

Engineering Services Report

Gansons Pty Ltd, Ganboys Pty Ltd, Ganbros Pty Ltd

12-18 Thompson Street Bowen Hills Job Reference Number – 8858

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1 Introduction

1.1. Purpose and Scope

Inertia Engineering has been commissioned by Gansons Pty Ltd, Ganboys Pty Ltd, Ganbros Pty Ltd to prepare an Engineering Services Report for the proposed development at 12-18 Thompson Street, Bowen Hills (the subject site) to accompany a development application to be submitted to Economic Development Queensland (EDQ) for approval.

The proposed development will create a commercial precinct consisting of 4 tower building and will be completed over four stages. Details of the four stages including a master plan can be found in the Architectural and Civil plans in *Appendix A* and *C* respectively and is referred to as the 'site' which is lot 1 on RP121293 and Lot 4 on SP312302.

This report has been prepared to address the civil engineering aspects associated with stormwater management (quality and quantity), earthworks and erosion and sediment control during the construction and operational phases of Stage 1 whilst considering the future stages of the development as a whole.

The report will also demonstrate conceptually how the four staged development can be serviced by water, sewer and other infrastructure such as gas, electricity and telecommunications progressively throughout its stages.

The required detailed design for the service infrastructure will be subject to the conditions (if any) attached to the Development Approval to be provided by Council and any nominated referral agencies.

This report has been prepared in accordance with the *State Planning Policy* (SPP, 2017), *Queensland Urban Drainage Manual Fourth Edition 2016 - Provisional* (QUDM, 2016) and Brisbane City Council's City Plan (2014) and include relevant Brisbane City Council (BCC) codes responses.



1.2. Report Limitations

This report has been prepared by Inertia Engineering Pty Ltd for Gansons Pty Ltd, Ganboys Pty Ltd, Ganbros Pty Ltd and may only be used and relied on by Gansons Pty Ltd, Ganboys Pty Ltd, Ganbros Pty Ltd for the purpose agreed between Inertia Engineering and Gansons Pty Ltd, Ganboys Pty Ltd, Ganboys Pty Ltd, Ganbros Pty Ltd as detailed within this report.

Inertia Engineering otherwise disclaims responsibility to any person other than Gansons Pty Ltd, Ganboys Pty Ltd, Ganbros Pty Ltd arising in connection with this report. Inertia Engineering also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by Inertia Engineering in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. Inertia Engineering has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by Inertia Engineering described in this report. Inertia Engineering disclaims liability arising from any of the assumptions being incorrect.

Inertia Engineering has prepared this report on the basis of information provided by Gansons Pty Ltd, Ganboys Pty Ltd, Ganbros Pty Ltd and others who provided information to Inertia Engineering (including Government authorities), which Inertia Engineering has not independently verified or checked beyond the agreed scope of work. Inertia Engineering does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2 Site Characteristics

The land contained within the site is described as follows:

Title Details:	Lot 1 on RP121293 and Lot 4 on SP312302
Street Address:	12-18 Thompson Street, Bowen Hills
Area:	Total: 1.2611 ha

2.1. Location

The subject site is located in Bowen Hills, approximately 8 km north-east of Brisbane CBD. It is bounded by Thompson St to the east, Inner city by pass to the west and commercial buildings to all the other directions.



Figure 2-1 – Location Plan

2.2. Topography

The site grades from 8.5 AHD in the south-west corner to 6.5m AHD in the south east corner, resulting in an average grade of 2%.

2.3. Existing Services

Electronic records from 'Dial Before You Dig' (DBYD), Queensland Urban Utilities GIS service, Brisbane City Council eBimap have been accessed to obtain details of existing infrastructure services and utilities for the site and surrounding area. This existing infrastructure is outlined in the following sections.

2.3.1. Stormwater

There are multiple stormwater assets in the proximate vicinity of the site. There is stormwater infrastructure located within Murray Street which stormwater conveys runoff collected from an internal stormwater drainage system consisting of inlets and pipe drainage within the site and discharge to the Council network.

There is also stormwater infrastructure to the northwest of the carpark which collects stormwater runoff from the western carpark catchment and discharges into the pipe drainage system located in Abbotsford Road adjacent to the Inner City By Pass.

Note that the location of the stormwater network external to the site has been determined from the BCC eBimap mapping service and a limited site investigation with limited access to structures.

2.3.2. Sewer

There is an existing 150mm dia sewer reticulation main runs along Murray Street. The subject site is currently serviced through multiple property connections via this reticulation main.

Note that the location of the sewer network external to the site has been determined from the QUU GIS mapping service.

2.3.3. Water

There is an existing 180mm Polyethylene water reticulation main runs within the western verge of Thompson Street. The subject site is currently serviced by multiple 20mm property connections via this reticulation main.

Note that the location of the water network external to the site has been determined from the QUU GIS mapping service.

2.3.4. Electrical/Gas/Telecommunications

- Telstra provides telecommunication infrastructure within the eastern verge of Thompson Street and services the subject site through this;
- Energex infrastructure is located along the eastern verge of Thompson Street and services the subject site through this; and
- 40mm gas main is located along the eastern verge of Thompson Street.

Note that the location of infrastructure external to the site has been determined from DBYD data.

3 Development Layout

The development consists of a 13 storey tower with three levels of podium car parking, commercial office space within the tower.

Refer to Appendix A for the proposed Architectural plans.



Figure 3-1 – Development Layout

4 Filling and Excavation

4.1. Earthworks

Very minimal earthworks are proposed for Stage 1. The finished ground floor levels of Tower 1 as documented on the Architectural plans is estimated to be within 200mm – 500mm of the existing carpark level.

Earthworks cutting and filling will be performed to ensure the proposed ground floor levels, open space, landscaping and pavement areas will be shaped to achieve necessary levels whilst achieving compliant disable access and driveway access in accordance with the following standards:

- AS 1428: Design for Access and mobility;
- As 2890: Parking Facilities: Off-street car parking.

Where earthworks are proposed and any ground is disturbed by construction works, sediment and erosion control measures will be implemented in accordance with the following documents:

- Relevant BCC sediment and erosion control guidelines;
- International Erosion Control Association (IECA) Sediment and Erosion Control Guidelines; and
- Australian Standards AS 3798-2007.

Given the site is below RL 20m AHD, the proposed development is may potentially expose acid sulfate soils (ASS). The soil shall be tested for ASS by a qualified geotechnical engineer with NATA accreditation and shall ASS be present, an ASS management plan shall be implemented.

Refer to the earthwork's plans found in *Appendix B* which shows preliminary earthworks proposed for Stage 1 of the commercial precinct and *Appendix D* for the Responses to BCC's Filling and Excavation Code.

Earthworks for Stages 2, 3 and 4 will be addressed individually under separate Engineering Service Reports to suits staged works.

4.2. Erosion and Sediment Control Measures

4.2.1. Pre-Development

Prior to construction of Stage 1, the following sediment and erosion control measures will be implemented to minimise disturbance and ensure water quality is maintained;

- Construct entry/exit areas that comprise a designed gravel pad or shake down device in accordance with the IECA (2008);
- Install inlet treatment devices to adjacent stormwater pits;
- Install sediment fences around the proposed bulk earthworks site; and
- Install dust control fences adjacent to the proposed bulk earthworks site.

4.2.2. Bulk Earthworks

- Earthworks areas are to be protected against wind and water erosion;
- Silt fences are to be erected around perimeter of Stage 1 works and on the downside of disturbed earthworks and material stockpiles;
- Stockpiles and construction material are not permitted to be stored within the road reserve; and,
- Diversion drains to be provided at upstream catchments to reduce flows onto earthworks areas.

4.2.3. Construction

The following measures will be undertaken to mitigate water quality impacts during the construction phase:

- Sediment fences to be erected at the base of all batters and stockpiles to prevent sediment transportation off site;
- Grass filter strips to be placed along all road verges;
- Re-vegetation of all disturbed areas within two weeks of completion;
- All sediment control structures to be maintained in an effective manner and inspected after each storm event. No structure is to accumulate sediment above 40% of its capacity;
- Dust producing areas to be swept to remove silt/dust and wetting of roads is only permitted where sweeping has failed;
- At least one bin or litter trap is to be provided for waste material.

4.2.4. Post-Development-Maintenance Period

Silt fences are to remain in place during the maintenance period until the landscaping has established and accepted "On-Maintenance" by BCC.

4.2.5. Performance Objectives and Indicators

The BCC Guideline on Identifying and Applying Water Quality Objectives in Brisbane City (2000) states that stormwater runoff during the construction phase must be in accordance within the concentration ranges shown in Table 5.1 below.



Table 5-1 – Constructior	n Phase	Pollutant	Objectives
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Pollutant	Criteria
Total Suspended Solids	90th %tile < 100mg/L for wet weather periods 15mg/L for combined wet and dry periods
рН	6.5 – 8.5
Total Nitrogen (mg/L)	0.65
Total Phosphorous (mg/L)	0.07
Dissolved Oxygen	80 to 105 percent saturation
Oils and Grease	No visible films or odours
Litter	No anthropogenic material greater than 5mm

4.3. Monitoring and Maintenance

The following monitoring and maintenance procedures are to be undertaken by the site supervisor during all phases of the development:

- Restrict all work activities to designated construction areas;
- Earthworks and site cleaning are undertaken in accordance with the Erosion and Sediment Control plans;
- Inspections of Stormwater and Sediment and Erosion Controls are to be conducted at the end of each construction day and after each rainfall event (>25mm); and
- Any failure to the stormwater system shall be immediately rectified to prevent uncontrolled discharge from the site.

5 Stormwater Management

5.1. Objectives

The hydrologic objectives have been set in accordance with QUDM (2016) and BCC City Plan (2014), including but not limited to:

- The proposed development shall ensure that all stormwater drainage is directed to a lawful point of discharge in accordance with QUDM Section 3.9 (2016);
- No adverse impact on adjoining or downstream properties; and
- MUSIC modelling to determine a treatment strategy to achieve the SPP water quality objectives.

5.2. Lawful Point of Discharge

The nominated lawful point of discharge for Stage 1 is the existing drainage in Murray Street.

The remainder of the site discharge to both the Murray Street and Abbotsford Road drainage systems.

5.3. Stormwater Quantity Calculations

The Rational Method was used to estimate the site flow for both the existing and developed site conditions.

5.3.1. Existing Conditions

In order to quantify all stormwater runoff discharging from site, the total site (Stages 1 - 4) has been considered and consists of 4 catchments which are identified on the Pre Development Catchment Plan found in *Appendix B*.

Catchments EX1 to EX3 are considered to discharge to the Murray Street drainage system whereas catchment EX4 discharges to the drainage system located in Abbotsford Road. The four existing catchments are:

- EX1 Existing carpark and commercial building adjacent to Murray St and Thompson St.
- EX2 Existing commercial building adjacent to Murray St and Thompson St.
- EX3 Existing medical building (mid-block) and internal carpark.
- EX4 Existing medical building and internal carpark adjacent to Abbotsford Rd.

The total fraction impervious for existing catchments EX1 to EX3 is 97.5% and the total fraction impervious for existing catchment EX4 is 88.9%.

Detailed in the following Tables 6-1 and 6-2 are the parameters extracted from QUDM (2016) and used to calculate stormwater runoff generated from the respective catchments.

Note that the existing catchment includes the site only and does not include any external areas.



Deremeters	Linite	Design Storm Event (yr ARI)						
Parameters	Units	1	2	5	10	20	50	100
Catchment Area	ha				0.756			
Time of Concentration	min		5.0					
Runoff Coefficient (Cy)		0.714	0.759	0.848	0.892	0.937	1.000	-
Rainfall Intensity (Iy)	mm/hr	113	127	174	205	236	276	-
Peak Flow	L/s	169	202	310	384	464	580	-

Table 5-1 – Existing Site Flows (Catchments EX1 – EX3)

Table 5-2 – Existing Site Flows (Catchment EX4)

Darameters	Units	Design Storm Event (yr ARI)						
Faranteters		1	2	5	10	20	50	100
Catchment Area	ha		0.525					
Time of Concentration	min		5					
Runoff Coefficient (Cy)		0.693	0.737	0.824	0.867	0.910	0.997	-
Rainfall Intensity (Iy)	mm/hr	113	127	174	205	236	276	-
Peak Flow	L/s	114	136	209	259	313	401	-

5.3.2. Developed Conditions

Similarly to the pre developed conditions above, all stormwater runoff discharging from site from all four stages (Stages 1 - 4) has been considered and consists of 4 catchments which are identified on the Post Development Catchment Plan found in *Appendix B*.

Under developed conditions, there are four internal catchments:

- C1 Tower 1 adjacent to Thompson St and Murray St.
- C2 Tower 2 adjacent to Thompson St. and Murray St including adjacent green space.
- C3 Internal road (round-a-bout) and Tower 4 driveway access and adjacent green space.
- C4 Tower 3 and 4 adjacent to Abbotsford Rd including adjacent green space.

The total fraction impervious for existing catchments C1 to C3 is 78.0% and the total fraction impervious for existing catchment C4 is 67.0%.

Detailed in the following Tables 6-3 and 6-4 are the parameters extracted from QUDM (2016) and used to calculate stormwater runoff generated from the respective catchments.

Note that the existing catchment includes the site only and does not include any external areas.

Daramotors	Units	Design Storm Event (yr ARI)						
		1	2	5	10	20	50	100
Catchment Area	ha				0.704			
Time of Concentration	min		5.0					
Runoff Coefficient (Cy)		0.667	0.709	0.792	0.834	0.876	0.959	-
Rainfall Intensity (ly)	mm/hr	113	127	174	205	236	276	-
Peak Flow	L/s	147	176	270	334	404	518	-

Table 5-3 – Developed Site Flows (Catchments C1 – C3)

Table 5-4 – Developed Site Flows (Catchments C4)

Parameters	Units	Design Storm Event (yr ARI)						
Faranteters		1	2	5	10	20	50	100
Catchment Area	ha		0.576					
Time of Concentration	min		5.0					
Runoff Coefficient (Cy)		0.641	0.681	0.761	0.801	0.841	0.921	-
Rainfall Intensity (Iy)	mm/hr	113	127	174	205	236	276	-
Peak Flow	L/s	116	138	212	263	318	407	-

5.3.3. External Upstream Catchments

The subject site is elevated above Abbotsford Road and Murray Street falls from the site boundary towards Thompson Street. The site is considered at the top of its catchment with all stormwater runoff falling away from the site to the street frontages. There is no upstream catchments discharging stormwater on to the site.

5.3.4. Pre Development vs. Post Development

In order to establish the effects the proposed development will have on the existing site whereby a non-worsening effect is mitigated, a comparison between pre developed and post developed peak discharge flows has been performed and is reflected in Tables 6-5 and 6-6 below.

Table 5-5 – Peak Flows Comparison	(Catchments: EX1 – EX3 vs.	C1 - C3)
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Darameters	Units	Design Storm Event (yr ARI)						
Parameters		1	2	5	10	20	50	100
Pre Dev. Peak Flows	L/s	169	202	310	384	464	580	-
Post Dev. Peak Flows	L/s	147	176	270	334	404	518	-

Table 5-6 – Peak Flows Comparison (Catchments: EX4 vs. C4)

Parameters	Units	Design Storm Event (yr ARI)						
		1	2	5	10	20	50	100
Pre Dev. Peak Flows	L/s	114	136	209	259	313	401	-
Post Dev. Peak Flows	L/s	116	138	212	263	318	407	-



It can be seen from the previous tables, the post development peak discharges values are very similar too if not below the pre development peak discharge flows and demonstrate a non-worsening effect has been successfully achieved and no mitigation devices are required.

5.4. Stormwater Detention Requirements

It can be seen from the previous section above and both the pre development and post development catchment plans found in *Appendix B*, the subject site in its existing state is predominantly impervious and a reduction in impervious area at the post development stage will generate less stormwater runoff and therefore eliminates the need for any additional on-site detention.

Please refer to *Appendix B* for the proposed staging of the stormwater drainage.

6 Operational Stormwater Quality Management

6.1. Introduction

The operational phase of the management plan focuses on appropriate consideration of Stormwater Quality Improvement Devices and Water Sensitive Urban Design (WSUD) principles to be incorporated into the total water cycle management of the developed site.

The State Planning Policy (2017) states for a proposed material change of use that involves a site area greater than 2500m² and will result in an impervious area greater than 25% a Site Based Stormwater Quality Management Plan is required.

Stage 1 water quality sizing is the focus of this section with the specific water quality treatment train applying to this stage only. Each of the future stages of the development will be treated with individual systems that replicate each stage and catchment. As the layout of the future stages is yet to be finalised, the stormwater treatment for each of the stages will be confirmed upon confirmation of the layout.

6.2. Pollutants

Pollutants typically generated during the operational phase of the development are shown below (BCC, 2015).

Pollutant	Sources				
Litter	Construction, construction, food waste materials				
Sediment	Exposed soils and stockpiles				
Oxygen demanding substances	Organic or chemical matter				
Nutrients (N & P)	Nitrogen, phosphorus				
Pathogens / Faecal coliforms	Sewerage				
Hydrocarbons	Fuel and oil spills				
Heavy metals (with fine sediment)	Sediment runoff				
Surfactants	Detergents from car washing, cleansing agents				
Organochlorines & organophosphates	Pesticides, herbicides				
Thermal pollution	Heat (ie runoff from impervious areas)				
pH altering substances	Washwaters				

Table 6-1 – Pollutants typically generated during the operational phase

6.3. Water Quality Objectives

The State Planning Policy (2017) sets out the following water quality objectives for South East Queensland in order to protect downstream receiving waters:

•	Total Suspended Solids (TSS)	80% reduction
•	Total Phosphorus (TP)	60% reduction
•	Total Nitrogen (TN)	45% reduction
•	Gross Pollutant (>5mm)	90% reduction

The percent reductions listed above are the target reductions for comparing mitigated site annual pollutant loads with unmitigated site annual pollutant loads. The proposed treatment strategy selected for the development will ensure these objectives are met for all pollutants.

6.4. Proposed Treatment Strategy

To achieve the water quality objectives the following treatment strategy is proposed:

6.4.1. SPEL Stormsacks

The SPEL Stormsacks provide effective filtration of solid pollutants and debris typical of urban runoff, while utilising the existing or new storm drain infrastructure. The Stormsack is designed to rest on the flanges of conventional catch basin frames and is engineered for most hydraulic and cold climate conditions.

6.4.2. SPEL Filter Cartridges

The SPEL Filter Cartridges will be the final stage in the onsite stormwater treatment. The filters use media-filled cartridges to absorb and retain pollutants from stormwater runoff. The SPEL cartridges will be located inside the detention tanks and will treat the detained water before it is released out of the site.

6.5. Water Quality Modelling

The proposed treatment strategy has been modelled using MUSIC version 6.1.

Rainfall, catchment properties and pollutant characteristics have been sourced from Water By Design's 'MUSIC Modelling Guidelines' (2010).

The rainfall data uses rainfall station 40214 (Brisbane Regional Office), 6 minute time step from 01/01/1980 to 31/12/1989 and all source and treatment nodes parameters have sourced from Water By Design's 'MUSIC Modelling Guidelines' (2010).

The model source node parameter values and pollutant concentration parameters are shown in the tables below.

Table 6-2 – Summary of catchment parameters

Catchment	Area (ha)	Fraction
Roof Commercial	0.161	1.00
Ground Commercial	0.018	50

Table 6-3 - MUSIC Source Node Parameters (Commercial)

Rainfall Runoff Parameters	Values
Rainfall Threshold (mm/day)	1.00
Soil Storage Capacity (mm)	18
Initial Storage (% of capacity)	10
Field Capacity (mm)	80
Infiltration Capacity Coefficient – a	243
Infiltration Capacity Exponent – b	0.6
Initial Depth (mm)	50
Daily Recharge rate (%)	0
Daily Baseflow Rate (%)	31
Daily Deep Seepage (%)	0

		TSS		ТР		TN	
		Base	Storm	Base	Storm	Base	Storm
		Flow	Flow	Flow	Flow	Flow	Flow
Roof	Mean (Log mg/L)	0	1.30	0	-0.89	0	0.37
	Std Dev (Log mg/L)	0	0.38	0	0.34	0	0.34
Road	Mean (Log mg/L)	0.78	2.43	-0.60	-0.30	0.32	0.37
	Std Dev (Log mg/L)	0.39	0.38	0.50	0.34	0.30	0.34
Ground	Mean (Log mg/L)	0.78	2.16	-0.60	-0.39	0.32	0.37
	Std Dev (Log mg/L)	0.39	0.38	0.50	0.34	0.30	0.34

Table 7-2 - MUSIC Pollutant Concentration Parameters (Commercial)

The treatment train for the proposed development will incorporate a minimum of 1 x SPEL Stormsacks to be installed in field inlet around the site. A minimum of 7 x SPEL Filters will be required to be installed in an underground housing for treatment of stormwater prior to discharging from the site. In addition, all roof areas will be conveyed to a minimum 5kL rainwater tank that will be plumbed for irrigation reuse.

Refer to the Stormwater Drainage Layout Plan in Appendix B for further details.

The configuration of the model and results are shown in Figure 6-1 below. This demonstrates that the water quality objectives can be achieved by incorporating the proposed treatment strategy into the development.

The MUSIC model can be provided upon request.



Figure 6-1 Stage 1 - MUSIC Model Configuration



7 Services, Works and Infrastructure

7.1. Policies

The internal sewerage and water reticulation works proposed within the development will comply with the following documents:

- AS 3500.2 Plumbing and Drainage Sanitary plumbing and drainage
- AS 3500.1 Plumbing and Drainage Water Services.

All privately owned water supply infrastructure will be designed in accordance with the relevant plumbing and drainage standards to ensure adequate connection to the QUU owned water reticulation main. Any live works will comply with the following documents:

- Relevant QUU development guidelines & standard drawings
- SEQ WS&S D&C Code Amendment to Sewerage Code of Australia
- Water Association of Australia (WSAA) Sewerage Code of Australia guidelines and standard drawings

7.2. Sewerage Reticulation

A DN160 sewer property connection point is proposed to be installed from a proposed manhole located at the end of Murray St. This property connection shall service Stage 1. The existing main entering the site shall be converted to a property connection and continue servicing the existing building and provide the ability to connect future Stages 2 - 4 as development progress.

As future stages progress, existing property connections on the existing main shall be sealed and end capped.

Note that the suitability of this proposed connection point is subject to discussions and approval with QUU to be undertaken in the detailed design at the Operational Works stage.

Detailed sewer reticulation drawings will be provided as part of the future Operational Works for civil works application once the development application has been approved by Council.

Details of the sewer servicing arrangement and how it progresses as the stages progress can be seen on the civil plans found in *Appendix B*.

7.3. Water Reticulation

In order to provide fire and water services to all four stages (Towers 1 - 4) of the development, a single master meter arrangement with sub metered fire and water service connections is proposed.

During Stage 1, a water service with master meter shall be installed of the existing main in Murray St. An internal water main shall connect to the proposed master meter and water service and shall provide a sub metered fire and water service to Stage 1 (Tower 1).



Provision shall be made to allow future sub metered fire and water services to connect to the internal main to allow progressive development of Stages 2 - 4 (Towers 2 - 4).

Details of the water servicing arrangement and how it progresses as the stages progress can be seen on the civil plans found in *Appendix B*.

Detailed water reticulation drawings will be provided as part of a future Operational Works for civil works application once the development application has been approved by Council.

7.4. Electricity, Communications and Gas

Electricity, gas and telecommunication infrastructure is available in the near vicinity of the subject site although the capacity of these existing services has not been determined.

The developer shall engage suitably qualified consultants during the Operational Works to establish minimum service requirements need to service the proposed development throughout the progressive stages of development.

8 Conclusions and Recommendations

This Engineering Services Report has assessed the stormwater management, earthworks and service infrastructure for the proposed development at 12-18 Thompson Street, Bowen Hills. Earthworks, erosion and sediment control solutions required on site can be performed using common and accepted methods. It is noted that the proposed earthworks will trigger retaining works which will have to be constructed according to BCC codes.

The stormwater management strategy has the following components:

- Comparison of pre and post development flow rates has demonstrated there will be a reduction if peak flows to both Lawful Points of Discharge
- Stage 1 stormwater quality will comprise of 7 x SPEL filters in a 6 m² housing and a minimum of 1 x SPEL. Minimum 5 kL rainwater tank to be used for irrigation purposes.

The water service will consists of a single connection point from QUU water service with sub-meter arrangements for fire and potable water services to each building. The sewer service will be connected to the sewer main located in Murray Street. Both internal sewer and water services will be staged to suit the staged development.

Service supply points for electricity, telecommunications and gas are located within close proximity to the proposed development and should not present any major connection issues.

This report has demonstrated that the proposed development proposal provides an acceptable solution for all engineering services and has been designed to comply with BCC's City Plan (2014).

9 References

AS/NZS (2003) Australian Standards/New Zealand Standards, 'Plumbing and Drainage – Part 1: Water Services', 2003

AS/NZS (2003) Australian Standards/New Zealand Standards, 'Plumbing and Drainage – Part 2: Sanitary Plumbing and Drainage', 2003

BCC (2014) Brisbane City Council, Guidelines and Standards

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- Infrastructure Design Code
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Appendix A – Architectural Plans







JAN '20





REVISION 15

15 17.03.20 PRE-LODGEMENT ISSUE

DA-102

LEVEL 2 - TYPICAL CARPARK







17.03.20 PRE-LODGEMENT ISSUE REVISION 15

DA-103

LEVEL 3 - TYPICAL CARPARK







REVISION

15

17.03.20 PRE-LODGEMENT ISSUE

DA-104

LEVEL 4 - TYPICAL CARPARK



REVISION

16

19.03.20 PRE-LODGEMENT ISSUE

DA-105

LEVEL 5 - TOWER (LOWER)



REVISION 17 19.03.20 PRE-LODGEMENT ISSUE

DA-106

LEVEL 6 - TOWER (CHILDCARE)

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REVISION

5 1

17.03.20 PRE-LODGEMENT ISSUE

DA-107

LEVEL 7 - TOWER TYPICAL(A)

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REVISION 14 17.03.20 PRE-LODGEMENT ISSUE

DA-108

LEVEL 9 - TOWER TYPICAL (B)



REVISION DA-110

LEVEL - ROOF TERRACE

15 17.03.20 PRE-LODGEMENT ISSUE

NOTE: ROOF TERRACE EXTERNAL WORKS SUBJECT TO CHANGE BASED OFF LANDSCAPE ARCHITECT'S DRAWINGS.


REVISION

8

17.03.20 PRE-LODGEMENT ISSUE

DA-111

LEVEL - ROOF PLAN



FINISH CODES

EXTERNAL GLASS FINISHES

- EG 01 FULL HEIGHT GLAZING SYSTEM LIGHT BLUE GLAZING
- EG 02 FULL HEIGHT GLAZING SYSTEM FIRE RATED GLAZING

WALL FINISH

WA - 01	EXPRESSED CONCRETE; PAINTED (VIVID WHITE)
WA - 02	BLOCKWORK; RENDERED AND PAINTED (VIVID WHITE)
WA - 03	BLOCKWORK; RENDERED AND PAINTED (MONUMENT)
WA - 04	BLOCKWORK; RENDERED AND PAINTED (NATURAL WHITE)
WA - 05	BLOCKWORK; RENDERED AND PAINTED (MALAY GREY)
WA - 06	BLOCKWORK; RENDERED AND PAINTED (LEADMAN)
WA - 07	BLOCKWORK; RENDERED AND PAINTED (ACCORD)
WA - 08	BLOCKWORK; RENDERED AND PAINTED (GUILD GREY)
MISC	
SCR - 01	FEATURE BLADES TO PODIUM; POWDERCOAT WHITE (400x50)
SCR - 02	FEATURE BLADES TO TOWER POWDERCOAT WHITE (500 DEPTH)
SG - 01	BUILDING SIGNAGE
MRS - 01	METAL ROOF SHEETING
W - 01	GLAZED WINDOW; ALUMINIUM FRAME
COL - 01	COLUMN; PAINTED FINISH
SP - 01	SOLAR PANELS
GW - 01	GREEN WALL
 DP - 01	DEEP PLANTER
(RED DASH)	



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FINISH CODES

	LINIOL	CODES
	EXTERNA	L GLASS FINISHES
	EG - 01	FULL HEIGHT GLAZING SYSTEM LIGHT BLUE GLAZING
	EG - 02	FULL HEIGHT GLAZING SYSTEM FIRE RATED GLAZING
01		
	WALL FIN	ISH
1	WA - 01	EXPRESSED CONCRETE; PAINTED (VIVID WHITE)
<u> </u>	WA - 02	BLOCKWORK; RENDERED AND PAINTED (VIVID WHITE)
	WA - 03	BLOCKWORK; RENDERED AND PAINTED (MONUMENT)
	WA - 04	BLOCKWORK; RENDERED AND PAINTED (NATURAL WHITE)
02	WA - 05	BLOCKWORK; RENDERED AND PAINTED (MALAY GREY)
	WA - 06	BLOCKWORK; RENDERED AND PAINTED (LEADMAN)
	WA - 07	BLOCKWORK; RENDERED AND PAINTED (ACCORD)
	WA - 08	BLOCKWORK; RENDERED AND PAINTED (GUILD GREY)
	MISC	
	SCR - 01	FEATURE BLADES TO PODIUM; POWDERCOAT WHITE (400x50)
	SCR - 02	FEATURE BLADES TO TOWER POWDERCOAT WHITE (500 DEPTH)
01	SG - 01	BUILDING SIGNAGE
	MRS - 01	METAL ROOF SHEETING
	W - 01	GLAZED WINDOW; ALUMINIUM FRAME
	COL - 01	COLUMN; PAINTED FINISH
	SP - 01	SOLAR PANELS
1	GW - 01	GREEN WALL
	DP - 01	DEEP PLANTER

16 19.03.20 PRE-LODGEMENT ISSUE

DA-201



ARCHITECTURE

FINISH CODES

EXTERNAL GLASS FINISHES				
EG - 01	FULL HEIGHT GLAZING SYSTEM LIGHT BLUE GLAZING			
EG - 02	FULL HEIGHT GLAZING SYSTEM FIRE RATED GLAZING			

WALL FINISH

CR - 02	WA - 01	EXPRESSED CONCRETE; PAINTED (VIVID WHITE)
	WA - 02	BLOCKWORK; RENDERED AND PAINTED (VIVID WHITE)
OL - 01	WA - 03	BLOCKWORK; RENDERED AND PAINTED (MONUMENT)
	WA - 04	BLOCKWORK; RENDERED AND PAINTED (NATURAL WHITE)
G - 01	WA - 05	BLOCKWORK; RENDERED AND PAINTED (MALAY GREY)
	WA - 06	BLOCKWORK; RENDERED AND PAINTED (LEADMAN)
	WA - 07	BLOCKWORK; RENDERED AND PAINTED (ACCORD)
	WA - 08	BLOCKWORK; RENDERED AND PAINTED (GUILD GREY)
	MISC	
	SCR - 01	FEATURE BLADES TO PODIUM; POWDERCOAT WHITE (400x50)
	SCR - 02	FEATURE BLADES TO TOWER POWDERCOAT WHITE (500 DEPTH)
	SG - 01	BUILDING SIGNAGE
	MRS - 01	METAL ROOF SHEETING
ADJOINING PODIUM	W - 01	GLAZED WINDOW; ALUMINIUM FRAME
SH LINE)	COL - 01	COLUMN; PAINTED FINISH
/A - 08	SP - 01	SOLAR PANELS
	GW - 01	GREEN WALL
P - 01	DP - 01	DEEP PLANTER
CR-01		

WA - 01

ELEVATION - SOUTH





FINISH CODES

EXTERNAL GLASS FINISHES					
EG - 01	FULL HEIGHT GLAZING SYSTEM LIGHT BLUE GLAZING				
EG - 02	FULL HEIGHT GLAZING SYSTEM FIRE RATED GLAZING				

WALL FINISH

	WA - 01	EXPRESSED CONCRETE; PAINTED (VIVID WHITE)
_	 WA - 02	BLOCKWORK; RENDERED AND PAINTED (VIVID WHITE)
	WA - 03	BLOCKWORK; RENDERED AND PAINTED (MONUMENT)
_	 WA - 04	BLOCKWORK; RENDERED AND PAINTED (NATURAL WHITE)
	WA - 05	BLOCKWORK; RENDERED AND PAINTED (MALAY GREY)
_	 WA - 06	BLOCKWORK; RENDERED AND PAINTED (LEADMAN)
	WA - 07	BLOCKWORK; RENDERED AND PAINTED (ACCORD)
_	 WA - 08	BLOCKWORK; RENDERED AND PAINTED (GUILD GREY)
	 MISC	
	SCR - 01	FEATURE BLADES TO PODIUM; POWDERCOAT WHITE (400x50)
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	SG - 01	BUILDING SIGNAGE
_	 MRS - 01	METAL ROOF SHEETING
	W - 01	GLAZED WINDOW; ALUMINIUM FRAME
- 04	 COL - 01	COLUMN; PAINTED FINISH
- 06	SP - 01	SOLAR PANELS
- 05	 GW - 01	GREEN WALL
- 02	DP - 01	DEEP PLANTER
04		









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DA-302



















(i	e Development)		SK006	В
DESIGNED: DAM	APPROVED: CK	RPEQ No.	DWG. No.	REVISION









BRISBANE CITY COUNCIL ABN 72 002 765 795

Erosion Hazard Assessment - June 2014

Brisbane City Council (BCC), *Erosion Hazard Assessment* form must be read in conjunction with the *Erosion Hazard Assessment- Supporting Technical Notes* (June 2014 or later version) for explanatory terms and Certification information.

What is an Erosion Hazard Assessment?

Soil erosion and sediment from urban development, particularly during construction activities, is a significant source of sediment pollution in Brisbane's waterways. The Erosion Hazard Assessment determines whether the risk of soil erosion and sediment pollution to the environment is 'low', 'medium' or 'high'.

When is the EHA required?

An *Erosion Hazard Assessment* form must be completed and lodged with BCC for any Development Application (ie MCU or ROL) that will result in soil disturbance OR Operational Works or Compliance Assessment Application for 'Filling' or Excavation.

Failure to submit this form during lodgement of an application may result in assessment delays or refusal of the application.

Privacy Statement

The personal information collected on this form will be used by Brisbane City Council for the purposes of fulfilling your request and undertaking associated Council functions and services. Your personal information will not be disclosed to any third party without your consent, unless this is required or permitted by law.

Assessment Details

- 1 Please turn over and complete the erosion hazard assessment.
- **2** Based on the erosion hazard assessment overleaf, is the site:

A 'low' risk site

Best practice erosion and sediment control (ESC) must be implemented but no erosion and sediment control plans need to be submitted with the development application. Factsheets outlining best practice ESC can be found at http://www.waterbydesign.com.au/factsheets

X A 'medium' risk site

If the development is approved, the applicant will need to engage a Registered Professional Engineer (RPEQ) <u>or</u> Certified Professional in Erosion and Sediment Control (CPESC) to prepare an ESC Program and Plan and supporting documentation — in accordance with the requirements of the Infrastructure Design Planning Scheme Policy.

A 'high' risk site

If the development is approved, the applicant will need to engage a RPEQ and CPESC to prepare an ESC Program and Plan and supporting documentation — in accordance with the requirements of the Infrastructure Design Planning Scheme Policy. The plans and program will need to be certified by a CPESC. 3 Site Information and Certification

Application number (if known)

Site address

12-18 Thompson Street	
Bowen Hills	
QLD	Postcode 4006

I certify that:

- X I have made all relevant enquiries and am satisfied no matters of significance have been withheld from the assessment manager.
- X I am a person with suitable qualifications and/or experience in erosion and sediment control.
- X The Erosion Hazard Assessment was completed in accordance with the Erosion Hazard Assessment Supporting Technical Notes and the BCC Infrastructure Design Planning Scheme Policy.
- X The Erosion Hazard Assessment accurately reflects the site's overall risk of soil erosion and sediment pollution to the environment.
- I acknowledge and accept that the BCC, as assessment manager, relies, in good faith, on this certification as part of its development assessment process and the provision of false or misleading information to the BCC constitutes an offence for which BCC may take punitive steps/ action against me/ enforcement action against me.

Certified by Print name

Daley Curran

Certifier's signature

Date
02 / 03 / 2020

Table 1: Low Risk Test







Job Reference:

8858

BCC – Filling and Excavation Code

Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
PO1 Development for filling or excavation minimises visual impacts from retaining walls and earthworks.	 AO1 Development ensures that the total height of any cut and fill, whether or not retained, does not exceed: (a) 2.5m in a zone in the Industry zones category; (b) 1m in all other zones, or if adjoining a sensitive zone. 	AO	The total height of any cut and fill on site does not exceed 1m.	
PO2 Development of a retaining wall proposed as a result of filling or excavation: (a) is designed and constructed to be fit for purpose; (b) does not impact adversely on significant vegetation; (c) is capable of easy maintenance. Editor's note—A retaining wall also needs to comply with the Building Regulation and embankment gradients will need to comply with the Building Regulation. Note—Guidance on the protection of native	 AO2.1 Development of a retaining structure, including footings, surface drainage and subsoil drainage: a) is wholly contained within the site; b) if the total height to be retained is greater than 1m, then: (i) the retaining wall at the property boundary is no greater than 1m above the ground level; (ii) all further terracing from the 1m high boundary retaining wall is 1 vertical unit:1 horizontal unit; (iii) the distance between each successive retaining wall (back 	AO	Retaining walls at the property boundary have been terraced where exceeding 1m in height. No significant vegetation is located in or near the subject site. Retaining wall finishes will be acceptable to Council standards. Clean fill will be used where required.	

Inertia

Acceptable outcomes	Solutions*	Comments	Council Use
of lower wall to face of higher wall) is no less than 1m horizontally to incorporate planting areas.			
AO2.2 Development of a retaining wall over 1m in height protects significant vegetation on the site and on adjoining land and is designed and constructed in accordance with the structures standards in the			
Infrastructure design planning scheme policy and certified by a Registered Professional Engineer Queensland.			
A02.3			
Development provides a retaining wall finish that presents to adjoining land that is maintenance free if the setback is less than 750mm from the boundary.			
AO2.4 Development for filling only uses clean fill that does not include any construction rubble, debris, weed seed or viable parts of plant species listed as an undesirable plant species in the Planting species planning scheme policy.			
	Acceptable outcomesof lower wall to face of higher wall) is no less than 1m horizontally to incorporate planting areas.AO2.2Development of a retaining wall over 1m in height protects significant vegetation on the site and on adjoining land and is designed and constructed in accordance with the structures standards in the Infrastructure design planning scheme policy and certified by a Registered Professional Engineer Queensland.AO2.3Development provides a retaining wall finish that presents to adjoining land that is maintenance free if the setback is less than 750mm from the boundary.AO2.4Development for filling only uses clean fill that does not include any construction rubble, debris, weed seed or viable parts of plant species listed as an undesirable plant species in the Planting species planning scheme policy.	Acceptable outcomes Solutions* of lower wall to face of higher wall) is no less than 1m horizontally to incorporate planting areas. Acceptable outcomes AO2.2 Development of a retaining wall over 1m in height protects significant vegetation on the site and on adjoining land and is designed and constructed in accordance with the structures standards in the Infrastructure design planning scheme policy and certified by a Registered Professional Engineer Queensland. AO2.3 Development for filling only uses clean fill that does not include any construction rubble, debris, weed seed or viable parts of plant species listed as an undesirable plant species in the Planting species planning scheme policy.	Acceptable outcomes Solutions* Comments of lower wall to face of higher wall) is no less than 1m horizontally to incorporate planting areas. horizontally to incorporate planting areas. AO2.2 Development of a retaining wall over 1m in height protects significant vegetation on the site and on adjoining land and is designed and constructed in accordance with the structures standards in the Infrastructure design planning scheme policy and certified by a Registered Professional Engineer Queensland. House the structure standards in the Infrastructure design planning scheme policy and certified by a Registered Professional Engineer Queensland. AO2.3 Development provides a retaining wall finish that presents to adjoining land that is maintenance free if the setback is less than 750mm from the boundary. House the set of wall to plant species in the Planting species planning scheme policy. AO2.4 Development for filling only uses clean fill that does not include any construction rubble, debris, weed seed or viable parts of plant species in the Planting species planning scheme policy. Here is the planting species planning scheme policy.



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
PO3 Development ensures that a rock anchor is designed and constructed to be fit for purpose.	 AO3 Development ensures that a rock anchor: a) is constructed in accordance with the standards in the Infrastructure design planning scheme policy; b) where it extends beyond the property boundary, is supported by a letter of consent from the adjoining land and building owners. 	AO	It will be decided at operation works stage, if rock anchors will be used, once a detailed geotechnical report has been undertaken. If it is expected rock anchors will be used in the design, the design will be in accordance with the standards in the infrastructure design planning scheme policy. Consent from the neighbouring properties will be sought, should the rock anchors need to extend within adjoining lots.	
PO4 Development protects all services and public utilities.	AO4 Development protects services and public utilities and ensures that any alteration or relocation of services or public utilities meets the standard design specifications of the responsible service authorities.	AO	Construction of the development will take necessary precautions and actions to ensure the protection of existing services and public utilities.	
PO5 Development provides surface and sub- surface drainage to prevent water seepage, concentration of run-off or ponding of stormwater on adjacent land.	AO5 Development ensures all flows and subsoil drainage are directed to a lawful point of discharge of a surface water diversion drain, including to the top or toe of a retaining wall in accordance with the stormwater drainage section of the Infrastructure design planning scheme policy.	AO	Acceptable surface drainage has been designed in accordance with the infrastructure design planning scheme policy. Appropriate subsoil drainage will be designed at the detailed design stage according to the infrastructure design planning scheme policy.	
PO6 Development ensures that the design and construction of all open drainage works is	AO6 Filling or excavation does not involve the construction of open drainage.	AO	No major open drainage works are proposed as a part of the development.	

Inertia

Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
undertaken in accordance with natural channel design principles, being the development of a stormwater conveyance system for major flows, by using a vegetated open channel or drain that approximates the features and functions of a natural waterway to enhance or improve riparian values of those stormwater conveyance systems.				
Editor's note—Guidance on natural channel				
Council's publication Natural channel design				
guidelines.				
 PO7 Development for filling or excavation: a) does not degrade water quality or adversely affect environmental values in receiving waters; b) ensures site sediment and erosion control standards are best practice. 	 AO7.1 Development for filling or excavation provides water quality treatment that complies with the stormwater drainage section of the Infrastructure design planning scheme policy. AO7.2 Development provides erosion and sediment control standards that are in accordance with the stormwater drainage section of the Infrastructure design planning scheme policy. 	AO	Water quality treatment has been designed in accordance with the infrastructure design planning scheme policy and the State Planning Policy. An erosion and sediment control plan will be designed at the detailed design stage and will be in accordance with the infrastructure design planning scheme policy.	
PO8 Development for filling or excavation is conducted such that adverse impacts at a sensitive use due to noise and dust are prevented or minimised.	AO8.1 Development ensures that no dust emissions extend beyond the boundary of the site, including dust from construction vehicles entering and leaving the site.	AO	Erosion and sediment control measures will be implemented on site to ensure no dust emissions. Earthworks will be restricted to the	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
Note—A noise and dust impact management plan prepared in accordance with the Management plans planning scheme policy can assist in demonstrating achievement of this performance outcome.	AO8.2 Development for filling or excavation activity only occurs between the hours of 6:30am and 6:30pm Monday to Saturday, excluding public holidays.		recommended working hours.	
PO9 Development ensures that vibration generated by the filling or excavation operation does not exceed the vibration criteria in Table 9.4.3.3.B, Table 9.4.3.3.C, Table 9.4.3.3.D and Table 9.4.3.3.E. Note—A noise management report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	AO9 Development involving filling or excavation does not cause a ground-borne vibration beyond the boundary of the site.	AO	Filling and excavation activities undertaken on site will ensure that ground-borne vibration does not exceed the criteria set out by BCC.	
PO10 Development ensures that heavy trucks hauling material to and from the site do not affect the amenity of established areas and limits environmental nuisance impact on adjacent land.	 AO10 Development ensures that heavy trucks hauling material to and from the site: a) occur for a maximum of 3 weeks; b) use a major road to access the site; c) only use a minor road for the shortest-most-direct route that has the least amount of environmental nuisance if there is no major road alternative. 	AO	Truck movements to and from site will be restricted as per BCC guidelines.	
PO11 Development for filling or excavation	AO11 Development does not involve:	AO	Due to the existing nature of the site it is not expected that the site is listed on the contaminated land register. A search can	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
protects the environment and community health and wellbeing from exposure to contaminated land and contaminated material.	 a) excavation on land previously occupied by a notifiable activity or on land listed on the Environmental Management Register or the Contaminated Land Register; b) filling with material containing a contaminant. 		be undertaken if requested. All fill material sourced for the development will be free of contaminants.	
 PO12 Development provides for: a) landscaping for water conservation purposes; b) water sensitive urban design measures which are employed within the landscape design to maximise stormwater use and to reduce any adverse impacts on the landscape; c) stormwater harvesting to be maximised and any adverse impacts of stormwater minimised. 	 AO12.1 Development provides landscaping which is designed using the standards in the Landscape design guidelines for water conservation planning scheme policy. AO12.2 Development ensures that the design and requirements for irrigation are in compliance with the standards in the Landscape design guidelines for water conservation planning scheme policy. AO12.3 Development provides areas of pavement, turf and mulched garden beds which are drained. Note—This may be achieved through the provision and/or treatment of swales, 	AO	Landscaping areas are provided throughout the proposed development. Where appropriate, surface drainage has been provided to remove excess runoff from the site.	
PO12	spoon drains, field gullies, sub-surface drainage and stormwater connections.	40	The development does not involve the	
FUI3	AUIS	~~	The development does not involve the	1



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
Development ensures cutting and filling for the development of canals or artificial waterways avoids adverse impacts on coastal resources and processes.	Development does not involve the creation of canals or artificial waterways.		creation of canals or artificial waterways.	



BCC – Stormwater Code

Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use		
Section A—If for a material change of use, reconfiguring a lot, operational work or building work						
Note—Compliance with the performance stormwater management plan for high righted by the stormwater management plan for high righted by the store	e outcomes and acceptable outcomes in th isk development only.	is section sh	ould be demonstrated by the submission o	of a site-based		
 PO1 Development provides a stormwater management system which achieves the integrated management of stormwater to: (c) minimise flooding; (d) protect environmental values of receiving waters; (e) maximise the use of water sensitive urban design; (f) minimise safety risk to all persons; (g) maximise the use of natural waterway corridors and natural channel design principles. Editor's note—The stormwater management system to be developed to address PO1 is not intended to require management of stormwater quality. 	AO1 Development provides a stormwater management system designed in compliance with the Infrastructure design planning scheme policy.	AO	The proposed stormwater quantity and quality management system is designed in accordance with the Infrastructure design planning scheme policy. Please refer to the report for further design details relating to the stormwater management system. Please also refer to the existing and developed catchment plans and the proposed stormwater drainage layout.			
PO2 Development ensures that the stormwater management system and site work does not adversely impact	AO2.1 Development does not result in an increase in flood level or flood hazard on up slope, down slope or adjacent premises.	AO	The proposed stormwater management system is designed in compliance with the standards in the Infrastructure design planning scheme policy and will not result in an increase in flood level or			



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use	
flooding or drainage characteristics of premises which are up slope, down slope or adjacent to the site.	AO2.2 Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.		flood hazard on upstream, downstream or surrounding properties.		
PO3 Development ensures that the stormwater management system does not direct stormwater run-off through existing or proposed lots and property where it is likely to adversely affect the safety of, or	AO3.1AOThe stormwater management system and lawful point of discharge is in compliance with the infrastructure design planning scheme policy.eDevelopment ensures that the location of the stormwater drainage system is contained within a road reserve, drainage reserve, public pathway, park or waterway corridor.AOThe stormwater management system and lawful point of discharge is in compliance with the infrastructure design planning scheme policy.where it is rafety of, orreserve, public pathway, park or waterway corridor.Easements have been provided over stormwater infrastructure where	AO	AO	lawful point of discharge is in compliance with the infrastructure design planning scheme policy. Easements have been provided over stormwater infrastructure where	
cause nuisance to properties.	AO3.2 Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.		applicable.		
	AO3.3 Development obtains a lawful point of discharge in compliance with the standards in the Infrastructure design planning scheme policy.				
	AO3.4 Where on private land, all underground stormwater infrastructure is secured by a drainage easement.				



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
PO4 Development provides a stormwater management system which has sufficient capacity to safely convey run-off taking into account increased run-off from impervious surfaces and flooding in local catchments.	 AO4.1 Development provides a stormwater conveyance system which is designed to safely convey flows in compliance with the standards in the Infrastructure design planning scheme policy. AO4.2 Development provides sufficient area to convey run-off which will comply with the standards in the Infrastructure design planning scheme policy. 	AO	The development provides a stormwater conveyance system which is designed to safely convey stormwater runoff in accordance with the infrastructure design planning scheme policy. The development provides sufficient area to convey runoff in accordance with the infrastructure design planning scheme policy.	
PO5 Development designs stormwater channels, creek modification works, bridges, culverts and major drains to protect and enhance the value of the waterway corridor or drainage path for fauna movement.	AOS Development ensures the design of stormwater channels, creek modifications or other infrastructure, permits terrestrial and aquatic fauna movement.	N/A	No stormwater channels or creek modification works are proposed as a part of the development.	
 PO6 Development ensures that location and design of stormwater detention and water quality treatment: a) minimises risk to people and property; b) provides for safe access and maintenance; c) minimises ecological impacts to creeks and waterways. 	 AO6.1 Development locates stormwater detention and water quality treatment:	AO	The proposed stormwater quality and quantity management system is not located within a waterway corridor and is in accordance with the Infrastructure design planning scheme policy.	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
	planning scheme policy.			
 PO7 Development is designed, including any car parking areas and channel works to: a) reduce property damage; b) provide safe access to the site during the defined flood event. 	 AO7.1 Development (including any ancillary structures and car parking areas) is located above minimum flood immunity levels in Table 9.4.9.3.B, Table 9.4.9.3.C, Table 9.4.9.3.D, Table 9.4.9.3.E and Table 9.4.9.3.F. Note—Compliance with this acceptable outcome can be demonstrated by the submission of a hydraulic and hydrology report identifying flood levels and development design levels (as part of a sitebased stormwater management plan). AO7.2 Development including the road network provides a stormwater management system that provides safe pedestrian and vehicle access in accordance with the standards in the Infrastructure design planning scheme policy. 	AO	The development achieves the minimum flood immunity levels nominated. Safe pedestrian and vehicle access has been designed in accordance with the planning scheme policy.	
PO8 Development designs stormwater channels, creek modification works and	AO8.1 Development ensures natural waterway corridors and drainage paths are retained.	AO	Development ensures natural waterway corridors and drainage paths are retained. Appropriate energy dissipation devices	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
the drainage network to protect and enhance the environmental values of the waterway corridor or drainage path.	AO8.2 Development provides the required hydraulic conveyance of the drainage channel and floodway, while maximising its potential to maximise environmental benefits and minimise scour. Editor's note—Guidance on natural channel design principles can be found in the Council's publication Natural channel design		have been provided at stormwater outlets to minimise scour where required.	
	AO8.3			
	Development provides stormwater outlets into waterways, creeks, wetlands and overland flow paths with energy dissipation to minimise scour in compliance with the standards in the Infrastructure design planning scheme policy.			
	A08.4			
	Development ensures that the design of modifications to the existing design of new stormwater channels, creeks and major drains is in compliance with the standards in the Infrastructure design planning scheme policy.			
PO9	AO9	PO	Development has incorporated	
Development is designed to manage run- off and peak flows by minimising large	No acceptable outcome is prescribed.		landscaping to minimise impervious area and allowed for stormwater re-use where	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
areas of impervious material and maximising opportunities for capture and re-use.			appropriate.	
 PO10 Development ensures that there is sufficient site area to accommodate an effective stormwater management system. Note—Compliance with the performance outcome should be demonstrated by the submission of a site-based stormwater management plan for high-risk development only. 	AO10 No acceptable outcome is prescribed.	PO	There is sufficient area on-site to accommodate an effective stormwater management system.	
 PO11 Development provides for the orderly development of stormwater infrastructure within a catchment, having regard to the: a) existing capacity of stormwater infrastructure within and external to the site, and any planned stormwater infrastructure upgrades; b) safe management of stormwater discharge from existing and future upslope development; c) implication for adjacent and downslope development. 	 AO11.1 Development with up-slope external catchment areas provides a drainage connection sized for ultimate catchment conditions that is directed to a lawful point of discharge. AO11.2 Development ensures that existing stormwater infrastructure that is undersized is upgraded in compliance with the Infrastructure design planning scheme policy. 	AO	There are no major external catchments draining through the site that need to be provided with a drainage connection. The existing infrastructure has sufficient capacity to cater for the runoff from the development.	
PO12 Development provides stormwater	AO12.1 The stormwater management system is	AO	The stormwater management system is in compliance with the infrastructure design	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
infrastructure which: a) remains fit for purpose for the life of the development and maintains full functionality in the design flood event;	designed in compliance with the Infrastructure design planning scheme policy.		planning scheme policy. No existing stormwater manholes are located on the subject site.	
 b) can be safely accessed and maintained cost effectively; c) ensures no structural damage to existing stormwater infrastructure. 	AO12.2 Development provides a clear area with a minimum of 2m radius from the centre of an existing manhole cover and with a minimum height clearance of 2.5m.			
 PO13 Development ensures that all reasonable and practicable measures are taken to manage the impacts of erosion, turbidity and sedimentation, both within and external to the development site from construction activities, including vegetation clearing, earthworks, civil construction, installation of services, rehabilitation, revegetation and landscaping to protect: a) the environmental values and water quality objectives of waters; b) waterway hydrology; c) the maintenance and serviceability of stormwater infrastructure. 	AO13 No acceptable outcome is prescribed.	PO	An erosion and sediment control plan will be designed at the detailed design stage, which will incorporate industry best practice methods to reduce any possible impacts to receiving waters and stormwater infrastructure.	
Note—The Infrastructure design planning scheme policy outlines the appropriate measures to be taken into account to achieve the performance outcome.				


Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
 PO14 Development ensures that: a) unnecessary disturbance to soil, waterways or drainage channels is avoided; b) all soil surfaces remain effectively stabilised against erosion in the short and long term. 	AO14 No acceptable outcome is prescribed.	PO	The development will avoid unnecessary disturbance to soil, waterways and drainage channels and erosion control measures will be implemented for both short and long term stabilisation.	
 PO15 Development does not increase: a) the concentration of total suspended solids or other contaminants in stormwater flows during site construction; b) run-off which causes erosion either on site or off site. 	AO15 No acceptable outcome is prescribed.	PO	The development will be designed to minimise increases in run-off and TSS concentrations during construction.	
Section B—Additional performance outco	omes and acceptable outcomes which app	ly to high-ris	k development, being one or more of the	following:
 a) a material change of use for an urban purpose which involves greater than 2,500m² of land that: i. will result in an impervious area greater than 25% of the net developable area; or ii. will result in 6 or more dwellings. b) reconfiguring a lot for an urban purpose that involves greater than 2,500m² of land and will result in 6 or more lots; c) operational work for an urban purpose which involves disturbing greater than 2,500m² of land. 				
PO16 Development ensures that the entry and transport of contaminants into stormwater is avoided or minimised to protect receiving water environmental	AO16 Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme	AO	The proposed stormwater quality management system is designed in accordance with the standards in the Infrastructure design planning scheme policy.	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
values.	policy.			
Note—Prescribed water contaminants are defined in the <i>Environmental Protection Act</i> 1994.				
PO17	A017	РО	The development will ensure that	
Development ensures that: a) the discharge of wastewater to a waterway or external to the site is avoided; or	No acceptable outcome is prescribed.		wastewater discharge is managed in accordance with the Infrastructure design planning scheme policy.	
b) if the discharge cannot practicably be avoided, the development minimises wastewater discharge through re-use, recycling, recovery and treatment.				
Note—The preparation of a wastewater				
management plan can assist in demonstrating achievement of this				
performance outcome.				
Editor's note—This code does not deal with sewerage which is the subject of the Wastewater code.				
Section C—Additional performance outc	omes and acceptable outcomes for assess	able develop	ment for a material change of use or recor	nfiguring a lot



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
 PO18 Development protects stormwater infrastructure to ensure the following are not compromised: a) the long term infrastructure for the stormwater network in the Long term infrastructure plans; b) the existing and planned infrastructure for the stormwater network in the Local government infrastructure plan; c) the provision of long term, existing and planned infrastructure for the stormwater network which: i. is required to service the development or an existing and future urban development in the planning scheme area; or II. is in the interests of rational development or the efficient and orderly planning of the general area in which the site is situated. 	 AO18 Development protects stormwater infrastructure in compliance with the following: a) for long term infrastructure for the stormwater network, the Long term infrastructure plans; b) for existing and planned infrastructure for the stormwater network, the Local government infrastructure plan; c) the standards for stormwater drainage in the Infrastructure design planning scheme policy. 	AO	The development will not adversely impact on existing or future planned stormwater infrastructure and is in compliance with the standards of the Infrastructure design planning scheme policy.	
Editor's note—A condition which requires a proposed development to keep permanent improvements and structures associated with the approved development clear of the area of long term infrastructure, may be imposed.				



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
PO19 Development provides for the payment of extra trunk infrastructure costs for the following:	AO19 No acceptable outcome is prescribed.	РО	The developer will pay the appropriate infrastructure costs in accordance with Council's infrastructure plans.	
 a) for development completely or partly outside the priority infrastructure area in the Local government infrastructure plan; 				
 b) for development completely inside the priority infrastructure area in the Local government infrastructure plan involving: 				
 I. trunk infrastructure that is to be provided earlier than planned in the Local government infrastructure plan; 				
 Iong term infrastructure for the stormwater network which is made necessary by development that is not assumed future urban development; 				
III. other infrastructure for the stormwater network associated with development that is not assumed future urban development which is made necessary by the development.				
Editor's note—The payment of extra trunk				



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
infrastructure costs for development				
completely inside the priority infrastructure				
area in the Local government infrastructure				
plan is to be worked out in accordance with				
the Charges Resolution.				
Editor's note—See section 130 Imposing				
Development conditions (Conditions for				
extra trunk infrastructure costs) of the				
Planning Act 2016.				



BCC – Infrastructure Design Code

Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
 PO1 Development provides roads, pavement, edging and landscaping which: a) are designed and constructed in accordance with the road hierarchy; b) provide for safe travel for pedestrians, cyclists and vehicles; c) provide access to properties for all modes; d) provide utilities; e) provide high levels of aesthetics and amenity, improved liveability and future growth; 	AO1 Development provides roads and associated pavement, edging and landscaping which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	AO	The development will provide pavement, edging and landscaping to be in compliance with the road corridor design standards in the infrastructure design planning scheme policy.	
and other pollution;				
g) provide a high-quality streetscape; h) provide a low-maintenance asset with a minimal whole-of-life cost.				
Note—This can be demonstrated in an engineering report prepared and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.				



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
 PO2 Development provides road pavement surfaces which: a) are well designed and constructed; b) durable enough to carry the wheel loads of the intended types and numbers of travelling and parked vehicles; c) ensures the safe passage of vehicles, pedestrians and cyclists, the discharge of stormwater run-off and the preservation of all-weather access; d) allows for reasonable travel comfort. 	AO2 Development provides road pavement surfaces which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	AO	Any required pavements will be designed in accordance with BCC Standard Drawings and the road corridor design standards in the Infrastructure design planning scheme policy at the detailed design stage.	
 PO3 Development provides a pavement edge which is designed and constructed to: a) control vehicle movements by delineating the carriageway for all users; b) provide for people with disabilities by allowing safe passage of wheelchairs and other mobility aids. 	AO3 Development provides pavement edges which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	AO	Any required pavement edges will be designed in accordance with BCC Standard Drawings and the road corridor design standards in the Infrastructure design planning scheme policy at the detailed design stage.	
PO4 Development provides verges which are designed and constructed to: a) provide safe access for pedestrians	AO4 Development provides verges which are designed and constructed in compliance with the road corridor design and	AO	The development will achieve the requirements set out in the road corridor design standards in the infrastructure design planning scheme	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
clear of obstructions and access areas for vehicles onto properties; b) provide a sufficient area for public utility services; c) bo maintainable by the Council	streetscape locality advice standards in the Infrastructure design planning scheme policy.		policy.	
		N/A	No louro en louro en encorre en este este este este este este este	
 Development provides a lane or laneway identified on the Streetscape hierarchy overlay map or in a neighbourhood plan which: a) allows equitable access for all modes; b) is safe and secure; c) has 24-hour access; d) is a low-speed shared zone environment; e) has a high-quality streetscape. 	AUS Development provides a lane or laneway identified on the Streetscape hierarchy overlay map or in a neighbourhood plan which is embellished in compliance with the streetscape locality advice standards in the Infrastructure design planning scheme policy.	N/A	part of this development.	
 PO6 Development of an existing premises provides at the frontage to the site, if not already provided, the following infrastructure to an appropriate urban standard: a) an effective, high-quality paved roadway; b) an effective, high-quality roadway kerb and channel; c) safe, high-quality vehicle crossings 	AO6 Development of an existing premises provides at the frontage of the site, if not already existing, the following infrastructure to the standard that would have applied if the development involved new premises as stated in the road corridor design standards in the Infrastructure design planning scheme policy: a) concrete kerb and channel;	AO	Infrastructure at the frontages of the site will be provided in accordance with BCC Standard Drawings and the road corridor design standards in the Infrastructure design planning scheme policy.	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
 Performance outcomes over channels and verges; d) safe, accessible, high-quality verges compatible and integrated with the surrounding environment; e) safe vehicle access to the site that enables ingress and egress in a forward gear; f) provision of and required alterations to public utilities; 	Acceptable outcomesb)forming and grading to verges;c)crossings over channels and verges;d)a constructed bikeway;e)a constructed verge or reconstruction of any damaged verge;f)construction of the carriageway;	Solutions*	Comments	Council Use
g) effective drainage; h) appropriate conduits to facilitate the provision of required street- lighting systems and traffic signals.	 g) payment of costs for required alterations to public utility mains, services or installations; h) construction of and required alterations to public utility mains, services or installations; i) drainage works; j) installation of electrical conduits. 			
PO7 Development provides both cycle and walking routes which: a) are located, designed and constructed to their network classification (where applicable); b) provide safe and attractive travel routes for pedestrians and cyclists for commuter and recreational	AO7 Development provides cycle and walking routes which are located, designed and constructed in compliance with the road corridor design and off-road pathway design standards in the Infrastructure design planning scheme policy.	N/A	No cycle or walking routes are proposed as a part of the development.	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
purposes;				
 c) provide safe and comfortable access to properties for pedestrians and cyclists; 				
 d) incorporate water sensitive urban design into stormwater drainage; 				
e) provide for utilities;				
 f) provide for a high level of aesthetics and amenity, improved liveability and future growth; 				
g) are a low-maintenance asset with a minimal whole-of-life cost;				
 h) minimise the clearing of significant native vegetation. 				
Note—This can be demonstrated in an engineering report prepared and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.				
policy.APO8ADevelopment provides refuse and recycling collection, separation and storage facilities that are located and managed so that adverse impacts on building occupants, neighbouring properties and the public realm are minimised.A	AO8.1 Development provides refuse and recycling collection and storage facilities in accordance with the Refuse planning scheme policy.	AO	The development provides refuse and recycling collection and storage facilities that will not adversely impact on land uses within or adjoining the development in accordance with the Refuse planning scheme policy. Please refer to architectural drawings for further details.	
	AO8.2 Development ensures that refuse and recycling collection and storage location			



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
	and design do not have any adverse impact including odour, noise or visual impacts on the amenity of land uses within or adjoining the development. Note—Refer to the Refuse planning scheme policy for further guidance.			
PO9 Development ensures that: a) land used for an urban purpose is serviced adequately with regard to water supply and waste	AO9.1 Development ensures that the reticulated water and sewerage distribution system for all services is in place before the first use is commenced.	AO	The development will be provided with reticulated water supply and sewerage connections to QUU's network prior to use commencing.	
b) the water supply and waste disposal; b) the water supply meets the stated standard of service for the intended use and fire-fighting purposes.	AO9.2 Development provides the lot with reticulated water supply and sewerage to a standard acceptable to the distributor- retailer.		Please refer to the concept services layout for details on how the site can be serviced by sewer and water infrastructure.	
PO10 Development provides public utilities and street lighting which are the best current or alternative technology and facilitate accessibility, easy maintenance, minimal whole-of-life costs, and minimal adverse environmental impacts.	 AO10.1 Development provides public utilities and street lighting which are located and aligned to: a) avoid significant native vegetation and areas identified within the Biodiversity areas overlay map; b) minimise earthworks; c) avoid crossing waterways, waterway corridors and wetlands or if a crossing is unavoidable, tunnelboring techniques are used to minimise disturbance, and a 	AO	Public utilities and street lighting location and alignment will be optimised to avoid significant native vegetation, minimise earthworks and avoid crossing waterways in accordance with the standards in the Infrastructure design planning scheme policy.	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
	disturbed area is reinstated and restored on completion of the work.			
	Note—Guidance on the restoration of habitat is included in the Biodiversity areas planning scheme policy.			
	A010.2			
	Development provides compatible public utility services and street-lighting services which are co-located in common trenching for underground services.			
	AO10.3			
	Development provides public utilities and street lighting which are designed and constructed in compliance with the public utilities standards in the Infrastructure design planning scheme policy.			
PO11	A011	AO	The development can be serviced	
Development ensures that land used for urban purposes is serviced adequately with telecommunications and energy supply.	Development provides land with the following services to the standards of the approved supplier:		adequately with gas, telecommunications, and electricity supply.	
	a) electricity;			
	c) gas service where practicable.			
PO12	A012	AO	Conduits will be provided where	
Development ensures that major public projects promote the provision of affordable, high-bandwidth	Development provides conduits which are provided in all major Council and government works projects to enable the		provision of fibre optic cabling.	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
telecommunications services throughout the city.	future provision of fibre optic cabling, if: a) the additional expense is unlikely to be prohibitive; or			
	b) further major work is unlikely or disruption would be a major concern, such as where there is a limited capacity road; or			
	c) there is a clear gap in the telecommunications network; or			
	d) there is a clear gap in the bandwidth available to the area.			
	Editor's note—An accurate, digital 'as built' three-dimensional location plan is to be supplied for all infrastructure provided in a road.			
PO13	A013	N/A	No public art is proposed as a part of this	
Development provides public art identified in a neighbourhood plan or park concept plan which: a) is provided commensurate with the status and scale of the proposed development;	Development provides public art identified in a neighbourhood plan or park concept plan which is sited and designed in compliance with the public art standards in the Infrastructure design planning scheme policy.		development.	
b) is sited and designed:				
 as an integrated part of the project design; 				
II. as conceptually relevant to the context of the location;				



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
III. to reflect and respond to the cultural values of the community;IV. to promote local character in a				
planned and informed manner.				
PO14 Development provides signage of buildings and spaces which promote legibility to help users find their way.	 AO14 Development provides public signage: a) at public transport interchanges and stops, key destinations, public spaces, pedestrian linkages and at entries to centre developments; b) which details the location of the key destinations, public spaces and pedestrian linkages in the vicinity, the services available within the development and where they are 	N/A	Public signage is not required as a part of this development.	
	located.			
PO15 Development that provides community facilities which form part of the development is functional, safe, low maintenance, and fit for purpose.	AO15 Development that provides community facilities which form part of the development is designed in compliance with the community facilities standards in the Infrastructure design planning scheme policy.	N/A	No community facilities are proposed as a part of this development.	
PO16 Development provides public toilets which: a) are required as part of a community facility or park;	AO16 Development that provides public toilets is designed and constructed in compliance with the public toilets standards in the Infrastructure design planning scheme policy.	N/A	No public toilets are proposed as a part of this development.	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
 b) are located, designed and constructed to be: i. safe; ii. durable; iii. resistant to vandalism; iv. able to service expected demand; v. fit for purpose. 				
PO17 Development provides bridges, tunnels, elevated structures and water access structures that are designed and constructed using proven methods, materials and technology to provide for:	AO17 Development that provides bridges, tunnels, elevated structures and water access structures is designed and constructed in compliance with the standards in the Infrastructure design	N/A	No bridges, tunnels, elevated structures or water access structures are proposed as a part of the development.	
 a) safe movement of intended users; b) an attractive appearance appropriate to the general surroundings and any adjacent structures; c) functionality and easy maintenance; d) minimal whole-of-life cost; e) longevity; f) current and future services. 	planning scheme policy.			
Note—All bridges and elevated and associated elements must be designed and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.				



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
 PO18 Development provides culverts which are designed and constructed using proven methods, materials and technology to provide for: a) safety; b) an attractive appearance appropriate to the general surroundings; c) functionality and easy maintenance; d) minimal whole-of-life cost; e) longevity; f) future widening; g) current and future services; h) minimal adverse impacts, such as increase in water levels or flow velocities, and significant change of flood patterns. 	AO18 Development that provides culverts is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	N/A	No culverts are proposed as a part of the development.	
Note—All culverts and associated elements are to be designed and certified by a Registered Professional Engineer Queensland in accordance with the applicable design standards.				
PO19 Development provides batters, retaining walls, and seawalls and river walls which	AO19 Development that provides batters, retaining walls, seawalls and river walls is	AO	Batters and retaining walls will be designed and constructed in accordance with the structures standards in the	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
are designed and constructed using proven methods, materials and technology to provide for: a) safety;	designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.		Infrastructure design planning scheme policy.	
 b) an attractive appearance appropriate to the surrounding area; 				
c) easy maintenance;				
d) minimal whole-of-life cost;				
e) longevity;				
f) minimal water seepage.				
Note—All retaining walls and associated elements are to be designed and certified by a Registered Professional Engineer Queensland in accordance with the applicable design standards.				
If for development with a gross floor are	a greater than 1,000m ²			
PO20 Development ensures that construction is managed so that use of public spaces and movement on pedestrian, cyclist and other traffic routes is not unreasonably disrupted and existing landscaping is adequately protected from short- and long-term impacts.	AO20 Development ensures that during construction: a) the ongoing use of adjoining and surrounding parks and public spaces, such as malls and outdoor dining, is not compromised; b) adjoining and surrounding	AO	A construction management plan will be prepared prior to works commencing to ensure that surrounding parks, public spaces and landscaping is protected during construction and that pedestrian, cyclist and vehicular movements can be managed effectively.	
Note—The preparation of a construction	landscaping is protected from			
management plan can assist in	damage;			
demonstrating achievement of this	c) safe, legible, efficient and sufficient			



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
performance outcome. Note—The Transport, access, parking and servicing planning scheme policy provides advice on the management of vehicle parking and deliveries during construction.	pedestrian, cyclist and vehicular accessibility and connectivity to the wider network are maintained.			
 PO21 Development ensures that construction and demolition activities are guided by measures that prevent or minimise adverse impacts including sleep disturbance at a sensitive use, due to noise and dust, including dust from construction vehicles entering and leaving the site. Note—A noise and dust impact management plan prepared in accordance with the Management plans planning scheme policy can assist in demonstrating achievement of this performance outcome. 	 AO21.1 Development ensures that demolition and construction: a) only occur between 6:30am and 6:30pm Monday to Saturday, excluding public holidays; b) do not occur over periods greater than 6 months. AO21.2 Development including construction and demolition does not release dust emissions beyond the boundary of the site. AO21.3 Development construction and demolition does not involve asbestos-containing materials. 	AO	Demolition and construction works will be limited to the approved working hours. Dust will be managed during construction to ensure it is not blown beyond the property boundary.	
PO22 Development ensures that: a) construction and demolition do not result in damage to surrounding	AO22 Development ensures that the nature and scale of construction and demolition do not generate noticeable levels of	AO	Vibration levels will be effectively managed during demolition and construction works.	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
property as a result of vibration; b) vibration levels achieve the vibration criteria in Table 9.4.4.3 B. Table	vibration.			
9.4.4.3.C, Table 9.4.4.3.D and Table 9.4.4.3.E.				
Note—A vibration impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.				
If for a material change of use or reconfig common private title, where involving bu	guring a lot in an urban area (as defined in uildings, either attached or detached, that	the Regulation are not cove	on) involving premises that is, or will be, a red by other legislation mandating fire hy	ccessed by drants
 PO23 Development ensures that fire hydrants are: a) installed and located to enable fire services to access water safely, effectively and efficiently; b) suitably identified so that fire services can locate them at all hours. 	AO23.1 Above or below ground fire hydrants are provided on residential, commercial and industrial streets and private roads, at not more than 90m intervals, and at each street intersection. Note—On residential streets, above ground fire hydrants may be single outlet. On commercial and industrial streets above ground fire hydrants should have dual valved outlets.	AO	Fire hydrants will be provided at no more than 90m spacings and will be identified by marker posts and RRPMs.	
	AO23.2 Fire hydrants are identified by: a) raised reflectorised pavement markers (RRPM) on sealed roads;			



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
	 b) marker posts at the fence line where on an unsealed road, as road (HR) or path (HP) hydrants. 			
PO24 Development ensures road widths and construction within the development, are adequate for refuse vehicles and for fire emergency vehicles to gain access to a safe working area close to buildings and near water supplies whether or not on- street parking spaces are occupied.	AO24 Internal private roads have a minimum roadway clearance between obstructions of 3.5m wide and 4.8m high in addition to any width required for on-street parking.	AO	Internal private roads have been provided with a minimum roadway clearance of 3.5m wide and 4.8m high for fire emergency vehicles to gain access to a safe working area.	
Development for major electricity infrast where not in the Utility services zone pre	ructure and bulk water supply infrastructu cinct of the Special purpose zone	ure identified	d on the State Planning Policy Interactive N	Mapping System
PO25 Development avoids or otherwise minimises adverse impacts on surrounding land uses through the use of buffers and setbacks and the appropriate design and location of plant and operational areas within the site.	AO25 No acceptable outcome is prescribed.	N/A	The development does not involve major electricity infrastructure or bulk water supply infrastructure.	
Development potentially impacting on m Interactive Mapping System where the in	najor electricity infrastructure and bulk wa nfrastructure is not in the Utility services ze	ter supply in one precinct	frastructure identified on the State Planni of the Special purpose zone	ng Policy
PO26 Development is sited and designed to:	AO26 No acceptable outcome is prescribed.	N/A	The development is not located near major electricity infrastructure or bulk	



Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
 a) avoid safety risks to people or property; 			water supply infrastructure.	
 b) minimise noise and visual impacts to people and property; 				
 c) ensure the physical integrity and operation, maintenance and expansion of the infrastructure is not compromised. 				



INERTIA ENGINEERING PTY LTD 5B 85 Hudson Rd, ALBION QLD 4010 P I 07 3857 7868 F I 07 3262 7359 E I info@inertiaeng.com.au

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