-seal inspection.
- (3) Advice of any remedial treatment directed by the Consulting Engineer is to be included with any failed test results for any pavement layers or pavement materials.

Material Quality Compliance Tests

- (4) 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 the Local Government and provided prior to the pre-seal inspection.



- (5) Quality compliance testing is to be carried out by an authorised registered laboratory.
- (6) A certificate is to be prepared showing results of testing in accordance with each of the tests listed in Appendix 3.2.

Quality Assurance Testing

- (7) The date and time of the sampling is to be recorded.
- (8) The four (4) day Soaked CBR, fines quality and particle size distribution test is to be carried out at the rate of one (1) test per 500m³ of material of each class for each parameter.
- (9) 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 the Local Government at any time.
- (10) Grading analysis is to be submitted in graphical or tabulated form.
- Non-Compliance with Material Requirements**
- (11) The responsibility for maintenance of acceptable material standards rests with the Consulting Engineer and the nominated contractor.
- (12) Compliance of the pavement materials is to be covered by the Engineers certification for the adequacy of the works.
- (13) Materials submitted for approval but not complying in full with the relevant specification requirements may be accepted or rejected at the discretion of the Local Government.

Pavement Depth Verification

- (14) Pavement depth verification is to be carried out in accordance with section 6.4.3 of this Planning Scheme Policy.

9.5.2 Visual Test

- (1) The Visual Test requires that—
- (a) The pavement surface be even and have an acceptable crossfall (nominally 3%).

NOTE 9.5.2A

Stringlines, tape and necessary personnel are to be arranged by the Consulting Engineer.

- (b) Sufficient depth is available to place the required thickness of seal.
- (c) The surface be clean, coarse, tight, and stony.

NOTE 9.5.2B

- (1) The surface should be power broomed beforehand so that the true surface is visible.
- (2) The surface should not be excessively wet.

9.5.3

Load Test

NOTE 9.5.3A

- (1) Proof loading is normally—
- (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 (refer section 9.4.3).
- (2) Deflections detected in this test may indicate a weakness in the underlying pavement materials or a weak sub-base and the consultant is to ensure appropriate remedial works are undertaken.

9.5.4

Pavement Compaction Testing

- (1) Field density testing is to be carried out at the frequency nominated in section 6.4.2 of this Planning Scheme Policy.
- (2) The minimum acceptable density is 95% Modified Maximum Dry Density and this is to be achieved at or near to the Optimum Moisture Content.

9.5.5

Remedial Works

- (1) Pavements that are deemed to have failed any of the tests outlined in this division 5 will require remedial treatments.
- (2) 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 tyne up and recompaction of materials; or
- (c) adjusting the moisture content.

NOTE 9.5.5A

The Consulting 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.



Division 6—Concrete Testing

9.6.1 General

- (1) Prior to the "On Maintenance" inspection being carried out, all available concrete test results are to be submitted to the Local Government.
- (2) The minimum requirement is for all seven (7) day test results to be available.
- (3) All outstanding test results (28 day tests) are to be submitted during the Maintenance Period.
- (4) Tests are to be carried out as set out in Appendix 3.3.

NOTE 9.6.1A

For structural elements such as bridges, retaining walls, cast insitu box culverts, etc., full design strength is to be obtained prior to "On Maintenance" as the structures will be expected to be put into service following acceptance of the works.

Division 7—Landscape Pre-Planting

9.7.1 Inspection

- (1) The landscape supervisor is to organise a pre-planting inspection of all planting stock equivalent to a 100 litre bag size or greater.

Division 8—On Maintenance Inspection Procedures

9.8.1 General

NOTE 9.8.1A

- (1) The purpose of the "On Maintenance" inspection is to ensure that the development works have been completed in accordance with the approved Engineering or Landscaping Plans, the conditions of development approval and that the appropriate standards of construction methods and materials have been used.
- (2) The inspected works are put on trial for the minimum periods specified in Part 10 of this Planning Scheme Policy.
- (3) Longer maintenance periods may be required for specific items, where problems have been encountered or where non-standard methods or materials have been used.

- (4) In accordance with the Local Government's aim to progress over time toward a Quality Assurance approach to the management of subdivisional and development works, consultants are to complete a checklist to confirm that critical aspects of the work have been inspected and completed to a standard appropriate for acceptance by the Local Government.
- (5) The need for a detailed "On Maintenance" inspection by the Local Government representatives will be at the discretion of the Local Government.
- (6) In most cases only an "audit" inspection by the Local Government representatives should be necessary.

- (1) In addition to the pre-inspection checklist, the consultant is to furnish a formal Consulting Engineer's Certificate (on the consultant's letterhead) for the works, which is to be in a form similar to that shown in Appendix 3.1.

9.8.2 Pre-Inspection Checklist

- (1) The pre-inspection checklist is to be in the form given in Appendix 3.4 advising that all works as per the checklist have been completed and inspected to the satisfaction of the Consulting Engineer.
- (2) The checklist is to be forwarded to the Local Government prior to the requested On Maintenance inspection date.
- (3) The Local Government inspection will not be carried out if this checklist has not been received from the Consultant.
- (4) If more than two (2) items on the checklist (items not of a minor nature) are found to be incorrect and the site is not ready, the inspection may be immediately cancelled at the discretion of the Local Government's representative.

9.8.3 Inspection

- (1) The need for a detailed inspection is to be at the discretion of the Local Government.
- (2) In the majority of cases it is intended that an "audit" inspection only be necessary.
- (3) The on-site inspection is to be attended by the Consulting Engineer, the Civil Contractor(s) and the Local Government representative(s).



NOTE 9.8.3A

- (1) Each person will be required to provide their own safety equipment for the inspection of subsurface structures, e.g. helmet, boots.
- (2) Any need for specialised equipment should be pre-arranged by the Consulting Engineer with the contractor in accordance with the requirements of the Workplace Health and Safety Act.
- (3) The Consulting Engineer's attention is drawn to the requirements of the Workplace Health and Safety Act, in particular, where the pipe drainage system or sewer reticulation system is to be subjected to a detailed inspection, i.e. entry into confined spaces such as gully pits and manholes.
- (4) It is the Principal Contractor's responsibility to ensure the requirements of the Act are satisfied.

9.8.4 Non-Conforming Inspection

- (1) If the development fails to satisfy the requirements of the inspection as outlined in section 9.8.2, other than for minor defects, the Consulting Engineer is to be so advised.
- (2) When the defects have been remedied, the Consulting Engineer is to arrange another inspection.

9.8.5 Post Compliance Action

- (1) The Consulting Engineer is to forward to the Local Government the following information prior to formal acceptance of the works "On Maintenance"—
 - (a) Letter confirming satisfactory completion of the On Maintenance inspection and requesting that the maintenance period commence from the date of inspection.

NOTE 9.8.5A

A list of items recorded at the On Maintenance inspection for further attention shall be included.

- (b) Certification by the Consulting Engineer that the works have been completed in accordance with the approved Design and Specifications.
- (c) All outstanding test data and measurements of asphalt quality (with the exception of 28 day concrete tests in specific circumstances and AC core tests).

- (d) "As Constructed" information is to be submitted in accordance with section 1(31) 'Infrastructure As Construction Submission' of Planning Scheme Policy 2—Information Local Government May Request.
- (e) Notification of the contract amount and maintenance security amount (refer Section 10.1.3 (7), and how it is to be handled, i.e. reduction of existing bond, cash payments, or bank guarantee lodged with the Local Government.
- (f) Payment of all outstanding monies pertaining to any works undertaken by the Local Government on the developer's behalf.
- (g) Payment of any outstanding Fees and Permits i.e. Road Opening Permit.
- (h) Copies of written clearance for works carried out on land under other ownership if applicable.
- (i) Any other relevant documentation as may be required by the Local Government.

- (2) The Landscape Consultant is to forward to the Local Government the following information prior to formal acceptance of the landscape or bushland rehabilitation works "On Maintenance"—
 - (a) Letter confirming satisfactory completion of the On Maintenance inspection and requesting that the maintenance period commence from the date of inspection.

NOTE 9.8.5B

A list of items recorded at the On Maintenance inspection for further attention shall be included.

- (b) Certification by the Landscape Consultant that the works have been completed in accordance with the approved Design and Specifications.
- (c) All outstanding rehabilitation monthly and chemical use logs and photographic monitoring.
- (d) Notification of the contract amount and maintenance security amount and how it is to be handled, i.e. reduction of existing bond, cash payments, or bank guarantee lodged with the Local Government.



NOTE 9.8.5C

- (1) Formal acceptance of the works On Maintenance will be in the form of a letter from the Local Government to the Manager of the consulting firm.
- (2) The letter will confirm the On Maintenance date and list the defects requiring rectification during the maintenance period, and confirm how the maintenance security is to be handled.

Division 9—Maintenance Period**9.9.1 General**

- (1) During the maintenance period, responsibility and liability for the maintenance and rectification of defects of materials and works, lies with the developer or consultant, not the Local Government (unless the work may be directly related to Local Government activities).
- (2) AC core tests and 28 day concrete cylinder tests not available at the On Maintenance inspection, are to be supplied during the maintenance period.

Division 10—Off Maintenance Inspection**9.10.1 General****NOTE 9.10.1A**

- (1) The purpose of the "Off Maintenance" inspection is to ensure that the constructed works have performed satisfactorily during the maintenance period and that omissions, defects, and damage have been rectified.
- (2) If this has been achieved, then the Consulting Engineer and Developer may be relieved of any further responsibility regarding future maintenance of the works and the works are accepted by the Local Government.

- (1) The Consulting Engineer is to remain liable for all works in relation to certificates attested to by the Consultant.
- (2) The Local Government retains the right to call upon the Consulting Engineer to rectify any works which have been found not to comply with the certificates received by the Local Government.

9.10.2 Inspection

- (1) An inspection, when requested by the Consulting Engineer, will generally be undertaken within ten (10) working days at a mutually agreed time.
- (2) All areas inspected at the On Maintenance stage are to be re-inspected with special emphasis placed on any unsatisfactory points noted during the On Maintenance inspection or any points that have been brought to the Local Government's attention during the maintenance period.
- (3) Any matters outstanding at the time of this inspection will constitute an incomplete work and such works will not be accepted by the Local Government.

9.10.3 Non-Compliance Inspection

- (1) All unsatisfactory or outstanding work is to be rectified prior to the consultant arranging a second inspection.

9.10.4 Post Compliance Action

- (1) The Consulting Engineer is to forward a letter to the Local Government requesting that the—
 - (a) development be taken Off Maintenance; and
 - (b) maintenance security and any other bond monies be released.

NOTE 9.10.4A

- (1) Formal acceptance Off Maintenance will be by a letter from the Local Government to the Manager of the consulting firm confirming that the relevant works have been accepted by the Local Government.
- (2) The letter will also indicate that the maintenance security deposit is to be released (unless specified to the contrary by the consultant).
- (3) At this time the relevant works formally become a Local Government asset.



PART 10—MAINTENANCE

10.1.1 Introduction

- (1) The purpose of this Part is—
- (a) to outline the obligations of persons who develop land within the City to maintain Public (Municipal) Works carried out by them in connection with such development;
 - (b) to ensure that Public (Municipal) Works are constructed in a good and workmanlike manner with good quality materials and in accordance with the approved design before such works become the full responsibility of the Local Government and, thus, the ratepayers of Ipswich; and
 - (c) to ensure that landscaping works continue to be maintained and that plants are nurtured to maturity, and weeds suppressed.

10.1.2 Definitions

- (1) For the purpose of this Part, all definitions used are those contained in the Planning Scheme with the following additions—
- “Accelerated Trunk Infrastructure Agreement”** means an agreement made pursuant to division 8 of Planning Scheme Policy 5—Infrastructure.
- “Accept on Maintenance”** means the issue of a letter of acceptance by the Local Government in respect of any Public (Municipal) Works pursuant to section 10.1.3 of this Planning Scheme Policy.
- “Codes”** means the various Planning Scheme Codes which provide the specific outcomes, criteria, probable solutions and standards for various land uses and development types.
- “Connecting Works Trunk Infrastructure Agreement”** means an agreement made pursuant to division 8 of Planning Scheme Policy 5—Infrastructure.
- “Establishment Period”** means the minimum 12 week period applicable to all public (municipal) landscape planting works commencing from the date of the satisfactory practical completion inspection of the relevant works. The initial twelve (12) week establishment period will be included in the prescribed maintenance period should a successful establishment

(i.e. deemed acceptance for on maintenance) be achieved. Otherwise this establishment period is exclusive of, and in addition to, the required maintenance periods.

“Maintain” means the keeping, preserving and enhancing (in the case of landscape works) of Public (Municipal) Works to a standard as set out in this policy and other Codes.

“Maintenance Period” means the following periods for each of the categories of Public (Municipal) Works specified—

- (a) landscaped or grassed areas within road reserves— the period of eighteen (18) months post establishment period and commencing from the date the relevant Public (Municipal) Works are Accepted on Maintenance; Note: Vegetation requires a minimum 12 week establishment period prior to acceptance.
- (b) landscaping in areas dedicated as open space, dry/wet detention basins (including natural channels, rehabilitation areas, gross pollutant traps, bio-retention systems and associated works and landscaping) - the period of twenty-four (24) months post establishment period and commencing from the date the relevant Public (Municipal) Works are Accepted on Maintenance;
- (c) all other Public (Municipal) Works – the period of twelve (12) months commencing from the date the relevant Public (Municipal) Works are Accepted on Maintenance.

NOTE 10.1.2A

- (1) For the purpose of clarity it is recorded that longer maintenance periods may be required for specific items, where problems have been encountered during construction, where non-standard methods or materials have been used, where temporary works are required after construction is completed, or where Public (Municipal) Works have been constructed in accordance with an Accelerated Trunk Infrastructure Agreement, Connecting Works Trunk Infrastructure Agreement or Trunk Infrastructure Agreement.



- (2) In the case of vegetated stormwater quality improvement devices, the maintenance period shall not commence until 90% of the contributing stormwater catchment to the device (approved as part of the development application) has the building phase completed, or where the contributing catchment has greater than 20 lots, 95% of the building works have been completed.
- (3) For vegetated assets, widespread failure of plants (greater than 40% failure) or weed invasion may result in the re-commencement of the maintenance period following rectification of defects.
- (4) Minor failure may result in other extensions to the maintenance period at the discretion of Council.

“Public (Municipal) Works” means all works, services, land, buildings, structures, roads, park structures, fencing, irrigation, landscape features (hard and soft), grassed or turfed areas, paved areas, footpaths, pathways, cycleways, natural features, park and street furniture including light poles and associated structures which are to pass to or come under the control of the Local Government.

“Practical Complete” means where all Public (Municipal) Works are considered by Council to be completed with only minor defects to be rectified and submission pursuant to section 10.1.3 (6) and (7) of this Planning Scheme Policy required.

“Trunk Infrastructure Agreement” means an agreement made pursuant to division 8 of Planning Scheme Policy 5—Infrastructure

- (2) Where any provision outlined in this Part does not accord with the terms or intent of any Infrastructure Agreement, the provisions of the Infrastructure Agreement is to take precedence.

10.1.3 Acceptance on Maintenance

- (1) Upon the Local Government being satisfied that any Public (Municipal) Works have been properly completed or established, a notification letter of “On Maintenance” acceptance is to be issued.
- (2) The Public (Municipal) Works except for the Landscape Planting works, are deemed to be Accepted on Maintenance from the date of that letter.
- (3) With regard to the Public (Municipal) Landscape Planting Works, an inspection with Council's attendance is required following the practical completion of the works.

- (4) A second inspection following the minimum 12 week establishment period is also required.
- (5) The satisfactory establishment of the landscaping works is deemed necessary for the issuing of the notification letter to indicate the “On Maintenance” acceptance.
- (6) Where the outstanding matter or matters as required in the notification letter of “On Maintenance” acceptance are not completed or submitted to Council within twenty (20) business days of the date of acceptance, the on Maintenance acceptance date will revert to the date of where all these outstanding matters are completed.
- (7) Prior to Accepting on Maintenance any Public (Municipal) Works the following is required:
 - (a) a bank guarantee or bond equivalent to not less than the greater of: 5% of the value of the Public (Municipal) Works or 100% of the value of the vegetated asset works or minimum \$2000 to be lodged with the Local Government as security for the performance of the maintenance obligations; and
 - (b) a Maintenance Bond and Licence Deed agreement; or
 - (c) a Bond and Licence Deed agreement in accordance with Section 10.1.4.

NOTE 10.1.3A

In the case of vegetated assets and landscaping works, the maintenance bond may be reduced as the maintenance period progresses, subject to performance (ie substantial vegetation growth and adequate weed suppression) and at the discretion of Council.

- (8) Before any Public (Municipal) Works are passed as practically complete and Accepted on Maintenance, the requirements of Part 9 ‘Compliance with Standards for Reconfigurations and Site Development Works’ of this Planning Scheme Policy are to be complied with.



NOTE 10.1.3B

- (1) The following list is a guide for consultants to help facilitate acceptance of public (municipal) works "On Maintenance" by the Local Government.
- (a) Preliminary inspections carried out by Consultant of roadworks, sewer reticulation, water reticulation, stormwater drainage systems and, if relevant, parkland at or near practical completion and the pre-inspection checklist as required by Part 9 "Compliance with Standards for Reconfigurations and Site Development Works" of this Planning Scheme Policy are completed and forwarded to the Local Government prior to the requested "On Maintenance" inspection date.
 - (b) A formal "On Maintenance" inspection is carried out by the Local Government's representative and the Consultant.
 - (c) A date of practical completion is nominated and any further items requiring rectification listed.
 - (d) The works will be "Accepted on Maintenance" for the required period from the date a letter of acceptance has been issued following the receipt by the Local Government of the information contained in Appendix 4.

10.1.4 Bonding Incomplete Works Associated with the Reconfiguring of Land

- (1) The Local Government may approve Plans of Subdivision, prior to acceptance of works "On Maintenance", subject to the following prerequisites.

NOTE 10.1.4A

At all times, the Local Government reserves the right not to accept the bonding of incomplete works if it considers that satisfactory security has not been given to ensure compliance with the requirements of the Act or this Planning Scheme.

- (a) The bulk earthworks are completed.

NOTE 10.1.4B

Bulk earthworks include any proposed cutting and filling of lots.

- (b) Kerbing and channelling and carriageway works are completed.
- (c) Roads are certified by an authorised surveyor to be within the correct alignment.

NOTE 10.1.4C

Road works that may be bonded include: streetlighting and other electrical infrastructure, streetscape landscaping, verge works footpaths and turfing.

- (d) Water works are to have achieved practical completion.

NOTE 10.1.4D

For water works practical completion means that water quality test results have minimum 14 days currency and infrastructure is deemed acceptable for live connection works to proceed and connection fees are paid.

- (e) Sewer works are to have achieved practical completion.

NOTE 10.1.4E

For sewer works practical completion means that infrastructure is deemed acceptable for live connection works to proceed and connection fees are paid.

- (f) Stormwater works are to have achieved practical completion.

NOTE 10.1.4F

- (1) For stormwater works (excluding water quality devices or systems) practical completion means that infrastructure is deemed acceptable with only minor rectification works required.
- (2) For stormwater water quality devices or systems practical completion means that the devices are constructed to the agreed standard that allows for adequate protection of the devices throughout the construction phase.

- (g) Where a bond is accepted:-
 - (i) the amount of the bond is to be the value of outstanding works plus either 25% for civil and landscaping works or 100% for stormwater water quality devices, natural channels and rehabilitation areas, provided that at all times the total bond is not less than 5% of the total cost of the bonded works; and



- (ii) a Combined Incomplete Works and Maintenance Bond and Licence Deed agreement is to be in effect.
- (h) The Consulting Engineer or the Consulting Landscape Architect is to provide a certified Schedule of Quantities and rates for the outstanding works as the basis for the Local Government determining the appropriate amount of the bond.

NOTE 10.1.4G

The Schedule of Quantities is to include the provision of all required testing, compilation of “as constructed” information and any outstanding park or streetscaping works.

- (i) The Developer is to give an undertaking, in writing to the Local Government, that unless all outstanding development (operational) works are completed and “Accepted On Maintenance” within three (3) months of the date of the approval of the Plans of Subdivision (or such longer time as the Local Government may approve), the Local Government may call up the bond and undertake all works to complete the approved development, including all testing and compilation of “as constructed” information.

NOTE 10.1.4H

- (1) Subdivisional (operational) works and “As Constructed” information are to be completed and a licensed surveyor’s certificate stating that all survey marks (including reinstated survey marks) are in their correct position in accordance with the Plan of Subdivision are to be lodged within 3 months of the approval of the Plan of Subdivision (or such longer time as the Local Government may approve).
- (2) The approval of the Plan of Subdivision is also subject to the developer meeting all the conditions of the permit(s) which do not involve bonded works.

- (j) Bonding is to be in the form of a Bank Guarantee in form acceptable to Local Government except for very minor works where the Local Government may agree to accept a cash bond. Amongst other matters the Bank Guarantee must comply with the following:
 - (i) Council’s Policies in relation to Credit Risk;
 - (ii) Detail the name of the customer/applicant;

- (iii) Detail the real property description of the property for which the security bond is held;
- (iv) Where applicable, detail the different types of bonds, the relative amounts covered by the guarantee and a statement describing the specific purpose of the bond; and
- (v) Detail the development permit and date.

NOTE 10.1.4I

- (1) Generally an incomplete works bond shall be reduced when the outstanding works are formally accepted “On Maintenance” by Council, at which time the bond shall be reduced to the required 5% maintenance bond.
- (2) The original Bank Guarantee should be worded appropriately to enable reduction i.e. “incomplete works/maintenance bond”.
- (3) Alternatively, a separate bond may be submitted to enable works to be “Accepted On Maintenance”.

10.1.5 Maintenance of Public Works

- (1) Each item of Public (Municipal) Works is to be at no cost to the Local Government—
 - (a) maintained during its Maintenance Period; and
 - (b) have any latent defects of which the Council gives notice prior to the formal acceptance “off maintenance”, promptly rectified.
- (2) Failure to perform the obligations under this Part entitles the Local Government to call up the whole or any part of a bank guarantee or bond held by it as security in respect of those Public (Municipal) Works and apply all moneys to meet the cost of the Local Government performing those obligations.

10.1.6 Formal Acceptance Off Maintenance

- (1) Upon formal acceptance of the works “off maintenance” for any item of Public (Municipal) Works, maintenance of that item becomes the responsibility of the Local Government, subject to the rectification of defects identified at the Off Maintenance inspection or notified in accordance with section 10.1.5(1)(b).



NOTE 10.1.6A

The following list is a guide for Consulting Engineers or Consulting Landscape Architects to facilitate the acceptance of public (municipal) works "Off Maintenance" by the Local Government.

- (a) The consultant by letter is to notify the Local Government of the expiration date of the "on maintenance" period.
- (b) The Consultant is to submit any outstanding items as listed at the time of acceptance of works "On Maintenance".
- (c) Any works items listed during "On Maintenance" inspection are to be rectified and works prepared for joint inspection.
- (d) The Consultant is to arrange a joint "Off Maintenance" inspection with the Local Government's representatives.
- (e) Following the inspection and approval by the Local Government's representatives of the rectification of any listed items, the Consulting Engineer is to forward to the Local Government a letter requesting that the—
 - (i) development be taken off maintenance; and
 - (ii) the maintenance security and any other bond monies be released.
- (f) The Local Government is to send a letter to the Owner/Consultant upon formal acceptance of works "Off Maintenance" and confirming release of the maintenance security bond.

10.1.8 Agreements

- (1) Where an agreement is required, details to be assessed and covered by the agreement are to include the following matters (as applicable)—
 - (a) the Maintenance Period;
 - (b) the maintenance standard to be applied to the various Public (Municipal) Works;
 - (c) the nature and amount of security to be lodged and details of the use and release of such security; and
 - (d) any other details deemed appropriate by the Local Government.
- (2) Any agreement required under this section is to be in writing and prepared by the Local Government at the Developer's cost or by the Developer at the Developer's cost (subject to such agreement being acceptable to the Local Government).

10.1.7 Liability

- (1) Nothing in this Part operates so that any duty of care relating to the design and construction of any Public (Municipal) Works owed to the Local Government is limited, released or waived in any respect.



APPENDIX 1—CERTIFICATE OF DESIGN COMPLIANCE — LANDSCAPE WORKS

ICC Reference File No:

Date:

CERTIFICATE OF DESIGN COMPLIANCE—LANDSCAPE WORKS

(Documentation of Proposed Works)

The documentation of the proposed Landscape Works

at

.....

in accordance with the following drawings

.....

.....

for

.....

I, of

.....

being duly authorised in this behalf, do certify that the documentation of the proposed Landscape Works for the above development, comply with the desired standards of service for as per Planning Scheme Policy 3—General Works. Where items are non-complying, a statement has been prepared in accordance with the guiding principles outlined in section 3.1.2 of Planning Scheme Policy 3—General Works.

Designation

Certified this day of 20



APPENDIX 2—CERTIFICATE OF COMPLETION COMPLIANCE — LANDSCAPE WORKS

ICC Reference File No:

Date:

CERTIFICATE OF COMPLIANCE—LANDSCAPE WORKS

(Practical Completion of Landscape Works)

The construction of the proposed Landscape Works

at

.....

in accordance with the following drawings

.....

.....

for

.....

I, of

.....

being duly authorised in this behalf, do certify that the proposed Landscape Works for the above development, have been completed in accordance with the approved drawings, the conditions of approval for the Development incorporating any approved amendments within generally accepted tolerances, also in accordance with relevant certificates, sound Landscape Architectural principles and practices and that the works are for the purpose for which they are intended.

And I make this certificate conscientiously believing that I/We have appropriate procedures for inspection in place to assure the quality of the works and conscientiously believing these procedures have been followed during the construction of the works.

Designation

Certified this day of 20



APPENDIX 3.1—CONSULTING ENGINEER’S CERTIFICATE

ICC File:

Date:

CONSULTING ENGINEER'S CERTIFICATE

Construction of Roadworks, Stormwater Drainage and Associated Works.

at

.....

for

.....

I, of

.....

Consulting Engineers, being duly authorised in this behalf, do certify that the earthworks, roadworks, stormwater drainage and associated works for the above Development, have been completed in accordance with the approved drawings, designs, schedules and specifications, the conditions of approval for the Development incorporating any approved amendments, and within specified tolerances or, where not specified, within generally accepted tolerance, also in accordance with relevant certificates, sound engineering principles and practices and that the works are fit for the purpose for which they are intended.

And I make this certificate conscientiously believing that I/We have appropriate procedures for inspection and testing in place to assure the quality of the works and conscientiously believing these procedures have been followed during the construction of the works.

Designation

RPEQ No

Certified thisday of..... 20

EXAMPLE ONLY



APPENDIX 3.2—SUMMARY OF TESTS FOR MATERIAL QUALITY COMPLIANCE

Testing for quality compliance is to be carried out in accordance with the applicable standard test procedures of the Department of Transport and Main Roads, including in particular the following—

DTMR Test Method Method No.	Description
Q101	Preparation of Distributed Sample
Q102	Moisture Content
Q103A	Particle Size Distribution (wet sieving)
Q104A	Liquid Limit (Cone penetrometer)
Q105	Plastic Limit and Plasticity Index
Q110A	Dry Density/Moisture Relationship (standard compaction)
Q110B	Dry Density/Moisture Relationship (modified compaction)
Q113A	California Bearing Ratio (standard compaction)
Q215	Determination of Crushed Faces
Q106	Linear Shrinkage
Q119	Resistance to Weathering
Q204B	Aggregate Crushing Value (wet)

Los Angeles Abrasion Test and the Sodium Soundness Test is to be in accordance with the following ASTM Specification—

	<u>Course</u>	<u>Fine</u>
Los Angeles Abrasion Test ASTM	C 535	and C131
Sodium Sulphate Soundness Test ASTM	C88	- 69



APPENDIX 3.3—CONCRETE TESTING

CONCRETE CYLINDER TESTS

Inspection and Certification

Item	Target Strength (28 days)	Frequency	Submit to Local Government	When Required
Kerb and Channel	25MPa	1 per 300 m	Yes	On or Off Mtce ⁽³⁾
Vehicular Crossings	25 MPa	1 per crossing	No	
Bikeways	25 MPa	1 per 300 m	Yes	On or Off Mtce ⁽²⁾
Footpaths	25 MPa	1 per 300 m	Yes	On or Off Mtce ⁽²⁾
Concrete channels	25 MPa	1 per 150 m	Yes	On Mtce ⁽³⁾
Structures ⁽⁵⁾	per design	as directed	Yes	On Mtce ⁽⁴⁾
Manholes/Gully-Pits ⁽⁶⁾	per design	as directed	Yes	On Mtce ⁽⁴⁾

Notes:

1. Test according to AS 1012 (pts 1-14) "Method of Testing Portland Cement Concrete".
2. Tests may be submitted after On Maintenance only if bonded.
3. Minimum Requirement is for the 7-day tests to be provided at On Maintenance.
4. 28-day test required.
5. Bridges, retaining walls, cast insitu box culverts, etc.
6. Major structures other than standard manholes and gully-pits.



APPENDIX 3.4—COMPLIANCE WITH STANDARDS

COMPLIANCE WITH STANDARDS

Pre-On Maintenance Inspection Checklist of Works

DEVELOPMENT

ICC FILE NO.

Item	Work Passed (Yes/No/N.A.)	Comment
Roofwater Drainage System		
The works have been finally inspected and—		
(a) Roofwater drainage system is constructed to plan.		
(b) Roofwater pits have been constructed to a satisfactory standard, i.e.— <ul style="list-style-type: none"> — benching; — correct cover, embossed RWD; — location relative to lot boundaries; — 50-75mm proud of finished surface level. 		
(c) Pipework has been visually inspected and is satisfactory, i.e.— <ul style="list-style-type: none"> — alignment and grade; — free of debris and siltation; — sanded end connector, for uPVC pipework; — no visual sign of trench subsidence. 		
(d) Outlets (especially to kerb and channel) are satisfactory.		
(e) Lots not provided with roofwater drainage system can be drained to kerb and channel.		
Stormwater Drainage System		
The works have been finally inspected and—		
(a) Pipe layout is as per plan or approved amendments with respect to pipe size, levels and location.		
(b) Pipework has been visually inspected and is satisfactory, i.e.— <ul style="list-style-type: none"> — alignment and grade; — free of debris and siltation; — pipe joints satisfactory; — lifting plug holes sealed; — no visible sign of trench subsidence. 		



Item	Work Passed (Yes/No/N.A.)	Comment
(c) Gully pits and manholes have been constructed to the correct standards, i.e.— <ul style="list-style-type: none"> — correct type of grate or cover; — backstones; — side entry slots; — benching; — pipe connections are not constructed to the corner of two walls such that the pipe capacity is reduced; — grates are satisfactorily seated in frames; — weepholes provided to bedding material. 		
(d) All density tests of backfill are available and satisfactory.		
(e) PSD's have been submitted or are available for bedding material.		
(f) Outlet/inlet structures are satisfactorily constructed and are free from scour or siltation.		
(g) All manhole and gully pit pipe connections are mortared flush with the walls and no pipe reinforcement is exposed.		
(h) Open cut channels have been finally inspected and are satisfactory, i.e.— <ul style="list-style-type: none"> — cut to design profiles; — lining of channel is to the required thickness and reinforcement, with appropriate weepholes. 		
(i) Overland flow works have been finally inspected and appropriate flowpaths are provided and clear of obstruction.		
(j) Outlets and outfalls have been constructed to control discharge flow in accordance with the plans.		
(k) Subsoil drainage discharges to gullies or other approved point of discharge.		
Earthworks		
The works have been finally inspected and—		
(a) Tow of batters not on road reserve except as approved.		
(b) Retaining walls clear of road reserve except as approved.		
(c) Batter slopes stabilised against erosion.		
(d) Interim drainage constructed in accordance with drawings.		
(e) All areas distributed by the works have been grass seeded and fertilised.		



Item	Work Passed (Yes/No/N.A.)	Comment
Road Pavements		
The works have been finally inspected and—		
(a) Plan layout and geometry of road system is in accordance with the drawings.		
(b) Finished levels at crown and channel are at design levels.		
(c) Crossfalls are to the approved plan.		
(d) AC is satisfactory with regard to finish and thickness.		
(e) Joints in the seal (especially where various development stages apply) are flush.		
(f) The sealed surface is free of blemishes, including those caused by the base of backhoe legs. (When caused by service authorities, the damage is to be repaired during the maintenance period.)		
Segment Pavers		
The works have been finally inspected and—		
(a) All pavers have been correctly laid to pattern, within allowable tolerance, compacted and the joints filled.		
(b) Bedding sand for pavers drains to sub-soil drainage.		
(c) Pavers adjacent to CKC, edge restraints etc have been correctly cut and laid.		
Concrete Kerb and Channel Medians		
The works have been finally inspected and—		
(a) The correct type has been used at all locations (including medians) in accordance with standards.		
(b) Ponding of stormwater does not occur.		
(c) Transitions and connections to existing construction are smooth and to a satisfactory standard of workmanship.		
(d) Service markers have been placed to kerb face.		
(e) Lip and back of kerb are flush with the roadway and footpath respectively.		
(f) All channelisation works and medians have been satisfactorily completed.		
(g) Infill treatment of medians has been inspected and found satisfactory. Any landscaping has been completed to standard.		
(h) Backing strips have been provided to median kerbs where required.		
(i) Side drains have been provided under medians.		
Footpaths		
The works have been finally inspected and—		
(a) Profiles are as per plan.		
(b) Footpath has been topsoiled to Local Government's requirements.		
(c) Footpaths have been grass seeded and fertilised or turfed to Local Government's requirements.		



Item	Work Passed (Yes/No/N.A.)	Comment
(d) All service fixtures (such as valves etc) are flush with the surrounding footpath.		
(e) Concrete footpaths have been constructed to Local Government's requirements.		
(f) Kerb ramps constructed as required.		
Pathways, Driveways and Bikeways		
The works have been finally inspected and—		
(a) Location and width are as per the plan.		
(b) Kerb ramps and crossings are constructed.		
(c) Safety rails and signs have been installed.		
Bushland Management		
(a) Works have been completed in accordance with the approved bushland management plan.		
(b) Vegetation planted has had a minimum 12 week establishment period.		
(c) 100% of declared weeds have been removed and 95% of environmental weeds (except where staged weed removal is required in erosion prone areas).		
(d) Minimum 90% plant survival rate.		
(e) All rubbish has been removed.		
(f) Eroded or otherwise degraded areas have been stabilised.		
Vegetated Assets (including stormwater devices and drainage channels)		
(a) Vegetation planted has had a minimum 12 week establishment period.		
(b) 100% suppression of environmental and declared weeds.		
(c) No evidence of scour, erosion or siltation.		



Item	Work Passed (Yes/No/N.A.)	Comment
Other		
(a) Street name signs, traffic signs and pavement marking have been installed.		
(b) Works have not resulted in problems on neighbouring properties. Clearance letters as may be applicable have been submitted or are available.		
(c) All boundaries of Reconfiguration/Development have been inspected to ensure works as constructed will not affect adjoining properties.		
(d) All necessary testing to ensure the quality of the work has been carried out and results are available and have been provided to the Local Government.		
(e) Engineer's (civil and electrical) Certificate of completion is available and has been provided to the Local Government.		
(f) Private works accounts for live sewer and water connections etc have been paid.		
(g) "As Constructed" details are available and have been provided to the Local Government including pavement depth details.		
(h) All lot boundaries, easements etc, have been pegged.		
(i) Any outstanding fees and charges have been paid, i.e. Design Review, Works Inspection, Road Opening Permit, Permit to Draw Water.		
<p>NOTE: Construction is within stated tolerances or otherwise within normally accepted engineering standard tolerances.</p> <p>CONSULTANT'S SIGNATURE: _____ NAME: _____</p> <p>NAME OF CONSULTANCY: _____</p> <p>DATE: ____/____/____</p>		



APPENDIX 3.5—COMPLIANCE REQUIREMENTS FOR PUBLIC (MUNICIPAL) WORKS

COMPLIANCE REQUIREMENTS FOR PUBLIC (MUNICIPAL) WORKS

Tests And Certificates	Provide Prior To	Comments
Earthworks <ul style="list-style-type: none"> – Density Tests – Retaining walls and Batters, Structural and Geotechnical Certification 	<ul style="list-style-type: none"> On Maintenance On Maintenance 	Consultant responsible for submission of all relevant test results.
Roadworks <ul style="list-style-type: none"> – Subgrade CBR/OMC – Pavement Design – Subgrade, Field Density – Pavement— <ul style="list-style-type: none"> ▪ Field Density ▪ CBR's/PSD ▪ Material Quality ▪ As Constructed Levels – Traffic Signals connected to STREAMS – AC Surfacing— <ul style="list-style-type: none"> ▪ Marshall Tests ▪ Delivery Dockets ▪ Compaction Tests 	<ul style="list-style-type: none"> Pavement Construction Pavement Construction Subgrade Inspection Pre-seal Inspection On Maintenance On Maintenance On Maintenance On Maintenance Off Maintenance 	Consultant responsible for submission of all relevant test results.
Stormwater Drainage <ul style="list-style-type: none"> – Trench and backfill compaction <ul style="list-style-type: none"> ▪ under road ▪ other – PSD's for bedding material – CCTV recordings 	<ul style="list-style-type: none"> Subgrade Inspection On Maintenance On Maintenance 	Consultant responsible for submission of all relevant test results.
Concrete Tests <ul style="list-style-type: none"> – CKC – Footpaths – Bikeways – Crossings – Other 	See Appendix 4.3	



Tests And Certificates	Provide Prior To	Comments
Landscaping and Bushland Management <ul style="list-style-type: none"> Completed Certificate of Compliance – Landscape Works (practical completion of landscape works) Monthly log of works Photographic monitoring 	On Maintenance On Maintenance On Maintenance	
Other <ul style="list-style-type: none"> Pre-Inspection Certificate / Checklist Engineers Certificate As Constructed Bonding Arrangement Private Works Accounts Clearance letters if applicable Outstanding fees and charges Request for works to go On Maintenance As Constructed pavement depth details Playground equipment certification 	On Maintenance On Maintenance On Maintenance On Maintenance On Maintenance On Maintenance On Maintenance On Maintenance On Maintenance On Maintenance	Required before inspection will proceed Consultant to advise Consultant to formally request list of outstanding items, works to be rectified to be included
Maintenance Period <ul style="list-style-type: none"> Rectify all defects AC Core Tests Concrete Tests Provide any additional "As Constructed" details as may be required by the Local Government Submit any other outstanding test results or certificates 	Off Maintenance Off Maintenance Off Maintenance	
Off Maintenance <ul style="list-style-type: none"> Request to take works off maintenance All works rectified Maintenance security bond 	Off Maintenance Off Maintenance Post Off Maintenance	Consultant to formally request Consultant to formally request release of maintenance security bond



APPENDIX 4—ENGINEERING CERTIFICATION CHECKLIST — ON MAINTENANCE

Application No: / Development Name:

General

<input type="checkbox"/>	Engineer's Certificate of Construction
<input type="checkbox"/>	Pre-On Maintenance Inspection Checklist
<input type="checkbox"/>	Geotechnical and Structural Certification where applicable i.e. retaining walls, cut and fill batters etc.
<input type="checkbox"/>	"As Constructed" plans received. Date Received: / /
<input type="checkbox"/>	"As Constructed" Certification Signed by Consultant and Surveyor
<input type="checkbox"/>	"Drawing File"
<input type="checkbox"/>	"Database" (Electronic and Hard Copy)
<input type="checkbox"/>	Last Issue of the Engineering Design Drawings
<input type="checkbox"/>	Financial Apportionment Form (Hard Copy and Electronic)
<input type="checkbox"/>	Specific RPEQ Certification received for items identified during construction. Example: Unobserved rectification of specific defects identified during Council sub-grade and pre-seal inspections.

Earthworks

<input type="checkbox"/>	Lot fill compaction test results
<input type="checkbox"/>	As required by Development Approval conditions
<input type="checkbox"/>	Level I Certificate

Roadworks

<input type="checkbox"/>	CBR test results for Type 2.1, 2.3 and 2.5
<input type="checkbox"/>	Subgrade compaction test results
<input type="checkbox"/>	Pavement gravel materials compaction test results for Type 2.1, 2.3 and 2.5
<input type="checkbox"/>	Pavement gravel quality compliance test results for Type 2.1, 2.3 and 2.5 (Test results from Quarry)
<input type="checkbox"/>	Pavement gravel Quality Assurance test results for Type 2.1, 2.3 and 2.5 (Test results from in-situ location)
<input type="checkbox"/>	Asphalt quality test results
<input type="checkbox"/>	Asphalt compaction test results
<input type="checkbox"/>	Pavement depth verification test results – signed by consultant and surveyor



APPENDIX 4—ENGINEERING CERTIFICATION CHECKLIST — ON MAINTENANCE CONTINUED...

Stormwater

- ☐ Trench backfill compaction test results
- ☐ PDS's for bedding material if required by the Local Government
- ☐ CCTV video and inspection Summary Report

Concrete Test Results

- ☐ As required by A.S. Specification and Manufacture of Concrete
- ☐ As required by PSP3 Appendix 3.3

Miscellaneous

- ☐ Clearance letters
- ☐ Outstanding design documentation
- ☐ Matters listed during construction

