

INFRASTRUCTURE INSTALLATION AND CONSTRUCTION REQUIREMENTS MANUAL

Revision 5.0
April 2022

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AMENDMENT REGISTER

Ed/Rev Number	Section Number	Description	Date
1.0		Original issue	Jun 2014
2.0	Various	Structural asset requirements revised and updated	Sep 2016
3.0	9.4	Roadworks and Paths As-Constructed requirements updated	Oct 2018
	9.13	Bus Stop Infrastructure As-Constructed requirements included	
3.1	9.13	Electrical test report requirements updated.	Nov 2018
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	Appendix A	Street Lighting Design – Parameters Form removed from document	
	Appendix B	Fax number removed, replaced with email contact address. Council unit name changed from 'Local Asset Services' to 'Asset Services'.	
5.0	1.0	Purpose – item 1 updated	April 2022
	2.2	Street Naming – paragraph updated	
	2.4.4	Electrical Supply to Parks – section removed	
	2.5	Council Community Services Conduits – paragraph removed	
	2.6.3	Design and Approval – section 2 – first dot point removed	
	2.6.5	Section updated	
	2.8.1	Water Conservation in Landscape Design – removed	
	2.9	Structural Asset Design Standards – removed	
	4.1	General - Table 4.2 – Structures General – first three lines removed	
	Appendix B	Street Lighting Design – Submission Form – removed from document	
	Appendix E	Traffic Signals Personality Request Form – form updated	
	Appendix G	Traffic Signal Concept Submission Form – removed from document	
	Appendix H	Traffic Signal Design Submission Form – removed from document	
	Appendix K	Signal Installation Audit Templates – removed from document	
Appendix O	Park Maintenance Program (Template) – removed from document		

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1.0 PURPOSE

This publication provides a collection of technical notes and procedures including:

1. Supplementary design information to that provided in the Brisbane City Council's City Plan 2014/Infrastructure Design Planning Scheme Policies.
2. Comprehensive requirements and procedures to be followed during a development process.

2.0 DESIGN REQUIREMENTS, INFORMATION AND SUBMISSIONS

2.1 GENERAL

This section provides design information not included in the Infrastructure Design Planning Scheme Policy (IDPSP) and procedural requirements for the design and submission of a development.

2.2 STREET NAMING

The Street naming application and drawing should be lodged with the Building and Construction Management Team, Development Services.

The approved subdivision layout drawings and the approved functional layout drawings must accompany the application before any assessment can proceed.

It is recommended that this application be lodged for approval as soon as possible after the functional layout drawing approval to avoid any delay in sealing the survey plan in the event that the street names applied for are not approved and need to be resubmitted.

2.3 DETAILED DESIGN

2.3.1 Street Lighting

2.3.1.1 Lodgment of Design Forms

A suitably qualified Electrical Engineering Consultant may liaise with Council about the street lighting design.

The Electrical Engineering Consultant shall prepare the lighting design, having regard to the applicable development conditions and then lodge the design drawing and the applicable fees with Council's City Lighting unit. This can be lodged electronically or by post.

The Consultant must be rated to perform work under Energex's SWP 47.3 (Design of Rate 2 Public Lighting Systems).

Council has also instituted a system of rating applicable to Consultants that are suitably qualified to submit electrical/street lighting designs. Within the Council rating system, the Consultant must be a Registered Professional Engineer in Queensland (RPEQ) and hold professional indemnity insurance to the value of not less than \$5,000,000. It is also preferable that the designs are reviewed by a Member of the Illuminating Engineers Society of Australia & New Zealand. It is encouraged that 'A' or 'B' Council rated designers are used in order to maintain a high standard of submission that meets all requirements. A and B ratings are based on experience (i.e. number of designs submitted without errors). Further reduced fees apply to submissions made by these suitably rated Consultants.

Energex approval will only be provided after Council provides approval of the lighting design. Submission of Street Lighting Designs.

2.3.2 Clause Removed

2.3.3 Non-Standard Illumination of Local Area Traffic Management Devices

AS 1158 is a series of standards which covers lighting schemes for roads in general and outdoor public areas. These standards are considered to be a set of best industry 'guidelines'. Departing from these standards could be considered if it is done on a controlled basis and subjected to a process which manages the risks involved in departing from these standards.

AS 1158.0:2005 defines Category V as "Lighting which is applicable to roads on which the visual requirement of motorists are dominant e.g. traffic routes" and Category P as "lighting which is

applicable to roads on which the visual requirement of pedestrians are dominant e.g. local roads". Local roads are defined as roads in a local area or neighbourhood precinct which could also include a collector road. In these roads, the motorists are predominantly dependent upon the use of the headlights on the motor vehicle to light the roadway.

The lighting of Local Area Traffic Management (LATM) devices on Category P roads is intended to reveal sufficient details of the device to allow approaching road users to safely navigate through the area (*AS 1158 Part 3 Clause 3.2.6.2*). For P Category roads, Clause 3.2.6.2, recommends the requirement to light the LATM, to alert the driver of the presence and nature of the device for the purpose of controlling speed, and Clause 3.2.6.3 recommends using reflective devices to deter traffic.

It should always be the intent of the lighting designer to produce a design that satisfies the lighting requirements of *AS 1158*. LATM devices installed in V category roads shall always be lit to the requirements of *AS 1158.1*. For P category roads the design standard *AS 1158.3* should be adhered to. Where this may not be practical or achievable due to geometry, environmental or existing infrastructure conditions (e.g. overhead services, road alignments, trees etc.), a documented deviation from the standard using professional judgement and explanation may be permitted on a case by case basis.

In providing lighting as per *AS 1158*, the lighting designer should be careful to avoid using a light which is unsuitable to the local conditions e.g. causes glare or spill light into a resident's property (resulting in nuisance complaints etc.), provides 'hot spots' which may make the road non-compliant with the requirement to provide a uniform light level along the length of the roadway.

Council should avoid providing excess light or insufficient light at intersections and along a roadway.

Therefore, if lighting levels cannot meet the requirement of *AS 1158*, then the lighting designer needs to carry out the following:

- Investigate the warrants for providing the LATM device or roundabout with the LATM design team (part of the engineering group).
- Carry out a risk assessment for the lighting design. The risk assessment needs to consider why the LATM device is being provided, the likely consequences of an incident occurring at this intersection (e.g. road geometry), the likely volume of traffic affected, the sight visibility to the LATM device from the road, the number of vehicles travelling along the road, and the design speed of the road.
- Carry out a site inspection.
- Meet with the RPEQ Engineer and engineering group to discuss the reasons and need for providing the device, and to provide the client with the best project outcomes. Discussions should include:
 - Other methods of identification of LATM devices; and
 - Other treatments of the LATM device, including a view to modifying the design as well as acceptance of the street lighting design to a lower standard can occur based on engineering judgment.

If the LATM is being provided to manage the speed of vehicles turning into the P Category road, then it is important to ensure that the correct lighting levels are maintained, so that drivers can clearly 'see' the LATM device, and are able to adjust driving to avoid it. It is important to ensure that the nose of the LATM device is lit to the required light levels, so that motorists can clearly see the obstruction, while the level of lighting at the trailing end of the obstruction is less likely to cause an incident as the driver has already taken steps to avoid the nose of the island. Therefore, Council can accept, with appropriate justification, a level of lighting which is lower than 3.5 Lux, at the trailing ends of the obstruction, without increasing the risk to motorists. A motorist travelling (with headlights on) along a P Category road, should be able to see the nose of the island as they are travelling from an area of poor lighting levels into an area which has a higher standard of lighting, and therefore, the motorist should easily be able to identify the LATM device.

If the LATM devices are being provided with the intent to deter traffic, then these devices can be identified using reflective technology or street lighting to identify the device to the motorist. Lighting can therefore be designed using *Sections 3.2.3 or 3.2.6 of AS 1158.3*.

Acceptance of a deviation from the standard should be based on engineering Judgement of the RPEQ Engineer and should be based on the process of documented warrants and risk assessment. As a minimum, a copy of the Isolux drawing, risk assessment and warrants for the installation of the LATM Device and the Design Safety Report should be kept on the project file. The documentation should clearly highlight areas where the lighting design doesn't meet current AS 1158 design standards, and a brief justification for the acceptance of the same.

2.3.4 Illumination of Bikeways

AS 1158 is a series of standards which covers lighting schemes for roads in general and outdoor public areas. These standards are considered to be a set of best industry 'guidelines'. Departing from these standards could be considered if it is done on a controlled basis and subjected to a process which manages the risks involved in departing from these standards. In general, the following are required:

Mounting Heights

The preferred mounting height is 5m/5.5m as this allows for the lights to be maintained without the use of elevated work platforms. Higher mounting heights will not be accepted unless future access by an elevated work platform is guaranteed.

Lighting Category

The lighting design should comply with *AS/NZS 1158.3.1-Lighting for Roads and Public spaces – Part 3.1 Pedestrian area (Category P) lighting*. Generally, the performance and design requirements should be subcategory "P3"/"P4". However, there could be areas where this category could change depending on the individual site requirements as detailed in the standard e.g. High Crime Areas "P1".

Light Sources

Light sources are detailed on *Standard Drawing BSD-11031*. However, Council is currently phasing out High Pressure Mercury Vapour lamps. The category 'P' standard above has recommended that these lamps should not be permitted after 2020.

Light Emitting Diodes (LED) could also be considered to be used.

Laboratory test results shall be provided for luminaires to be used. Test results shall be provided by NATA (National Association of Testing Authorities), or an affiliated Laboratory under the mutual recognition scheme, for IES file (Illuminating Engineering Society of North America) or CIE file (Commission on Illumination aka Commission internationale de l'éclairage). Some manufacturers have been known to overstate the performance of their luminaires, especially some LED manufacturers.

Metered and Unmetered Tariff Types

Lighting loads available for unmetered connections (including Rate 3) are those listed in the Australian Energy Market Operator (AEMO) load tables.

Lighting loads for metered connections do not have to be tested and approved by AEMO.

For installations located in a park, metered installations should be considered as this enables all types of electrical assets to be connected, e.g. power, lights, BBQs, etc. Council's City Lighting unit should be consulted on this option.

Solar installations should not be used unless the cost of mains power is excessive. Solar installations have expensive whole of life costs.

Electrical Works

Electrical works shall comply with *AS/NZS 3000 Electrical Installations* (known as the Australian/New Zealand Wiring Rules).

Joints in pits for areas subject to flooding and luminaire circuit protection in pits in marine environments are to be in "IP68" bells, as per the Queensland Department of Transport & Main Roads (DTMR) specifications (Drawings 1624, 1625 and 1626).

Any decorative lights are to be on different circuits to lights for public safety so that, any faults in the decorative light circuit does not trip the public safety lighting.

All electrical "backbone" circuits should have additional safety switch protection, unless wiring of cables in openable joint shall be as per DTMR specifications (Drawings 1624, 1625 and 1626).

Backbone cable should be a minimum of 16mm Cu (Single or Three Phase) and backbone earth wire should be a minimum 6mm Cu.

Electrical Works – Lighting of Bikeways Within Flood Areas

Council has specifically developed and implemented an electrical reticulation policy for lighting of bikeways within flood areas which stipulates the following:

1. All poles shall have a No. 4 pit located within 1m of the pole preferred location.
2. Cables shall be terminated and "T" off within the pit with an IP68 Underground Power Isolation Closure (UPIV), commonly known as an openable joint (J/BOX).
3. "T" off cable shall go directly from the openable joint to the luminaire.
4. The earthing system shall still be earthed at earth stud location in the terminal chamber of the pole.
5. Isolation/protection of luminaire will be via a minimum 6A fuselink located within the openable joint.
6. Wiring of cables in openable joint shall be as per DTMR specifications (Standard Drawings SD1624, SD1625 and SD1626).
7. Self-adhesive label shall be inserted in terminal chamber with the words "Luminaire isolation point in pit"(or similar).
8. Pole/luminaire heights shall be subject to flood height data. Where possible the luminaire height shall be above the Q20 (1 in 20 year event) flood level.

Light Poles

Lights should be pole mounted to minimise chance of vandalism.

There should be no up-lights in verges or garden beds due to the possibility of being covered by vegetation and mulch, being forgotten about and the susceptibility to water ingress and vandalism.

Non-standard type of poles can be approved only where the Proponent demonstrates that a standard pole will not be applicable. The Proponent will be required to pay to Council the whole of life cost variance between standard and non-standard type poles and are paid in advance.

Poles shall be numbered to enable identification for maintenance and asset tracking. For Rate 3 designs, pole numbers are allocated by Energex, and for all other installations, contact Council's City Lighting unit (07 3403 8888) for pole number allocations.

Luminaires

Locally sourced luminaires should be used to minimise replacement costs.

Documentation for Acceptance of a Deviation From the Design Standard

Acceptance of a deviation from the standard should be based on the engineering judgment of the RPEQ Engineer and should be based on a process of documented warrants and risk assessments. As a minimum, a copy of the Isolux drawing, risk assessment and warrants for the installation of the bikeway lights and the Design Safety Report should be kept on the project file. The documentation should clearly highlight areas where the lighting design doesn't meet current AS 1158 design standards, and a brief justification for the acceptance of the same. This will need to be approved by the relevant section of Council prior to construction.

2.4 ELECTRICAL

2.4.1 Process

All the design and construction work on the Electrical Distribution Entity's assets must be carried out by the Electrical Distribution Entity or consultants/contractors approved by the Electrical Distribution Entity. The verification of the underground electricity services shall be done in conjunction with the approval of the street lighting layout plans by Council.

It is strongly recommended that the Proponent approach the Electrical Distribution Entity or an Electrical Engineering Consultant early in the project as the planning and construction of electricity reticulation can have long lead times.

2.4.2 Costs

The Proponent is responsible for all the design, approval and construction costs including any relocation of the Electrical Distribution Entity's assets, if required as part of the development.

2.4.3 Development/Redevelopment in an Established Area

This development category usually involves the intensification of land use in a site either fully or partly surrounded by developed sites. Typical examples include:

- The start of a new use of the premises (e.g. construction of a factory on a vacant lot).
- The re-establishment on the premises of a use that has been abandoned.
- A material change in the intensity or scale of the use of the premises (e.g. changing use of land from a house to a multi-unit dwelling, increasing the gross floor area, etc.).
- Changing the intensity of use by virtue of increasing lot yields (e.g. reconfiguring an existing 1215 m² lot to 3 individual 405 m² lots with frontage to an existing road).

The electricity provider will determine the point of origin, route, point of attachment and facilities required for the attachment and connection of the service line.

Existing overhead supply line that crosses lot boundaries must be altered to meet the electricity provider's requirements.

Where the proposed structure or building encroaches on the statutory safety clearances, for example a two storey multi-unit dwelling which is in close proximity to the overhead power lines at the property boundary. Then, any existing overhead reticulation (and telecommunication) must be converted to underground. The extent of the undergrounding must be between the existing power poles at or beyond the limits of encroachment.

2.4.4 Electrical Supply to Parks

Section removed – for electrical design requirements refer to Brisbane City Council's City Plan 2014 – Schedules/Schedule 6 Planning Scheme Polices/SC6.16 Infrastructure design planning scheme policy/Chapter 10 Parks

2.5 COUNCIL COMMUNITY SERVICES CONDUITS

Paragraph removed as it was not relevant to design or procedures.

2.5.1 Waiving of the Requirement for Council Community Services Conduits

The requirement for some or all of the dedicated Community Services Conduit may be waived, with Council approval, in the following circumstances:

1. If the chosen wholesale carrier does not require ownership of the telecommunications conduits, or is prepared to share space in the telecommunications conduits with Council,
2. If Traffic Signal Communications conduits and Community Services conduit are required on the same path, the Traffic Signal Communications conduit specifications shall apply and only one set of conduits, which will also count as the Community Services conduits, is required over these sections.
3. If a Community Services conduit is to cross an intersection where Traffic Signal Intersection (orange) conduits are being installed, the Community Services conduits may connect into the traffic signal pits at the intersection and avoid the need for the Community Services conduit across the road.
4. In-fill or change-of-use developments in streets that would otherwise have qualified for Community Services conduit, provided:
 - a. the frontage is less than 60 metres; and
 - b. the existing underground telecommunications conduits are sufficient to meet the chosen carrier's requirements without excavating along the frontage.

If the verge will be covered with paving or constructed landscaping as part of the development, a Community Services conduit is still required.

2.6 TRAFFIC SIGNALS AND INTELLIGENT TRANSPORT SYSTEMS

2.6.1 Traffic Impact Study

The need for traffic signals and intelligent transport systems (ITS) is determined by the volume of vehicle and pedestrian traffic and its ensuing traffic impact and complexity. The need for traffic signals and the traffic signals design is based on the traffic impact study and assessment as detailed in Appendix C – Traffic Impact Assessment Guide.

The traffic impact study shall reflect the impact of changed traffic volumes on the existing infrastructure and traffic (using current traffic signals phasing) at opening year and the 10-year future horizon.

If any existing traffic signals and ITS hardware installation requires modification or extension, all new works must be upgraded to comply with current Australian and Council Standards. All ITS linking cables shall comply with ITS 003 or G562.d standards.

2.6.2 Traffic Signal and Intelligent Transport Systems – Conduits

Council has a community requirement associated with development/improvement works at intersections and road corridors. Where applicable, conduits are installed to enable ITS and traffic signal linking. Approval for the connection shall be required prior to works commencing from Council's ITS Group.

2.6.3 Design and Approval

The traffic signals and ITS designs for an intersection are normally considered simultaneously with the Functional Layout and the Signs and Lines drawings.

An underground service check must be carried out prior, to ensure there is no conflict with existing services and vegetation upon the design of the functional layout, traffic signals and ITS designs. These drawings shall include all existing underground and above ground services and vegetation. All necessary sub trenching investigations shall be carried out to ascertain that all footings can be installed with sufficient clearance with other services, prior to submission of the functional layout, traffic signals and ITS drawings.

It is the responsibility of the Proponent to check that the existing traffic signals and ITS hardware installation/s comply with current Australian and Council standards. If not, the Proponent shall modify/upgrade the installation/s for compliance. Should the Council deem that the Proponent has not modified/ upgraded the traffic signals and ITS hardware to comply with Australian and Council Standards, the Proponent will be notified of the non-compliance and the requirements for rectification at no cost to Council.

Should any issues, such as existing utility services prevent Council's approval of traffic signals and ITS drawings, issues will be referred back to the Proponent for rectification. Amendments shall be sent to Council's Congestion Reduction Unit (CRU) – Traffic Signals Operation (TSO) and ITS Group (ITSG) for approval, at no cost to Council.

The traffic signals approval process has the following design approval stages:

1. Town Planning Stage (i.e. Material Change of Use or Reconfiguration of a Lot) – the Proponent shall lodge a Conceptual Functional Layout plan for consideration with the Planning Application.

For new traffic signals at intersections, phasing, capacity or major alignment changes to existing traffic signalised intersections, a traffic impact study and assessment and SIDRA traffic signal model input and output files shall be submitted to Council's Congestion Reduction Unit, Traffic Signals Operation and ITS Group for assessment. SIDRA Base Saturation Flow figure to be used is 1,850 vehicles per hour.

In some cases, as deemed necessary, a traffic signal network model may be required in order to adequately determine impacts of proposed new traffic signalised intersection/s on the surrounding road network. Council's standard network model is Transyt 7F.

In some cases, as deemed necessary by Council's Congestion Reduction Unit, Traffic Signals Operation and ITS Group, temporary VMS and CCTV installations maybe required.

For all existing traffic signals and ITS, any stage changes including changes to traffic signals phasing, post and lantern location, intersection alignment or capacity, road sensors, control systems, CCTV and VMS, construction staging plans must be submitted to

Council's Congestion Reduction Unit, Traffic Signals Operation and ITS Group for approval prior to construction works. Staging traffic signals plans shall comply with current Australian and Council Standards.

2. Operational Works Stage (as well as compliance assessment) – the Proponent shall lodge the traffic signals and ITS design in accordance with Council requirements for electronic lodgement.

The traffic signals design approval is subject to the same concurrency period as all Operational Works approvals.

Approval of the functional layout, traffic signals and ITS design shall be obtained prior to lodgement of the roadworks and drainage design drawings.

- Additionally, approval of the following is also required at the Design Stage: Advanced traffic signals phasing design.
- Location of controller box, posts (including heights and footings), lanterns, pedestrian count down timers, etc.
- Location of traffic signs, pavement markings, pedestrian crossings, kerb ramps, bus stops, telephone booths etc.
- Street lighting, communication lines and connections, location of ITS equipment – MUX unit, VMS signs, CCTV, VSLS, etc. designs – and shall be consistent and reflect the traffic signals plan and vice-versa. Where ITS equipment is not installed on traffic signal posts, additional details and CAD drawings are required.
- Visibility of signal faces.
- Source of power supply and electrical design.

2.6.4 Plan Presentation Details

All engineering drawings submitted to Council shall be signed by a Registered Professional Engineer Queensland experienced in the appropriate discipline.

Drawing presentation details shall be as detailed in the Infrastructure Design Planning Scheme Policy – Chapter 1 – Introduction including all site-specific details, road geometry and traffic signals hardware locations. Traffic Signals design drawings shall comply with the standard symbols and hardware as shown in Council's BSD 4000 Series Standard Drawings. A typical example of a traffic signals drawing is shown in Appendix D (An appropriate standalone BSD is being considered).

2.6.5 Receipt of Traffic Signals and Intelligent Transport Systems Operational Works Approval

Upon receipt of Operational Works approval, the Proponent may proceed with the following design aspects:

- Signals hardware design e.g. locations of posts, mast arms, traffic signal controller/s. Once the traffic design has been approved by Congestion Reduction Unit, the traffic signal's controller personality request can be sent to Council's Congestion Reduction Unit – refer to Appendix E for Traffic Signal Personality Request form.
- Linemarking and regulatory signs such as turn bans, parking, give way, stop etc.
- Plan for traffic signals staging and description of associated work.

Wherever possible, Council's drawing template shall be used for the comprehensive design.

2.7 SIGNS AND PAVEMENT MARKING DRAWINGS

Requirements for submission and details to be provided for the Signs and Pavement Marking drawings are located in the Infrastructure Design Planning Scheme Policy Section 1.9.7. The Signs and Pavement Marking drawings shall be consistent with the Traffic Signals and ITS drawings. A typical example of a Signs and Pavement Marking drawing is shown in Appendix F (An appropriate standalone BSD is being considered).

2.8 LANDSCAPE DESIGN

2.8.1 Water Conservation in Landscape Design

Paragraph removed – for water conservation in landscape design refer to Brisbane City Council’s City Plan 2014 – Schedules / Schedule 6 Planning Scheme Policies / SC6.17 Landscape design guidelines for water conservation planning scheme policy

2.8.2 Landscaping Within Road Corridors

All landscaping within the road corridor must:

- Provide at least 100m clear vision to traffic signal lanterns and pedestrians on pedestrian crossings, kerb ramps and refuge areas. Trees that exceed 1.5m in height are not to be planted within 80m of an approach to an intersection.
- All plantings within 10m of an intersection shall be ground cover only or in line with road authority standards.

2.8.3 Water Sensitive Urban Design

The design of Water Sensitive Urban Design devices (WSUD) are to be in accordance with the Queensland Government publication – Urban Stormwater Quality Planning Guidelines and the Healthy Waterways – Water by Design suite of guidelines. These documents require these devices to accommodate an interim construction phase to address the high pollutants to be expected during the civil and building phases of the development. The WSUD design needs to accommodate the two-stage construction requirement as follows:

Stage 1

During this stage, a WSUD device may: require additional cleaning or desilting; need to be disconnected from the stormwater system; need to be protected from high stormwater flows and pollutant loads; or need to be partially constructed and transformed into another device such as a sediment basin. This phase may last for several years. The proponent is to stage the development to minimise this time to a more reasonable period. Desirably, this phase can be limited to the twelve (12) month On-Maintenance period for the Civil Works.

Stage 2

This is the transformation of the device into its final design form. This phase includes the: transformation of the device; removal of anthropogenic debris and sediment; testing of vulnerable components that may have been damaged (impervious liners, filter media, etc.); planting the vegetation required by the design (if not done as part of stage 1); planting any outstanding landscaping (not done as part of stage 1); establishment of the vegetation; acceptance On-Maintenance; the Maintenance/Defects Liability Period; Acceptance Off-Maintenance.

The use of proprietary WSUD products shall be limited to private properties. The MUSIC node requirements for those devices shall be determined in accordance with section 4.8 of the MUSIC Modelling Guidelines.

The use of gully baskets shall be limited to the central business district or regional commercial precincts.

Generally, WSUDs to be constructed in the road reserves are small and will be constructed with and assessed over the same defects liability period for the road and drainage assets. Typically these devices will be swales, small bio-retention systems and enclosed gross pollutant traps. The swales are permitted in footpaths over which access is not expected, such as park frontages. The bio-retentions will desirably be constructed in the kerb build-outs associated with parking lanes and traffic management devices. Where these devices are not constructed in these locations, additional road width is to be provided so that adequate space is provided for the traffic functions of the road, the traffic signage and sight line requirements, street trees, the needs of the public utilities, and the flood capacity conveyance needs of the area. These devices are not to be located over the underground utilities as they are likely to be dug up within the life of the device. The designer is to co-ordinate the design components to ensure that the devices are not co-located with street lighting, signage or street trees.

Bio-retentions constructed in residential areas are to be aligned with property boundaries and designated driveways provided for the properties that front the device.

2.9 STRUCTURAL ASSET DESIGN STANDARDS

Section removed – information is provided in Brisbane City Council’s City Plan 2014 – Schedules / Schedule 6 Planning Scheme Policies / SC6.16 Infrastructure design planning scheme policy / Chapter 8 Structures

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3.0 CONSTRUCTION

3.1 GENERAL

The Proponent shall only commence work on site if all drawings submitted to Council have been stamped and approved by Council.

3.2 TRAFFIC SIGNALS AND INTELLIGENT TRANSPORT SYSTEMS – CONSTRUCTION REQUIREMENTS

Prior to works commencing on site:

- All ITS communication requirements need to be verified as part of the detailed design and agreed with Council's ITS group; and
- All drawings submitted to Council have been stamped and approved by Council's Congestion Reduction Unit – Traffic Signals Operation's engineers responsible for traffic signals and ITS within Council.

Construction of traffic signals cannot commence without a prestart meeting with Council engineers from Development Assessment, Congestion Reduction Unit and Traffic Signals Operation. Refer to Section 5 for further information regarding the above.

3.3 TRAFFIC SIGNALS ELECTRICAL CONDUITS – INTERSECTION INSTALLATION REQUIREMENTS

Electrical (orange) conduits across and around the traffic signals intersection, including the power feed conduit to the controller, must be installed as required by the traffic signals design.

A licensed electrical contractor must certify the installation of these conduits.

3.4 WSUD CONSTRUCTION REQUIREMENTS

The construction of all civil works must be completed before WSUD devices will be considered for acceptance On-Maintenance. A separate Operational Works application may be requested for WSUD devices within parks and drainage reserves. However, the WSUD devices must be placed On-Maintenance no earlier than the civil components (roads and drains) of the development.

Special considerations for the staged construction of different types of devices are as follows:

1. Bio Retention Basins:

- Stage 1 requires, as a minimum, the basin to be fully constructed with the exception of planting of the final type of vegetation. The surface of the filter media shall be protected from high flows and sediment loads. The following elements shall be completed: earthworks and profiling, impermeable liner (where applicable), hydraulic inlet and outlet structures, maintenance access (if applicable), sub-soil drainage and filter media layers, and protective layers (such as geo-fabric and turf).

Alternately, the device can be fully planted and disconnected from the upstream catchment flows by the construction of temporary bypass structures. This option will require the plants to be watered regularly until the device is reconnected with the drainage system. This alternative will also require other treatment devices to be constructed to treat the water during this period.

- Stage 2 requires those devices that had been fully planted and disconnected from the drainage system to be reconnected and considered for placement On-Maintenance.

Those devices that had protective surfacing placed over the filter media may now have the turf and geo-fabric removed, the filter material tested to confirm it is not contaminated with silt and sediment, and the vegetation required by the design installed. The vegetation is to be maintained until it is established and weed free. This will usually be a 24-month period.

2. Constructed Wetlands:

- Stage 1, the wetland earthworks shall be completed, impermeable liner installed (where applicable), hydraulic structures, maintenance access and high flow bypass constructed

including the inlet and outlet stabilisation completed. The flood flow bypass is to be modified to divert all flows around the partially completed works. Desirably, the growing media will be placed, the device filled with water, vegetated and mulched. The vegetation and water requirements shall be maintained to ensure the device and vegetation is fully established in readiness for operation.

During this period, a sediment basin shall be required to treat the design flows. Regular cleaning of the sediment basin is required. The sediment basin may be part of the pre-treatment of the wetland or an additional device.

- Stage 2, for wetlands that have been taken off-line and the vegetation planted and maintained for a minimum period of twelve (12) months, the following works are required:
 - The sediment basin that pre-treats the inflows shall be cleaned and returned to its design specifications;
 - The high-level bypass shall be reinstated as per the approved design;

The device may be considered for acceptance on a twelve (12) month Defects Liability Period (On-Maintenance). Note: the plants must be fully established, weed free, and at least twenty-four (24) months old before acceptance Off-Maintenance.

- Stage 2, for wetlands that have not been fully constructed and planted in accordance with the design for Stage 1, the following works are required:
 - Ensure the impermeable layer is sound and earthwork levels within the device are in accordance with the design.
 - Place the growing media as per the design;
 - Install and maintain the vegetation until fully established;
 - If not already done, install and fully establish the associated landscaping;
 - At the appropriate stage for the plant establishment, fill the device with water;
 - When devices are filled with water, the plants shall be established for a minimum period of twelve (12) months. The device may then be considered for acceptance on a twelve (12) month Defects Liability Period (On-Maintenance). Note, the plants must be fully established, weed free, and at least twenty-four (24) months old before acceptance Off-Maintenance.

3. Swales

- Stage 1, the swale shall be fully constructed, which includes the earthworks and profiling, hydraulic structures and planting of turf or vegetation. In addition, protective sediment fencing is required. This stage must last at least until the vegetation is fully established – between six (6) to twelve (12) months. It is in the Proponent's interests to have this period occur prior to Practical Completion of the civil works.
- Stage 2, the sediment fences may be removed, and the maintenance period of the swale commence. The minimum maintenance period for a swale is twelve (12) months.

At the end of the maintenance period, a survey of the swale is required to verify that the accumulation of sediments has been adequately managed.

If during this period, areas are identified as having poor drainage, then subsoil drains will be required to be installed and the On-Maintenance period restarted.

4. Sediment Basins

- Stage 1, these shall be fully constructed at the time of Practical Completion. All associated vegetation shall be planted and mulched. Generally, this vegetation is required to act as a visual amenity screen or is required for the management of public safety. The maintenance period is expected to last twenty-four (24) months.

3.5 STRUCTURAL ASSETS COMMENCEMENT ACTIVITIES

Within twenty-eight (28) days of commencing site works the Proponent shall forward to Councils' Structural Asset Manager a construction commenced stage, registration and asset management file containing electronic copies of the contract documents including:

- The 'For Construction' drawings, specifications and associated priced Bill of Quantities;
- Certificate/s provided by a Registered Professional Engineer Queensland (RPEQ) certifying that the works are designed in accordance with Councils' Planning Scheme Policies;

- The environment and cultural heritage management plans and permits;
- The geotechnical and environmental site investigation reports and associated laboratory test reports.

3.6 BONDING OF UNCOMPLETED WORKS

Bonding of uncompleted works by a Proponent enables Council to permit early signing and sealing of a survey plan. The following criteria should be met at the time of lodging the request to Council for sealing of the survey plan:

1. All bulk earthworks are completed. Bulk earthworks include excavation and filling of the road formations and allotments.
2. WSUD devices have been constructed in accordance with the approved temporary form, which provides their protection from damage caused by high flows and pollutant loads.
3. Council has approved engineering and landscape drawings for all the works.
4. The total value of all uncompleted works, including internal water supply and sewerage works, does not exceed 50% of the total value of all subdivisional works.
5. All outstanding rates are paid to Council.
6. All monetary contributions required by the conditions of approval (water, sewerage, drainage, waterways, transport, public recreation land, etc.) are paid.
7. The Proponent should provide the following information:
 - Certification of the value of uncompleted works.
 - Detailed schedule of the scope and cost of the uncompleted works for auditing purposes.
 - Certification that all external and internal works can be completed and accepted On-Maintenance within three (3) months of plan sealing.
 - Certification that the contract has been let for the construction of the remaining external and internal works and the name of the Contractor.
 - Proposed finish dates for remaining internal and external works.
8. An uncompleted works bond has been prepared and executed. The amount of the bond should be 125% of the certified value of the uncompleted works including the cost of any works to be carried out by Council for which payments have not been received. Bonding requirements for WSUD devices is detailed in Section 4.1.

The release of the uncompleted works bond can be arranged through Council's Plan Sealing Unit, Express Services, Development Assessment Licensing, Sealing & Certificates unit on the advice by Council that works have been satisfactorily completed. Council will not bond minor one-off items such as driveways or footpaths due to unnecessary administrative burden.

Where the amount of security for uncompleted works is \$200,000 or less, the Proponent is required to provide a letter of undertaking and submit a bond document. The bond is executed by the bank in a standard Council format and incorporates a schedule of outstanding works and estimates.

Where the amount of security for uncompleted works exceeds \$200,000, the Proponent is required to enter into a subdivision deed drawn up by Council at the Proponent's expense and provide security, generally in the form of a bank guarantee.

9. The minimum uncompleted works bond is \$50,000 including GST.

3.7 BONDING OF UNCOMPLETED WSUD WORKS

WSUD devices and their associated landscaping need to be protected from damage until the upstream catchment has been fully established and the pollutant loads are in accordance with the design expectations for the device. In the majority of cases, the WSUD will be constructed in a temporary form. Once the catchment has been fully developed, the device will be converted into the permanent form. So as to not delay the signing and sealing of the survey plan, or the release of bonds associated with the remainder of the outstanding works, the Proponent may choose to take out a separate bond for this work.

If the Proponent chooses to bond the WSUD device, then the value of the bond shall be 150% of the cost for Council to undertake the construction transformation works. This will include supply, planting and establishment of vegetation, testing of various components of the device and the maintenance during the twenty-four (24) months defects liability period.

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4.0 NOTIFICATION, MEETING, INSPECTION AND LIASION REQUIREMENTS

4.1 GENERAL

The Proponent is responsible for organising inspections and certifying that:

- The design intent of the approved engineering and landscape drawings and relevant standards has been satisfactorily achieved.
- The works are constructed to within the tolerances specified in the approved engineering and landscape drawings, technical specifications and contract documents.

Council officers will not deal directly with the Contractor. The Proponent is responsible for liaising and arranging with Council for the key joint inspections. The minimum working days' notice that shall be given is detailed in Table 5.1 below:

Table 4.1 Minimum Working Days' Notice for Inspections

Inspection	Type	Minimum Working Days Required
Pre-Start	Mandatory	5
During Construction (civil, electrical, ITS)	As Required	2
Traffic signals and ITS Pre-Commissioning	Mandatory	10
Traffic signals and ITS Commissioning	Mandatory	10
On-Maintenance (civil, electrical, landscaping)	Mandatory	5
Traffic signals and ITS Off-Maintenance	Mandatory	10
Off-Maintenance (civil, electrical, landscaping)	Mandatory	5

The Proponent shall provide information and notify Council to request inspections as required by the key activities outlined in Table 5.2. It should be noted that, joint inspection and submission of compliance certificates to Council are generally only required for the following developments:

- All subdivisions.
- Site developments incorporating one or more of the following activities:
 - Substantial quantities of contributed assets (external works) are involved.
 - Significant ecological constraints exist.
 - Significant landscape management works are involved.
- Traffic signal installations.

Table 4.2 – Notification, Meeting, Inspection and Liaison Requirements

Activity	Timing	Details
Contact details	Prior to commencement of site works	The Proponent shall submit a letter advising: <ul style="list-style-type: none"> ▪ Name, address and telephone number (including after-hours contact) of the Superintendent (Consultant) for the development. ▪ Name, address and telephone number of the Contractor/s and major Sub-Contractor/s for the development (including after- hour contact). ▪ Intended date of commencement of works.
Pre-start meeting	Prior to commencement of site works	The Proponent shall request a pre-start meeting, noting that the meeting can only be held after all the engineering and landscape drawings have been approved. The agenda will generally include: <ul style="list-style-type: none"> ▪ Introduction of stakeholders. ▪ Review of Development Approval conditions and approved engineering and landscape drawings. ▪ Inspection and identification of parks, waterways, and environmentally significant areas. ▪ Construction activities and program.

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Activity	Timing	Details
	During site works	<p>connections, traffic signal's personality, communications requirements etc.</p> <p>Construction of traffic signals cannot commence without a prestart meeting with Council engineers from the Development Assessment and Signals' Management Groups.</p> <p>System Integration</p> <p>Due to the critical nature, programming and system integration of the traffic signal personality controllers into the Brisbane Metropolitan Traffic Management system can only be carried out by qualified Council staff. For this purpose, the Proponent shall liaise closely with Council's Congestion Reduction Unit - Traffic Signals Operation's Traffic Signal Inspector.</p> <p>Pre commissioning of Traffic Signals</p> <p>The Proponent shall:</p> <ul style="list-style-type: none"> ▪ Make a request to Council's Congestion Reduction Unit - Traffic Signals Operation for power supply connection to new traffic signal sites and/or relocating existing power supply to existing traffic signal sites with a minimum of six weeks' notice. ▪ Ensure compliance with the approved design and BSD Standards, which includes the traffic signals pits and lids, above-ground hardware, cables and loops have all been installed and terminations made. ▪ Submit signed Contractor Traffic Signals Underground Cable/Conduit Certification to Council. Refer Appendix J ▪ Arrange joint inspection for pre-commissioning, commissioning/On-Maintenance for traffic signals with Council's Transport Network Provider Compliance officer and Congestion Reduction Unit – Traffic Signals Operation at the Proponent's cost. <p>The following documents are required from the Proponent:</p> <ul style="list-style-type: none"> ▪ The 'Contractor Traffic Signal Cable/Conduit Certification' (refer to Appendix J) shall be filled in, signed off and forwarded to Council's Congestion Reduction Unit – Traffic Signals Operation. ▪ 'As-Constructed' drawings in DWG file. <p>The following are also required from the contractor:</p> <ul style="list-style-type: none"> ▪ Communications link established to all ITS including, but not limited to Council's traffic signals SCATS system ▪ Controller head turned on, with lamps off, for Council's Congestion Reduction Unit – Traffic Signals Operation to monitor the site on SCATS ▪ Testing carried out on all equipment/hardware, including, but not limited to, loop vehicle detectors and push buttons input and flash testing of all lanterns. ▪ The Proponent shall arrange a traffic signal electrician to be on site to carry out flash and detector input tests for Council's Congestion Reduction Unit – Traffic Signals Operation's Traffic Signal Inspector to witness and verify acceptance. ▪ Linemarking, signage, scrub works, footpath, kerb ramps etc. have been completed. Note; line marking of new stop bars and pedestrian cross walk lines shall not be painted until the day of the commissioning date, as agreed with Council's Congestion Reduction Unit – Traffic Signals Operation's Traffic Signal's Inspector and after the pre commissioning inspection audit. All critical and safety defects and non-compliance items shall be rectified at no cost to Council, before commissioning date of the traffic signals.

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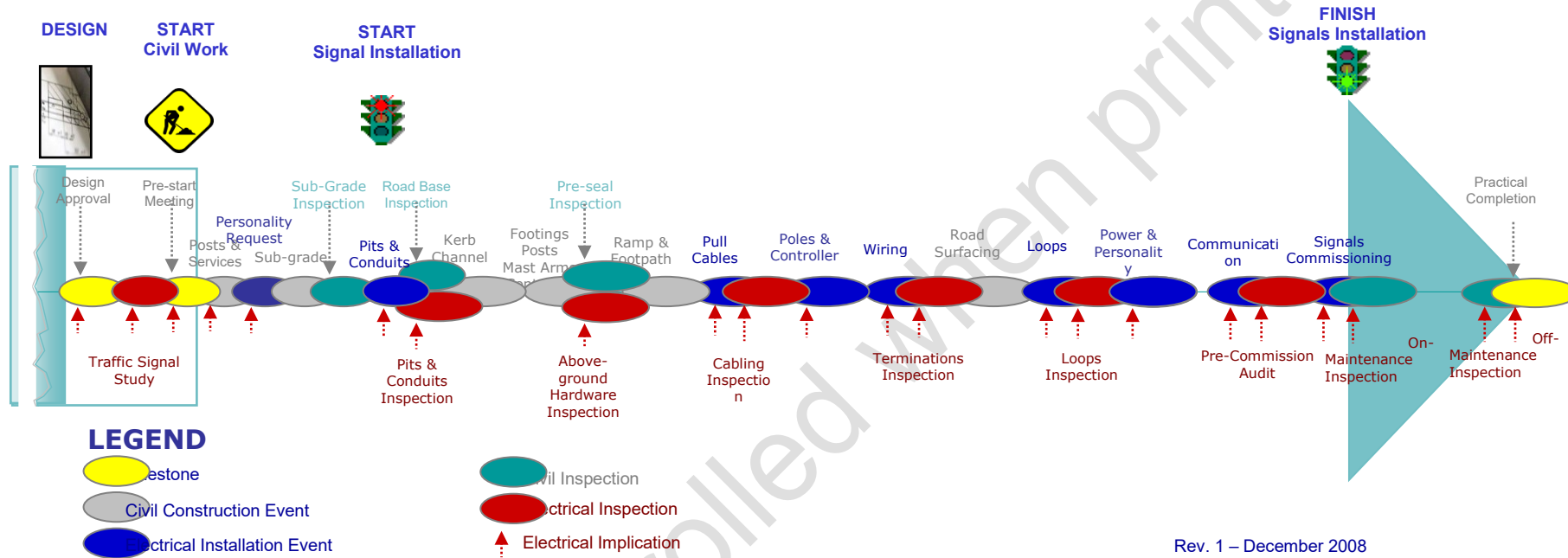
Activity	Timing	Details
	<p>Commissioning/ On-Maintenance</p> <p>Off-Maintenance</p>	<ul style="list-style-type: none"> ▪ The majority of the non-operational lanterns (minimum of 3 per approach) including pedestrian lanterns shall be covered with 'Not in Use' signs. ▪ Portable VMS and CCTV maybe required by Council's Congestion Reduction Unit – Traffic Signals Operation at no cost to Council. <p>Once Council's Congestion Reduction Unit - Traffic Signals Operation's Traffic Signal Inspector has carried out the pre-commissioning inspection, a pre-commissioning audit report listing any defects and non-compliance will be forwarded to the Proponent to rectify prior to commissioning/on-maintenance of the traffic signals.</p> <p>The Proponent must contact Council's Congestion Reduction Unit - Traffic Signals Operation to arrange a commissioning/on maintenance date of traffic signals after the defects and non-compliance issues identified in the pre-commissioning audit report have been rectified. On the agreed date of commissioning/on maintenance date, the Proponent shall complete the line marking of all stop bars and pedestrian cross walk lines. The Proponent shall arrange a traffic signal's electrician to carry out a final flash test and switch on.</p> <p>Final Inspection/Compliance Inspection</p> <p>Final inspection/compliance inspection shall be carried out by an appointed Electrical Compliance Officer and a Council Development Assessment engineer. If satisfactory, Practical Completion will be granted which will initiate the defects liability period.</p> <p>Emergency Response</p> <p>The Proponent shall provide 24 hour/7 days emergency response contact details for their Consultant and/or Contractors, including their traffic signal's fault response contractor which includes qualified traffic signals electrician/s. The Proponent shall ensure the Council's Fault Response Times requirements are met once works has commenced on site. Refer Appendix I – Traffic Signals Fault Reporting.</p> <p>The Proponent shall contact Council to arrange an off-maintenance inspection. Any defects identified shall be rectified at no cost to Council.</p>
Structures	<p>General</p> <p>Prior to Practical Completion</p>	<p>The Proponent in liaison with Council and other stakeholders commence planning and preparing to comply with their commitments imposed by handover requirements from project inception. This action will ensure that all matters for resolution and any noncompliance issues are identified early and managed to avoid negative impact on the assets whole of life cost.</p> <p>The Proponent shall arrange a meeting with Council and all relevant stakeholders to occur at least four weeks prior to achieving practical completion to discuss the structure handover process and to agree on maintenance requirements and outcomes.</p> <p>Typically, the meeting agenda shall allow adequate time to discuss and agree:</p> <ul style="list-style-type: none"> ▪ The meeting objectives. ▪ Project orientation. ▪ Anticipated date of practical and final completion. ▪ Certificates and compliance requirements. ▪ Heritage, environmental and other approvals. ▪ On and off maintenance inspections.

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Activity	Timing	Details
	Three (3) months prior to Defects Liability Period end date	<ul style="list-style-type: none"> ▪ Operational and Maintenance requirements. ▪ Security, corrosion and fire fighting systems and staff training needs. ▪ Inspection and maintenance access routes, site and ownership boundaries, and extents of maintenance responsibility and lines of demarcation. ▪ Defects and operational maintenance management, roles and responsibilities during defects period. ▪ As-Constructed information requirements including all test results and certificates. ▪ Asset component level data registration requirements. <p>A DTMR Level 2 bridge inspection or similar to suit the asset type shall be completed within three (3) months prior to the defects liability period end date. This will include extensive visual inspection of every component of the bridge above ground level by an accredited bridge inspector. The objective of the inspection is to identify defective components and assign condition ratings to each component. The inspection results together with photographs of the defects are to be recorded on standard forms.</p>
Parks	During Construction and On/Off-Maintenance	Liaison with Council's Development Assessment /Regionals Parks Coordinator to ensure incorporation of park assets/infrastructure to landscape/concept plans, conditions and standards.
On-Maintenance Inspection (civil, landscaping/lighting – except traffic signals, structures, WSUD)	At Practical Completion	<p>The Proponent shall submit the On-Maintenance Inspection Checklist (refer Appendix L) to Council and request an On-Maintenance inspection.</p> <p>Refer Section 6 for details of the requirements to have the work formally accepted On-Maintenance.</p>
On-Maintenance Inspection of WSUD devices	When the development is fully established	The Proponent shall submit the On-Maintenance Inspection Checklist for each device to Council (refer Appendix L) and request an On-Maintenance inspection. Refer Section 7.2.3 for further details.
Off-Maintenance Inspection	End of maintenance period	Following the expiry of the maintenance period (minimum 12 months), the Proponent shall notify Council of the impending Off-Maintenance inspection. The Proponent shall inspect the site prior to the joint inspection to ensure that all the listed faults have been rectified. Refer Section 8 for the requirements to have the work formally accepted Off-Maintenance.
Off-Maintenance inspection of WSUD devices	End of WSUD maintenance period	Following the expiry of the maintenance period (minimum 12 months), the Proponent shall notify Council of the impending Off-Maintenance inspection. The Proponent shall inspect the site prior to the joint inspection to ensure that all the listed faults have been rectified. Refer Section 8.5 for the requirements to have the work formally accepted Off-Maintenance.

FIGURE 5.1

TYPICAL SEQUENCE OF EVENTS TRAFFIC SIGNALS INSTALLATION



5.0 COMPLIANCE REQUIREMENTS

The Proponent is responsible for submitting compliance results (field and laboratory tests, and construction tolerances), information and all relevant certificates to Council. These requirements are summarised in Table 6.1.

TABLE 5.1 – COMPLIANCE REQUIREMENTS

Item	Description	Reference	Timing Of Submission To Council
1	Pavement Design E.g. 4 day soaked CBR values at subgrade	Infrastructure Design Planning Scheme Policy	Prior to placement of pavement material
2	On-Maintenance Inspection Checklist	Appendix L	Prior to On-Maintenance inspection
3	Earthworks E.g. compaction standards, select fill, construction tolerances	Specification S120 – Quality Specification S140 – Earthworks	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
4	Geotechnical Certificates		Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
5	Pavement Materials E.g. grading, soaked CBR values, Atterberg limits, flakiness index	Specification S300 – Quarry Products Specification S310 – Supply of Dense Graded Asphalt	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
6	Pavement Construction E.g. compaction standards, delivery docket, AC core tests, construction tolerances	Specification S140 – Earthworks Specification S150 – Roadworks Specification S300 – Quarry Products Specification S320 – Laying of Asphalt	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
7	Structures E.g. construction tolerances, slump and strength tests, docket and certificates.	Specification S120 – Quality Specification S200 – Concrete Work Appendix P Appendix Q	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection

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Item	Description	Reference	Timing Of Submission To Council
	Provide copies of: <ul style="list-style-type: none"> ▪ All relevant, environment and cultural heritage management plans; ▪ Approval documents and structural design reports; ▪ Material and construction specifications; ▪ Compliance certification; ▪ Location of supplied materials incorporated into the works; ▪ Operating and Maintenance manuals; and Plans with cost projections for Council's information and use throughout the assets life.	Section 8.3	Prior to acceptance Off-Maintenance
8	Stormwater Drainage E.g. trench and backfill compaction results, construction tolerances, closed circuit television camera survey	Specification S140 – Earthworks Specification S160 – Drainage Infrastructure Design Planning Scheme Policy	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
9	WSUD Devices Checklists, test results, documentation and certifications	As required by the Water by Design Suite of Guidelines. Sections 7.2.3 and 8.5	At the: <ul style="list-style-type: none"> ▪ Temporary (protective) construction - Stage 1 - when the civil works (roads & drains) are placed On-Maintenance; ▪ The On-Maintenance period for the WSUD device to ensure establishment of the vegetation; ▪ At the Off -Maintenance inspection for the WSUD device.
10	Traffic Signals/ITS	Inspection Forms If applicable – Standard Drawings BSD 2000 and BMS 6000 series Sections 6.3, 6.4, 6.5, 9.9, 9.10 and 9.11	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection or prior to signing and sealing of the survey plan, whichever comes first
11	Electrical/Lighting	Section 6.3 Appendix L	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection or prior to signing and sealing of the survey plan, whichever comes first
12	Telecommunications	Section 6.2	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection or prior to signing and sealing of the survey plan, whichever comes first

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Item	Description	Reference	Timing Of Submission To Council
13	Landscaping, streetscape and Park Infrastructure	Specification S190 – Landscaping Infrastructure Design Planning Scheme Policy And Standard Drawing sets <ul style="list-style-type: none"> ▪ Series 8000 Series – Stormwater Drainage and Water Quality ▪ Series 9000 Series – Streetscape and Landscape and ▪ Series 10000 Series – Park and Natural Area Facilities 	Prior to acceptance On-Maintenance and within 2 weeks from -maintenance inspection
14	As-Constructed Drawings including Asset Register	Infrastructure Design Planning Scheme Policy and Section 9 and 10. Appendix N, R and S	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
15	Certificate of Completion	Appendix M	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
16	Bonding Arrangement	Sections 4 and 7	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
17	Request for development to go On-Maintenance	Section 7	Prior to acceptance On-Maintenance and within 2 weeks from On-Maintenance inspection
18	Bonding Arrangement	Section 7	Following expiry of maintenance period and rectification of all defects
19	Release of bonds and securities	Section 7	Following expiry of maintenance period and acceptance of any defects and completed works by Council

5.1 STRUCTURAL ASSETS

The handover of structural assets shall occur when the Proponent is satisfied that the following prerequisites for any contributed, handed over or acquired Council structural assets and attached or associated sub assets are satisfied:

- Are wholly contained within a Council-controlled road corridor, easement or Council owned or managed land.
- The ownership and maintenance responsibilities, lines of demarcation, property boundaries, rights of access and any contractual commitments are made clear and accepted by Councils' Asset Owner and Asset Manager.
- Are 95% complete;
- The works can be reasonably made defect free within twelve (12) months of achieving practical completion.

5.2 ELECTRICAL

Prior to signing and sealing of the Survey Plan by Council, a copy of the 'Certificate for Electricity Supply' shall be submitted to Council. If street lighting is required, the electrical Distribution Entity

will need to sight documentary evidence of street lighting approval by Council before the 'Certificate for Electricity Supply' is issued.

If the electricity supply is unmetered then Council will need to sight documentary evidence of expected running load, and this shall include all items connected to the supply point.

5.3 COMMUNICATIONS

Prior to signing and sealing of the Survey Plan or prior to Commencement of Use (whichever is the earlier) the Proponent shall provide to Council:

1. A copy of the agreement with the chosen wholesale carrier demonstrating that telecommunications services will be available from a Certified Retail Service Provider when owners/occupiers are ready for services, or, a copy of the request for services to the "carrier of last resort" relevant for the type of development, and a copy of the carrier's acknowledgement.
2. Where the Proponent needs to install new pits and/or conduits to meet this requirement, a certification from a suitably qualified Registered Professional Engineer Queensland (RPEQ) that the installed telecommunications conduits and pits comply with or exceed the Council Design and Construction Principles, the Commonwealth Telecommunication Act 1997 and National Broadband Network (Fibre Ready) requirements current at the date of the agreement and relevant to the development;
3. If the Proponent installs telecommunications conduits and pits, and the chosen wholesale carrier requires their ownership to fulfil the agreement, a copy of ownership transfer and acknowledgement documents; and
4. If the Proponent installs telecommunications conduits and pits, and the chosen wholesale carrier does not want ownership, As-Constructed drawings, Asset Inventory Data Sheets, test results certified by an appropriately qualified RPEQ as complying with the Design and Construction Principles, and a document transferring ownership of the new telecommunications conduits and pits to Council;

5.4 COMMUNITY SERVICES – CONDUITS

Prior to signing and sealing of the Survey Plan or prior to Commencement of Use (whichever is the earlier) the Proponent shall provide to Council:

1. As-constructed drawings, Asset Inventory Data Sheets and test results certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) that the installed Community Services conduits and pits comply with the design and construction principles;
2. A document transferring ownership of the Community Services conduits and pits to Council.

5.5 TRAFFIC SIGNALS/INTELLIGENT TRANSPORT SYSTEMS – CONDUITS

Prior to signing and sealing of the Survey Plan or prior to Commencement of Use (whichever is the earlier) the Proponent shall provide to Council:

1. As-constructed drawings, Asset Inventory Data Sheets and test results certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) that the installed ITS conduits and pits comply with the design and construction principles.
2. A document transferring ownership of the ITS conduits and pits to Council.

5.6 TRAFFIC SIGNALS/INTELLIGENT TRANSPORT SYSTEMS – FIBRE

Undertake and provide records of the following OTDR tests in both directions for 100% of installed optical linking cabling including any connected (spliced) optical fibre cabling.

Prior to testing, provide a testing plan to Council's Asset Management Duct and Fibre Group detailing test setting parameters, the number and type of tests to be performed, test locations and duration at each location.

Provide test results in soft copy in cable tester native format and a summary in hard copy. All test results shall include a copy of the current calibration certification for each test instrument used.

Optical fibre launch and exit leads of at least 500m shall be used.

The following table of acceptable losses shall apply to optical fibre cabling installed under these guidelines. These acceptable loss levels shall apply to cabling between Council sites.

TABLE 6.2 – COMPLIANCE REQUIREMENTS

Item	1310	1550
Splice Loss	0.1 dB max	0.1 dB max
SC-APC Connector Loss	0.5 dB max	0.5 dB max
Cable Loss	0.33 dB/Km	0.22 dB/Km

6.0 ON-MAINTENANCE/DEFECTS LIABILITY PERIOD

6.1 GENERAL

The maintenance or defects liability period for civil works is twelve (12) months minimum from the date of acceptance On-Maintenance. However, longer periods may be required for specific items within the development where problems have been encountered or where poor workmanship is evident or where non-standard methods or materials have been used. For example, the Maintenance Period for:

- Landscaping plant stock larger than 25litre container size requires twenty-four (24) months establishment, as outlined in S190 Section 11.
- Plant Rehabilitation Works is generally minimum twenty-four (24) months.
- Plant Offset Works is generally minimum five (5) years.
- Vegetation associated with Water Sensitive Urban Design (WSUD) assets is to be a minimum period of twenty-four (24) months. This time may include time prior to the acceptance of the civil works On-Maintenance, However, the completed device, with established vegetation must have a minimum performance assessment period of twelve (12) months.

The minimum twelve (12) month maintenance period has been selected for the following reasons:

- Ability to monitor performance of contributed assets over a full seasonal cycle.
- Ability to monitor performance of contributed assets for design loads. For example, roads in a new subdivision are not always subject to the design traffic loads (e.g. refuse collection vehicles) during the first six (6) months.
- The nominated period is consistent with industry trend.
- Ability to evaluate the overall performance of contributed assets especially with the shift towards self-certification. Further, maximising the use of ecologically sensitive solutions such as natural channels and wetlands often requires longer establishment and performance monitoring periods.

Works, including the installation of street and park signs, street lights, speed control devices, traffic signals, traffic signs and pavement marking, should be completed in order to be accepted On-Maintenance. A \$5,000 maintenance bond will be held for traffic signal maintenance and used as required to ensure continuity of operation.

During the maintenance period, responsibility and liability for rectification of defects and for any damage that may occur (including damages caused by builders or utility service providers) lies with the Proponent and not with Council, unless the work may be directly related to Council activities. The Proponent should undertake the necessary steps to minimise the occurrences of damages. In circumstances where Council has a duty of care to undertake emergency repair works to safeguard public safety, and where the repair works are related to defective works or materials, Council will recover costs from the Proponent.

6.2 PROCESS TO ACHIEVE ON-MAINTENANCE

Within two weeks from the date of the On-Maintenance inspection, the Proponent should lodge the following documentation with Council, so that the formal acceptance of the development On-Maintenance can be processed. If the documentation is not supplied within the nominated period, the date of works being accepted On-Maintenance will be deferred to the date when all the information is satisfactorily lodged.

- Letter confirming satisfactory completion of the On-Maintenance inspection and requesting that the maintenance period commence from the date of inspection and acknowledge that any defects will be attended to as soon as possible within the maintenance period.
- A formal Certificate of Completion is issued by the Principal Engineering Consultant, based on the proforma template outlined in Appendix M. The non-compliance records and remedial actions have been incorporated to the Certificate of Completion in order to expedite the checking and approval process by placing the responsibility for identifying and reporting non-conforming works with the Proponent. Council will only undertake random audit checks.

- A bond provided for any outstanding works required to bring WSUD devices in Open Spaces to their final operating form. This includes: removal of protective layers, testing of filter media and supply, plant, establishment and maintenance of vegetation.
- A letter certifying that all WSUD devices have been inspected in accordance with the appropriate requirements of the Healthy Waterways – Water by Design suite of guidelines. The letter is to include the appropriate certificates, survey of the surface levels of swales, bio-retentions, sediment basins and wetlands and completed and signed Water by Design checklists;
- One set of electronic (PDF) As-Constructed drawings, endorsed by a Licensed Surveyor shall be lodged prior to the on maintenance inspection.
- As-Constructed asset register – refer [Appendix N - Asset Register Proformas](#)
- All quality control testing and monitoring results including construction tolerances.
- A landscape park maintenance program including the maintenance of cultural heritage artefacts based on Reference Specifications for Civil Engineering Work S190-Landscaping.
- Where applicable, building approvals and RPEQ certification of structures such as retaining walls and shade structures.
- Where applicable, certification of design, manufacture and installation of play and fitness equipment.
- Where applicable, maintenance manuals and reports for specialised infrastructure such as artwork (refer to Council's Urban Design deaccessioning plans), irrigation systems, pumps and toilet hoists etc.
- Advise form of proposed maintenance security. Alternatives may include offsetting against an existing bond, additional cash payment, or bank guarantee. The maintenance security for a park, rehabilitation and offset area should be a minimum \$10,000 but not less than 5% of the contract sum. The Maintenance security for a streetscape should be a minimum \$5,000 but not less than 5% of the contracted sum. An additional \$1.00 per m² of park area is required to cover the day to day maintenance demands on parks, including the cost of garden beds, mown areas, landscaping, cleaning of buildings and furniture, and regular inspection and maintenance to playgrounds installed in the park.
- Evidence of Public Liability Insurance for the park/streetscape/rehabilitation area/offset area of \$20 million is to be provided.

Formal acceptance of On-Maintenance will be in the form of a correspondence from Council to the Proponent, confirming the On-Maintenance date and listing the defects requiring rectification during the maintenance period, and advising how the maintenance security will be executed.

The following sections provide specific requirements and information required for particular infrastructure items to be placed On-Maintenance.

6.2.1 Traffic Signals and Intelligent Transport Systems

An On-Maintenance and commissioning inspection must be undertaken with a Council Development Assessment engineer, a Congestion Reduction Unit – Traffic Signals Operation's traffic signal's engineer and an electrical engineer prior to Council accepting the asset on maintenance.

An on-maintenance agreement shall be established between the Proponent and either Council or an approved contractor to carry out reactive maintenance services complying with Council response standards (Refer Appendix I).

During the maintenance period, the Proponent shall arrange maintenance with the approved maintenance contractor or contract Council's Traffic Network Services to ensure compliance with Council's required response times. Any costs arising will be at the Proponent's expense and be in accordance with the established maintenance service agreement. During the maintenance period, the Proponent must ensure rectification and elimination of equipment or system failures, and provide for the timely supply of spares as outlined in Appendix I - Traffic Signals Fault Reporting.

6.2.2 Structural Assets

The On-Maintenance inspection findings (defect list) shall be recorded on a template provided in Appendix P, signed off by the responsible delivery team members and key stakeholders in attendance.

The Proponent shall schedule an 'On Maintenance' inspection, when the works are 95% complete and within 28 days supply the documents required to register and capitalise the structural asset.

The purpose of this inspection is to ensure Councils' Asset Manager are adequately briefed on the scope, nature and extent of works they required to operate and maintain to realise Councils' visions.

6.2.3 Landscaping, Water Sensitive Urban Design, Park Infrastructure, Rehabilitation and Offset Works

All landscaping and park infrastructure, including permanent fencing, barriers and embellishments shall be installed prior to the commencement of the streetscape and park On-Maintenance. Streetscapes and parks will need to be publicly accessible and useable from this point of time. The Proponent is required to maintain an appropriate public liability insurance cover during the maintenance period.

Where items such as playgrounds, electric barbecues, drinking fountains and buildings are installed in the park, agreement shall be reached between the Proponent and Council over responsibility for day to day operational maintenance during the on maintenance period. Council may take responsibility for periodic operational inspections of items such as playgrounds and barbecues where this is a substantial responsibility. Any agreement reached will not reduce the responsibility of the Proponent to maintain all soft landscaping (grass, garden beds, trees, etc.), and to repair all defects that arise during the on maintenance period. Council will not accept any park operational maintenance responsibilities unless a formal agreement is signed by the Proponent and Council.

All rehabilitation and offset works shall be installed prior to the commencement of the rehabilitation and offset On-Maintenance. Rehabilitation and offset areas may be publicly accessible from this point of time, and the Proponent is required to maintain an appropriate public liability insurance cover during the maintenance period.

6.2.3.1 Water Sensitive Urban Design within Road Corridors

All WSUD devices in Road Corridors are to be linked to the On/Off-Maintenance of the road and drain assets. All devices must: be inspected in accordance with the appropriate requirements of the Healthy Waterways – Water by Design suite of guidelines, have appropriate certificates and surveys carried out, and have completed and signed checklists forwarded to Council.

Typically, WSUD devices consist of: proprietary in-ground systems; constructed in-ground traps and filters; swales; sediment traps and bio-retentions systems. Until the development of the upstream catchment is fully established, all of these devices will require either an increased cleaning and maintenance regime, (particularly for the proprietary in-ground systems and constructed in-ground traps and filters) or protection from stormwater flows and pollutants by use of swales, sediment traps and bio-retentions systems etc. This is referred to as the initial stage or temporary form of the device. This stage is to be complete before the devices can be accepted On-Maintenance. Further to the establishment of the upstream catchment, any vegetation associated with a WSUD must be fully established (minimum period of twelve (12) months) and weed free before going on a further twelve (12) month On-Maintenance during which the performance of the device is to be assessed.

Swales are to be fully constructed including earthworks and profiling, hydraulic structures, planting of turf and/or vegetation. The sediment fencing required to protect the vegetation until established (minimum period of twelve (12) months) is to be removed before acceptance On-Maintenance. As these devices will be linked to the On-Maintenance of the civil works (roads and drains), it is in the Proponent's interests to have the establishment period to occur prior to practical completion of the civil works.

Sediment traps are to be fully constructed, including earthworks and profiling, scour protection and hydraulic structures. All associated landscaping shall have been established for a minimum twelve (12) month period, weed free and mulched. As these devices will be linked to the On-Maintenance of the civil works (roads and drains) it is in the Proponent's interests to have the

twelve (12) month establishment period for the landscaping to occur prior to practical completion of the civil works.

Bio-retention systems will have either been bypassed or modified to act as a sediment basin during the establishment phase of the development. For the On-Maintenance period, the device is to be fully transformed to its permanent form and planted with the treatment vegetation and any associated landscaping. Regarding:

- The devices that were fully planted and modified so that stormwater flows bypassed them during the establishment phase may be placed On-Maintenance when the vegetation is at least 12 months old, fully established, and weed free. When the plants are fully established, the device is to be filled with water to check that the under drains are functioning and the media is not blocked. The On-Maintenance period will be a minimum of 12 months to allow the performance of the device to be assessed.
- The devices that were transformed into a sediment trap for the establishment phase are to have the protective layers removed and filter media tested to confirm its drainage properties are within specification. Any contaminated filter media is to be removed and replaced with compliant filter media. Survey shall be undertaken to confirm that the levels of the filter media are as per design. The under drains shall be tested to confirm they are functioning and treatment vegetation planted including associated landscaping planted and mulched. The vegetation is then to undergo a 12 month plant establishment period before being considered for acceptance on a Maintenance Defect Liability period of a further twelve (12) months.
 - Infiltration testing of the filter media is to be undertaken in at least three locations of the bio-retention filter material. If a test fails (i.e. a flow rate less than 120mm/h), 100mm of filter media is to be removed and the filter media retested. This process may be repeated three times. If more than 300mm is found to be below specification, then the media and under drains are to be removed and reconstructed.
 - Note, the minimum Maintenance/Defects Liability Period for WSUDs in road reserves is twelve (12) months.

6.2.3.2 Water Sensitive Urban Design (WSUD) Assets in Public Open Space (Typically in Drainage Reserve or Park)

The placement of the associated civil works (Roads and Drains) On-Maintenance cannot occur until the Stage 1 Construction Works for these WSUD devices is complete. Separate approvals may be considered to allow different Off-Maintenance periods between these devices and the roads and drains assets. These devices must be inspected in accordance with the appropriate requirements of the Healthy Waterways – Water by Design suite of guidelines. The appropriate certificates and surveys shall be carried out and completed and signed checklists forwarded to Council. The placement of these devices On-Maintenance cannot commence until they have been transformed to their permanent form and the associated vegetation has been fully established (minimum twelve (12) months period) and are weed free and mulched as appropriate.

Before these devices can be placed On-Maintenance:

- The development is established and the stormwater flows and pollutant loads are in accordance with the design expectations;
- The road and drain assets have been accepted Off Maintenance;
- The vegetation must be fully established and mulched where appropriate;
- A bond provided for any outstanding works including maintenance of vegetation;
- The device has been inspected in accordance with the appropriate requirements of the Healthy Waterways – Water by Design suite of guidelines, and the appropriate certificates, material specifications, test results provided, surveys carried out and completed and signed checklists forwarded to Council.

Following completion of these requirements, the device may be considered for placement on a defects liability period (minimum twenty-four (24) months) and its performance assessed.

6.2.3.3 Planting Establishment

The planting establishment period commences at the date of On-Maintenance inspection. Unless nominated differently, the following maintenance periods apply:

- General planting – twelve (12) months.

- 100 mm Deep NT to 300 mm pot (inclusive) – twelve (12) months.
- 25 L pot to Ex-ground (inclusive) – twenty-four (24) months.
- Rehabilitation planting – twenty-four (24) months
- Offset Planting – five (5) years

6.2.3.4 Existing Planting and Grass

Where existing grass or planting is within the landscape contract area, maintain it as for the corresponding classifications of new grass or planting.

6.2.3.5 Recurrent Works

Throughout the planting establishment and On-Maintenance period, carry out maintenance work including watering, mowing, weeding, rubbish removal, sediment removal, fertilising, pest and disease control, reseeding, returfing, staking and tying, replanting, cultivating, pruning, hedge clipping, aerating, reinstatement of mulch, renovating, top dressing, and keeping the site neat and tidy.

6.2.3.6 Replacements

Continue to replace failed, damaged or stolen plants.

6.2.3.7 Grassed Areas

Commence grass maintenance works at the completion of sowing, hydroseeding and turfing. Maintain healthy weed free growth. Grass coverage must achieve at least 80% at the time of practical completion i.e. before going On-Maintenance.

6.2.3.8 Log Book

Maintain a log-book recording when and what maintenance work has been done and what materials, including toxic materials, have been used. Make the log-book available for inspection at request.

6.2.3.9 Supply and Application of Water for Landscaping Maintenance

Water provided shall be Class 'A' recycled water or better. Untested natural water shall comply with the following criteria:

- All existing water within tanks shall be removed at a location away from the supply point prior to filling to ensure contaminants, such as algae and microbes are not translocated across catchments.
- Water selected shall be from the same catchment area and as close to the distribution point as practical.
- Water is to be delivered directly from the supply location to the distribution point.
- Water is to remain uncontaminated from any products from supply to distribution.
- Where supplied water is to be recycled, potable or natural water is to be identified prior to supply and records kept, including decontamination records; and
- Where recycled water is used, the Proponent must ensure that personnel are trained in the handling and distribution.

No excessive amounts of water shall be allowed to enter stormwater gullies, spray onto or flow across or pond on paved areas including roadways, bikeways, footpaths and park assets. Costs to repair damage of treated areas that directly relate to the application of water will be incurred by the Proponent.

7.0 OFF-MAINTENANCE

7.1 GENERAL

Work that may have been bonded for construction during the maintenance period such as footpaths and bikeways should be completed prior to the development being taken Off-Maintenance. All temporary facilities, such as irrigation systems installed for park establishment, should be removed. However, deferred construction may be considered in multi-stage developments. Any outstanding quality control test results such as asphalt core tests and 28 day concrete strengths not available at the On-Maintenance inspection should be supplied during the maintenance period.

The purpose of the Off-Maintenance inspection is to ensure that the constructed works had performed satisfactorily during the maintenance period and omissions and defects have been rectified. The Proponent is responsible for making sure that all unsatisfactory work and defects have been rectified prior to the Off-Maintenance inspection.

Where Council deems that the Off-Maintenance inspection is satisfactory, the Proponent should request in writing for the development to be taken Off-Maintenance and that the maintenance security and any other bond monies be released.

Formal acceptance of Off-Maintenance and release of security deposit will be in the form of a correspondence from Council to the Proponent. At this time, the contributed assets are formally transferred to Council ownership.

The following sections provide specific requirements and information required for particular infrastructure items to be placed Off-Maintenance.

7.2 TRAFFIC SIGNALS AND INTELLIGENT TRANSPORT SYSTEMS

At the end of the maintenance period, a final inspection must be undertaken with a Council Development Assessment engineer, a Congestion Reduction Unit – Traffic Signals Operation engineer and an electrical engineer prior to Council accepting the asset off-maintenance.

At the commencement of 'Off-Maintenance' only the modifications made during the maintenance period should be provided.

7.3 STRUCTURAL ASSETS

7.3.1 Off-Maintenance Inspection

The Proponent shall schedule an 'Off Maintenance' inspection, at the end of the Defect Liability Period. The Off-Maintenance inspection process is similar to the on maintenance inspection and the template provided in Appendix Q is used.

At this stage the structural assets should be defect free, registered and under Councils' Asset Management control and capitalised.

The purpose of the Off Maintenance inspection is to review constructed works performance since practical completion and that any omission, defects or emergent issues are rectified and complete.

7.3.2 Operation and Maintenance Manuals

The Operational and Maintenance manuals associated with structural assets shall contain both planned/proactive and unplanned/reactive activities that outline overall maintenance strategies.

The manuals shall cover operations and maintenance standards, inspection and preventative maintenance programs and specific plans for critical events (such as floods) and failure of critical assets.

As far as mechanical, electrical and services assets are concerned, the manuals are to provide schedules of plant and equipment, manufacturer's technical literature including performance information on individual plant and equipment, operating and maintenance instructions, commissioning records, log books, original software programmes and all passwords, copies of certifications and warranties, list of suppliers etc. and other information that will enable the on-going operation and maintenance of the services, plant and equipment.

The comprehensive documents outlined above are to be accompanied by the appropriate diagrams and other necessary illustrations to facilitate knowledge and understanding about the operation of the plant and equipment. Examples include: hydraulic flow diagrams, electric wiring diagrams, electronic circuit plans and mechanical air flow diagrams etc.

Where applicable, maintenance manuals relating to specialised infrastructure for artwork, bridge facilities and irrigation systems etc. are required to be submitted to Council.

7.3.3 Documentation

The Proponent is in possession of a complete set of documents including:

- The 'As Constructed' drawings and associated priced Bill of Quantities
- All assets are designed in compliance with the requirements of Council's Planning Scheme Policies.
- A Registered Professional Engineer Queensland (RPEQ) certifies that the works are constructed in accordance with the design drawings and specifications.
- The environment and cultural heritage management plans and permits.
- The geotechnical and environmental site investigation reports and associated laboratory test reports.
- An independent accredited inspectors Queensland Department of Transport and Main Roads style Level 2 bridge inspection report or similar depending on the asset class confirming the assets component and whole asset condition class 1.
- Material test certificates with details of their location within the permanent works.
- Operating, inspection and maintenance manuals and costed plans to inform financial and maintenance planning and delivery.
- A register of separable assets to be contributed; handed over or transferred to Council ownership (Refer to [Appendix N - Asset Register Proformas](#)).

7.3.4 Training Sessions

Where appropriate the Proponent shall organise adequate and effective training for each system and specialised plant/equipment prior to the proposed handover date using only qualified and competent trainers. Adequate and appropriate training materials inclusive of as-installed drawings and operation and maintenance manuals are to be used as the basis for training.

7.4 FENCES

Unless all survey pegs are obvious, the Proponent shall submit certification by a Licensed Surveyor that the fences are contained entirely within the development prior to the acceptance of works Off-Maintenance.

7.5 LANDSCAPING

Comply with the Council's nominated requirements in S190 for the Maintenance and Inspection processes. Refer to Reference Specifications for Civil Engineering Work S110-General Requirements for the General Requirements for the Proponent's submissions.

Tree stakes and weeds are to be removed, gardens remulched and embellishments safety checked and cleaned prior to requesting Off-Maintenance inspection.

7.5.1 Water Sensitive Urban Design (WSUD)

All WSUDs in road corridors are linked to the Off-Maintenance of the road as they both influence each other, and therefore, come Off-Maintenance together.

All WSUDs and basins (retention, detention and sediment basins, etc.) in public open space may go On-Maintenance when the civil works come Off-Maintenance. The earliest these devices may come off maintenance is twelve (12) months after the civil works come Off-Maintenance.

For WSUD devices to come off maintenance the following requirements must be met:

- Remove any buildup of anthropogenic material (litter, sediments and silt);

- Survey the surface levels of swales, bio-retention systems, wetlands, sediment basins, and detention/retention basins to confirm that any build-up of material (silt and sediment) has been removed;
- For bio-retention systems, undertake soil infiltration tests in at least 3 locations of the basin to demonstrate that the filter performance hasn't been compromised (no result less than 120mm/h). Note; if this fails, remove vegetation and 150mm of filter media and retest. If it passes place new filter media and replace plants. If the test fails remove a further 150 mm of material and retest. If this test fails, reconstruct the under drains, replace the filter media, and replant the vegetation. If the test passes add 300mm of new filter media, and replant the vegetation. When the remedial work has been completed, extend the maintenance period for a further twelve (12) months;
- All devices are to be inspected in accordance with the appropriate requirements of the Healthy Waterways – Water by Design suite of guidelines, the appropriate certificates provided, surveys carried out and checklists completed, signed and forwarded to Council; and
- After the WSUD devices have been on maintenance for a minimum of twelve (12) months, certification shall be provided by a RPEQ confirming that:
 - The devices have been verified and tested as operating in accordance with the design; and
 - All vegetation has been maintained in accordance with Council's landscaping specifications and any vegetation that did not perform was replaced and maintained.

7.5.2 Maintenance Manual

Submit recommendations for maintenance of plants and park infrastructure e.g. water-play pumps, toilets, WSUD devices etc.

7.5.3 Cleaning

At the end of the planting establishment period, remove stakes and ties no longer required and any temporary protective fences.

8.0 AS-CONSTRUCTED REQUIREMENTS

8.1 GENERAL

The Proponent is responsible for ensuring that the As-Constructed information (drawings and asset register) is accurate and reflects the actual construction, endorsed by a Licensed Surveyor. The survey accuracy shall be such that the As-Constructed information is fit for the purpose to which the information will be used. Refer to [Appendix N - Asset Register Proformas](#) and Appendix R for accuracy requirements.

Where a Non-conformance is identified between the Design requirements and actual As-Constructed position, certification is required to demonstrate that the Non-conformance satisfies the original design requirements.

Where the whole or part of the infrastructure or asset has been identified during the As-Constructed process as having infringed upon an adjoining property, one of the following actions is to occur:

- Obtain written agreement from the owner of the adjoining property for approval of the asset to remain and to accept future liability for that part of the asset;
- Acquire the land to adjust the property boundary and ensure the asset is contained within a single property boundary; or
- Modify the asset to ensure the asset is contained within a single property boundary.

8.2 CADASTRE BASE

The cadastre base provides a graphical representation of property boundaries together with property identifiers such as lot on plan description, house numbers and street names. Drawings should be superimposed on the cadastre base where appropriate. The survey accuracy of the cadastre base shall be acceptable for lodgement with the Land Department.

8.2.1 Earthworks

Submit certification that the As-Constructed spot levels are in accordance with the approved design drawings and built to within the specified construction tolerances.

8.3 ROADWORKS AND PATHS

Submit certification that the As-Constructed grade and cross sectional information is confirmed in areas where roadway and path overland flow capacities are critical, and built to within the specified construction tolerances.

Submit pavement details as per the 'Road Pavement' tab in the [Appendix N - Asset Register Proformas](#).

The As-Constructed drawings should also depict:

- The permanent street, warning and regulatory signs and road pavement markings are installed including path signs in accordance with the approved engineering drawings;
- Pavement and subgrade details:
 - Cross sections of pavement composition and associated thickness for every different configuration.
 - The minimum CBR values for the subgrade and pavement materials shall be noted on the longitudinal sections.

Roadworks and paths As-Constructed information shall be supplied to the limits as shown in Appendix R.

8.4 STORMWATER AND ROOFWATER DRAINAGE

The following information should be depicted on As-Constructed drawings:

- Inspection pits – location established by two ties, surface and invert levels and depth of cover to pipe (inlet and outlet).
- Stormwater – diameter, class, material type, length, grade, depth of cover, alignment and bedding support type.

- Stormwater line inlets and outlets – road and field gully types, surface and invert levels, grate types and lintel sizes;
- Roofwater house connections – location established by two ties, surface and invert level.
- Overland flow path – surface levels and profile.
- WSUD devices – manufacturer model number and type, treatment area, batter slopes, landscaping areas, safety fences and access driveways.

Stormwater As-Constructed information shall be supplied to the limits as shown in Appendix R.

8.5 DIGITAL TERRAIN MODEL

To enable Council to progressively update the citywide levels and contours, the following submissions are required:

- Digital terrain model (xyz file with breaklines) of the development. The accuracy of the survey data should generally conform to the construction tolerances specified in the Reference Specifications for Civil Engineering Work S140-Earthworks. However, in non-critical areas such as allotments and areas with no hard surfacing, the planimetric precision of 0.2m and vertical precision of 0.15m are usually sufficient.
- A hardcopy plan depicting the 0.25m contour intervals and survey spot levels of the development. Certification by a licensed surveyor is required to ensure that the accuracy and reliability of the dataset is maintained.

8.6 STREET LIGHTING

Street Lighting As-Constructed drawings including details of schedule of all items must be submitted prior to hand over.

8.7 ELECTRICAL

Point of supply documentation and supplier numbers shall be included on the as constructed documentation for the site.

8.8 COMMUNITY SERVICES CONDUITS

Conduit plan/s in AutoCAD (DWG AutoCAD v2009) indicating the route and each pit and its respective number are required. The plan shall be provided in both hard and soft copy.

8.9 TRAFFIC SIGNAL DETAILS

Accompanied by the Traffic Signal Submission form, the RPEQ certified, As-Constructed in AutoCAD (DWG AutoCAD v2009) documentation including all layers in the file, shall be lodged. Acceptance criteria will include but not be limited to:

- Design data
- Traffic impact study
- Traffic Signals system and components
- Traffic Signals face layouts and display sequences
- Traffic Signals phasing
- Location of traffic signal equipment and RFID Tags
- Overall network efficiency
- Street lighting design (i.e. for joint use poles)
- Earlier approvals
- Asset Inventory Register – refer [Appendix N - Asset Register Proformas](#)
- Electrical Certification to AS 3000 as per Appendix M

8.10 TRAFFIC SIGNALS/INTELLIGENT TRANSPORT SYSTEMS – LINKING FIBRE CABLING

8.10.1 Traffic Signals/Intelligent Transport Systems – Linking Fibre Cabling

Within one week of practical completion, the Proponent shall supply to Council's Asset Management Duct and Fibre Group, updated copies of all design documentation to reflect "as

constructed" CAD dwg file with full test results, completion advice and network asset data, this includes but is not limited to:

- OTDR test results for all installed optical fibre cabling in both directions in soft copy with hard copy summary. Soft copy records shall be provided in cable tester native format only. PDF records are not acceptable.
- Certificate of Compliance to local regulations (i.e. completed ACMA TCA1 form).
- As-Constructed Images (site photographs) as specified below.
- Schematic MS Visio drawing of the entire cable route detailing all fibre cores splices, terminations and locations with full details in both soft and hard copy.
- Communications Cabinet layouts, if applicable, in MS Visio for all cabinet changes indicating installed optical fibre cabling, existing equipment and cabling in both soft and hard copy.
- Cable Pathway plan/s in AutoCAD (DWG AutoCAD v2009) indicating the route and each traversed cable pit and it's respective number along the entire route of the cable. The plan shall be provided in both hard and soft copy.

Provide one As-Constructed bound manual incorporating hard and soft copies of all documentation as specified.

8.10.2 Traffic Signals/Intelligent Transport Systems – Infrastructure Asset Data

The following is required:

- The Proponent shall supply the ITS infrastructure asset data for import into the Council's GIS system.
- GIS locations shall be within accuracy of +/- 10cm, based on the Geocentric Datum of Australia (GDA) Easting's and Northing's. The Map Projection is MGA94 Zone 56.
- Data is preferred to be supplied in "MapInfo" format. However, a flat .csv file with an identical table structure is acceptable.

8.10.3 Duct and Fibre – Infrastructure As-Constructed Images

Provide as constructed images of the cable pits, cable loops and cable joints installed and/or utilised as part of the works provided under this specification in .jpg format.

As-Constructed image files shall follow this naming:

- Cable Pits: P1718_1.jpg, P1718_2.jpg, P1718_3.jpg, P1718_4.jpg, P1719_1.jpg, etc.
- Loops in Pits: P1718_L1.jpg
- Joints in Pits: P1718_J1.jpg, P1718_J2.jpg, P1719_J2.jpg
- Image file names to be supplied as attributes values of fields.

8.10.4 Traffic Signal/Intelligent Transport Systems – Linking Fibre Test Results

The test results need to be submitted to Council's Asset Management Duct and Fibre Group with all as constructed documentation one week after the completion of the works. The documentation shall include the following:

- Cable and job information
- Section length
- OTDR test results as per Section 6.5

Cable Information

This information should include and be related back to the Cable Pathway Plans:

- Manufacturer of the cable
- Date of Manufacture
- Cable Type
- Batch number
- Core count
- If more than one cable vendor/core count/batch number has been used, the segment should be identified on the cable pathway plan and the cable information shown.

8.11 WATER AND SEWERAGE INFRASTRUCTURE

Refer to Queensland Urban Utilities for As-Constructed requirements.

8.12 BUS STOP INFRASTRUCTURE

Submit certification that the As-Constructed longitudinal grade and cross-fall are within the desired requirements, and that the bus stop conforms to relevant DDA and DSAPT requirements.

Submit asset details as per the 'Bus Stop – General', 'Bus Stop – Stop Infrastructure' and 'Bus Stop – Civil Infrastructure' tabs in the [Appendix N - Asset Register Proformas](#).

The As-Constructed drawings/documentation should depict:

- Shelter and/or seat type, bus stop marker type, tactile ground surface indicator (TGSi) type(s) and kerb;
- Boarding area slab size, longitudinal grade and cross-fall
- Location of bus stop marker in relation to Norminal Face of Kerb (NFK), access path, TGSi
- Location of TGSi in relation to NFK, footpath
- Kerb height
- Access path width
- Height and orientation of timetable
- Shelter slab longitudinal grade and cross-fall
- The associated infrastructure such as waste bins are installed in accordance with the approved engineering drawings;
- The permanent street, warning and regulatory signs and road pavement markings are installed including path signs in accordance with the approved engineering drawings.
- Any services that have been picked up during construction and that are not recorded accurately on the drawing(s) shall be marked up to show actual locations including depth of the services.
- An approved electrical test report form shall be completed and signed by the electrical contractor to meet requirements of the Electrical Safety Regulation. The recorded results will be for all associated tests required as per AS3000 Section 8 Verification.
- The signed "As-Constructed" electrical design drawings and the approved electrical test report form shall be sent to the Brisbane City Council Electrical Compliance mailbox BI-FS-Eleccompliance@brisbane.qld.gov.au.

Contact Council's Project And Program Unit team to organize final inspection and sign off of new bus stops.

8.13 OTHER INFRASTRUCTURE

As-Constructed information for infrastructure that does not form part of the previous asset types shall be supplied in [Appendix N - Asset Register Proformas](#) and to the accuracy limits as shown in Appendix R.

8.14 LODGEMENT OF AS-CONSTRUCTED DRAWINGS

One set of As-Constructed drawings for all asset categories shall be submitted electronically as a PDF file and shall be certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ). PDF files generated from reduced (scaled) drawings will not be acceptable.

To enable comparison with the approved design drawings, all design distances, levels and values are to remain in black on the drawings and 'struck out' with a diagonal line in red. All As-Constructed distances, levels and values (text), regardless of variance, are to be marked on the Drawings and Longitudinal Sections in red. The redrawn parts of any layout details (plan) and longitudinal or cross sections are to be drafted in red with the original linework to remain in black but 'struck out' in red as required. Encircling with a notated cloud usually denotes other amendments and is not to be used on As-Constructed drawings.

Refer to Appendix S for examples of marked As-Constructed drawings and longitudinal section. These show the general principles that shall apply for any asset types.

9.0 ASSET REGISTER

The asset register is an essential part of the engineering and architectural drawings and should be accurate and included on the leading drawing, generally in accordance with the proforma set out in [Appendix N - Asset Register Proformas](#). The Proponent is required to identify and quantify the asset only, as the actual construction costs may not be known at the design stage. The register should include all structures and items associated with the subdivision or development which will be handed over to Council following Off-Maintenance. These items are generally referred to as **contributed assets**.

[Appendix N - Asset Register Proformas](#) lists a comprehensive set of contributed assets excluding water supply and sewerage items. It is envisaged that only a subset of the listed items will apply in most cases as the list also incorporates historical assets such as arched brick drains and heritage construction material such as porphyry. The applicant should not assume that the listed items will imply automatic acceptance of a particular material or product, for example, the use of pavers is now restricted.

The final **asset register shall reflect the actual construction and shall be submitted as part of the As-Constructed Drawings in Excel – soft copy**. For each item, the applicant should specify the asset type, quantity, unit rate, and estimated value. Council will use the unit rates or value of the asset solely for the purpose of asset valuation and capitalisation.

10.0 ASSET INVENTORY DATA SHEETS

Equipment Schedule indicating equipment manufacturer, part number, location used and supplier contact details with individual product data sheets – refer [Appendix N - Asset Register Proformas](#).

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APPENDIX C1 TRAFFIC IMPACT ASSESSMENT GUIDE

1. INTRODUCTION

The intent of this document is to facilitate the assessment of potential traffic and transport impacts of development through the provision of clear requirements for the preparation of a Traffic Impact Assessment.

This document is intended for use by all parties involved in the identification and preparation of Traffic Impact Assessments. Its principle objectives are to identify:

- what scale of analysis should be undertaken and what issues should be addressed
- what methods and approaches should be adopted
- how traffic impact can be quantified
- how traffic impact can be ameliorated

2. PURPOSE

This document is a guide to help consultants and applicants to address traffic management and control requirements for a development. It provides information to assist in the assessment of potential traffic impacts and is a framework for providing relevant information using a Traffic Impact Assessment Report (TIA Report).

3. OUTCOME

Council requirements for the management of vehicular, pedestrian and cycle traffic generated by development are contained in the following documents:

- Transport Access Parking and Servicing Code
- Transport Access Parking and Servicing Policy
- Infrastructure Design Planning Scheme Policy.

The TIA Report must demonstrate how the proposed development complies with these Codes and standards, and identify the works and measures to be carried out to ensure traffic impacts are minimised.

4. INTENT STATEMENT

You should ensure that vehicle, pedestrian and cycle traffic generated by your development has safe access to the road network and does not adversely impact on the operation of the road network. Any potential adverse impacts must be mitigated. Generated traffic must be managed to achieve the requirements of the relevant Codes and Policies in the City Plan.

All applications for a material change of use or reconfiguring a lot must include an assessment of traffic impacts and traffic management measures, in accordance with the reporting requirements tables (refer to Table 1).

5. REPORTING REQUIREMENTS

Table 1 details the reporting requirements, report contents and Council analysis requirements which are to be used to compile the Traffic Impact Assessment Report (TIA Report).

Table 1 – Level of Traffic Impact Assessment (TIA) response required

Minor Development	Medium Development	Major Development
1. Type of development application		
Less than 20 units/townhouses MCU less than 1000 m ² GFA Industrial extensions less than 1000 m ² GFA 10 lot subdivision	More than 20 and less than 50 units/ townhouses MCU more than 1000 m ² GFA Industrial extensions more than 1000 m ² GFA More than 10 and less than 50 lot subdivision Centre extensions more than 1000 m ² Community facilities less than 1000 m ²	More than 50 units/townhouses MCU less than 1000 m ² GFA All new industrial developments More than 50 lot subdivision All new centres Community facilities more than 1000m ² Medical facilities Educational facilities

Minor Development	Medium Development	Major Development
	Child care centres	
2. External intersection assessments required		
Nil	Modification to existing unsignalised intersection/s Modification to existing signal/s New unsignalised intersection/s proposed	Modification to existing unsignalised intersection/s Modification to existing signal/s New unsignalised intersection/s proposed New signalised intersection/s proposed
3. Modelling Requirements		
Not applicable	Intersection analysis of existing intersection/s required (i.e. Sidra).	Network modelling required to determine the network impacts (i.e. Paramics, Saturn, Transyt).

6. BASIC INFORMATION REQUIRED IN A TIA

The information required in a TIA will reflect the size, complexity and type of development proposed. The TIA requires a detailed TAPS Policy assessment and must be signed, dated and referenced by a Registered Professional Engineer of Queensland (RPEQ).

7. GENERAL SITE CONDITION

- Name of applicant and landowner (please indicate if different).
- Brief description of proposal including size of development (m²/number of units).
- Application type
- Site location.
- Current development on site
- Adjoining land uses

8. EXISTING CONDITIONS

- Existing site access locations
- External road details quantifying the current traffic flows on links and intersections within the affected area
- Traffic counts required must not be older than 24 months at time of development application. Requirements for traffic counts are:

Minor Development – Not required

Medium Development – Typical 3-hour AM and PM count at identified intersections and at access

Major Development – 7-day count at identified intersections and at access (a 12hr count and or weekend count maybe more appropriate for developments less than 10,000sqm)

- Examination of historic accident records where appropriate
- Identification of pedestrian flows at critical locations
- Location of existing pedestrian, cyclist and public transport facilities
- Identification of critical links and intersections
- Identification of committed road network upgrades in the area which will affect traffic flow through the area.

9. PROPOSED DEVELOPMENT

- Description of proposed use, including site area and development phasing
- Specification of size of the development
- Impact on adjacent land uses
- Location of new site access

- Identify external generators that might be impacted by the proposed development (i.e. another centre close to the site, petrol station, offices, shops, etc).
Minor Development – Generators up to 200m from site access
Medium Development – Generators up to 500m from site access
Major Development – Generators up to 1000m from site access
- Provision of site plan for proposed development, where available

10. MODAL CHOICE/TRIP ATTRACTION

- Quantification of current trip attraction of the site
 - Estimation of projected modal split. This has already been factored if using the RTA Guide to Traffic Generating Developments
 - Estimation of trip attraction, specified by direction and vehicle type, for
 - weekday
 - peak hour
 - development peak
 - Justification for the values used
 - Identification of times when traffic impact is at its greatest, ie the peak combination of network and development traffic
- For multi-purpose sites, provision of details of each significant element

11. TRIP DISTRIBUTION

- Definition of catchment area
- Identification of transfer trips, ie. the trips that had previously been attracted to an alternative site
- Identification of non-primary trips, ie. 'pass-by' and 'diverted' trips that might already be on the network
- Distribution of trips
- Justification for the methodology adopted

12. ASSIGNMENT OF DEVELOPMENT TRAFFIC

- Identification of traffic routing to and from the site
- Definition of turning movements at the site entrance
- Provision of modified traffic projections at key links and intersections within the affected area

13. ASSESSMENT YEARS

- Estimation of traffic growth that takes into account future network road projects and population and employment growth over time for;
 - network traffic
 - development traffic
- Estimation of traffic flows on the adjacent links and at key links and intersections within the affected area for
 - base year, i.e. 'opening' or completion of last stage
 - base year plus 10 years

NOTE: Brisbane City Council typically requires amelioration of impacts at project 'opening' and/or upon completion of the final stage. The 10-year scenario is important for large developments and/or sites where a road upgrade has been committed to within the 10-year horizon. Growth rates for traffic volumes are to be obtained from the Brisbane Strategic Transport Model (BSTM) or other model approved for use by Council.

14. ROAD IMPACT

- Inclusion of the proposed site access layout
- Justification of the design
- Traffic assessments on other key links and intersections within the affected area

- Identification of reserve capacity and queue lengths where appropriate
 - Identification of alternative designs for key links and intersections within the affected area which may be necessitated by the increased traffic movements
 - Assess internal and external pedestrian and cyclist impacts
 - Identification of any departure from design standards
 - Safety assessment of all designs
 - All TIA's requiring a SIDRA analysis must provide a summary of the input data and output data for each scenario provided. Refer to Appendix A on the Modelling Requirements.
- 15. ROAD SAFETY**
- Examination of historical data for accident factors, trends and groups; for example, regular occurrence of one type of accident or involvement of one type of road user
 - Preparation of a safety audit on any proposed changes
- 16. INTERNAL LAYOUT**
- Definition of internal road and circulatory layout with dimensions
 - Planned consideration of service and emergency vehicle routes
 - Definition of aisle widths, road marking, traffic safety, visibility, etc.
 - Consideration of vehicle speed and control measures
- 17. PARKING PROVISION**
- Consideration of essential operational, visitor, disabled spaces
 - Specification of bay and aisle dimensions and location of spaces
 - Verification that vehicles can access each space with adequate turning provision
 - Determination of service area requirements
- 18. PUBLIC TRANSPORT**
- Indication of intended public transport provision
 - Determination of location of bus stops, routes, etc
 - Determination of access to bus/rail facilities
 - Provide for and assess public transport infrastructure requirements
- 19. PEDESTRIANS/CYCLISTS/PEOPLE WITH DISABILITIES**
- Assess the intern and external pedestrian and cyclist impacts
 - Indication of specific provisions
 - Indication of safety and security provisions
 - Indication of facilities for disabled
- 20. DEVELOPMENT WORK, EXTERNAL WORKS OR CONTRIBUTION**
- Details of the requirements for external roadwork, upgrade proposals for pedestrians, cyclist and public transport facilities, any other proposals necessary for a development approval
 - Identify special provisions for:
 - public transport;
 - bicycles;
 - parking (number of proposed parking spaces to be provided);
 - people with disabilities;
 - installation of, improved or changed pedestrian facilities;
 - delivery vehicles;
 - emergency services;
 - waste collection services;
 - heavy freight vehicles; and
 - roadsigns, and landscaping, etc.

APPENDIX C2 TRAFFIC MODELING REQUIREMENTS

1. GENERAL MODEL REQUIREMENTS

The type and extent of modelling required will depend on the development size and type. Modeling requirements should be discussed with Brisbane City Council preferably at a pre-lodgment meeting to confirm the extent of modelling to be assessed.

2. BASE MODEL

A base model is required. The model needs to demonstrate that it accurately recreates traffic conditions as observed and measured on-site. It should be suitable for use in analysing current network performance and as a benchmark against which other modeling scenarios can be tested.

3. OPTION MODEL

The option model is based on the validated base model that has been modified to take account proposed network changes. These changes can include physical layout, signal timings or predicted developments in traffic demand. By comparing proposed modeling to the original validated base model, the impact of the proposed changes can be determined, allowing informed decisions to be taken based on those impacts.

Data

- Traffic counts must be less than 24 months old at date of development submission.
- Traffic counts need to include pedestrian, cyclists, buses and heavy vehicles.
- A new traffic count is required if the road conditions have changed since the original count was taken.
- Traffic counts taken over 200m from an intersection are not valid.
- Where there are short up-stream and down-stream lanes, counts should record any lane under utilisation;
- Traffic counts are to be either taken as specified and should represent typical traffic conditions. The data needs to reflect general network conditions, traffic signals are operating typically and there are no other unusual activities or travel patterns. This includes, but is not limited to:
 - Day of week behaviour (e.g. avoiding Monday and Friday);
 - School holidays;
 - Roadworks;
 - Temporary road closures;
 - Demonstrations;
 - Festivals;
 - Traffic incidents;
- Data should be collected for all critical time periods being studied. It is recommended that the following time periods should be used:
 - AM peak;
 - School peak
 - PM peak;
 - Saturday midday peak (if required – typically a requirement for retail development proposals);
- Traffic counts taken from Council detector loops must be increased by 10% to accommodate loop counting inaccuracies (NOTE: inaccuracies could be higher if vehicles are very closely spaced, ie. vehicles filtering or giving way to vehicles and pedestrians).
- Record maximum vehicle queues and average delays during peak periods to validate the existing intersection operations (Refer Austroads Guide To Traffic Management Part 3: Traffic Studies and Analysis).
- Loop data with shared lanes are not appropriate to determine turning movements.
- Existing lane utilisation shall be reflected in analysis (if relevant) either measured on site or from detector loop data.

- Traffic volume data is to be tabulated in 15 minute intervals.

Saturation Flow

- All assessments must use a saturation flow of 1850vph.
- Saturation flow may be reduced to 1650vph in situations where there is kerbside parking or high pedestrian movements.
- Saturation flows higher than 1850 vph require on site surveys for justification. The methodology, data and calculations need to be supplied.

Signal Cycle Times

- Generally cycle times are to be in multiples of 10sec ranging from 50sec to 150sec. Preferred cycle times for stand lone intersections are 60, 80, 100, 120, 150 seconds.
- Generally the maximum cycle time of 120 seconds should be adopted. Cycle times greater than 120 seconds are generally only used on major arterials.
- If existing signals are to be modified, current cycle times, phase splits and offsets (if used in TRANSYT) are to be used for the base analysis. If in doubt the phase times should be measured on site.
- Pedestrians need to be considered in all modelling.
- The 'at opening' or completion signal phasing should use the existing cycle times.
- If the signals are demonstrated to function unsatisfactorily then other cycle times may be demonstrated.
- Where signals are linked along a corridor the cycle times for the corridor must be used.
- Pedestrians crossing times must be catered for at all times.
- Signals with high pedestrian movements should not have a cycle time greater than 120sec and it needs to be demonstrated that the pedestrian phase does not extend into the green time.
- The interaction between pedestrians and general traffic at crossing facilities needs to be considered

Right Turn Filters

- Right turn vehicle movements are not permitted to filter through pedestrians.

Uncontrolled Left Slip Lanes

- Are not be implemented in medium to high pedestrian areas particularly near schools.
- The need for a left turn slip lane is subject to confirmation by Council.

Maximum Queue Length

- 95th Percentile is generally accepted to represent a maximum back of queue.
- Turn pockets need to contain the queue to avoid queue spill-out.
- QUEUE SPACE
- Car: 6.0m
- Light truck 7.0m
- Heavy truck 13.0m

Note: Queue space is measured from the nose of the subject vehicle to the nose of the next vehicle in the queue and therefore includes of gap between vehicles.

Level Of Service (LOS)

- LOS should be based on DOS and delay criteria.
- LOS should consider queue lengths (need to be long enough to avoid queue spill out and should not queue back past downstream intersections, particularly signalised intersections).

Critical Gap And Follow-Up Headways

- As detailed in AUSTROADS

Inter Green Time

- Yellow time: 4 seconds

- All-red: 2 seconds (May be longer for large intersections – refer to Austroad Design Guides).

4. GENERAL ROAD GEOMETRY DESIGN STANDARDS

Right Turn Pockets

- Minimum pavement width is 3.0m (low truck volume).
- Minimum pavement width is 3.3m (high truck volume) where road widening is NOT achievable.
- Pavement width is 3.5m (high truck volume) for all new signal installations.

Centre Median Widths

- Provide a 2.0m minimum median island where road widening is achievable and for all new signal installations.
- Provide a 1.8m minimum median island where road widening is NOT achievable.

Through Lane Widths

- Provide 5.5m wide kerbside lane (including 3.5m through lanes + 2.0m cycle lane) where road widening is achievable and for all new signal installations.
- Provide 3.5m wide through lanes where road widening is achievable and for all new signal installations.
- Provide 3.1m (absolute minimum when all other options have been exhausted) through lanes where road widening is NOT achievable.

5. RELEVANT STANDARDS, GUIDELINES AND RESOURCES

National

- Austroad Design Guides

State

- Manual of Uniform Traffic Control Devices

Brisbane City Council

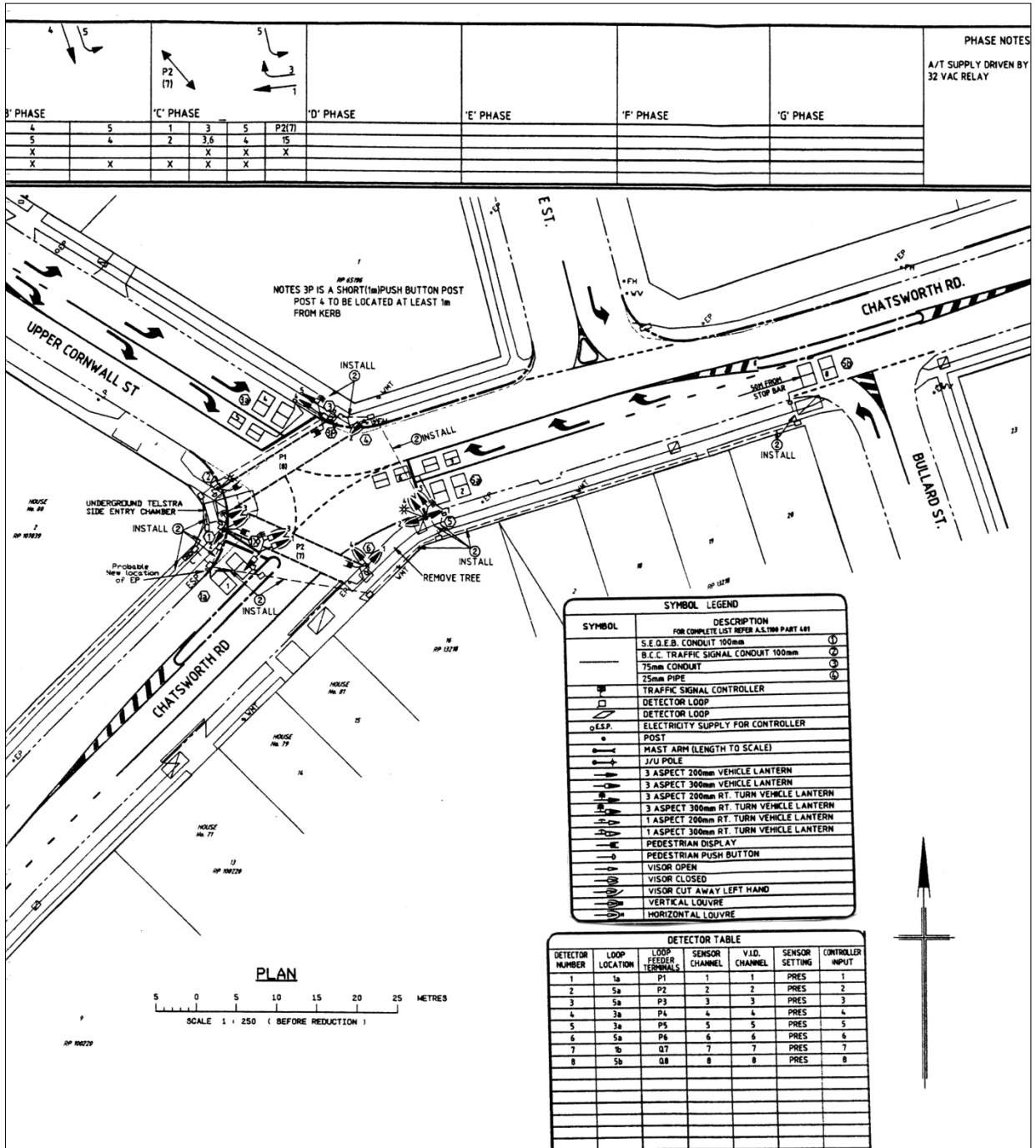
City Plan Codes and Policies, including:

- Council Standard Drawings
- Section 9.4.11 – Transport, Access, Parking and Servicing Code – Part 9 Development Codes – City Plan
- Schedule 6.31 – Transport, Access, Parking and Servicing Planning Scheme Policy – City Plan
- Infrastructure Design Planning Scheme Policy – City Plan

**APPENDIX D TYPICAL EXAMPLE OF A TRAFFIC SIGNALS
DRAWING**

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APPENDIX E TRAFFIC SIGNALS PERSONALITY REQUEST FORM

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BRISBANE CITY COUNCIL

Traffic Signal Personality Request

ABN 72 002 765 795

Brisbane City Council
Congestion Reduction Unit
Traffic Network Operations
GPO Box 1434
Brisbane QLD 4001

Email your Personality Requests and DWG AutoCAD files to: CRUcorrespondence@brisbane.qld.gov.au

The personal information provided will be used by Brisbane City Council or its agents for the purpose of processing your Traffic Signal Personality Request.

Conditions of Traffic Signal Personality Request

1. This form must be fully and correctly completed and submitted for all **Council-maintained** traffic signals which require a new Traffic Signal Personality.
2. Traffic Signal Personality Requests incur charges for the creation of the Traffic Signal Personality of **\$2,139.27 plus GST**.
3. The Requestor agrees to pay to Council the Personality Request Charges referred to in condition 2, within 7 days of receipt of a tax invoice from Council.
4. The Requestor must supply Council with an electronic DWG AutoCAD file of the latest approved Traffic Signal plan and Communication Design with this form otherwise the Traffic Signal Personality Request will not be accepted by Council.
5. Personality Module (PCMCIA – Card) to be supplied to Council Office.
6. Personality Requests take a minimum of 4 weeks to produce from the date of acceptance by Council of the Traffic Signal Personality Request that complies with the prerequisites specified in these Conditions.
7. The Requestor warrants and represents that the signatory for the Requestor is authorised to agree to and bind the Requestor to the Conditions of Request.

1 Intersection Details

Intersection Street Names

Suburb	

Approved Plan Number & Amendment

--

B Number Latest plan revision date

--	--

Is it a new intersection?	Yes	No
Does it need electrical connections?	Yes	No
Does it need Communications?	Yes	No
Is this Project replacing the existing Controller?	Yes	No
Is this Project replacing the Lanterns to LED?	Yes	No

Planned Installation Date (Project Completion)

--

2 Personality Module (PCMCIA) Supplied?

Yes No

Serial Number:

--

3 Project Manager

--

4 Requestor Details

Requestor's Name (full name and ABN)

--

Contact Name for the Requestor

--

Phone Number

--	--

Mobile Number

--	--

E-mail address

--	--

Fax Number

--	--

5 Requestor Billing Details: Name, ABN, Postal Address

Purchase Order No/ITS No:	

6 Delivery Details

Name of person to deliver Personality Package to

--

Contact Phone No. Date Required (4wks min)

--	--

Delivery address

7 Agreement to the Conditions of Traffic Signal Personality Request

The below named Authorised Representative of the Requestor:

1. warrants and represents that he/she is authorised to agree to and bind the Requestor to the Conditions of Traffic Signal Personality Request; and
2. has read, understood and, on behalf of the Requestor, agrees to and will comply with the Conditions of Traffic Signal Personality Request.

Signature of Authorised Representative of the Requestor:

--

Name of Authorised Representative of the Requestor:

--

Position of Authorised Representative of the Requestor:

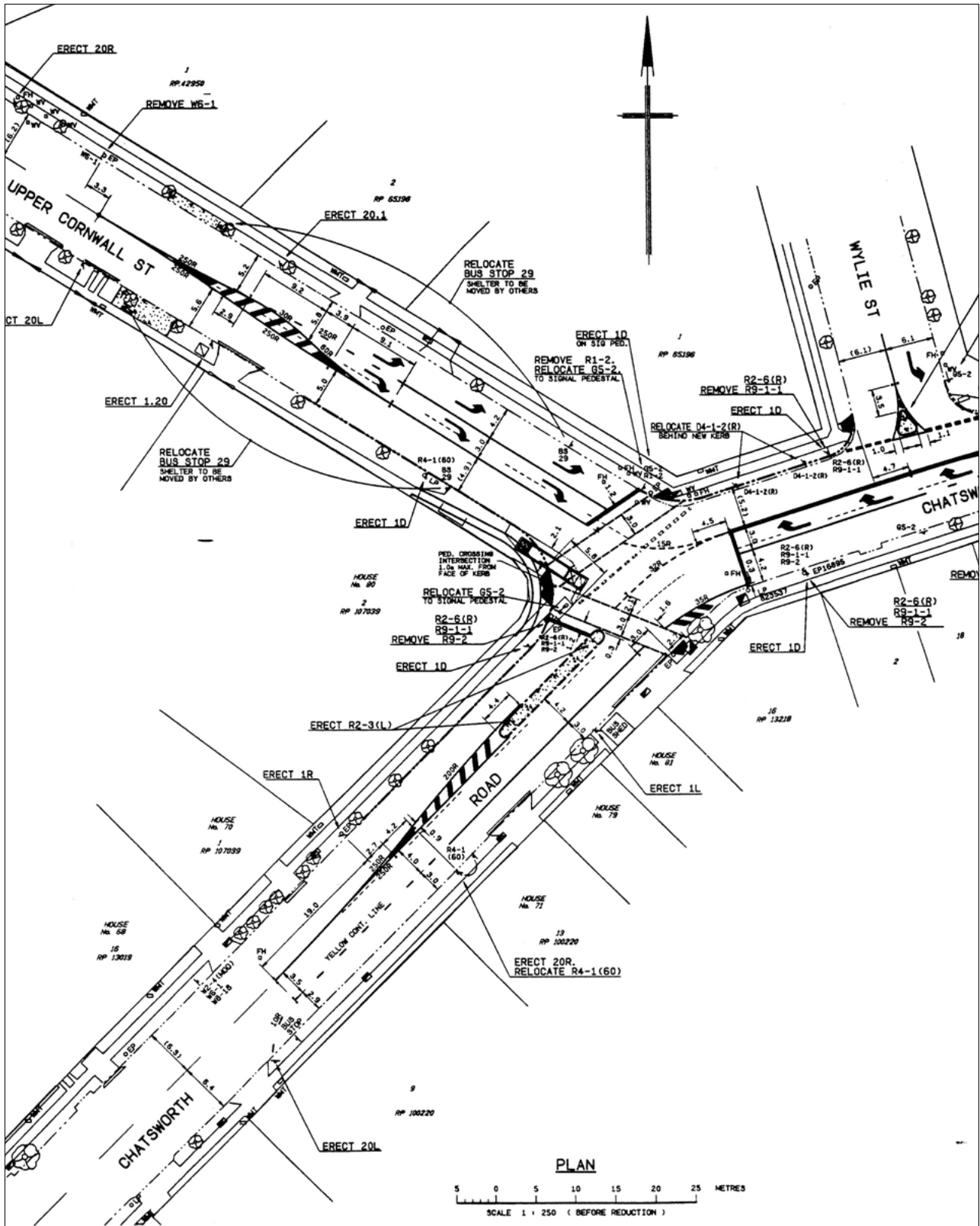
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8 Office Use:

Plan Correct	Yes	No
Date Received		
Date Accepted and Assigned		
Officer Name (Programmer)		
Date Complete		
Officer Name (Tested)		
Date Personality Issued		

**APPENDIX F TYPICAL EXAMPLE OF A SIGNS AND PAVEMENT
MARKING DRAWING**

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APPENDIX I TRAFFIC SIGNALS FAULT REPORTING

Fault Response Times

Re-Active Maintenance provides for a one hour fault attendance service for all traffic signals equipment site failures arising from any cause and shall include all hardware and controller malfunctions, accident damage and vandalism, storm and tempest damage, electrical safety incident and urgent over painting of graffiti when deemed offensive.

The Proponent will be in attendance of all advised documented faults within the specified response times contained in the tables below, noting that there are periods of system aberration, third party effect & storm episodes that may inhibited these response periodically.

Upon initial attendance, the Proponent shall notify BMTMC on arrival on site (Faults reported by BMTMC) identify the fault, ascertain the cause and rectify or make safe as soon as practical. The Proponent shall advise the BMTMC on completion and or immediately of critical operational or abnormal site safety issues, and notify of ongoing actions where rectification works will require:

- additional equipment / personnel;
- a second visit to the site;
- major works extending to greater than one (1) hour during normal hour periods or greater than three (3) hours during after-hours periods; and
- a site being left in an operational mode other than normal for a period greater than two (2) hours;

Upon satisfactory completion of repair works and returning the signals to normal operation the Proponent shall advise the BMTMC of the site status and action taken prior to departing the site.

Where follow-up action is required, temporary repairs should be initiated immediately and the site left in a safe operating state. The Proponent shall notify stakeholders and initiate appropriate works and where possible ensure completion within the following times:

- Involving replacement of electrical components within one (1) working day;
- Involving replacement of hardware components within two (2) working days;
- Involving replacement of pedestal or posts (no civil) ten (10) working days;
- Involving replacement and / or repair of mast arm outreach lantern within ten (10) working days (except where specialist sizes may require a longer lead time for the infrastructure);
- Involving base, pedestal conduit or other civil works within twenty (20) working days;
- Involving cable and / or feeder (loop) replacement within ten (10) working days; and
- Involving in ground loop recutting and termination within ten (10) working days; and

The Proponent shall advise CRU of any items not satisfactory repaired within the prescribed times and an estimate of the time required to complete the works.

All signal lantern lamp failures detected by SCATS at any time between program routine maintenance activities shall be replaced within five (5) working days unless otherwise requested by CRU. In cases where nominated lamp failures are on mast arm outreaches, the Proponent shall replace same within ten (10) working days of the report unless requested by CRU. The Proponent shall keep a log of all such lamp failures detailing the date of notification, location and date of rectification.

Response Times

Reported Fault	Max. Delay for Initial Attendance (Hours)
Intersection	
All Out – Offline	1
On Flash	1
Multiple Displays (Conflict)	1
No Displays	1
Stuck in Phase	1

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Infrastructure Installation and Construction Requirements Manual**

Reported Fault	Max. Delay for Initial Attendance (Hours)
Personality Fault – CRU to rectify	1 working day
Posts	
Damages	1
Controller	
Knock Down	1
Door Open	1
Cables & Conduits	
Exposed/hanging	1
Damaged	1
Detectors	
Detector Faults	1
Permanent Call	1
Not Operating Correctly	1
Intermittent detector locking	1
Audio Tactile	1
Push Button (new)	1
Signal Lanterns	
Spun Lantern	1
Damaged Lantern	1
Globe Faults	
Reported Globes Out (non-critical)	1
Reported Globes Out (critical <50%)	1
Reported Overhead Mast Arm Lantern	1
Fire Station/Ambulance Sites	
Fire Station/Ambulance Sites	1
Lamp Failure Rate	

The Proponent should be advised to attend ALL reported faults within one (1) hour where the electrical safety of the Signalisation or Traffic Management System is in doubt. The Proponent staff, upon receiving a call, shall attend the site within one (1) hour as agreed in this document, elapse between receiving the call and the initial attendance to the site.

**APPENDIX J CONTRACTOR TRAFFIC SIGNAL CABLE/CONDUIT
CERTIFICATION**

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CONTRACTOR TRAFFIC SIGNAL CABLE/CONDUIT CERTIFICATION

Council Project Number:

Site Location:

Transport Planning and Operations on behalf of Brisbane City Council request certification from the civil contractor that the electrical conduits installed in the public space were installed by an electrical worker or were installed under the supervision of an electrical worker.

This certification shall also include the electrical installation compliance that works performed meet the requirements of the Electrical Safety Act/Regulation, Council/DTMR Drawings and specifications, Standards and other Entity legislative requirements.

This document shall be used where there's no changes to the finished surface level and/or the conduits/cables are installed or have been installed by others.

* strike out which is applicable

I,

have witnessed the installation of all *conduits/cables for this project and confirm that these are installed as per the construction drawings and are on the correct alignment and depth (after the establishment of final surface levels)

Conduits installed as per Construction Drawings:

Date(s) Conduits Inspected: / /

Cables installed as per Construction Drawings:

Date(s) Cables Inspected: / /

Signed:

Name (Please Print):

Organisation/Company:

**APPENDIX K TEMPLATES REMOVED FROM DOCUMENT –
TEMPLATES NO LONGER USED**

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APPENDIX L ON MAINTENANCE INSPECTION CHECKLIST

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ON MAINTENANCE INSPECTION CHECKLIST

DEVELOPMENT NAME:

STAGE:

ADDRESS:

FILE REFERENCE:

Item	Description	Work Passed			Comments
		Yes	No	NA	
A	ROOFWATER RETCULATION				
A1	Roofwater drainage system is constructed to plan.				
A2	Outlets to kerb and channel are satisfactory, installed with full height kerb adaptor.				
A3	Outlets other than to kerb satisfactory.				
A4	Each lot falling to the street has a full height kerb adaptor.				
A5	Roofwater system has been flow tested and is operating as designed.				
A6	Prefabricated lids are used on inspection pits.				
B	ENCLOSED STORMWATER DRAINS				
B1	Pipe layout is as per the plan or approved amendments with respect to pipe size, levels and location.				
B2	All pipeline joints and lifting plug holes are mortared, except for externally banded pipes (invert only) and rubber ringed joints.				
B3	All pipework is free of debris, siltation, etc.				
B4	Outlet/inlet structures are satisfactorily constructed and are protected from scour or siltation.				
B5	Safety Grates in accordance with the requirements of QUDM have been installed and certified to all pipe inlets				
B6	Trenches: No visual subsidence has occurred All density tests are available and satisfactory				
B7	Closed circuit television camera (CCTV) inspection in accordance with the Council's inspections protocols has been completed and submitted together with a WinCan report to demonstrate that the pipes do not have any premature cracking or displaced joints.				
B8	Pipe connections to gully pits are not constructed to the corner of two walls such that the pipe capacity is reduced.				
B9	All gully pits are constructed to the correct standards (including grate types, slots, backstones, etc).				
B10	Grates are seated in frames without movement.				
B11	All manhole roofs (aspros) are mortared to the manhole walls.				
B12	Manhole lids are seated in frames without movement.				

ON MAINTENANCE INSPECTION CHECKLIST

DEVELOPMENT NAME:

STAGE:

ADDRESS:

FILE REFERENCE:

Item	Description	Work Passed			Comments
		Yes	No	NA	
B13	All manhole and gully pit pipe connections are mortared flush with the walls and that no pipe reinforcement is exposed.				
B14	Manholes are constructed to standards and are satisfactory eg absence of any foreign materials or voids.				
B15	Manholes are appropriately benched.				
B16	Step irons have been installed in gullies and manholes > 1.35 m deep and have been securely installed to provide easy access.				
B17	Ladders have been installed in manholes greater than 3m deep				
B18	Any approved trench grates are clean and to class D (AS 3996)				
C	OPEN CHANNELS				
C1	Open channels are constructed to design profiles.				
C2	Lining of channel is to the required thickness and reinforcement, with appropriate weepholes.				
C3	Low flow channel or pipe has been constructed satisfactorily.				
C4	Unlined sections are stable and/or grass/turf has been established.				
C5	Smooth transitions have been provided between new work and natural channels.				
C6	Cut-off walls have been constructed to all concrete channel edges and outlet or inlet structures.				
C7	Barriers/grates to open drains have been correctly installed including in park				
C8	Maintenance access to the open channel is appropriate and trafficable by maintenance vehicles.				
D	MISCELLANEOUS DRAINAGE				
D1	Appropriate overland flow paths are provided and clear of obstruction.				
D2	Survey of overland flow paths (longitudinal and cross sections) has been provided.				
D3	Outlets and outfalls have been constructed to control discharge flow in accordance with the plans.				
D4	Subsoil drainage discharges to gullies or other approved point of discharge.				
D5	Side drains have been checked hydraulically and found to operate satisfactorily.				
E	ROAD PAVEMENTS				
E1	Plan layout and geometry of road system is accordance with the drawings.				

ON MAINTENANCE INSPECTION CHECKLIST

DEVELOPMENT NAME:

STAGE:

ADDRESS:

FILE REFERENCE:

Item	Description	Work Passed			Comments
		Yes	No	NA	
E2	Finished levels at crown and channel are at design levels.				
E3	Crossfalls are to the approved plan.				
E4	AC surfacing is satisfactory in respect of finish and thickness.				
E5	Joints in the seal (especially where various development stages apply) are flush.				
E6	The sealed surface is free of blemishes, including those caused by the base of backhoe legs. When caused by utility service providers, the damage should be repaired during the maintenance period.				
E7	No areas of ponding around islands or adjacent manholes or channel.				
F	SEGMENTAL PAVERS				
F1	All pavers are laid to the correct pattern to within allowable tolerance, compacted, and the joints filled.				
F2	Bedding sand for pavers drain to subsoil drainage.				
F3	Pavers adjacent to CKC, edge restraints etc are cut and laid as per the specified standards.				
F4	Weedicide has been placed on the bedding sand.				
G	STENCIL PATTERN CONCRETE				
G1	Level of concrete pavement joins neatly onto the AC surface and the CKC.				
G2	Colour stability has been confirmed				
G3	Good coverage of colour hardener has been applied as per the specification.				
G4	Two coat protective sealer have been applied.				
H	CONCRETE KERB & CHANNEL (CKC) AND MEDIANS				
H1	The correct type are used at all locations (including medians) in accordance with the specified standards.				
H2	Ponding of stormwater does not occur.				
H3	Transitions and connections to existing construction are smooth and to a satisfactory standard of workmanship.				
H4	Service markers are placed in kerb face. Conduits should be exposed for inspection purposes.				
H5	Lip and back of kerb are flush with the roadway and footpath respectively.				
H6	All channelisation works and medians have been satisfactorily completed.				

ON MAINTENANCE INSPECTION CHECKLIST					
DEVELOPMENT NAME:			STAGE:		
ADDRESS:			FILE REFERENCE:		
Item	Description	Work Passed			Comments
		Yes	No	NA	
H7	Infill treatment of medians has been inspected and found satisfactory. Any landscaping has been completed as per approved drawings.				
H8	Backing Strips are provided to median kerbs where required.				
H9	Side drains are provided under medians.				
I	VERGES				
I1	Profiles are as per plan.				
I2	Verges are topsoiled in accordance with the specified standards.				
I3	Verges are grass seeded and fertilised or turfed to the specified standards.				
I4	All service fixtures (such as valves) are flush with the surrounding verge.				
I5	Concrete footpaths are constructed to the specified standards. Note: Concrete footpaths can be bonded for the construction at a later date.				
I6	Pram ramps are constructed as required.				
J	BIKEWAYS				
J1	Location and width are as per the plan. Note: Bikeways can be bonded for the construction at a later date.				
J2	Kerb ramps and crossings are constructed.				
J3	Safety rails and signs are installed.				
K	FENCING AND FEATURES				
K1	All fences other than approved entrances features are constructed within allotments. Survey pegs are visible.				
K2	Specifically approved entrance features are constructed in accordance with the drawings.				
K3	Entrance features and fences have satisfied Building Approvals (if required).				
K4	Sound attenuation fences are contained wholly within the allotments and constructed in accordance with the drawings.				
K5	Natural area/vehicle exclusion fencing/natural area gates have been installed in accordance with the drawings				
L	EARTHWORKS				
L1	Toe of fill batters and top of cut batters are setback a minimum of 0.3 m from boundary of the public space.				

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ON MAINTENANCE INSPECTION CHECKLIST					
DEVELOPMENT NAME:			STAGE:		
ADDRESS:			FILE REFERENCE:		
Item	Description	Work Passed			Comments
		Yes	No	NA	
L2	Retaining walls are contained wholly within the allotments.				
L3	Retaining walls constructed in accordance with the approved drawings.				
L4	Batter slopes are constructed in accordance with the approved drawings.				
L5	Batter slopes stabilised against erosion.				
L6	Interim drainage is constructed in accordance with approved drawings.				
M	LANDSCAPING				
M1	Landscaping is placed as per the approved landscaping plan.				
M2	Irrigation system has been removed, or will be removed by (insert date)				
M3	Establishment program is implemented.				
	LIGHTING				
Rate 2	Consultant to be Energex Accredited SWP 47.3				
	Consultant to submit Rate 2 design to Council for Pre-approval				
	Consultant to submit signed copy of the Energex Public Lighting Supply Agreement of Council (City Lighting)				
	Consultant to submit signed copy of the Energex Certificate for Electricity Supply Agreement to Council (City Lighting)				
	Consultants to submit signed copy of "as construction" drawings to Council (City Lighting) & Energex				
	As-Constructed drawings to comply with Energex's drawing standard (Library Ref No 6682 – A4)				
	Electrical Contractor to be Energex Accredited - WCS 37				
Rate 3	Consultant to submit Rate 3 design to Council for Pre-approval				
	Consultant to submit signed copy of the Energex Installation of Rate 3 Public Lighting Agreement to Council(relevant section with Council)				
	to nominate energy retailer				
	Consultant to complete nominated Energy retailers application form and submit to Council(relevant section with Council)				
	Council(relevant section with Council) to sign nominated Energy retailers application and with electrical/lighting drawing email complete application to nominated Energy retailer				

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ON MAINTENANCE INSPECTION CHECKLIST					
DEVELOPMENT NAME:			STAGE:		
ADDRESS:			FILE REFERENCE:		
Item	Description	Work Passed			Comments
		Yes	No	NA	
	Electrical contractor to complete and submit Electrical Work Request(Form 2) to Energex for connection of supply				
	Electrical Contractor to submit– Certificate of Test(Low Voltage Continuity, Insulation Resistances, Phasing and Earthing) to Council				
	Electrical Contractor to submit signed original “as construction” drawings to Energex, copy to Council and leave one set at the main electrical switchboard.				
N	WATER QUALITY				
N1	Implement the approved erosion and sediment control plan during construction phase.				
N2	If required, implement water quality sampling and analysis.				
N3	Other items.				
N4	WSUD devices have appropriate maintenance access available				
N5	WSUD device is clean and free of litter, debris, sediment and silt				
N6	Surface levels of the WSUD device are in accordance with the design.				
N7	WSUD vegetation is certified by a horticulturalist as established, healthy and weed free				
N8	WSUD hydraulic inlet and outlet structures are as per design				
N9	WSUD landscaping and fencing appropriately manage WPH&S issues and public safety requirements.				
O	OTHER MISCELLANEOUS				
O1	Signs and Pavement Marking for roads and bikeways are installed as per the approved drawings with reference to dependencies with the Traffic Signals design/installation.				
O2	Bus stop components are installed as per approved drawing				
O3	Street furniture is installed as per approved type and location				
O4	Works have not resulted in problems on neighbouring properties.				
O5	All new lots have been surveyed and found to be correct as per approved layout plan and engineering drawings.				
O6	The quality control testing program has been implemented.				
O7	Works are constructed to within the specified tolerances.				

ON MAINTENANCE INSPECTION CHECKLIST					
DEVELOPMENT NAME:			STAGE:		
ADDRESS:			FILE REFERENCE:		
Item	Description	Work Passed			Comments
		Yes	No	NA	
O8	Other items.				
P	PARKS				
P1	The park layout is in accordance with the approved Landscape Management & Siteworks Plan.				
P2	The park has been cleared of debris, old fences, disused structures.				
P3	Contaminated land (if present) has been remediated and completed site investigations or evidence of removal from the Contaminated Land Register of the EPA has been provided.				
P4	Earthworks profile has achieved: Grassed open activity areas with a slope of less than 1V:20H and greater than 1V:150H. Sportsfields draining to the perimeter at a grade of 1V:100H. Maintained parkland with gradients no steeper than 1V:4V if grassed and 1V:3H where planted with vegetation (1V:6H preferred).				
P5	Retaining earth structures (boulder walls, masonry and stone walls, timber sleeper walls) are constructed in accordance with the approved plans including: Subsoil drainage to back of walls connected to soakage trenches or stormwater. Geotextile fabric behind boulder walls. Edging and landscape strips. Barrier/balustrade at top of structure adjacent to park activity areas.				
P6	Batters, mounds, embankments and retaining structures do not encroach onto park activity spaces.				
P7	Existing vegetation designated for retention has been protected, dead-wooding and pruning of hazardous trees has been completed to required standard.				
P8	Proclaimed, noxious and environmental weeds are being removed especially class 1.				
P9	Rehabilitated surfaces of erosion prone and degraded areas including adjacent roadsides are stable and plants are well established at the required density and conditioned to survive dry periods.				
P10	Grassed areas have been trimmed to direct site drainage evenly and efficiently to the landscape, stormwater inlets or infiltration areas, drainage is not directed towards visitor and recreation facilities or neighbouring residences.				

ON MAINTENANCE INSPECTION CHECKLIST

DEVELOPMENT NAME:

STAGE:

ADDRESS:

FILE REFERENCE:

Item	Description	Work Passed			Comments
		Yes	No	NA	
P11	At least 80% grass cover is achieved on mown areas; potential hazards such as stones >30mm and boulders have been removed or covered with 100 mm of topsoil; new grassed areas are married into existing levels and to hard surfaces to avoid trip hazards; stabilising strips of turf are laid within overland flow paths, areas subject to regular inundation, alongside pathways and around visitor and recreation facilities.				
P12	Mulched areas have a nominal thickness of 100 mm and edge of the mulch is shaped to allow easy mowing, erosion control matting is used within overland flow paths and areas subject to regular inundation. Mulch complies with standards.				
P13	Concrete edging is provided around gardens and landscape beds (timber edging is only used where the tree and shrub canopy will extend beyond the edge of the beds), edging is straight or with long sweeping curves for ease of mowing, corners are between 45° and 90°.				
P14	Hollows have been eliminated in mown areas or field gullies provided in accordance with standard drawings.				
P15	Drainage from roads and car parks is dispersed into bio-retention swales the landscape, or to the stormwater network to approved plans.				
P16	Drains do not unduly impede maintenance operations and interfere with visitor use and safety.				
P17	Stormwater discharge into the park (network stormwater pipes and open drains) is constructed to approved plans.				
P18	Tree planting and landscaping has been completed in accordance with approved drawings, individual trees in grassed areas have mulched zone of at least 0.3 m radius, trees and plants are well established and conditioned to survive dry periods.				
P19	Imported soils used in landscaping comply with required standards.				
P20	Temporary irrigation systems have been removed, or will be removed by (insert date)				
P21	Permanent irrigation systems (where provided) are installed in accordance with approved plans and to required standards.				
P22	At least one tap is provided adjacent to or within landscaped and garden beds requiring ongoing maintenance.				
P23	Infrastructure colours match Council approved landscape plan, based on standard colours.				

ON MAINTENANCE INSPECTION CHECKLIST

DEVELOPMENT NAME:

STAGE:

ADDRESS:

FILE REFERENCE:

Item	Description	Work Passed			Comments
		Yes	No	NA	
P24	Vandalism and graffiti resistant materials are used for park infrastructure, vandalism and graffiti is being rectified during the construction and maintenance period.				
P25	Park facilities and access infrastructure complies with <i>AS 1428 Design for Access and Mobility</i> (e.g. continuous accessible path of travel).				
P26	Maintenance and emergency vehicle access points extends from road frontage into the park, and each access point provided with: A formed or constructed driveway. Appropriate queuing area. A removable bollard or lockrail.				
P27	Access is available to all maintained sections of the park for maintenance and emergency vehicles.				
P28	Fencing is installed along road frontages and around potential hazards in accordance with approved plans.				
P29	Park entrances, pathways, bridges and boardwalks, roads and car parks and pavement areas (where provided) are constructed in accordance with approved drawings and to required standards (refer also to items E, F & H above).				
P30	Signage is installed to promote safe and appropriate use of the park.				
P31	A 25 mm water connection is installed at the park boundary with a water meter and vandal proof tap.				
P32	An electricity supply pillar is installed at the park boundary within 25 m of a maintenance vehicle access point.				
P33	Lighting (where provided) is installed in accordance with approved plans and to required standards.				
P34	Playground (where provided) is designed and manufactured, installed and certified in accordance with approved drawings.				
P35	Visitor facilities, park furniture, sport and recreation facilities, and other park infrastructure (where provided) are designed, manufactured and installed in accordance with approved plans and to required standards.				
P36	Detention basins intended for recreation use in parks are constructed to approved plans and required standards including surface drainage after rain.				
P37	Power, gas, oil, telecommunication and landfill extraction easements over the park include safety measures such as fencing				

ON MAINTENANCE INSPECTION CHECKLIST					
DEVELOPMENT NAME:			STAGE:		
ADDRESS:			FILE REFERENCE:		
Item	Description	Work Passed			Comments
		Yes	No	NA	
	and signage and underground infrastructure is clearly marked.				
P38	Cultural heritage items have been protected during construction and required heritage conservation measures are implemented. Conservation management plan approved by Council.				
P39	Temporary fences have been removed, or will be removed by (insert date)				
P40	Other items.				
Q	Rehabilitation/Offset Planting Areas				
Q1	Plant densities are in accordance with approved drawings				
Q2	Mulch and erosion control measures (eg: jute matting) are completed in accordance with approved drawings.				
Q3	Plants are well established and conditioned to survive dry periods.				
Q4	Rehabilitation Areas have been cleared of debris, old fences, pest plants, disused structures.				
Q5	Habitat features (eg: nest boxes, poles, woody debris) are installed in accordance with approved drawings.				
Q6	Maintenance tracks are installed in accordance with approved drawings.				
Q7	Wildlife Movement Solutions are installed in accordance with approved drawings.				
Q8	Bushfire mitigation measures (eg: fire trails, asset protection zones, etc) are implemented in accordance with approved drawings				
Q9	Fauna friendly fences / exclusion fences are installed in accordance with approved drawings.				
R	TRAFFIC SIGNALS AND ITS				

PRINCIPAL CONSULTANT

Company Name

Contact Name

RPEQ No.

Signature

ON MAINTENANCE INSPECTION CHECKLIST					
DEVELOPMENT NAME:			STAGE:		
ADDRESS:			FILE REFERENCE:		
Item	Description	Work Passed			Comments
		Yes	No	NA	

Certification Date

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APPENDIX M CERTIFICATES OF COMPLETION (TEMPLATE)

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CERTIFICATE OF COMPLETION (TEMPLATE ONLY)
A separate certificate for each asset class shall be signed by the appropriate RPEQ

DEVELOPMENT DETAILS

Development Name
Stage (if applicable)
Development Approval Reference
Address
UBD Reference (e.g. 161 H16)
Real Property Description

PRINCIPAL CONSULTANT

Company Name
Contact Name
RPEQ No.
Address for Correspondence
Telephone/Facsimile/Email

CERTIFICATION

I certify that the works for the above development:

- Have been constructed to the specified tolerances,
- Have complied with the quality control testing standards, and
- Have been completed in accordance with the approved engineering drawings, specifications and the relevant documents.

Further I (or a nominated representative) have diligently undertaken all the necessary supervision and inspection of works to ensure that the design intent has been achieved.

Signature
Duly Authorised On Behalf of
(insert name of Consultant)
RPEQ No.
Date

List reference details of the relevant drawings and any other relevant documents, including title, revision, date, etc.
.....
.....
.....
.....
.....
.....
.....
.....
.....

I hereby certify that the As-Constructed drawings and asset register submitted herewith are accurate and have been prepared, checked and amended in accordance with the requirements of the *Subdivision and Development Guidelines*.

Signature

CERTIFICATE OF COMPLETION (TEMPLATE ONLY)
A separate certificate for each asset class shall be signed by the appropriate RPEQ

Duly Authorised On Behalf of
(insert name of
Consultant/Licensed Surveyor)
Professional Registration No.
Date

NON-CONFORMANCE AND CORRECTIVE ACTIONS

I hereby advise Council of the following outstanding non-conforming works and the corresponding proposed corrective actions, which will be implemented during the maintenance period.

Description of Defects	Proposed Corrective Actions
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Signature
Duly Authorised On Behalf of
(insert name of Consultant)
RPEQ No.
Date

APPENDIX N ASSET REGISTERS PROFORMAS

Available at the [Infrastructure Installation and Construction Requirements Manual](#) page on the Brisbane City Council [website](#).

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**APPENDIX P STRUCTURES ON-MAINTENANCE INSPECTION
FORM**

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Structures On-Maintenance Inspection Form

On-Maintenance Inspection		Lot Number	
Project Name		Snag List Number	
Asset Name		Handover Number	
Date of inspection		Time	

Present		
Name	Organisation	Title

No.	Detailed Location	Details of Snag	Agreed Resolution	Re-inspected/closed	
				Date	Signature
1					
2					
3					
4					

Inspected by	Name	Signature	Organisation

**APPENDIX Q STRUCTURES OFF-MAINTENANCE INSPECTION
FORM**

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Structures Off-Maintenance Inspection Form

Off-Maintenance Inspection		Lot Number	
Project Name		Snag List Number	
Asset Name		Handover Number	
Date of inspection		Time	

Present		
Name	Organisation	Title

No.	Detailed Location	Details of Snag	Agreed Resolution	Re-inspected/closed	
				Date	Signature
1					
2					
3					
4					

Inspected by	Name	Signature	Organisation

**APPENDIX R AS-CONSTRUCTED DRAWINGS TOLERANCES AND
PRESENTATION VARIANCES**

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**Brisbane City Council
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Asset Element	Survey Accuracy		Plan (Redraw Limits)		Tabulation (Retabulate & Calculate Limits)		Comments
	Lateral (XY) (mm)	Vertical (Z) (mm)	Lateral (XY) Variance (mm)	Vertical (Z) Variance (mm)	Lateral (XY) Variance (mm)	Vertical (Z) Variance (mm)	
Road Infrastructure							
Road Pavement – Rigid (Extent and Thickness)	±100	±20	±300	±50 (Thickness)	N/A	Actual*	* Actual thickness to be recorded and shown.
Road Pavement – Flexible			±300	±25 (Thickness)	N/A	Actual*	* Actual thickness to be recorded and shown.
Kerb and Channel			±300	±75	±100	±25	
Earthworks – Surfaces <1:4			±250	±200	±25	±25	
Earthworks – Batters >1:4			±250	±200	±25	±25	
Barriers (inc. Fences)			±200	±50	N/A	Actual	
Traffic control devices			±300	N/A	N/A	N/A	
Footpaths and Bikeways			±300	N/A	N/A	N/A	
Hardscape (Retaining Walls, Ramps, Stairs)			±300	±100#	N/A	N/A	# Retaining walls
Traffic Signals – Poles			±300	N/A	N/A	N/A	
Traffic Signals – Foundations			±100	N/A	Actual	N/A	
Street Lighting			±300	N/A	N/A	N/A	
Street Lighting – Foundations			±100	N/A	Actual	N/A	
Street Lighting – Conduits			±250	±200 #	Actual@	Actual@	@ Actual location and depth of Conduit line to be provided to service providers
Traffic Signs			±500 (Longitudinal) ±300 (Transverse)	N/A #	N/A	N/A	# Must meet Australian & UMS requirements for conduit covers

Asset Element	Survey Accuracy		Plan (Redraw Limits)		Tabulation (Retabulate & Calculate Limits)		Comments
	Lateral (XY) (mm)	Vertical (Z) (mm)	Lateral (XY) Variance (mm)	Vertical (Z) Variance (mm)	Lateral (XY) Variance (mm)	Vertical (Z) Variance (mm)	
Longitudinal Road Pavement Marking							
Length of line and/or gap	±20	N/A	±300	N/A	N/A	N/A	
Lateral Placement from spotting			±20	N/A	N/A	N/A	
Lateral Placement from existing line (repaints)			±25	N/A	N/A	N/A	
Trueness of line			±15 in 10 m	N/A	N/A	N/A	
Transverse Road Pavement Marking							
Placement from spotting	±20	N/A	±20	N/A	N/A	N/A	
Placement from existing markings			±20	N/A	N/A	N/A	
Raised pavement markers							
Lateral position – Barrier and edge line	±20	N/A	+25, -50 from longitudinal line	N/A	N/A	N/A	Lateral position – Barrier and edge line
Lateral position – Broken line & Flush medians			±20	N/A	N/A	N/A	
Longitudinal position			±100	N/A	N/A	N/A	
Structures							
Piles	±100	±20	±250	±250	±100 [^]	±250 [^]	[^] Toe Level Toe levels above design must be redrawn
Retaining Walls & Abutments			±250	±50	±250	±50	

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Asset Element	Survey Accuracy		Plan (Redraw Limits)		Tabulation (Retabulate & Calculate Limits)		Comments
	Lateral (XY) (mm)	Vertical (Z) (mm)	Lateral (XY) Variance (mm)	Vertical (Z) Variance (mm)	Lateral (XY) Variance (mm)	Vertical (Z) Variance (mm)	
RSS Walls - Straps			>250 length or orientation				
Headstocks/Pile Caps			±100	N/A	±25	Actual	
Deck			±100	N/A	±25	N/A	
Bridge Barrier			±100	N/A	±50	N/A	
Reinforcement (General)			N/A	N/A	N/A	N/A	Only redraw/retabulate where significant change to structure and/or design
Reinforcement (Prestressing)			±25	N/A	N/A	N/A	
Expansion Joints			±100	N/A	±100	N/A	
Bearings			±25	N/A	±25	N/A	
Stormwater							
Surface Pits (Gullies and Field Inlets)	±100	±20	±500	±200	±200	±25	
Manholes			±500	±200	±100	±25	
Stormwater Lines			±500	±200	±100	Actual ^a	^a Actual depth to invert and obvert to be recorded and shown.
Proprietary WSUD devices	100	20	500	200	200	Actual	Actual depth to invert and obvert of both inlet and outlet to be recorded and shown.
Constructed WSUD devices	100	20	500	200	100	Actual	Actual depth to invert and obvert of both inlet and outlet to be recorded and shown.
Bio Retention system under drains	100	20	200	20	200	20	
Other Infrastructure							

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Asset Element	Survey Accuracy		Plan (Redraw Limits)		Tabulation (Retabulate & Calculate Limits)		Comments
	Lateral (XY) (mm)	Vertical (Z) (mm)	Lateral (XY) Variance (mm)	Vertical (Z) Variance (mm)	Lateral (XY) Variance (mm)	Vertical (Z) Variance (mm)	
Conduits – Pits	±100	±20	±500	±200	±100	N/A	
Conduits – Lines			±250	±200	Actual@	Actual@	@ Actual location and depth of Conduit line to be provided to service providers
Furniture (Bins, Seats etc.)			±300	±75	±100	±25	
Architectural Lighting			±250	±200	±25	±25	
Parks infrastructure			±250	±200	±25	±25	

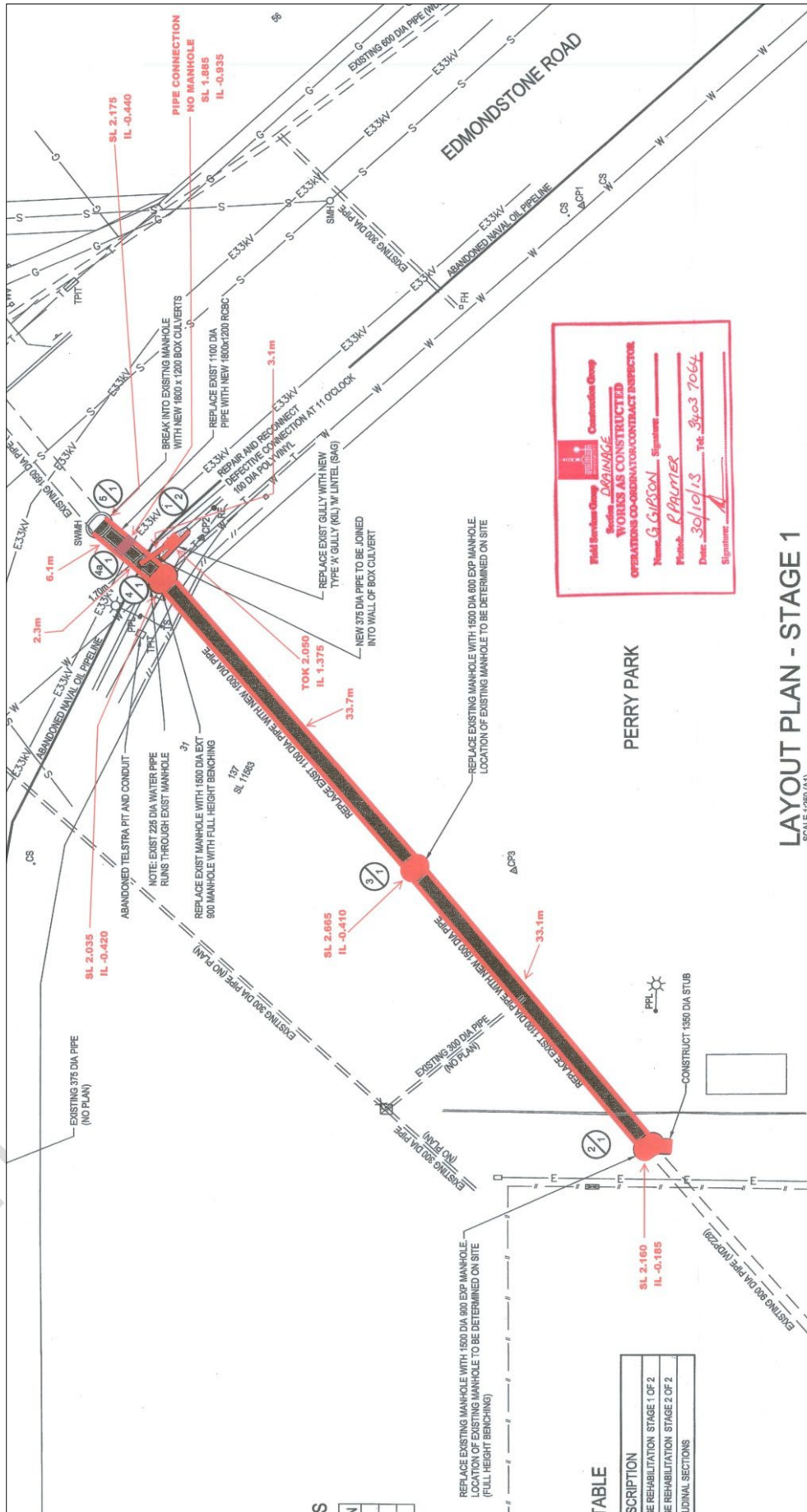
Survey: As-Constructed survey accuracy

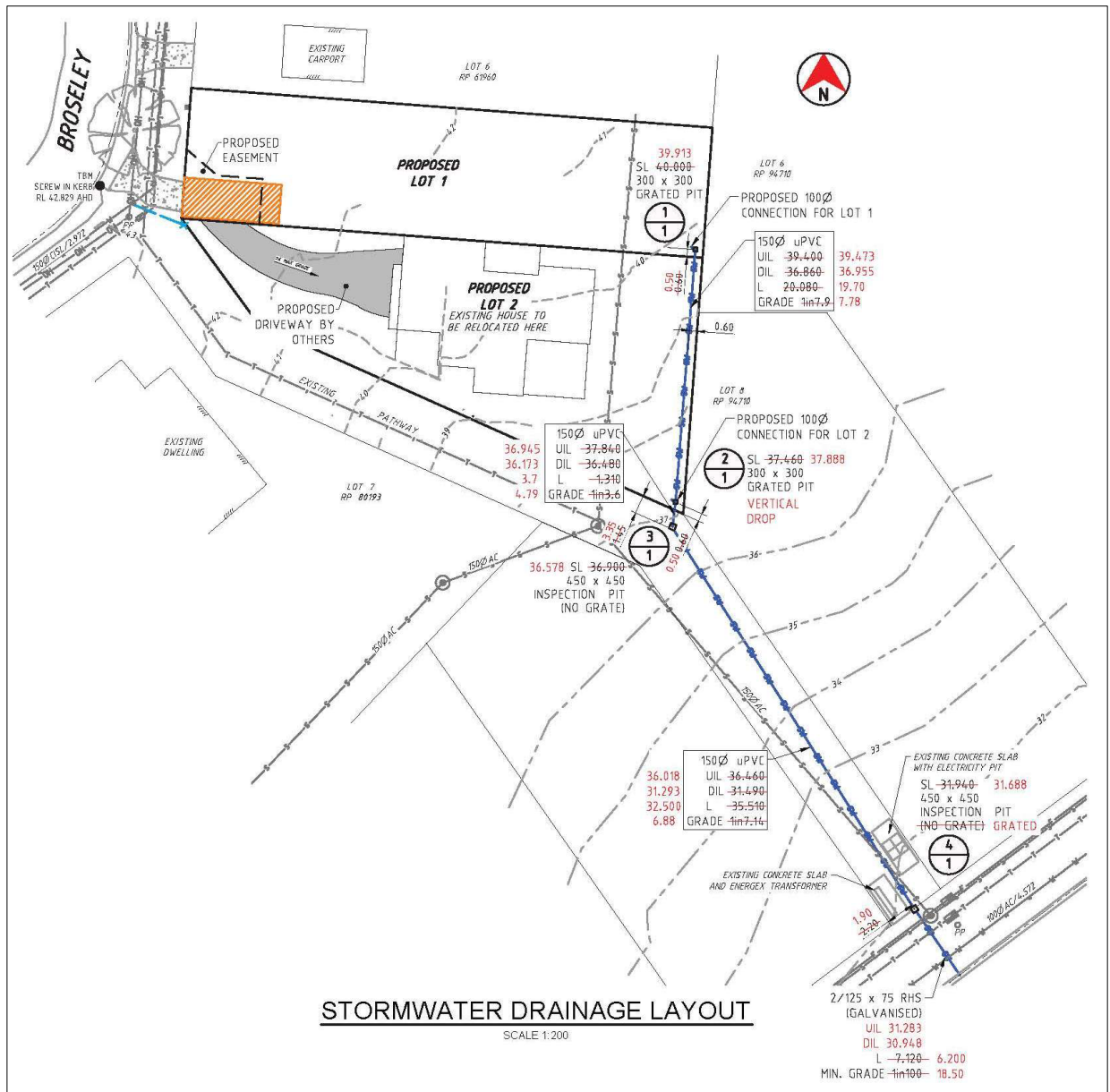
Plan: Plan alteration required to reflect actual constructed position of asset.

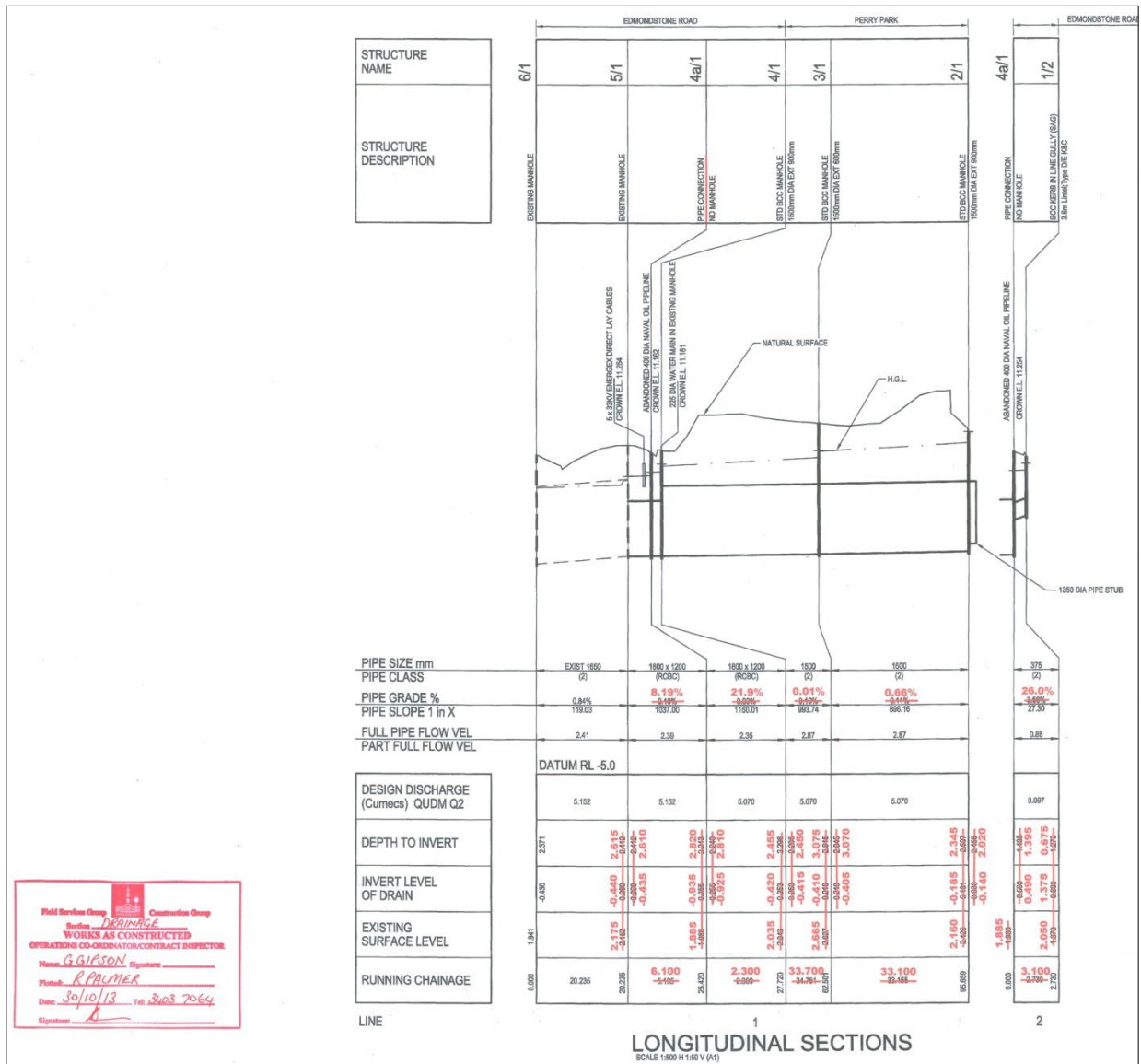
Tabulation: Tabulated data and reports modification required to reflect actual constructed infrastructure characteristics.

APPENDIX S AS-CONSTRUCTED DRAWINGS EXAMPLES

Uncontrolled when printed







Field Services Group Construction Group
 Works as Constructed
 OPERATIONS CO-ORDINATOR/CONTRACT INSPECTOR
 Name: G. GIBSON
 Phone: R. PALMER
 Date: 30/10/13 Tel: 3403 7064
 Signature: [Signature]