

Chief Executive Officer
City of Gold Coast Council
Planning and Environment
PO Box 5042
Gold Coast MC QLD 9729

Arcadis Australia Pacific Pty Limited
Level 7, Seabank Building
12-14 Marine Parade
PO Box 1653
SOUTHPORT QLD 4215
Tel No: +61 7 5532 3933
Fax No: +61 7 5591 4778
arcadis.com

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OPERATIONAL WORKS DEVELOPMENT APPLICATION - TRUNK RESERVOIR CHANGE TO GROUND LEVEL, CLEARING & VEHICULAR CROSS OVER

Dear Sir / Madam,

On behalf of our client please find enclosed the application for Operational Works approval for trunk reservoir change to ground level works, clearing works & vehicular cross-over works.

In support of this application, please refer to the following attachments:

Section 1 - Forms

- State DA Form 1.
- CoGC Application for Operational Works.
- CoGC Engineering Drawing Application Checklist.
- CoGC Application for Approval of Engineering Drawings.

Section 2 - Supporting Documents

- Cover Letter
- CoGC Change to Ground Level – 9.4.1

Section 3 - Plans & Drawings

- Engineering Drawings by Arcadis Australia Pacific Pty Ltd

The Clearing Works, Civil Works and Landscaping Works applications will be submitted under separate submissions for approval with Council.

Payment of the required fee is to be via generated invoice for Coomera GA Pty Ltd ATF The Coomera GA Unit Trust.

We trust this information is satisfactory and await Council's advice at your earliest convenience.

Should you require any further information, please do not hesitate to contact the undersigned of our Gold Coast office.

Yours sincerely,

Arcadis Australia Pacific Pty Ltd
Ashley Shepherd
Civil Engineer
(07) 5503 4808

City Plan code template

This code template supports the preparation of a development application against either the acceptable outcome(s) or performance outcome(s) contained in the code. Development assessment rules are outlined in **Section 5.3.3** of the City Plan.

Please note:

For assessment against the overall outcomes, refer to the appropriate code.

Note: The whole of the planning scheme is identified as the assessment benchmark for impact assessable development. This specifically includes assessment of impact assessable development against this strategic framework. The strategic framework may contain intentions and requirements that are additional to and not necessarily repeated in zone, overlay or other codes. In particular, the performance outcomes in zone codes address only a limited number of aspects, predominantly related to built form. Development that is impact assessable must also be assessed against the overall outcomes of the code as well as the strategic framework.

9.4.1 Change to ground level and creation of new waterways code

9.4.1.1 Application

This code applies to assessing operational work (change to ground level) and bulk earthworks undertaken as part of an operational work (works for infrastructure) application where indicated within **Part 5 Tables of assessment**.

When using this code, reference should be made to **Section 5.3.2** and, where applicable, **Section 5.3.3**, in **Part 5**.

Supporting information is prepared by a suitably-qualified person in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 8 – Engineering drawings, documents and reports** and/or **SC6.10 City Plan policy – Geotechnical stability assessment guidelines**.

9.4.1.2 Purpose

- (1) The purpose of the Change to ground level and creation of new waterways code is to protect the environment from impacts of earthworks and the creation or expansion of waterways.
- (2) The purpose of the code will be achieved through the following overall outcomes:

- (a) Ground level changes are undertaken with geotechnically and ecologically sound practices.

Note: For guidance on how to meet this overall outcome refer to **SC6.10 City Plan policy – Geotechnical stability assessment guideline**.

- (b) Development does not increase the risk of flood damage to life or property.
 - (c) Development does not increase the rate or volume of run-off during a flood.
 - (d) Soil disturbance and development of land containing potential and actual acid sulfate soils does not result in environmental damage.

- (e) Construction phase erosion and sediment controls are implemented to minimise erosion and ensure total suspended solids in receiving waters meet the water quality objectives (*Environmental Protection (Water) Policy 2009*).
- (f) Changes to existing ground levels, including the creation of new waterways do not adversely affect the amenity and landscape values.
- (g) The environment and public safety are protected from impacts arising from the creation or expansion of non-tidal artificial waterways, such as urban lakes.
- (h) Development does not adversely affect the quality of stormwater discharging from the development site.
- (i) The drainage capacity of the Woongoolba Flood Mitigation Scheme Area for rainfall events up to 1 in 10 year, 72 hours is maintained (contained within the Scheme drains within a 4 day period) and this capacity is not eroded due to cumulative impact of development.

9.4.1.3 Specific benchmarks for assessment

PART B – ASSESSABLE DEVELOPMENT BENCHMARKS

Table 9.4.1-1: Change to ground level and creation of new waterways code – for assessable development

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
Finished surface levels			
PO1 The finished surface level is free draining and free from localised flooding.	AO1 Development is free draining and the surface gradient of the fill and/or excavated area is between 0.5% to 1.5%. OR For steep surface gradients, integration with the surrounding topography must be achieved so that the finished profile does not interrupt or materially change the surface water.	AO1 – COMPLIES Refer bulk earthworks drawings provided with the development approval package. The development maintains minimum gradients where required, and in steep areas integrates with surrounding topography.	
Stormwater drainage			
PO2 Development does not cause adverse stormwater drainage impacts on or off the site.	AO2.1 The change to ground level maintains flood conveyance through the site for flood events up to a 1 in 100 (Q100) year Average Recurrence Interval (ARI) storm event using the drainage strategy in accordance with SC6.12 City Plan	N/A No flood conveyance is expected through the site.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
	policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design standards.		
	AO2.2 The change in ground level does not involve fill below the designated flood level, unless approved as part of a development approval for material change of use or reconfiguration of a lot.	N/A Site is not flood affected.	
	AO2.3 The change in ground level does not result in an alteration of overland flows onto other properties or create an increase in flood damage to other properties.	AO2.3 – COMPLIES The design maintains discharge point as per the Stormwater Management Plan prepared by Arcadis, GA0002-30157884-AAR- SBSMP.	
Woongoolba Flood Mitigation Scheme Catchment Area			
P03 In the Woongoolba Flood Mitigation Scheme Catchment Area, shown on the Water catchments and dual supply system area overlay map , peak outflow and its timing for Q2, Q5 and Q10 for rainfall events up to 72 hours does not change as a result of development.	AO3 No acceptable outcome provided.	N/A	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
Stormwater quantity			
PO4 Development ensures that there is no impact on local drainage systems, so that no damage is caused to any property upstream or downstream of the site.	AO4 A site stormwater quantity management plan is prepared by a suitably qualified professional and demonstrates: (a) achievable stormwater quantity control measures for discharge during both the construction and operational phases of development designed in accordance with the <i>Queensland Urban Drainage Manual (QUDM)</i> unless subject to specific requirements of SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design ; and (b) on-site detention systems are designed to restrict peak outflows for Q2, Q5, Q10, Q20 Q50 and Q100 to pre-development conditions. OR A Site Stormwater Quantity Management Plan is consistent with that approved in a related development approval.	N/A	
Erosion and sediment control			
PO5 All construction and operational work is designed and managed with specific regard to the density, scale, layout and staging of development. All reasonable and practicable measures are taken to protect the environmental values of waters and the functionality of stormwater infrastructure from the impacts of erosion, turbidity and sedimentation, on and downstream of	AO5.1 An assessment is undertaken in accordance with the criteria in Table 9.4.1-2: Erosion hazard assessment .	AO5.1 – COMPLIES The proposed development works exceed 11.	
	AO5.2 Where the Erosion hazard assessment has a risk score less than or equal to 10: a deemed-to-comply report is prepared by a suitably qualified person for Council's approval, including conceptual location and design	AO5.2 – COMPLIES Erosion and Sediment Control Plan will be requested to be conditioned to be provided to Council prior to works commencing.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
the development site.	drawings of each treatment measure in plan and section views, in accordance with the criteria within the guidelines entitled: <i>Urban Stormwater Quality Planning Guidelines by the Department of Environment and Heritage Protection</i>. OR Where the Erosion hazard assessment has a risk score <u>greater than 10</u>: an Erosion and Sediment Control Plan (ESCP) is prepared by a suitably qualified person for Council's approval in accordance with the: <i>Best Practice Erosion and Sediment Control International Erosion Control Association (ICEA) 2008, Australasia Chapter 2008</i> detailing the stormwater (quality and flow) treatment measure during the construction phase of development, demonstrating how the minimum design objectives in Table 9.4.1-3 Summary of design objectives for management of stormwater quality – construction phase are achieved including: (a) measures to ensure that the release of sediment-laden stormwater for the nominated design storm are minimised when the design storm is exceeded; (b) detailed design, installation, construction, monitoring and maintenance requirements of all approved proprietary products in accordance with local conditions and manufacturers recommendations; (c) detailing how the ESCP accompanying the Operational work (change to ground level) aligns with the Reconfiguration of lot staging.		
	AO5.3 Where development is on a lot less than 850m²,	N/A	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
	provide an ESCP in accordance with SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design and Section 8 – Engineering drawings, documents and reports .		
	AO5.4 Where development is on a lot equal to or more than 850m ² , provide an ESCP in accordance with SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design and Section 8 – Engineering drawings, documents and reports .	AO5.4 – COMPLIES Refer to response to Item AO5.2	
Hydraulic considerations			
PO6 Any change to the level of the land does not have adverse flooding and drainage impacts.	AO6 An Hydraulic report is prepared by a suitably qualified professional to accord with the Council's hydraulic requirements, demonstrating that the change to the level of the land does not: (a) cause ponding on the site or nearby land; (b) increase flooding which adversely affects the safety or use of any land upstream and downstream; (c) adversely affect the flow of water in any overland flow path, or otherwise.	N/A No overland flow or regional flooding affect the lot.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
Geotechnical fill			
P07 Material used as fill has the ability to adequately support future development of the land.	A07 The fill material type, composition and source is geotechnically suitable and adequately compacted to support future development, in accordance with SC6.12 City Plan policy – Land development guidelines, Section 3 – Change to ground level standards.	A07 – COMPLIES Earthworks will comply with this requirement.	
Geotechnical stability			
P08 All earthworks are carried out in a location which is not at risk from geotechnical instability.	A08 The site is free of compressible soils (e.g. soft clays underneath the site). OR Where the site is underlain by compressible soils, a Geotechnical stability assessment report is prepared by a suitably qualified professional demonstrating the treatment of compressible soils achieves a stable ground able to support future structures.	A08 – COMPLIES Earthworks will comply with this requirement.	
Batters and retaining wall			
P09 Batters and retaining walls do not create a negative visual impact on the area.	A09 Batters and retaining walls are in accordance with SC6.12 City Plan policy – Land development guidelines, Section 3 – Change to ground level standards.	A09 – COMPLIES Landscaping outcomes will be provided to offset the proposed retaining structure amenity.	
Local amenity, noise and emissions			
P010 Change to ground level or bulk earthwork activities do not impact on the amenity of the area.	AO10.1 Development work, which has the potential to generate dust is controlled by: (a) daily water spraying of exposed areas; (b) sealed roads;	AO10.1- COMPLIES Earthworks activities will comply with this requirement.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
	(c) protective covering of exposed areas; and (d) installing wind barriers.		
	AO10.2 All earthworks on the site is undertaken within the following days and hours: Day Hours Monday to Friday between 6:30am and 6:30pm Saturday between 6:30am and 6:30pm	AO10.2 – COMPLIES Earthworks activities will comply with this requirement.	
Managing contamination risk			
PO11 Any filling or excavation material does not result in the contamination of land.	AO11 All fill material is solid clean earth or clean inert material, free of organic, putrescible or refuse matter.	AO11 – COMPLIES Earthworks activities will comply with this requirement.	
Haulage activity and amenity			
PO12 Haulage activities do not impact on the amenity of the area.	AO12.1 Where transportation of fill material to or from the site is involved, the following applies: (a) loads are covered; (b) spilled or wheel-tracked material is immediately cleaned from external roads; and (c) heavy vehicle traffic is controlled.	AO12.1 – COMPLIES Earthworks activities will comply with this requirement.	
	AO12.2 All waste material, including vegetation from the site is disposed of in an approved location.	AO12.2 – COMPLIES Earthworks activities will comply with this requirement.	
	AO12.3 All haulage routes are approved: (a) for declared main roads – by the Department of Transport and Main Roads;	AO12.3 – COMPLIES Earthworks activities will comply with this requirement.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
	(b) for all other roads – by the Council.		
	AO12.4 All haulage to and from the site is conducted within the following days and hours: Day Hours Monday to Friday between 6am and 6pm Saturday between 7am and 6pm	AO12.4 – COMPLIES Earthworks activities will comply with this requirement.	
Created new waterways			
PO13 The waterway contributes to the amenity of the development and the surrounding area.	AO13.1 Created waterways within an Operational work (change to ground level) application are designed and managed for any of the following end-uses: (a) amenity, aesthetics, landscaping or recreation; (b) flood management; (c) stormwater harvesting within an integrated water-cycle management plan; and (d) aquatic habitat.	N/A	
	AO13.2 The end-use of the created waterway is designed and operated to protect water environmental values.	N/A	
PO14 The created waterway location is compatible with the land-use constraints of the site protecting water environmental values in existing natural waterways.	AO14.1 The created waterway within the Operational work (change to ground level) application achieves the following: (a) environmental values in downstream waterways are protected; (b) groundwater recharge areas are not affected; (c) the waterway location incorporates low-lying	N/A	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
	areas of a catchment connected to an existing waterway; and (d) any existing areas of ponded water are included.		
	AO14.2 Created waterways: (a) are located outside natural wetlands, waterways and associated buffer areas; (b) avoid soil or sediment disturbance; and (c) avoid alteration of the natural hydrologic regime in acid sulfate soil and nutrient hazard areas.	N/A	
PO15 The created waterway's location is compatible with existing tidal waterways.	AO15 Where the created waterway is adjacent or connected to a tidal waterway by a weir, lock, pumping system or similar: (a) there is sufficient flushing or a tidal range of >0.3m; OR (b) any tidal flow alteration does not adversely impact on the tidal waterway; OR (c) there is no introduction of salt water into freshwater environments.	N/A	
PO16 Created waterways are designed and managed to support the legislated environmental values and water quality objectives within <i>Environmental Protection (Water) Policy 2009</i> of connected receiving water environments.	AO16.1 The created waterway within the Operational work (change to ground level) application is designed, constructed and managed by a suitably qualified Registered Professional Engineer Queensland (RPEQ) with specific artificial waterway experience.	N/A	
	AO16.2	N/A	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
	The created waterway within the Operational work (change to ground level) application is supported by a Water Quality Management Plan, prepared by a suitably qualified professional, demonstrating the following: (a) water quality of the created waterway is the same or higher standard as the existing water quality; (b) long-term maintenance of the water quality standard is achieved; and (c) breeding potential of biting insects is minimised.		
	AO16.3 The created waterway does not have deep, isolated holes that stratify and increase the possibility of algal blooms occurring.	N/A	
	AO16.4 Pumping from a created waterway to maintain water quality is avoided.	N/A	
	AO16.5 The created waterway is designed with a suitable outlet to ensure that flooding is possible, if required.	N/A	
	AO16.6 Stormwater is treated before any stormwater enters a created waterway.	N/A	
PO17 Operational work does not cause geotechnical bank instability, erosion, bed scour or revetment wall collapse to existing or newly created waterway.	AO17 Edge treatments certified by a suitably qualified person are in place during and post-construction phase to strengthen the embankment and protect from damage.	N/A	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
PO18 The waterway is managed and operated to achieve the water quality objectives (<i>Environmental Protection (Water) Policy 2009</i>) in natural waterways.	AO18.1 Monitoring and maintenance programs manage the waterway to achieve the water quality objectives downstream.	N/A	
	AO18.2 Aquatic weeds are managed to achieve a low percentage (less than 10%) coverage of the water surface area. Pests and vectors are managed by avoiding stagnant water areas, providing for native fish predators, and, if necessary, other best practices for monitoring and treating pests.	N/A	
	AO18.3 The created waterway is managed and operated under agreement by an appropriate entity for the life of the waterway. A Waterway Management Plan is incorporated within the Community Management Statement for the principal body corporate that: (a) identifies the waterway; (b) states the period of responsibility of the entity; (c) states a process for transfer of responsibility for the waterway; (d) states required actions for monitoring water quality of the waterway and receiving waters; (e) states required actions for maintaining the waterway to achieve the policy outcomes of the <i>Environmental Protection (Water) Policy 2009</i> and approval conditions; and (f) identifies funding sources for the above matters including bonds, headworks charges or levies.	N/A	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome	Internal use
Access to new waterways			
PO19 Created waterways are designed to provide maintenance access to revetment walls and cleaning of the waterway.	AO19 Access is provided to the waterways by: (a) dedication of land to the Crown; or (b) existing access arrangements.	N/A	
PO20 Created waterways to be transferred to public ownership are supported by infrastructure to ensure public safety.	AO20 Created waterways are designed to create a safe public asset by including: (a) warning signs; and (b) fenced areas restricting access to steep-sided embankments or large drops.	N/A	

Table 9.4.1-2: Erosion hazard assessment

Controlling factor	Points	Score
Average slope of the whole site prior to operational works		
Slope less than 2%	0	
More than or equal to 2% but less than 5%	1	
More than or equal to 5% but less than 10%	2	
More than or equal to 10% but less than 15%	4	
More than or equal to 15%	5	High Risk
Soil type (to be disturbed)		
Gravels and sandy soils	1	
Sandy loam	2	
Clays on flood plains	3	
Shallow soils on slopes	4	
Clays on slopes greater than 5%/imported fill or untested	5	High Risk
Anticipated duration of site disturbance		
Duration of 2 weeks or less	0	
More than 2 weeks and up to, and including 3 months	2	
More than 3 months and up to, and including 6 months	4	
More than 6 months	5	High Risk
Anticipated erosive rainfall risk during site disturbance		
Low (monthly average rainfall less than 45 mm)	0	
Moderate (monthly average rainfall 46 - 100 mm)	1	
High (monthly average rainfall 101 - 225 mm)	2	
Very high (monthly average rainfall 226 - 1500 mm)	4	
Extreme (monthly average rainfall more than 1500 mm)	5	High Risk

Controlling factor	Points	Score
Off-site sediment control (down-slope of the soil disturbance)		
Score 1 point if there is no purpose-built sediment trap (e.g. sediment basin, gross pollutant trap or purpose-built wetland).	1	
Run-off entering the site		
Score 1 point if stormwater run-off is not diverted from entering the site or away from soil disturbance.	1	
Extent of site disturbance		
Score 2 points if the building works requires reshaping of the ground surface.	2	
Total Score		
Note: High erosion risk - if score 11 or greater, or 5 for any factor.		

This Erosion Hazard Assessment form is adapted from the Best Practice Erosion and Sediment Control, International Erosion Control Association (Australasia), IECA 2008 Appendix H - Building Sites, the Brisbane City Council Erosion Hazard Assessment Form and Attachment 2 to the QDC Draft Part 16 Erosion and Sediment Control.

Table 9.4.1-3: Summary of design objectives for management of stormwater quality – construction phase

Construction phase stormwater design objectives	Notes
Drainage control	
Design life and design storm of temporary drainage works: (1) Disturbed area open for less than 12 months - 1 in 2 ARI. (2) Disturbed area open for 12-24 months - 1 in 5 ARI. (3) Disturbed area open for more than 24 months - 1 in 10 ARI.	• ARI = Average Recurrence Interval (see Engineers Australia document Australian Rainfall and Runoff). • Design capacity excludes minimum 150 mm freeboard. • A higher drainage design objective may be required for temporary drainage structures upslope of occupied properties. • A revised drainage design storm may be required if these design objectives are found to be impracticable (e.g. in North Queensland).
Erosion control	
(1) Minimise exposure of disturbed soils at any time. (2) Avoid or minimise large construction activities in the 'wet season'.	• 'Wet season' means the high rainfall months, e.g. the four highest rainfall months. • For point 4, determine the erosion risk rating

Construction phase stormwater design objectives	Notes
(3) Divert water run-off from undisturbed areas around disturbed areas. (4) Use erosion risk ratings to determine appropriate erosion control measures.	using local rainfall erosivity, rainfall depth, or soil loss rate or other acceptable method. A rating scale such as very low, low, moderate, high, extreme should be applied. Such ratings should reflect the local area. Example ratings may be shown in local council guidelines or detailed in best-practice guidelines.
Sediment control	
(1) Use soil loss rates to determine appropriate sediment control measures. (2) Design storm for sediment control basins should be based on retaining the maximum sediment quantity for the maximum volume of water run-off. (3) Site discharge during sediment basin dewatering should not exceed 50 mg/L TSS and pH between 6.5 - 8.5.	- For point 1, surrogate determinations may be used such as monthly erosion or average monthly rainfall. - For point 2, a commonly used design storm for basin sizing is 80th percentile five-day event. Depending on the settling characteristics of local soils, a higher 'operational' design storm can be achieved with chemical dosing operated in flow-through mode in a large storm with rainfall-activated auto-flocculent dosing, and advanced hydraulic efficiency features such as floating off-takes, and a sediment forebay. - For point 3, TSS = Total Suspended Solids. Turbidity measurements (e.g. 60 Nephelometric Turbidity Units (NTU)) could be used; however, for accuracy, a site-specific relationship should be developed between turbidity and TSS.