

Proposed Reconfiguration of Lot

490 Beams Road, Fitzgibbon

Conceptual Stormwater Management Plan

Partners in Property Development Management Pty Ltd

21 April 2026

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

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EXECUTIVE SUMMARY

ADG Engineers (Aust.) Pty Ltd has been engaged by Partners in Property Development Management Pty Ltd to prepare a Conceptual Stormwater Management Plan suitable for submission to Economic Development Queensland as additional information in support of a Development Application for a proposed Reconfiguration of Lot for a site located on Lot 4 on RP80282, 490 Beams Road, Fitzgibbon.

The proposed development as described on the ADG Overall Layout Plan and Reconfiguration Of A Lot Plan by Therefore Group is for a three (3) lot development with a shared access driveway over a site of approximately 3.557 hectares. Following transport corridor resumptions, the site will be reduced in area to 2.395 hectares.

This report comprises stormwater quantity and quality advice to identify the need for on-site stormwater detention and treatment measures for the subdivision of the land only and associated infrastructure to support the subdivision. This Conceptual Stormwater Management Plan does not consider the final development on each of the proposed lots. As each of the lots is developed, a further Stormwater Management Plan addressing quantity and quality will be required with the Material Change of Use application for each of the lots.

The stormwater quantity objective is to demonstrate that the peak discharge to the lawful point of discharge from the site does not exceed permissible limits. This considered for storm events from the 39% AEP (1 in 2-year ARI) up to and including the 1% AEP (1 in 100-year ARI) storm event. The purpose is to ensure that the existing infrastructure and/or downstream properties are not adversely affected. It has been determined that following the reconfiguration of a lot the peak discharge to Beams Road is reduced and that there is no need to mitigate site discharge. It is also noted that the overall site discharge has decreased, meaning there is a net decrease in peak flow discharge from the site to the downstream Cabbage Tree Creek. Flows to the rail corridor are to be slightly increased due to the resumption of land along the south-west boundary of the site to facilitate the Northern Busway. It is proposed that this catchment will continue to discharge to the rail corridor via sheet flow, in accordance with the nature of the existing case in order to avoid burdening Queensland Rail with maintenance of a detention basin and concentration of catchment discharge, which are considered to be poor outcomes. It is not expected that there will be adverse impacts due to this increase and it is expected that the works associated with the future Northern Busway will account for mitigation of this minor increase in flow. This outcome was accepted for the previous EDQ approval over the site (EDQ Ref: DEV2020/1103).

In addition to the stormwater quantity assessment, the report includes a summary of the modelled water quality results. Water Sensitive Urban Design (WSUD) features have been included in the design to achieve the water quality objectives for South East Queensland specified in the State Planning Policy 2017 (SPP), namely, the removal of gross pollutants, suspended solids, nitrogen and phosphorus to target reduction levels. ADG recommends the use of the following devices to meet the water quality objectives identified within the SPP:

- ▶ A minimum of 1x Oceanprotect 690mm PSorb StormFilter cartridges located with a 1.0m² treatment tank; and
- ▶ A minimum of 1x OceanProtect OceanGuard units (to be fitted in all inlets discharging to the proposed treatment tank).

The stormwater quality treatment measures focus on the proposed common property area only and as noted above, further Stormwater Management Plans addressing the water quality objectives on each lot and complying with the requirements of the of all relevant authorities will be prepared with each subsequent Material Change of Use application.

All relevant standards and guidelines are addressed in this Conceptual Stormwater Management Plan including criteria from:

- Brisbane City Council Planning Scheme Policies;
- State Planning Policy (2017);
- Queensland Urban Drainage Manual (2017);
- Plumbing and drainage code AS 3500.3; and
- Australian Rainfall and Runoff Guide.

1 INTRODUCTION

1.1 General

ADG Engineers (Aust.) Pty Ltd has been engaged by Partners in Property Development Management Pty Ltd to prepare a Conceptual Stormwater Management Plan (CSMP) suitable for submission to Economic Development Queensland (EDQ) as additional information in support of a Development Application for a proposed Reconfiguration of Lot (ROL) for a site located on Lot 4 on RP80282, 490 Beams Road, Fitzgibbon, herein described as 'the site'. Although located in the Brisbane Council Local Government Area, the site is within the Fitzgibbon Priority Development Area (PDA) and hence why the application is assessed by EDQ.

The proposed development as described on the ADG Overall Layout Plan and Reconfiguration Of A Lot Plan by Therefore Group is for a three (3) lot development with a shared access driveway over a site of approximately 3.557 hectares. Following transport corridor resumptions, the site will be reduced in area to 2.395 hectares.

The purpose of this CSMP is to provide advice as to the development proposal as detailed in the Overall Layout Plan and Reconfiguration of a Lot Plan in Appendix B. The works described herein are subject to further approvals and cover works required to service the proposed development with regards to stormwater management. Detailed design of the stormwater system will be subject to final co-ordination requirements to be advised by the civil engineering consultant at operational works stage.

The stormwater quality treatment measures focus on the proposed common property area only and as noted above, further Stormwater Management Plans addressing the water quality objectives on each lot and complying with the requirements of the of all relevant authorities will be prepared with each subsequent Material Change of Use application.

The required infrastructure will be subject to the conditions attached to the development approval to be provided by EDQ and any nominated referral agencies.

1.2 Background

This report was compiled using information from the following sources:

- Site Survey prepared by Lawson Surveys (Refer to Appendix A);
- Overall Layout Plan and Reconfiguration of a Lot Plan by ADG Engineers (Refer to Appendix B);
- BCC eBimap2 records (Refer to Appendix E); and
- Aerial Imagery.

1.3 Property Detail

Although located in the Brisbane Council Local Government Area, the site is within the Fitzgibbon Priority Development Area (PDA) and hence why the application is assessed by EDQ. The site is bound by Beams Road to the north, Golden Place to the east, which services a low-medium density residential development (relocatable home park) to the east and the Caboolture railway line to the south-west. The land titles that make up the site are given in Table 1. Figure 1 displays the locality of the site.

Table 1 – Summary of Existing Land Title

Title Details	Lot 4 on RP80282
Street Address	490 Beams Road, Fitzgibbon QLD 4018
Site Area	35,576m ²
Developable Site Area	23,949m ² (After transport corridor resumptions)

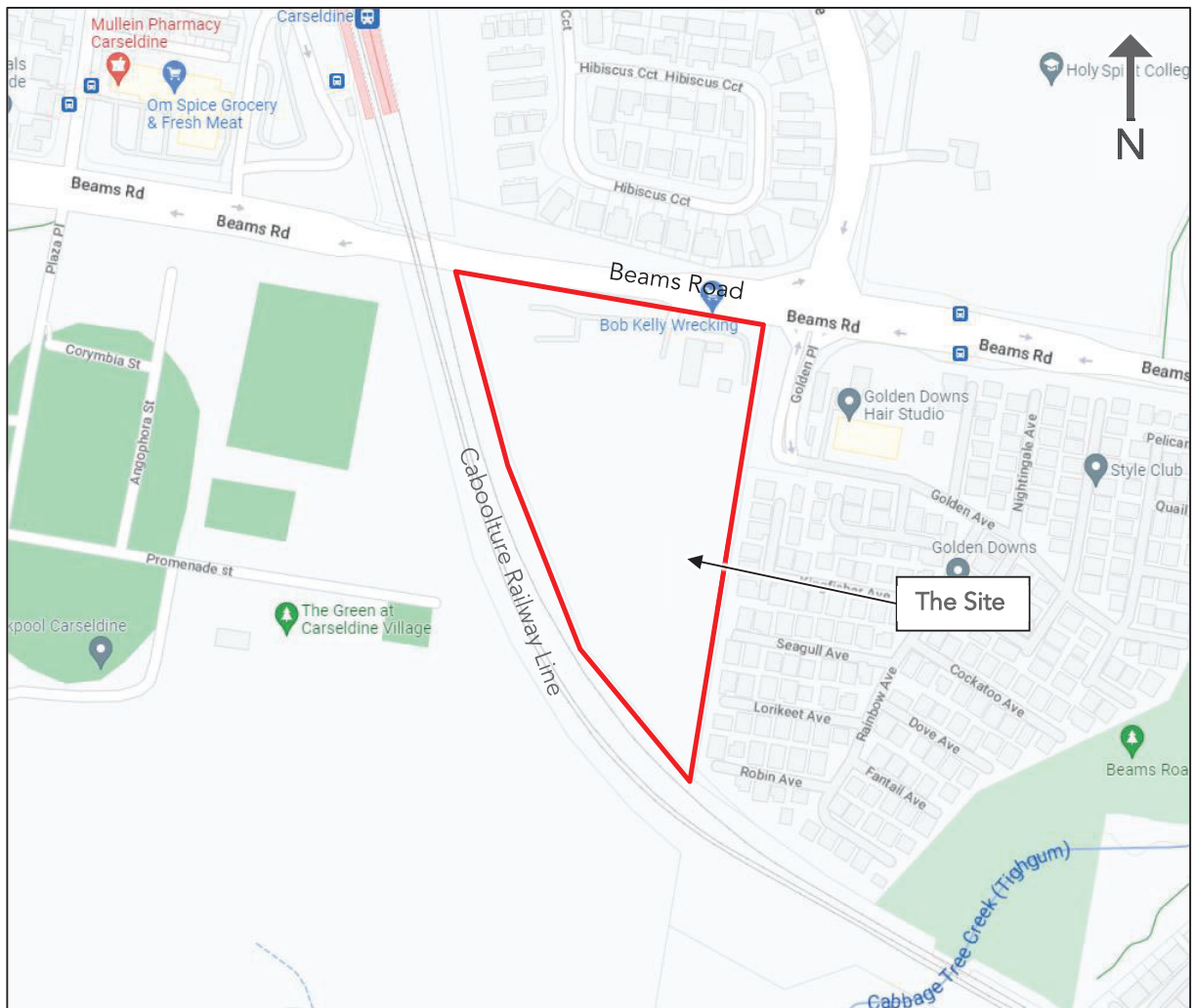


Figure 1 – Site Locality (Accessed on 03.03.2023 from Google Maps)

1.4 Existing Site Features

The site is located at 490 Beams Road, Fitzgibbon. Although located in the Brisbane Council Local Government Area, the site is within the Fitzgibbon Priority Development Area (PDA) and hence why the application is assessed by EDQ.

The pre-developed site is mostly pervious with trees along the south-western boundary, vehicular tracks laid out in a grid pattern through the centre and grass covering the remaining areas, facilitating its use as a car wreckers yard. It is currently occupied by a shed, carport and awning to the north-east corner of the site, and a security fence line that runs along the boundary of the entire site. Cabbage Tree Creek is the closest downstream waterway and is located approximately 400m to the east of the site. The pre-developed condition of the site is shown below in Figure 2.

The pre-developed site is relatively flat and predominantly slopes from south to north with grades in the order of 0.5% to 1.2%. The existing site is approximately 3.557 hectares in size, however following road and rail resumptions the site will be reduced in area to 2.395 hectares in the post developed case.

For further information regarding the existing features of the site please refer to the site survey provided by Lawson Surveys located in Appendix A.

1.5 Existing Stormwater Infrastructure

BCC overlay mapping from eBIMAP2 records in addition to the site survey have identified the following stormwater infrastructure within the vicinity of the site:

- ▶ A gully pit is located near the north-eastern corner of the site along Beams Road. This gully pit collects and conveys runoff via a DN375 pipe to a manhole within the verge at the Beams Road and Golden place intersection.
- ▶ An approximately 1m wide concrete swale drain is located adjacent to the site boundary within the neighbouring lot to the east and continues along the Golden Place road reserve. This concrete swale drain conveys flow to a headwall within the verge at the Beams Road and Golden place intersection. This headwall collects and conveys flows to the abovementioned manhole.
- ▶ From the abovementioned manhole, flows are conveyed east along Beams Road by a DN900 pipe, which enlarges to DN1050, then DN1220, and ultimately discharges into Cabbage Tree Creek.
- ▶ A gully pit is located on the western side of Golden Place, near the intersection with Beams Road. This gully pit collects and conveys runoff via a DN300 pipe, to the abovementioned DN1050 pipe along Beams Road.

Refer to the site survey in Appendix A, site photos in Appendix G and eBIMAP2 records in Appendix E for further information regarding the existing stormwater infrastructure.

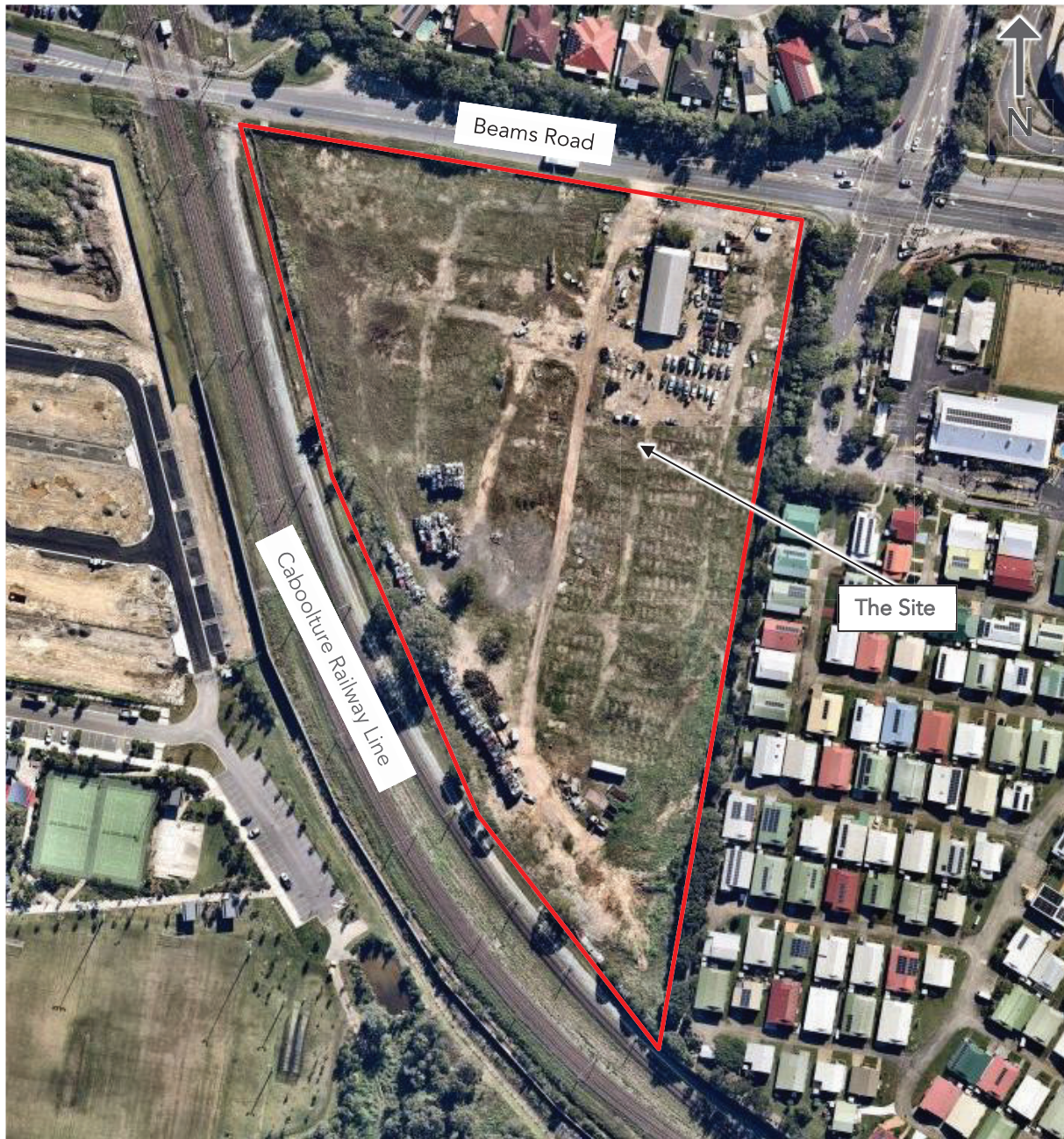


Figure 2 – Existing Site Features (Nearmap Image dated 06.06.2022)

2 PROPOSED DEVELOPMENT

The proposed development as described on the ADG Overall Layout Plan and Reconfiguration Of A Lot Plan in Appendix B is for a three (3) lot development with a shared access driveway over a site of approximately 3.557 hectares. Following transport corridor resumptions, the site will be reduced in area to 2.395 hectares.

2.1 Contributing Catchment Area

The pre-developed site has been separated into three (3) catchments;

- The developable site area;
- The balance of the pre-developed lot that falls to beams road in the north; and
- The balance of the pre-developed lot that falls to beams road in the south.

These catchments are summarised in Table 2 and shown on the Pre-Development Catchment Plan DA09 in Appendix C.

Table 2 – Pre-developed site catchments

Catchment Description	Catchment	Plan Area (ha)	Fraction Impervious *
Developable Site Area	EX1	2.395 ha	12% Impervious 12% Semi-pervious
Beams Road Resumption	EX2	0.451 ha	4% Impervious 14% Semi-pervious
Northern Busway Resumption	EX3	0.711 ha	4% Semi-pervious

* For details of impervious, semi-pervious and impervious area assumptions, refer to Section 3.2.1.

The post-developed site has been separated into three (3) catchments in the same manner as the pre-developed site, though the catchment boundaries shift post-development. These post-developed catchments are summarised in Table 3 and shown on the Post-Development Catchment Plan DA10 in Appendix C.

Table 3 – Post-developed site catchments

Catchment Description	Catchment	Land Use	Plan Area	Fraction Impervious *
Common Driveway Area	C1A	Hardstand Area	0.035 ha	100%
		Pervious Landscape Area	0.044 ha	0%
		Impervious Road Area	0.075 ha	100%
Lot Areas	C1B	Pervious Landscape Area	2.219 ha	0%
Total Developable Site Area	TOTAL C1		2.373 ha	5%
Beams Road Resumption	C2	Pervious Landscape Area	0.401 ha	0%
Northern Busway Resumption	C3	Pervious Landscape Area	0.783 ha	0%

* For details of impervious, semi-pervious and impervious area assumptions, refer to Section 3.2.1.

2.2 Flooding Considerations

A review of the creek/waterway flood planning area overlay map within the BCC eBimap2 records and the BCC Floodwise Property Report has identified the site is affected by flooding. The flooding across the site is shown on the BCC creek/waterway flood planning area map as corresponding to creek / waterway flood planning area 5. This is derived from Cabbage Tree Creek to the east of the site, where the 1% AEP level to be considered is 12.8m AHD.

It is proposed that earthworks are to be undertaken to elevate the proposed lots above the 1% AEP level plus freeboard requirements as outlined in the BCC and State codes, as presented and responded to in Appendix I. As the site is within creek / waterway flood planning area 5 no compensatory flood storage is required.

Refer to the BCC mapped Creek – Waterway Flood Planning area and the BCC Floodwise Property Report in Appendix F for further information.

2.3 External Catchments

No external catchments have been identified to act on the site.

2.4 Lawful Points of Discharge (LPD)

As described in Section 2.1, there are two Lawful Points of Discharge (LPD) for the site; the infrastructure in Beams Road and the Rail corridor to the south. It is proposed that this will remain unchanged in the post-development case. Refer to the preliminary civil drawings DA09 and DA10 prepared by ADG in Appendix C for further information.

3 STORMWATER QUANTITY ASSESSMENT

The aim of the stormwater quantity assessment is to ensure that the development shall impose no adverse effects on downstream properties or receiving water bodies and that the conveyance of flows will be in a safe manner with minimal risk of human endangerment as well as the following objectives:

- Address the need for stormwater quantity control measures;
- Ensure there is no increase in peak discharges to the LPD from the site for events from a 39% AEP (1 in 2-year ARI) event up to and including the 1% AEP (1 in 100-year ARI) event; and
- Ensure proposed quantity control measures detain and convey flows in accordance with QUDM (2017) minimum freeboard recommendations.

3.1 Proposed Development and Associated Issues

As noted in Table 2, the existing site is estimated to be 72% pervious, and as noted in Table 3, the developable area subject to the initial ROL only is approximately 95% pervious. Given there has been a decrease in pervious area across the site from pre to post-development for the ROL it is anticipated that there will be a decrease in peak site discharge as a result of the proposed development. This is corroborated by modelling in Section 3.2.4

The reconfiguration of catchment boundaries as a result of the proposed transport corridor resumptions results in an increase in the size of the catchment that falls south-west to the rail corridor. As noted in Table 4 this is predicted to result in an increase in flow predominantly in the order of 5% for larger events, with larger variation in smaller events. Mitigating these flows through the use of a detention basin would result in a maintenance burden on Queensland Rail and concentration of catchment discharge, which is considered to be a poor outcome. The creation of easements to drain a portion of Catchment C3 through the site is also considered a poor outcome, due to the need for extensive easements. It is anticipated that future works for the Northern Busway will accommodate this catchment.

No development is proposed in Catchment C2, which corresponds to the Beams Road resumption, and as such no further consideration of this catchment is required with regard to stormwater management.

The stormwater quality treatment measures focus on the proposed common property area only and as noted above, further Stormwater Management Plans addressing the water quality objectives on each lot and complying with the requirements of the of all relevant authorities will be prepared with each subsequent Material Change of Use application.

3.2 Stormwater Quantity Modelling – XP-STORM

An XP-STORM Hydraulic and Runoff model was created to analyse the pre- and post-developed scenarios. The model includes a typical node-link connectivity identifying the catchments and hydraulic parameters. The proposed model was designed to mitigate post-development peak discharge to match pre-developed rates.

The ARR Storm Generator was used based on the site coordinates to run all design storm events for events from the 10-minute storm to the 12-hour storm events. Longer duration storms were not considered due to the size of the site.

3.2.1 XP-Modelling Assumptions and Methodology

The following modelling assumptions were used to create the XP-STORM Models:

- Laurenson's method was used for catchment routing with an 'n' value of -0.285 and 'B' value

calculated by XP-STORM.

Infiltration was modelled as 'uniform loss' with the following parameters:

- Impervious Areas
 - Initial loss of 1.0mm;
 - Continuing loss of 0.1mm/hr; and
 - Appropriate Manning's 'n' to suit the surface.
- Semi-Pervious Areas
 - Initial loss of 10.0mm;
 - Continuing loss of 1.0mm/hr; and
 - Appropriate Manning's 'n' to suit the surface.
- Pervious Areas
 - Initial loss of 20.0mm;
 - Continuing loss of 2.2mm/hr; and
 - Appropriate Manning's 'n' to suit the surface.

Note: The initial losses provided by the AR&R storm generator for the site coordinates was just 13mm. As noted in the modelling assumptions discussed in Section 3.2.1 these losses were increased to 20mm, which is likely to be a better estimate given the good grass-coverage across the site.

Four (4) separate catchments were generated for modelling, which were:

- Pre-Development Catchments EX1 and EX3, (model node IDs 'EX1' and 'EX3'); and
- Post-Development Catchment C1 and C3 (model node ID 'C1' and 'C3').
- Catchments EX2 and C2 was not modelled, as there is no proposed modification to catchment boundaries pre to post-development and the catchment falls outside the developable area.
 - Each node included runoff sub-catchments stimulating the contributing areas;
 - Catchment areas were split into sub-catchments of impervious, semi-pervious and pervious areas; and
 - The models were run through all storms from 10-minute to 12-hour durations for all AR&R 2016 generated storms to determine the critical mean storm events for each duration and AEP.

3.2.2 Pre-Development Case Model

The pre-development scenario model consisted of a node representing the pre-developed developable site area. Sub-catchments were assigned to this node with different surface conditions, representing the different surfaces across the pre-developed site; pervious, semi-pervious, impervious roof and impervious road/ground. Refer to the Pre-Development Catchment Plan DA09 in Appendix C for further information regarding the modelled pre-developed catchments.

3.2.3 Post-Development Case Model

The post-development scenario model consisted of a node representing the post-developed developable site area. Sub-catchments were assigned to this node with different surface conditions, representing the different surfaces across the pre-developed site; pervious and impervious road/ground. Refer to the Post-

Development Catchment Plan DA10 in Appendix C for further information regarding the modelled post-developed catchments.

3.2.4 Comparison of Modelled Peak Site Discharge

A comparison between the peak discharge values between each of the XP-STORM modelled scenarios is presented in Table 4.

Table 4 – XP-STORM Modelling Peak Storm Results

Design Storm (AEP)	'EX1' Flows (m³/s)	C1 Flows (m³/s)	Flow change (m³/s)	'EX3' Flows (m³/s)	'C3' Flows (m³/s)	Flow change (m³/s)
39%	0.216	0.201	-0.015	0.071	0.074	0.003
20%	0.300	0.289	-0.011	0.104	0.114	0.010
10%	0.392	0.356	-0.036	0.145	0.148	0.003
5%	0.500	0.455	-0.045	0.179	0.189	0.010
2%	0.602	0.574	-0.028	0.202	0.219	0.017
1%	0.697	0.668	-0.029	0.238	0.256	0.018

It was determined that the proposed development works resulted in a reduction in site discharge to Beams Road. For further details of the XP-Storm model outputs, refer to Appendix D.

3.3 Recommendation

The results of the hydraulic modelling shown in Table 4 has demonstrated that Catchment C1 of the proposed ROL and creation of the driveway will not cause a worsening impact downstream of the site in the 39% AEP (2-year ARI) to 1% AEP (100-year ARI) storm events. It is also noted that the overall site discharge has decreased, meaning there is a net decrease in peak flow discharge from the site to the downstream Cabbage Tree Creek. Therefore, on-site detention will not be required.

The stormwater quality treatment measures focus on the proposed common property area only and as noted above, further Stormwater Management Plans addressing the water quality objectives on each lot and complying with the requirements of the of all relevant authorities will be prepared with each subsequent Material Change of Use application.

As discussed in Section 3.1, due to the resumption of land for the northern busway along the south-western edge of the site results in a larger catchment being directed towards the existing rail corridor in the post-developed case than in the pre-developed case. This is shown in Table 4 to result in an increase in flow predominantly in the order of 5%. It is anticipated that future works for the Northern Busway will accommodate this catchment and account for the minor increase in flows via mitigation with future development works. Mitigating these flows through the use of a detention basin would result in a maintenance burden on Queensland Rail and concentration of catchment discharge, which is considered to be a poor outcome. The creation of easements to drain a portion of Catchment C3 through the site is also considered a poor outcome, due to the need for extensive easements.

Subsequently, it is proposed that Catchment C3 will continue to discharge to the rail corridor via sheet flow, in accordance with the nature of the existing Catchment EX3, meaning flows will not be artificially concentrated or result in a perceivable nuisance. It is not expected that there will be adverse impacts due to this increase and it is expected that the works associated with the future Northern Busway will account for mitigation of this minor increase in flow.

4 STORMWATER QUALITY ASSESSMENT

4.1 Treatment Objectives

This assessment identifies issues relating to stormwater runoff quality and assesses possible methods of treatment if required. The aim of this section of the report is to determine practical approaches to achieving improvements in the quality of the stormwater run-off from the site that can be readily implemented.

The SPP proposes criteria which apply to 'high-risk' development for stormwater. The criteria include one or more of the following:

- A Material Change of Use (MCU) for an urban purpose which involves greater than 2,500m² of land that:
 - will result in an impervious area greater than 25% of the net developable area; or
 - will result in six (6) or more dwellings
- A Reconfiguration of a Lot (ROL) for urban purposes that involves a land area greater than 2,500m² and will result in six (6) or more lots; or
- Operational works for urban purposes that involve disturbing more than 2,500m² of land.

The proposal includes operational works for urban purposes that involve disturbing more than 2,500m² of land. Hence, the development is classed as 'high risk' for water quality and the SPP applies.

The SPP suggests the development aims to:

- Avoid or otherwise minimises adverse impacts on the environmental values of receiving waters, arising from:
 - Altered stormwater quality or flows;
 - Wastewater (other than contaminated stormwater and sewage);
 - The creation or expansion of non-tidal artificial waterways; and
 - Demonstrate compliance with the SPP code - Water quality (Appendix 3).

Appendix 3 (Table B) of SPP suggests 'Post Construction Phase – Stormwater Management Design Objectives' as:

Table 5 - South East Queensland (SEQ) Targets

Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)	Gross Pollutants >5mm
80% Removal	60% Removal	45% Removal	90% Removal

The objective is to provide the following:

- Nitrogen and Phosphorous removal
- Gross Pollutant and Suspended Solids Removal
- All of the site's impervious areas discharge to suitable treatment device/s

- Treatment device selection criteria are to be in accordance with Industry Best Practice and, WSUD Engineering Guidelines
- Provide engineering diagrams of the stormwater quality treatment of the proposed development

4.2 Erosion and Sediment Control

4.2.1 Erosion Hazard Assessment

The erosion risk has been assessed against the BCC Erosion hazard guidelines and found to be 'Medium' risk. Refer to the Erosion Hazard Form attached in Appendix J.

4.2.2 Pre-Development Phase

Prior to construction commencing, the following erosion and sediment control measures will need to be installed around the subject site to minimise disturbance and ensure the quality of runoff discharging from the site is of an acceptable standard:

- Sediment barriers to be installed on all entrances to downstream stormwater infrastructure (i.e. gully pits);
- Designation of transport routes through the site to minimise vegetation disturbance;
- Maximise retention of existing vegetation to reduce soil disturbance and provide filter strip treatment for runoff;
- Install construction entry and exit shakedown areas;
- Sediment fences are to be installed on the downstream boundaries of the subject site; and
- Install dust control measures as required.

All erosion and sediment control measures are to be designed and installed in accordance with IECA Guidelines. Further details regarding the proposed erosion and sediment control measures will be provided during the detailed design phase of the development.

4.2.3 Bulk Earthworks Phase

During the bulk earthworks phase, the following erosion and sediment control measure will need to be installed in addition to the aforementioned measures (Pre-Development Phase) to ensure there is minimal disturbance to downstream receiving water bodies:

- Construction chutes to control runoff over earthworks batters;
- Construction of temporary bunds at the top of all earthworks batters to ensure runoff is directed away from exposed batters;
- Sediment basins to be constructed at low points within each stage of the proposed development;
- Construction of temporary diversion drains to divert water to sediment basins and around any stockpiles;
- Sediment fences to be installed on the downstream side of any stockpiles; and

- Stabilisation of all batters upon reaching the finished earthworks levels.

All erosion and sediment control measures are to be designed and installed in accordance with IECA Guidelines. Further details regarding the proposed erosion and sediment control measures will be provided during the detailed design phase of the development.

4.2.4 Construction Phase

During the construction phase of the development, there is a risk of sedimentation transport due to large areas of disturbed land. The following erosion and sediment control measure will need to be installed in addition to the aforementioned measures (Pre-Development and Bulk Earthworks Phases) to ensure there is minimal disturbance and the quality of runoff is maintained to an acceptable standard:

- Construction of temporary diversion drains to divert water to sediment basins;
- Construction of temporary diversion drains to divert water to protect bioretention and treatment devices as required;
- Sediment barriers to be installed on all entrances to newly constructed stormwater infrastructure (i.e. gully pits);
- Sediment fences to be installed on the downstream side of any stockpiles and batters; and
- Re-vegetation of all disturbed areas within two (2) weeks of completion.

All erosion and sediment control measures are to be designed and installed in accordance with IECA Guidelines. Further details regarding the proposed erosion and sediment control measures will be provided during the detailed design phase of the development.

4.2.5 Maintenance

All erosion and sediment control devices are to be maintained through the entire phase of the development leading up to the operational phase. Erosion and sediment control devices will need to be monitored closely throughout the entire project to ensure they are operating correctly and efficiently. No erosion and sediment control devices are to be removed unless otherwise authorised by a suitably qualified engineer or the site superintendent.

4.3 Operational Phase Treatment

During the operational phase, it is proposed to have the common property area associated with the driveway drain through a *Stormfilter* device before discharging to Beams Road.

Internal stormwater drainage shall be designed and constructed in accordance with AS3500.3 and all other relevant standards and guidelines.

4.4 Stormwater Quality Improvement Devices (SQIDs)

The proposed stormwater quality treatment measures for the development will consist of:

- A minimum of 1x Oceanprotect 690mm PSorb StormFilter cartridges located with a 1.0m² treatment tank; and
- A minimum of 1x OceanProtect OceanGuard units (to be fitted in all inlets discharging to the proposed treatment tank).

4.5 MUSIC Model

Stormwater run-off from the site was modelled using MUSIC (version 6.3.0) and used to measure compliance with the water quality objectives for South East Queensland specified in the SPP of 80% TSS reduction, 60% TP reduction, 45% TN reduction, and 90% Gross Pollutants reduction.

The results of the above MUSIC model are shown in Figure 3 to be compliant with the requirements of BCC and the SPP. Details of the MUSIC model are attached with in Appendix H for further information.

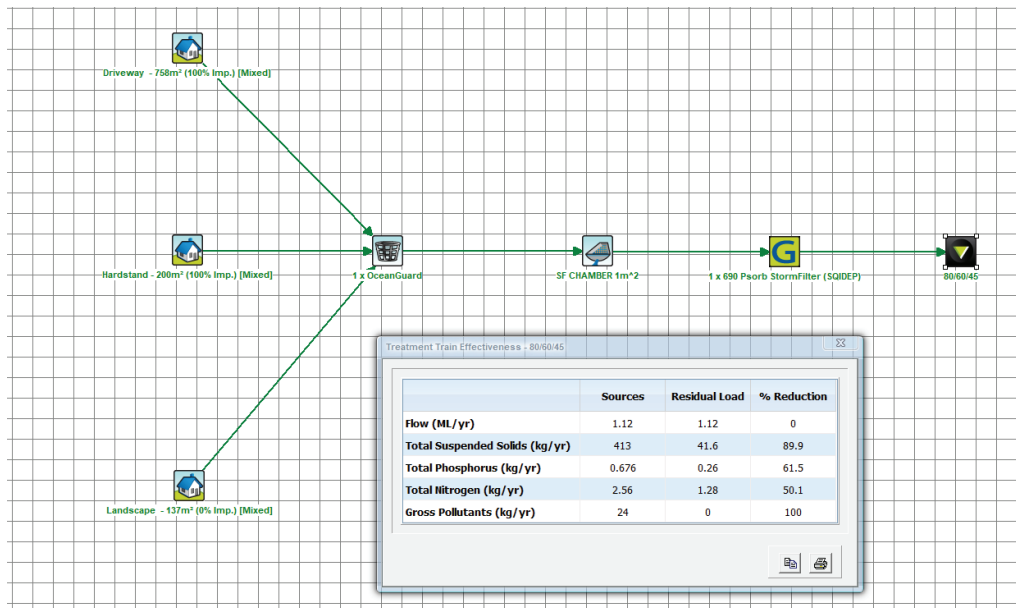


Figure 3 - Treatment Train and Results

4.6 On-site Treatment Lifecycle Costs

A lifecycle cost analysis is not a part of the scope of this report. All the recommended water quality treatment infrastructure lies within the development site and all maintenance and servicing shall be the responsibility of the owners of the development at no cost to Council.

4.7 Water Quality Monitoring

No water quality monitoring is proposed for this development at this stage due to the nature of the development and the expected pollutant levels. This would not be considered a high risk source.

4.8 Maintenance

Maintenance of the SQIDs will be the responsibility of the owners of the development. The maintenance should be carried out in accordance with the manufacturer's recommendations.

5 CONCLUSION

Detailed design is to address the above water quality and quantity recommendations. In preparing this report, we have achieved all requirements for Conceptual Stormwater Management Plans as described in QUDM standards, as well as the SPP and Brisbane City Council standards.

The proposed development is not anticipated to result in any noticeable nuisance and no on-site detention is proposed to manage peak site discharge.

The proposed stormwater quality treatment measures for the development will consist of:

- ▶ A minimum of 1x Oceanprotect 690mm PSorb StormFilter cartridges located with a 1.0m² treatment tank; and
- ▶ A minimum of 1x OceanProtect OceanGuard units (to be fitted in all inlets discharging to the proposed treatment tank).

This report considers development of the site only so far as the provision of servicing infrastructure and makes no allowance for the development of each proposed lot, which will each be required to submit a separate Stormwater Management Plan and comply with the requirements of the of all relevant authorities at the time of development.

Appendix A Site Survey

Appendix B

Proposed Development Plans

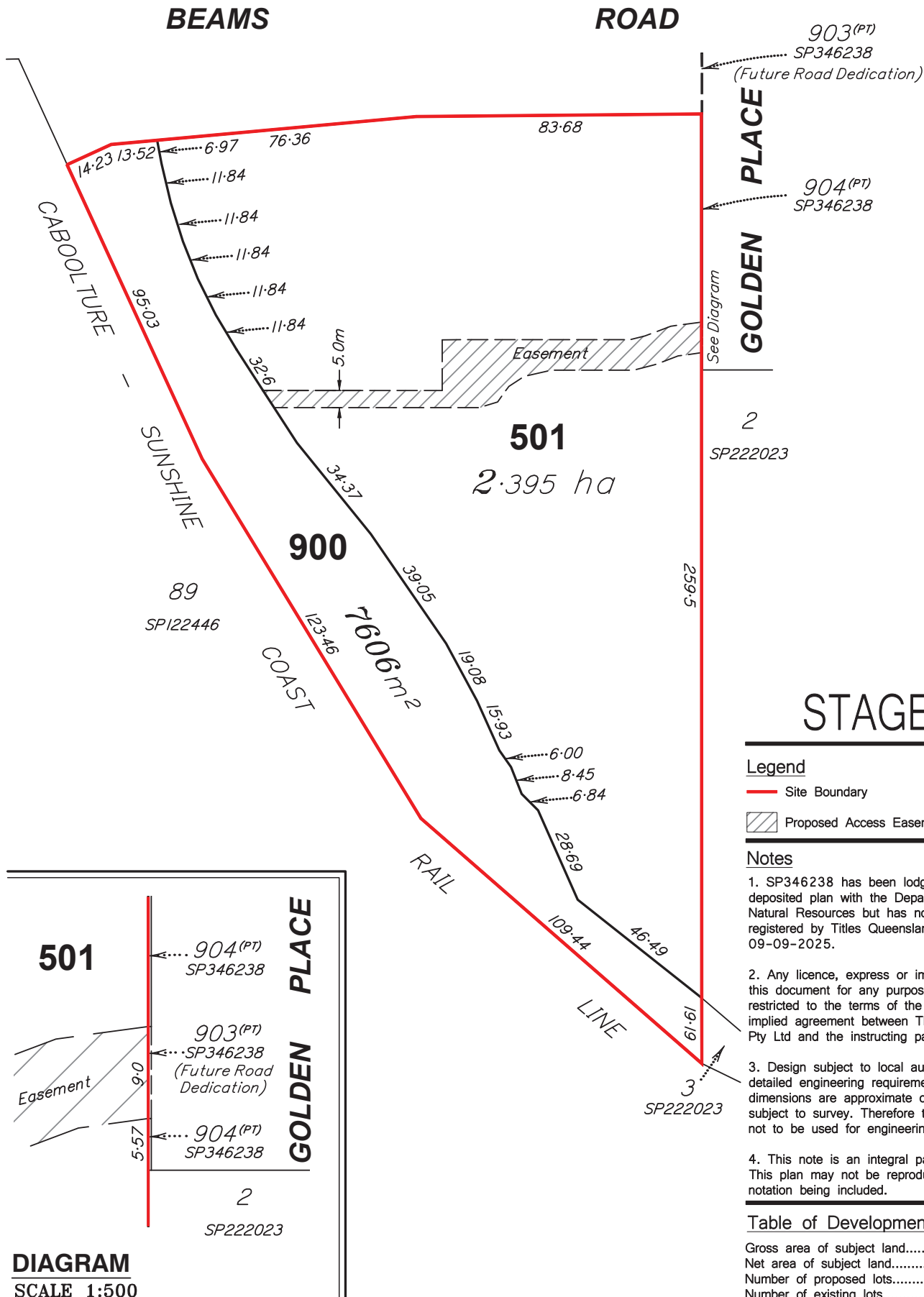


DIAGRAM
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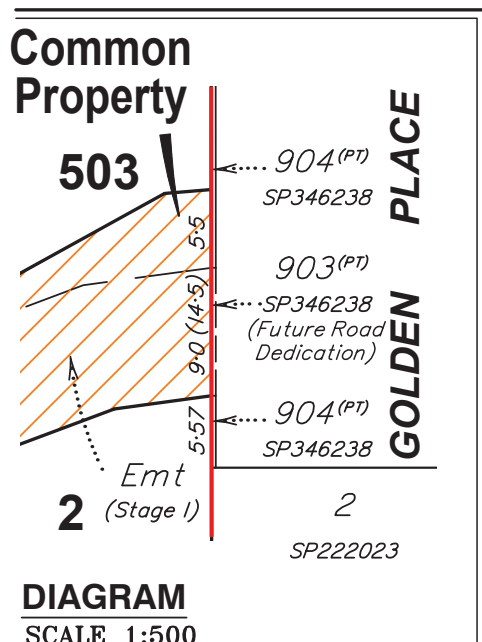
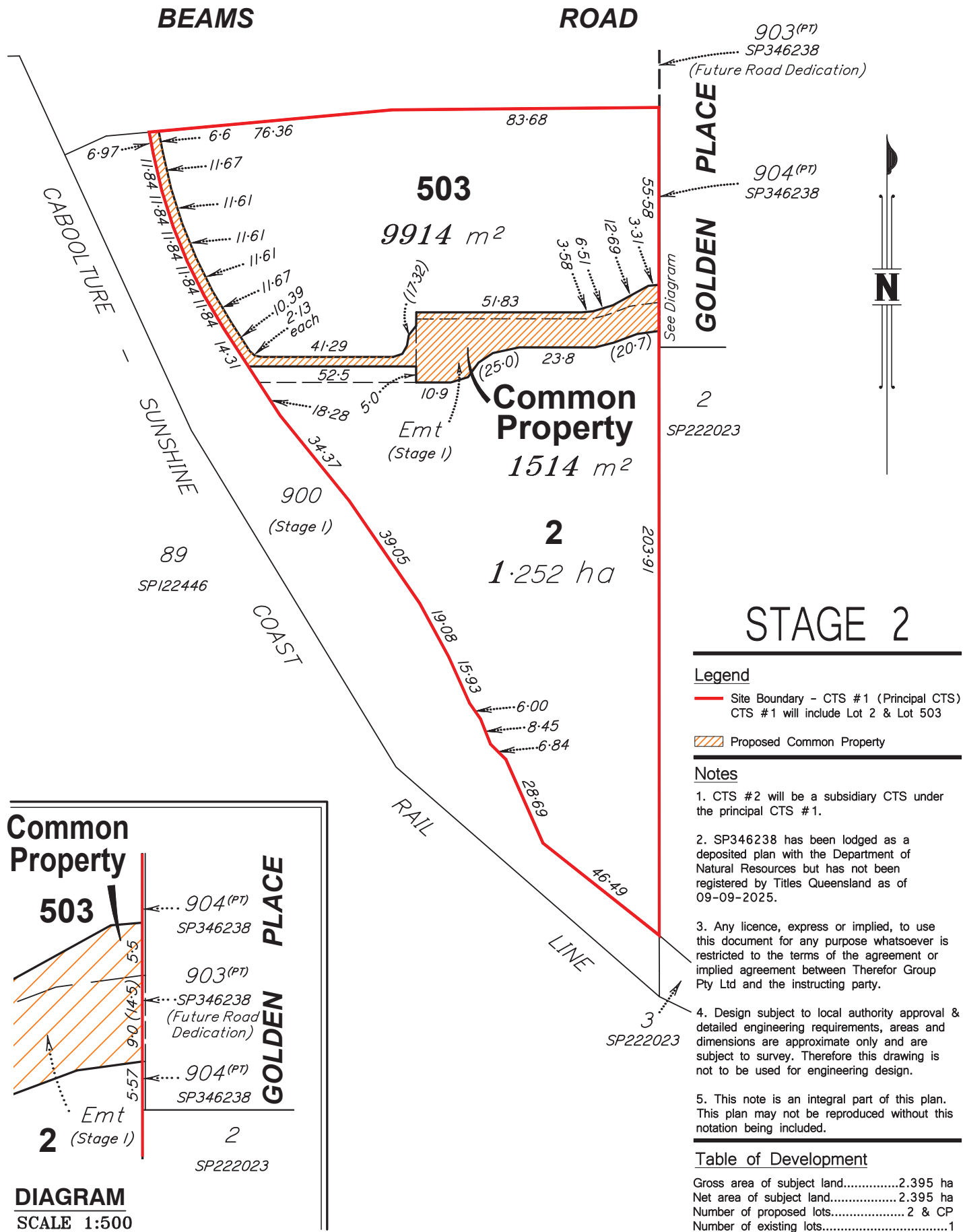


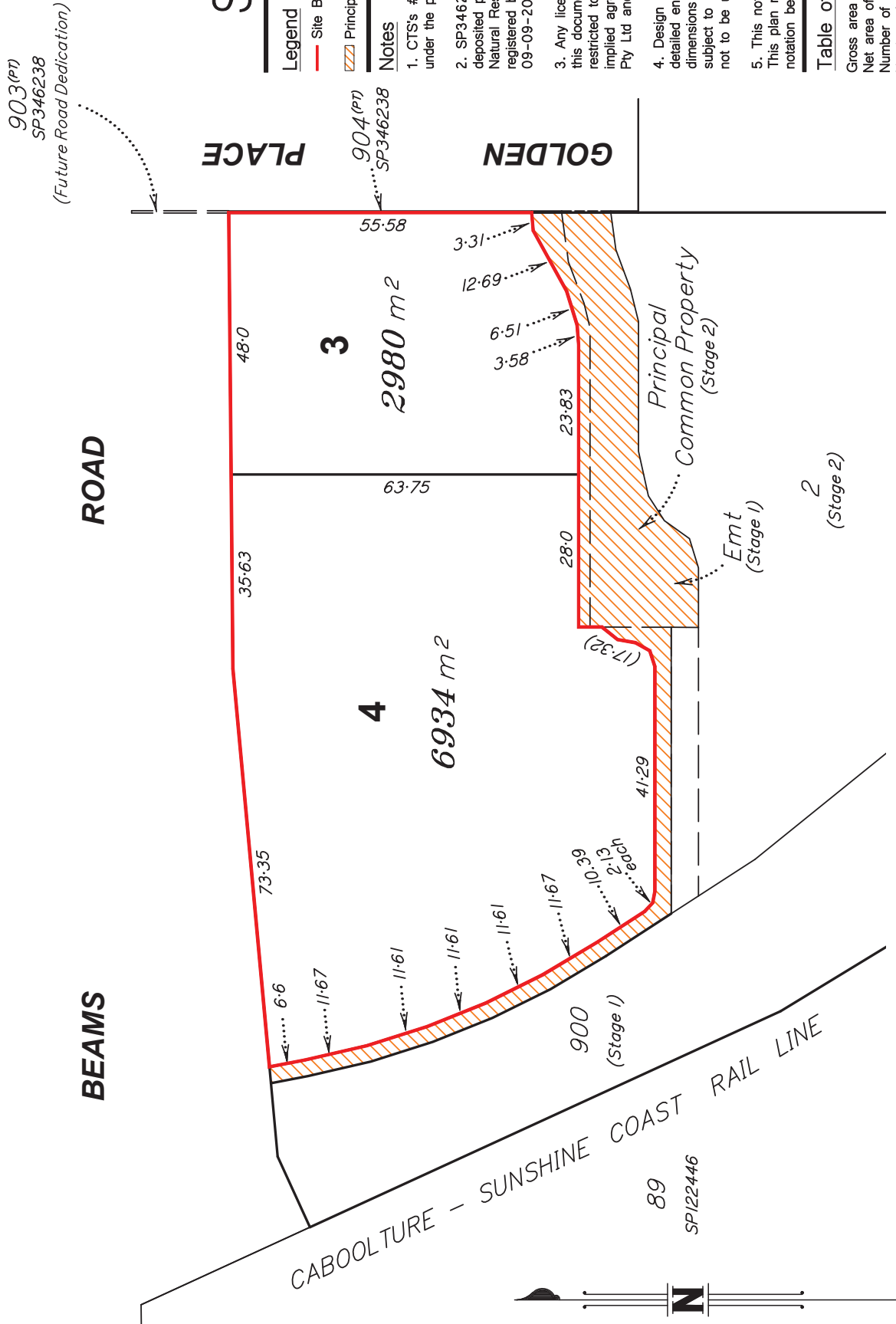
Scale 1:1500 @ A4
Lengths are in metres.

20 0 20 40

Plan of Reconfiguration - Stage 1
490 Beams Road, Fitzgibbon
Description Lot 2 on SP346226
Local Authority Brisbane City

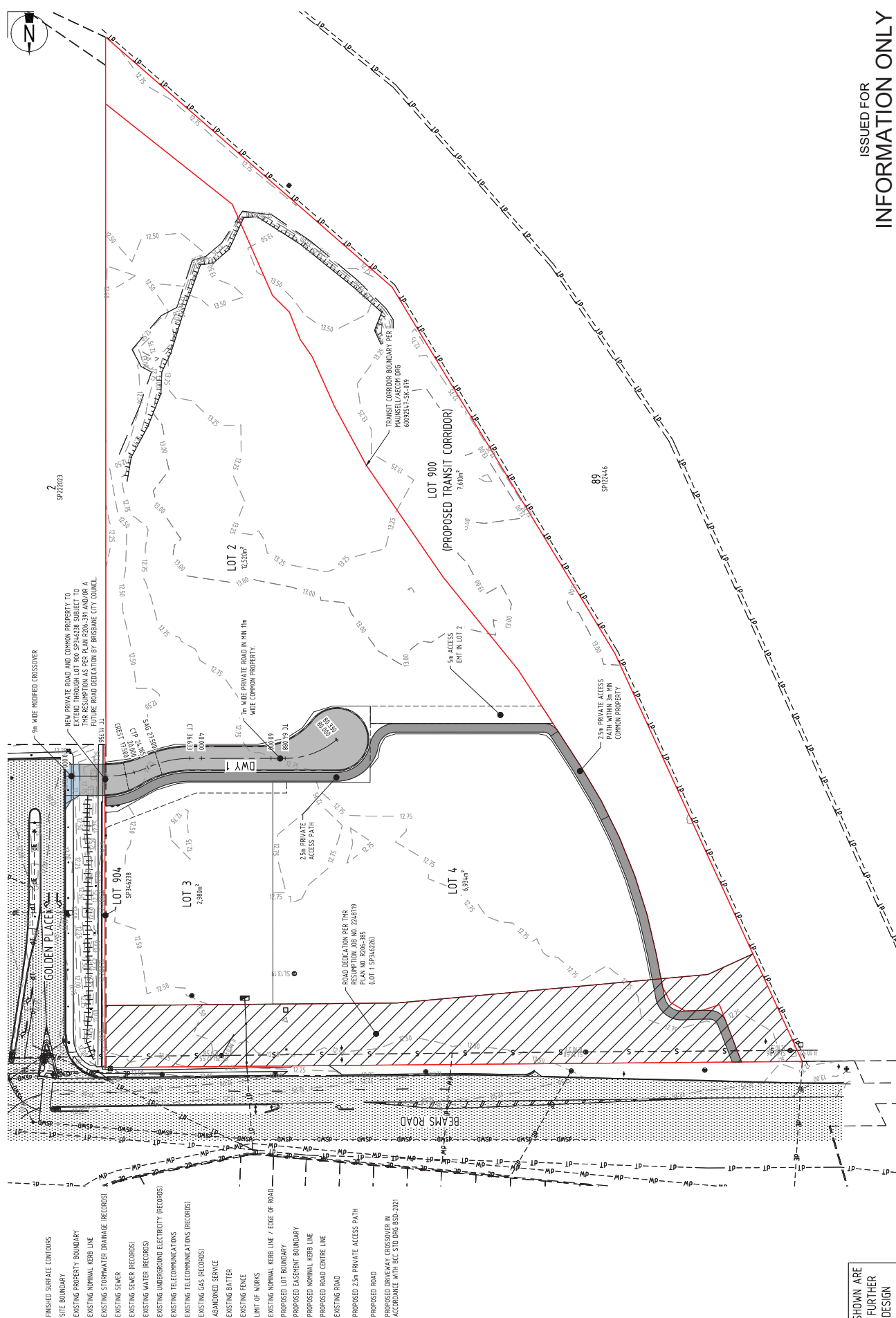
DRAWING NO. 24-0762S-01
VERSION E
DATE DRAWN 07-10-2025
SHEET NO. 1 of 1
JC





Appendix C

ADG Preliminary Drawings



ALL DETAILS SHOWN ARE
SUBJECT TO FURTHER
DETAILED DESIGN

[illegible]

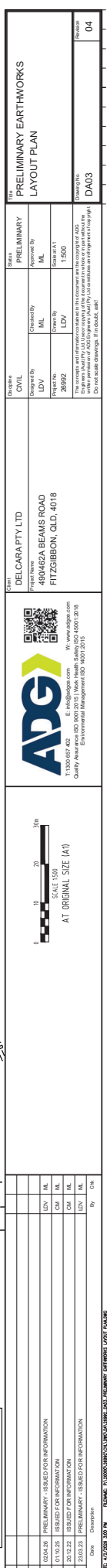
ISSUED FOR
INFORMATION ONLY

 ADG 1500 South Main Road, Suite 100, 1500 South Main Road, Suite 100, 1500 South Main Road, Suite 100 Environmental Management ISO 14001:2015	Project Name DEL CARA PTY LTD 489462A BEAMS ROAD FITZGIBBON, QLD, 4018	Discipline CIVIL	Subject OVERALL LAYOUT PLAN
	Project No. PTZGIBBON, QLD, 4018	Checked By ML	Approved By ML

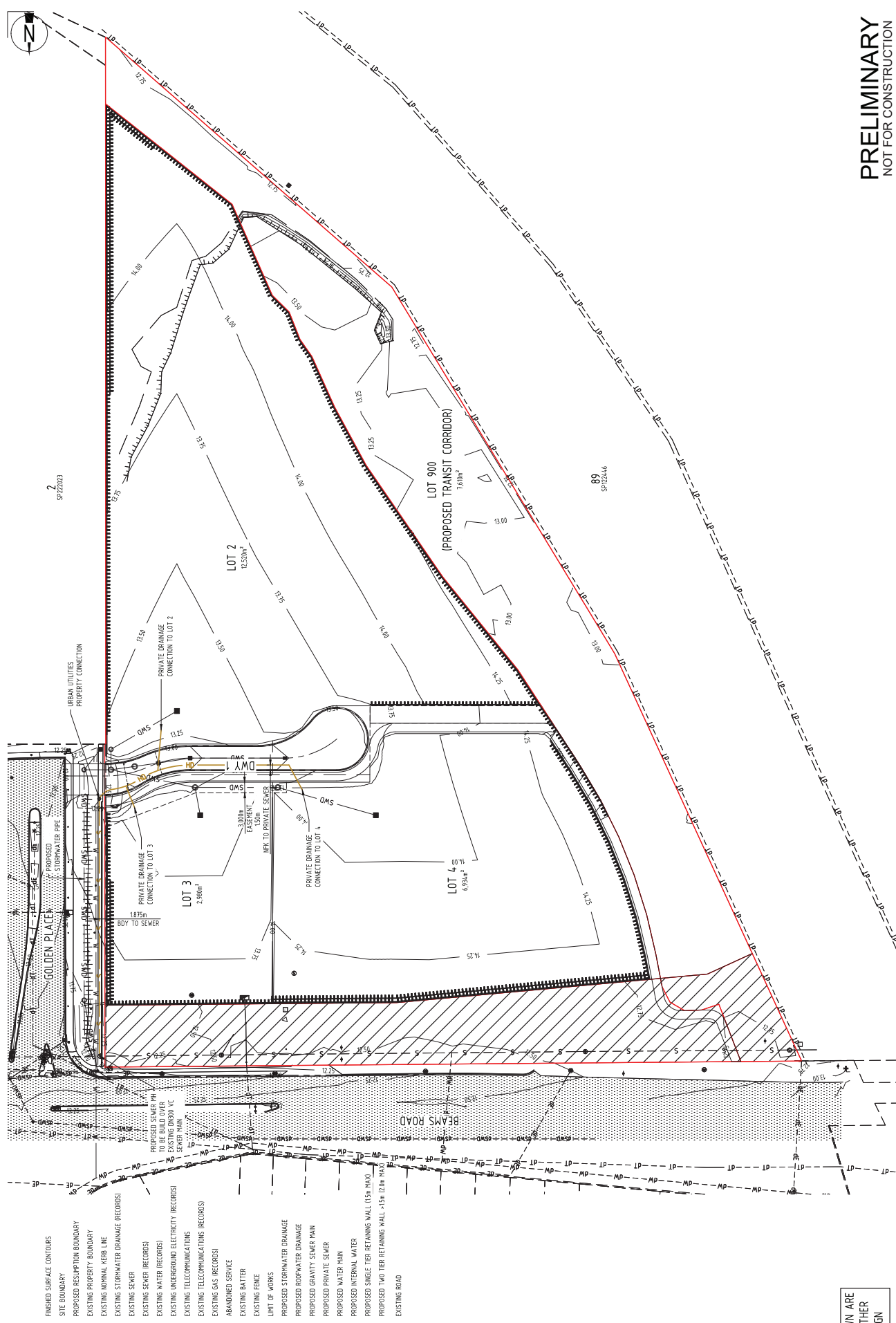
The completed and information contained in this document is the property of ADG. It is to be used for the project and site only. It is not to be used for any other project or site. It is not to be used for any other project or site. It is not to be used for any other project or site.

Do not scale drawings. If produce, state!

FILE NAME: P:\50000\30000\ON LINE\CA\30002.DAT; C:\BELL LAYOUT PLAN.CWG
 AS OF DATE: 4/7/2008 3:00 PM



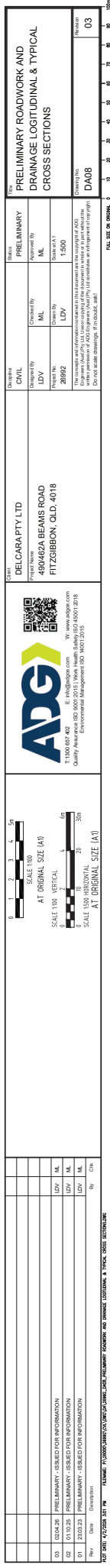
NOTE
FOR SITE SECTIONS REFER DRG NO. DA04

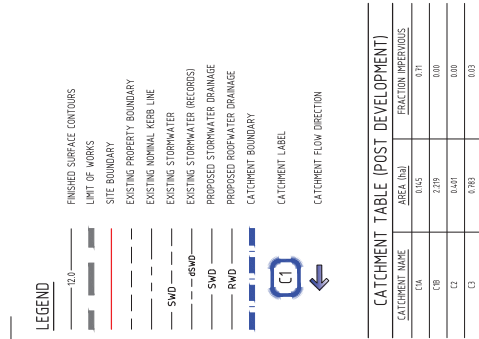


ALL DETAILS SHOWN ARE
SUBJECT TO FURTHER
DETAILED DESIGN

[illegible]

[illegible]





CATCHMENT TABLE (POST DEVELOPMENT)		
CATCHMENT NAME	AREA (ha)	FRACTION INTERIORS
C04	0.145	0.71
C08	2.219	0.00
C2	0.401	0.00
C3	6.783	0.03

PRELIMINARY
NOT FOR CONSTRUCTION

[illegible][illegible]

ALL DETAILS SHOWN ARE
SUBJECT TO FURTHER
DETAILED DESIGN

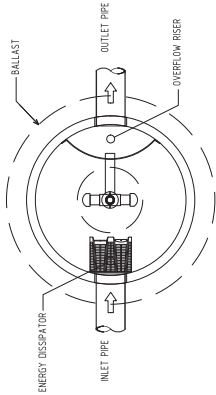
Rev	Date	Description	By	Chk
02	01/10/25	PRELIMINARY - ISSUED FOR INFORMATION	LDV	ML
01	23/03/23	PRELIMINARY - ISSUED FOR INFORMATION	LDV	ML

FILED: 10/7/2025 10:59 PM FILENAME: P:\V0000\2025\01\DWG\250105_P01_Preliminary Stormwater Drainage Management Layout.dwg

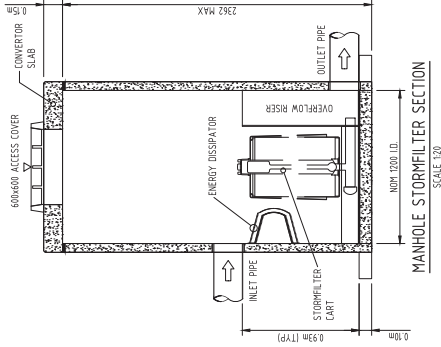
Client		Designer		Status	
Partners in Property DM Pty Ltd		Civil		Preliminary	
Project Name		Designed By		Approved By	
490462A BEAMS ROAD		LDV		ML	
FITZGIBBON, QLD 4018		Project No.		Drawn By	
T: 1300 657 402		28992		LDV	
E: info@adg.com		Project No.		Scale (A1)	
W: www.adg.com		28992		AS SHOWN	
Quality Assurance: 100% (100% of the project is the responsibility of the client)		Drawing No.		Revision	
Environmental Management: 100% (100% of the project is the responsibility of the client)		DA11		02	



0 0.5 1m
SCALE 1:50
AT ORIGINAL SIZE A1



MANHOLE STORMFILTER PLAN
SCALE 1:20

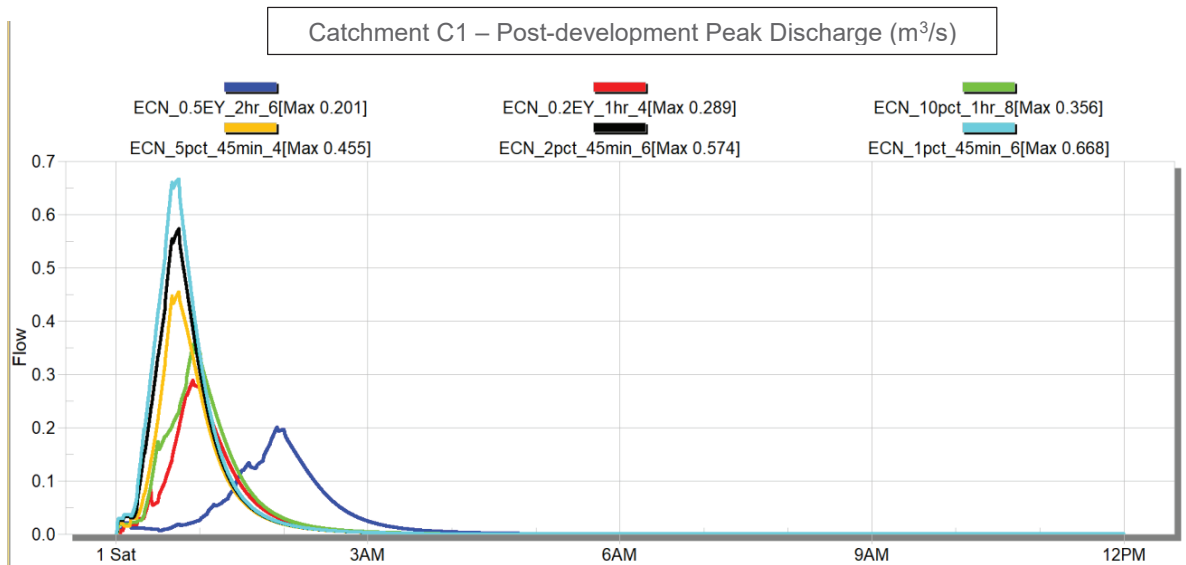
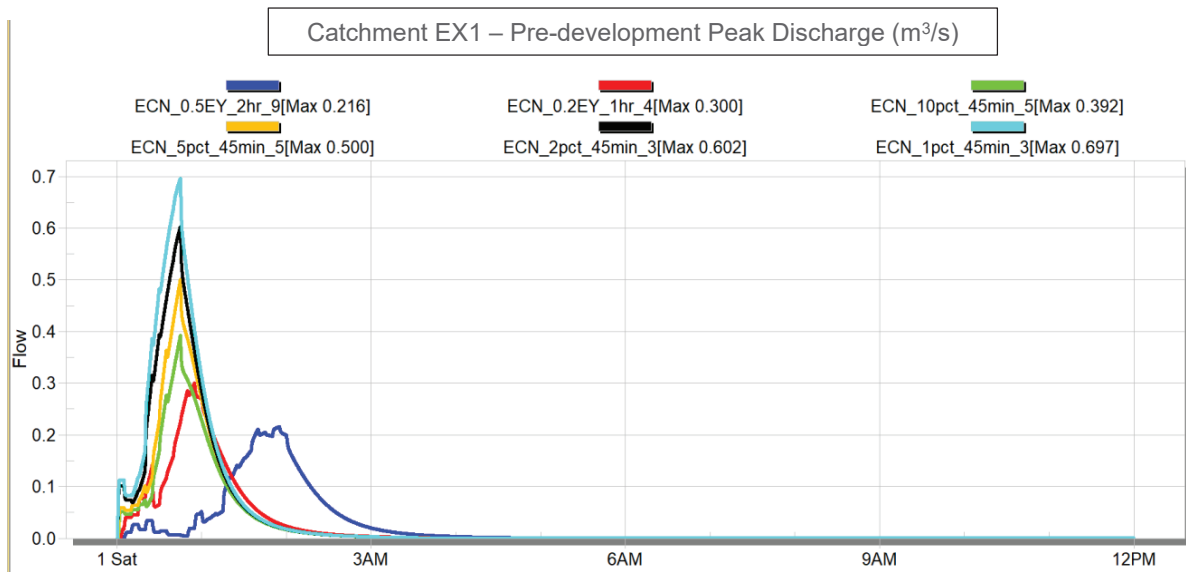


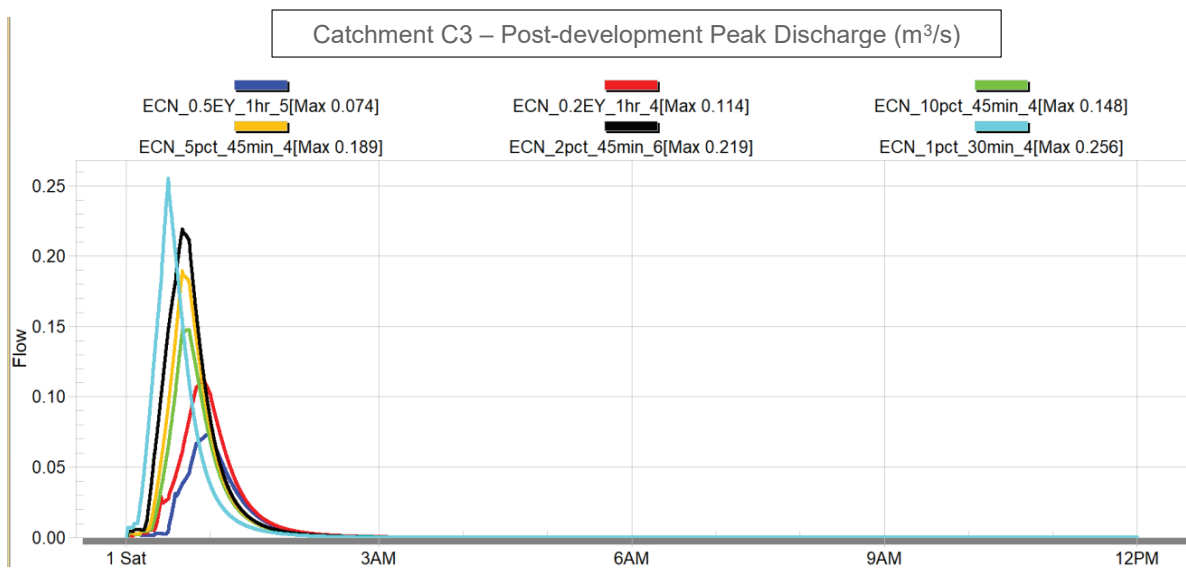
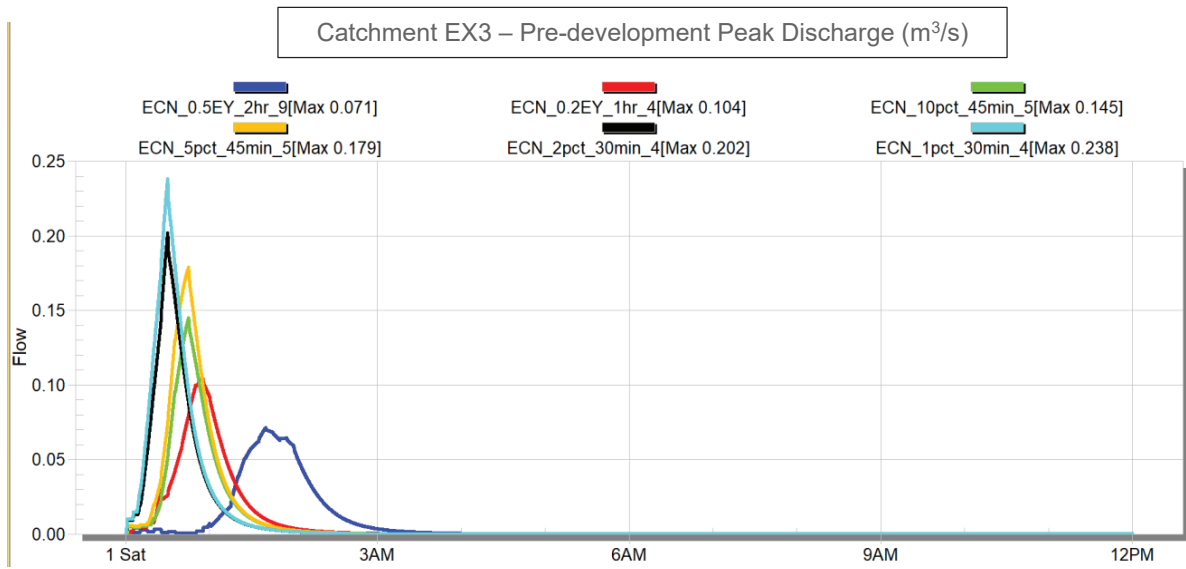
MANHOLE STORMFILTER SECTION
SCALE 1:20

PRELIMINARY
NOT FOR CONSTRUCTION

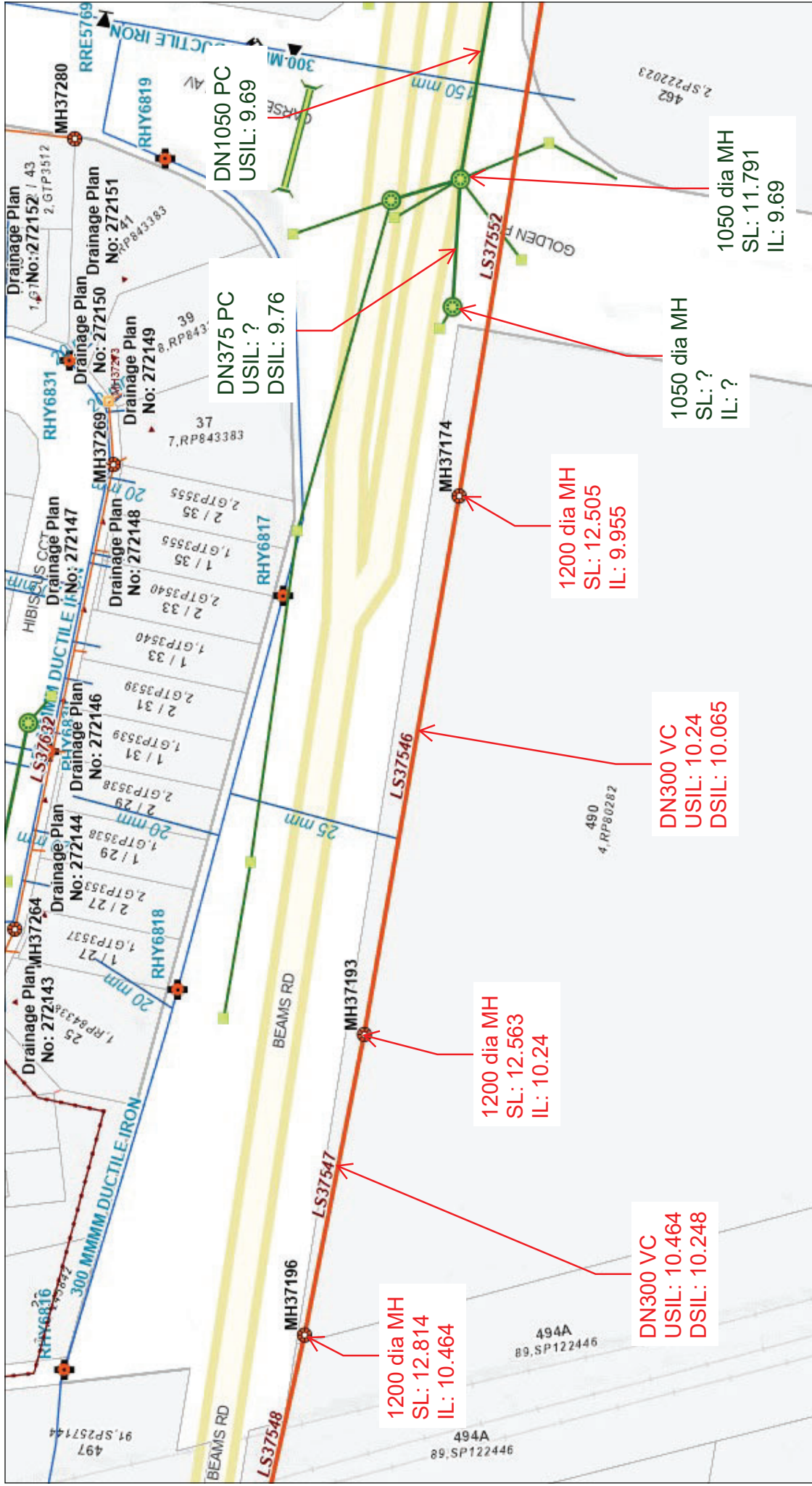
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Appendix D XP-Storm Results





Appendix E Brisbane City Council eBimap2 Records



Wat - Sew - SW

Notes:

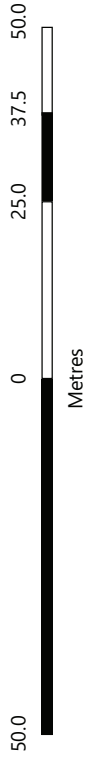
In consideration of Council, and the copyright owners listed above, permitting the use of this data, you acknowledge and agree that Council, and the copyright owners, give no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accept no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage), relating to any use of this data.

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StreetPro © 2021 Precisely; © 2021 PSMA Australia Ltd
Contours © 2009 AAMHatch



Print Date:
6/03/2023 - 8:54 AM

Projection:
Web Mercator Auxiliary Sphere



Scale: 1:1,001

Legend

- Recycled Water Device
-  LEVEL SENSOR

 LEVEL SENSOR - OFFLINE

 BEND

 JOINT

 TAPPING

 TEE

 PIGGING POINT

 <all other values>

 CONCRETE STOP

 PIPE BRIDGE
- Recycled Network Structure Boundary
-  PILLAR HYDRANT

 REFLUX

 PRESSURE SUSTAINING

 FLOW CONTROL

 AIR - OFFLINE

 ALTITUDE - OFFLINE

 GATE, CLOSED

 BALL, CLOSED
- Recycled Water Service Valve
-  <all other values>

 RESERVOIR - OFFLINE

 FILLING STATION

 PUMP STATION - OFFLINE

 BOOSTER PUMP

 LIFT PUMP - OFFLINE

 MODEL LINK

 SCOUR MAIN

 SCOUR MAIN - OFFLINE

 Model Link

 CHAMBER

 END FLUSHING POINT

 VACUUM LIFT

 RODDING JOINT

 END CAP

 TEE

 CROSS

 <all other values>

 PIPE BRIDGE

 PIER

 MANHOLE

-  PRESSURE GAUGE
-  PRESSURE GAUGE - OFFLINE
-  <all other values>
-  END CAP
-  GIBAULT JOINT
-  REDUCER
-  RESERVOIR INLET
-  SAMPLING STATION
- Recycled Water Structures
-  HEAD WALL

 <all other values>
- Recycled Water Hydrant
- Recycled Water Flow Meter
-  SCOUR

 PRESSURE REDUCING

 REFLUX - OFFLINE

 PRESSURE SUSTAINING - OFFLINE

 FLOW CONTROL - OFFLINE

 GATE, OPEN

 BALL, OPEN

 SERVICE VALVE CLOSED
- Recycled Water- Reservoirs
- Recycled Water Network Structure
- Recycled Water Pump Stations
- Recycled Water Network Structure Boundary
-  LIFT PUMP

 Recycled Vertical Pressure Main

 RETIC MAIN

 RETIC MAIN - OFFLINE

 Recycled Water Service

 Common Service

 CHAMBER - OFFLINE

 INLINE FLUSHING POINT
- Sewer Fitting - All Other Fittings
-  PROPERTY CONNECTION BOUNDARY

 BEND

 REDUCER

 INLET
- Sewer Structure - by Type
-  ANCHOR BLOCK

 Sewer Support Structure Boundary

 MANHOLE - OFFLINE

-  FLOW METER
-  FLOW METER - OFFLINE
- Recycled Water Fitting
-  CROSS

 TAPPING BAND

 WYE

 SCOUR OUTLET

 CHEMICAL INJECTION POINT

 ANCHOR BLOCK

 PIER
- Recycled Water Chamber
-  INGROUND HYDRANT

 Recycled Water Control Valve

 AIR

 ALTITUDE

 SCOUR - OFFLINE

 PRESSURE REDUCING - OFFLINE
- Recycled Water System Valve
-  BUTTERFLY, OPEN

 <all other values>

 SERVICE VALVE OPEN

 RESERVOIR

 TREATMENT PLANT

 PUMP STATION
- Recycled Water Pumps
-  BOOSTER PUMP - OFFLINE

 Recycled Water Pressure Main

 TRUNK MAIN

 TRUNK MAIN - OFFLINE

 Service
- Sewer Chamber
- Sewer Fitting - Main Fittings
-  OUTLET

 JOINT

 JUNCTION

 WYE

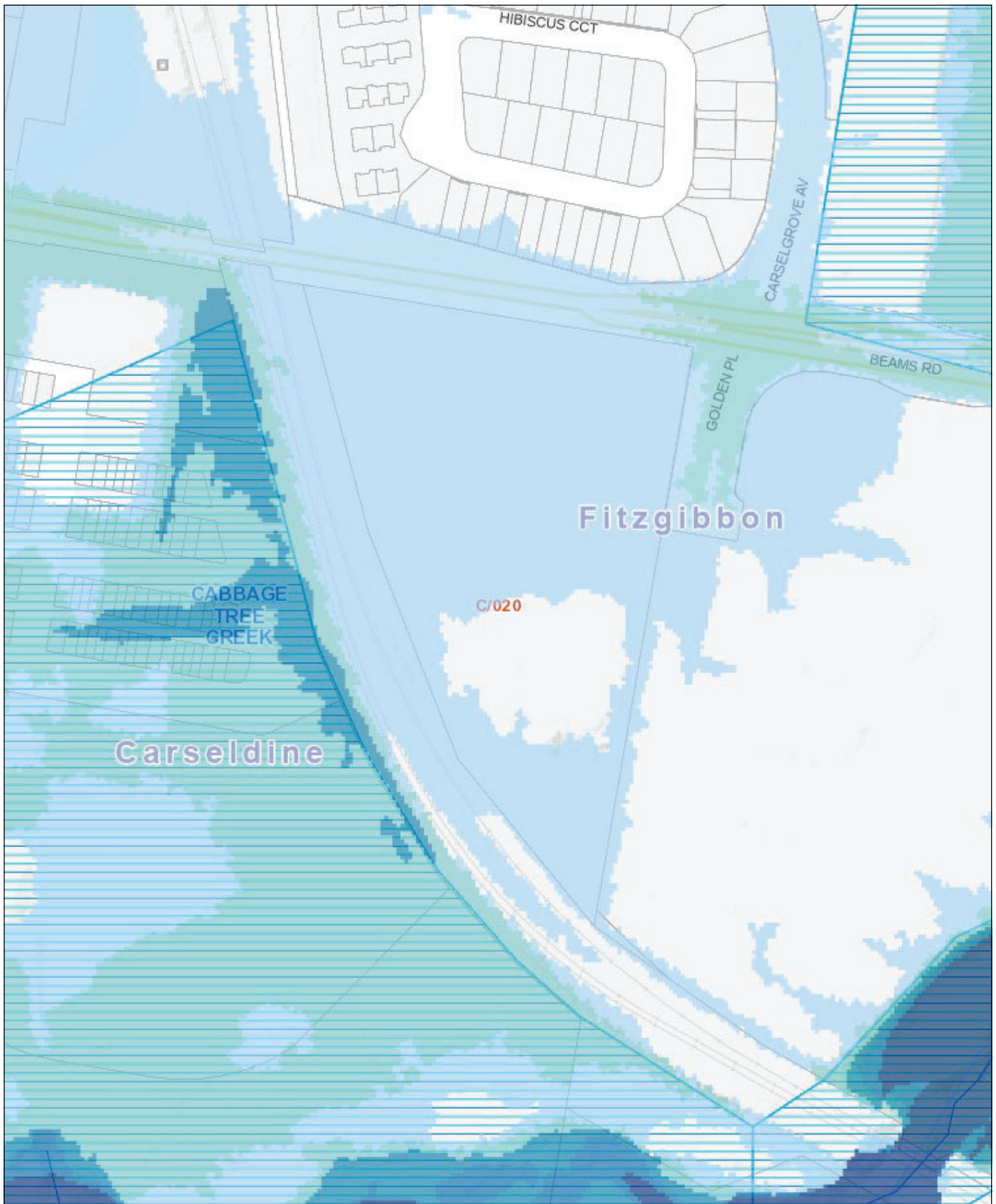
 GIBAULT JOINT

 OUTLET

 CONCRETE STOP

 HEAD WALL
- Sewer Manholes
-  <all other values>

Appendix F Brisbane City Council Flood Advice



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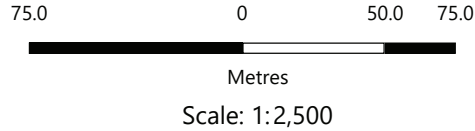
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Dedicated to a better Brisbane

Creek/waterway flood planning area

Print Date:
7/03/2023 - 8:39 AM
Projection:
Web Mercator Auxiliary Sphere



Legend

DFE Brisbane River

Brisbane River flood planning area 2b

Creek/waterway flood planning area

Creek/waterway flood planning area 4

Catchment

Property Holding

Brisbane River flood planning area

Brisbane River flood planning area 3

Creek/waterway flood planning area 1

Creek/waterway flood planning area 5

Sub-Catchment

Sealed Plan

Brisbane River flood planning area 1

Brisbane River flood planning area 4

Creek/waterway flood planning area 2

Overland flow flood planning area

Waterway Planning Units

Parcel - Outside Brisbane

FloodWise Property Report

490 BEAMS RD, FITZGIBBON 4018
Lot 4 on RP80282

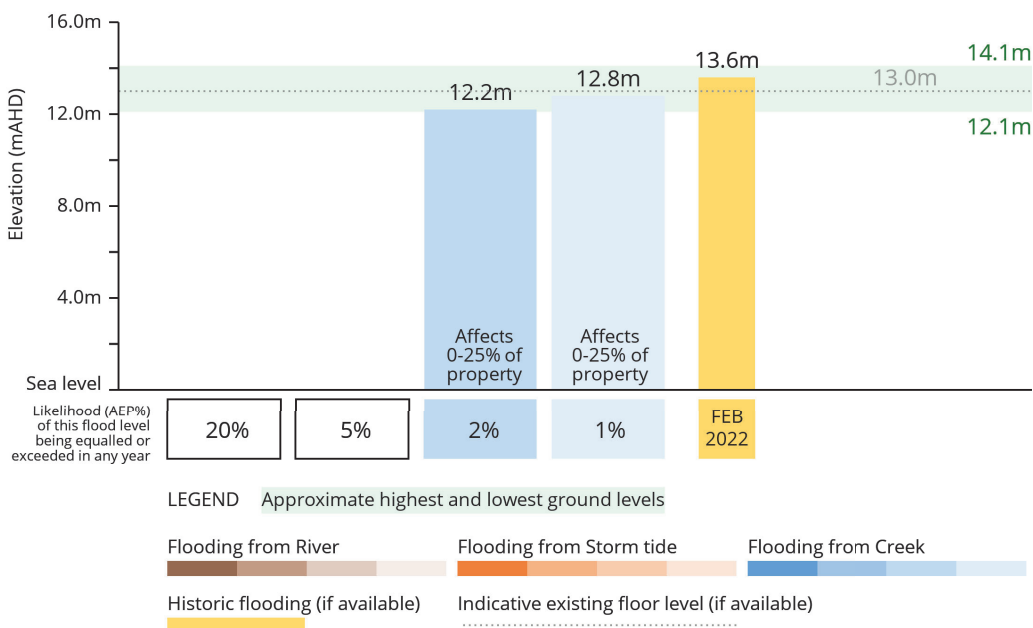


Dedicated to a better Brisbane

THE PURPOSE OF THIS REPORT IS FOR BUILDING AND DEVELOPMENT

Brisbane City Council's FloodWise Property Report provides technical flood planning information including estimated flood levels, habitable floor level requirements and more. This report uses the adopted flood planning information in CityPlan, that guides how land in Brisbane is used and developed for the future. Find out more about [planning and building](#). To understand how to be resilient and prepare for floods, visit Council's [Be Prepared](#) webpage. Find more information about [how to read a FloodWise Property Report](#).

Graph showing only the highest source/type of flooding for 1%, 2%, 5% and 20% likelihoods. Also shows historic flood levels. Other flood types and levels may be present and will be listed in the Flood Planning Information table below. This graph does not include overland flow flooding. If applicable, overland flow information is shown in the Planning and Development Information section below. **NOTE:** See Useful Definitions section to explain terminology.



Combined 1% AEP for river, creek and storm tide flood extent (if applicable). Aerial map shows river and creek flooding extent from the adopted CityPlan. Read more about [CityPlan](#).



Department of Resources and Brisbane City Council | Brisbane City Council | © Brisbane City Council... Powered by Esri



Are you resilient and ready for flood?

- Sign up to the Brisbane Severe Weather Alert at **brisbane.qld.gov.au/beprepared**
- Visit bom.gov.au for the latest weather updates.
- Have an evacuation plan, emergency kit and important phone numbers ready.
- Observe where water flows from and to during heavy rain.
- Consider how flood-resilient building techniques will have you home faster and with less damage.

Life threatening emergencies
000 Police/fire/ambulance
(mobiles **000** and **112**)

State Emergency Service (SES) **132 500**
Energex **13 19 62**
Brisbane City Council **3403 8888**

Technical Summary

This section of the FloodWise Property Report contains more detailed flood information for this property so **surveyors, builders, certifiers, architects, and engineers can plan and build** in accordance with Council's planning scheme.

Find more information about [planning and building](#) in Brisbane or talk to a Development Services Planning Information Officer via Council's Contact Centre on (07) 3403 8888.

Property Information Summary

The following table provides a summary of flood information for this property. More detailed flood level information is provided in the following sections of this report.

Property Summary	Level (mAHD) / Comment	Data Quality Code
Minimum ground level	12.1	C
Maximum ground level	14.1	C
Indicative existing floor level	13.0	C
Source of highest flooding	Creek/Waterway	

Flood Planning Information

The table below displays the peak estimated flood levels by probability for this property. Estimated flood level data should be used in conjunction with applicable planning scheme requirements - Refer to Flood Planning and Development Information section below for further information.

Note this table does not include overland flow. If overland flow is applicable to this property, refer to the Flood Planning and Development section below for further information.

Likelihood / Description	Level (mAHD)	Source
20%	N/A*	
5%	N/A*	
2%	12.2	Creek/Waterway (CABBAGE TREE CREEK)
1%	12.8	Creek/Waterway (CABBAGE TREE CREEK)
0.2%	13.1	Creek/Waterway (CABBAGE TREE CREEK)
FEB2022	13.6	Brisbane River and Creek/Waterway
Minimum Habitable Floor Level (dwelling house)	N/A*	

* Council does not have this data available. Customers are recommended to engage a Registered Professional Engineer of QLD for further advice.

Flood Planning and Development Information

This section of the FloodWise Property Report contains information about Council's planning scheme overlays. Overlays identify areas within the planning scheme that reflect distinct themes that may include constrained land and/or areas sensitive to the effects of development.

Flood overlay code

The Flood overlay code of Council's planning scheme uses the following information to provide guidelines when developing properties. The table below summarises the flood planning areas (FPAs) that apply to this property. Development guidelines for the FPAs are explained in [Council's planning scheme](#).

Flood planning areas (FPA)		
River	Creek / waterway	Overland flow
	FPA4	Not Applicable
	FPA5	

To find more information about Council's flood planning areas (FPAs) for Brisbane River and Creek/waterway flooding to guide future building and development in flood prone areas, please review [Council's Flood Planning Provisions](#).

Coastal hazard overlay code

The Coastal hazard overlay code of Council's planning scheme uses the following information to provide guidelines when conducting new developments. The table below summarises the coastal hazard categories that apply to this property. Development guidelines for the following Coastal hazard overlay sub-categories are explained in Council's [planning scheme](#).

Coastal hazard overlay sub-categories
There are currently no Coastal hazard overlay sub-categories that apply to this property.

Note: Where land is identified within one for more flood planning areas on the Flood overlay or is identified within one of the Storm tide inundation area sub-categories on the Coastal hazard overlay, the assessment criteria that provides the highest level of protection from any source of flooding applies.

Property development flags

Large allotment - This property is either a Large Allotment of over 1000 square metres or is located within a Large Allotment. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across the site.

For more information or advice, please consult a Registered Professional Engineer of Queensland (RPEQ).

Useful Flood Information Definitions

Australian Height Datum (AHD) - The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

Annual Exceedance Probability (AEP) - The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.

- **0.2% AEP** - A flood event of this size is considered rare but may still occur. A flood of size or larger has a 1 in 500 chance or a 0.2% probability of occurring in any year.
- **1% AEP** - A flood of this size or larger has a 1 in 100 chance or a 1% probability of occurring in any year.
- **2% AEP** - A flood of this size or larger has a 1 in 50 chance or a 2% probability of occurring in any year.
- **5% AEP** - A flood of this size or larger has a 1 in 20 chance or a 5% probability of occurring in any year.
- **20% AEP** - A flood of this size or larger has a 1 in 5 chance or a 20% probability of occurring in any year.

Data quality

- **Data Quality Code A** - Level data based on recent surveyor report or approved as-constructed drawings.
- **Data Quality Code B** - Level data based on ground-based mobile survey or similar.
- **Data Quality Code C** - Level data derived from Airborne Laser Scanning or LiDAR information.

Defined Flood Level (DFL) - The DFL is used for commercial and industrial development. The Defined flood level (DFL) for Brisbane River flooding is a level of 3.7m AHD at the Brisbane City Gauge based on a flow of 6,800 m³/s. DFL is only applicable for non-residential uses affected by Brisbane River flooding.

Flood planning area (FPA) - Council has developed five Flood planning areas (FPAs) as part of City Plan Flood overlay mapping for Brisbane River, Creek/waterway flooding and Overland flow to guide future building and development in flood prone areas. Storm tide flooding is mapped separately. The FPAs are designed to recognise the flood hazard for different flooding types. Flood hazard is a combination of frequency of flooding, the flood depth, and the speed at which the water is travelling. [Find more information here.](#)

Maximum and minimum ground level - Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

Minimum habitable floor level (dwelling house) - The minimum level in metres AHD at which habitable areas of development (generally including bedrooms, living rooms, kitchen, study, family, and rumpus rooms) must be constructed as required by the Brisbane City Plan.

Indicative existing floor level - The approximate level in metres AHD of the lowest habitable floor in the existing building. This data is sourced from a range of sources with varying accuracy levels.

Property - A property will contain 1 or more lots. The multiple lot warning is shown if you have selected a property that contains multiple lots.

Residential flood level (RFL) - This flood level for the Brisbane River equates to the 1% annual exceedance probability (AEP) flood level.

To learn more, visit [Brisbane City Council's Flood Information Hub](#)

Brisbane City Council's Online Flood Tools

Council provides several online flood tools:

- to guide planning and development
- to help residents and businesses understand their flood risk and prepare for flooding.

Council's online flood tools for planning and development purposes include:

- **FloodWise Property Report**
- **Flood Overlay Code**

For more information on Council's planning scheme and online flood tools for planning and development:

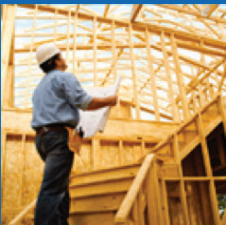
- phone (07) 3403 8888 and ask to talk to a Development Services Planning Information Officer

- visit brisbane.qld.gov.au/planning-building

Council's Planning Scheme - The City Plan (planning scheme) has been prepared in accordance with the Sustainable Planning Act as a framework for managing development in a way that advances the purpose of the Act. In seeking to achieve this purpose, the planning scheme sets out the Council's intention for future development in the planning scheme area, over the next 20 years.

Disclaimer

1. Defined flood levels and residential flood levels, minimum habitable floor levels and indicative existing floor levels are determined from the best available information to Council at the date of issue. These levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating levels.
2. Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property Report. Council disclaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.



Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit brisbane.qld.gov.au/planning-building

You can also find the Brisbane City Plan 2014 and Neighbourhood Plans as well as other information and training videos to help, with your building and development plans.

Appendix G Site Photos



BORNHORST + WARD CONSULTING ENGINEERS CIVIL AND STRUCTURAL	Level 4, 67 Astor Terrace Spring Hill, QLD 4000, Australia P. +61 (7) 3013 4699 mail@bornhorstward.com.au www.bornhorstward.com.au	PROJECT 490 BEAMS ROAD FITZGIBBON	SUBJECT CONCRETE SWALE DRAIN PHOTOS	PROJECT No. 19045 DRAWING No. REVISION
---	--	--	--	--

0 10 20 30 40 50 ORIGINAL SIZE A3

Appendix H

MUSIC Model Information

MUSIC Model Information

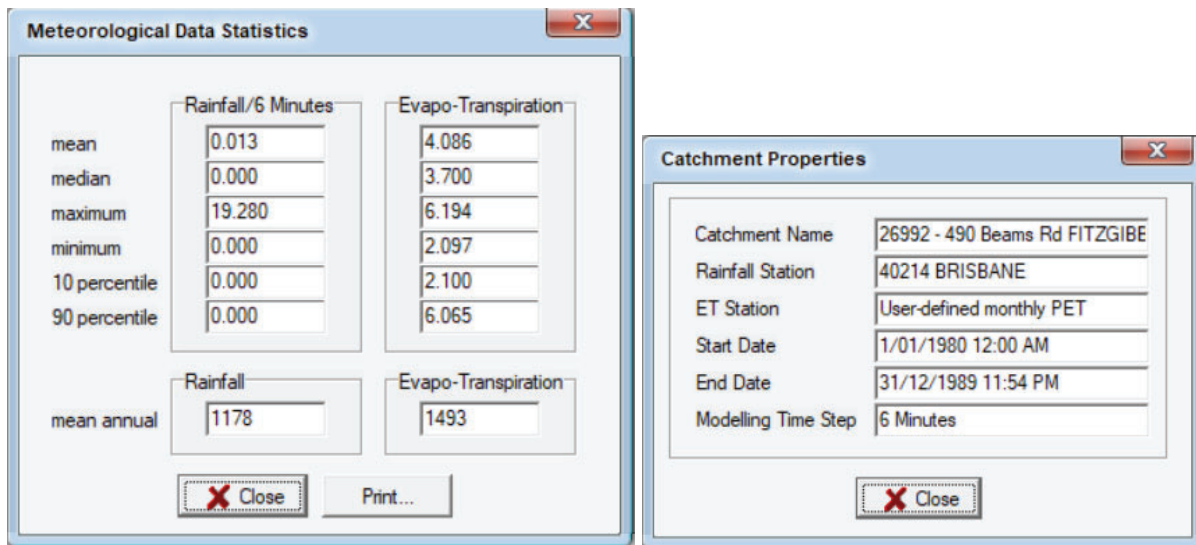
Introduction:

The quality of stormwater runoff and the impact of the proposed stormwater quality improvement measures were analyzed using MUSIC Version 6.3.0 according to the *MUSIC Modeling Guidelines Version 1.0, Water by Design 2010*. The source nodes in the model are split into various types and a summary of the area breakdown is presented below:

Meteorological Data:

The MUSIC model was carried out using the following parameters:

- Modeling period should be 10 years with a time step of 6 minutes
- The nearest available 6-minute time step rainfall series to the subject site is 40214 Brisbane, with a mean annual rainfall of 1,178 mm, and data from: 1/1/1980 to 31/12/1989.



Meteorological Data Statistics

	Rainfall/6 Minutes	Evapo-Transpiration
mean	0.013	4.086
median	0.000	3.700
maximum	19.280	6.194
minimum	0.000	2.097
10 percentile	0.000	2.100
90 percentile	0.000	6.065
mean annual	1178	1493

Buttons: Close, Print...

Catchment Properties

Catchment Name	26992 - 490 Beams Rd FITZGIBIE
Rainfall Station	40214 BRISBANE
ET Station	User-defined monthly PET
Start Date	1/01/1980 12:00 AM
End Date	31/12/1989 11:54 PM
Modelling Time Step	6 Minutes

Buttons: Close

The mean annual evaporation was 1,493mm.

Source Nodes, Fractions Impervious:

The areas of the source nodes were estimated from the Proposed areas as shown on the Pre-Development Catchment Plan DA09 and Post-Development Catchment Plan DA10 in Appendix C.

Source Nodes - Pollutant Exports:

Rainfall runoff and pollutant export parameters were assigned per Tables 3.7 and 3.8 of the Water by Design MUSIC Modeling Guidelines.

The rainfall runoff and pollutant export parameters for an urban residential development were adopted.

Modelled OceanProtect OceanGuard Unit Details:

Properties of Min. 2 x OceanGuard

Location: [Products >>](#)

Inlet Properties

Low Flow By-pass (cubic metres per sec)

High Flow By-pass (cubic metres per sec)

Target Element

☒ Gross Pollutants (kg/ML) ☐ Total Phosphorus (mg/L)

☐ Total Suspended Solids (mg/L) ☐ Total Nitrogen (mg/L)

Gross Pollutants (kg/ML)

Transfer Functions

☒ Concentration Based Capture Efficiency ☐ Flow Based Capture Efficiency

☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
14.7808	0.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Properties of Min. 2 x OceanGuard

Location: [Products >>](#)

Inlet Properties

Low Flow By-pass (cubic metres per sec)

High Flow By-pass (cubic metres per sec)

Target Element

☐ Gross Pollutants (kg/ML) ☒ Total Phosphorus (mg/L)

☐ Total Suspended Solids (mg/L) ☐ Total Nitrogen (mg/L)

Total Phosphorus (mg/L)

Transfer Functions

☒ Concentration Based Capture Efficiency ☐ Flow Based Capture Efficiency

☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
10.0000	7.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Properties of Min. 2 x OceanGuard

Location:  [Products >>](#)

Inlet Properties

Low Flow By-pass (cubic metres per sec)

High Flow By-pass (cubic metres per sec)

Target Element

☐ Gross Pollutants (kg/ML)
 ☐ Total Phosphorus (mg/L)
 ☒ **Total Suspended Solids (mg/L)**
☐ Total Nitrogen (mg/L)

Total Suspended Solids (mg/L)

Transfer Functions

☒ Concentration Based Capture Efficiency
 ☐ Flow Based Capture Efficiency
 ☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
20.8000	8.0000
40.3000	14.1000
60.6000	19.3000
79.3000	23.4000
99.9000	26.9000
121.0000	30.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Properties of Min. 2 x OceanGuard

Location:  [Products >>](#)

Inlet Properties

Low Flow By-pass (cubic metres per sec)

High Flow By-pass (cubic metres per sec)

Target Element

☐ Gross Pollutants (kg/ML)
 ☐ Total Phosphorus (mg/L)
 ☐ Total Suspended Solids (mg/L)
 ☒ **Total Nitrogen (mg/L)**

Total Nitrogen (mg/L)

Transfer Functions

☒ Concentration Based Capture Efficiency
 ☐ Flow Based Capture Efficiency
 ☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
50.0000	39.5000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Modelled Treatment Tank Details:

Properties of SF Chamber 1.4m2

Location: SF Chamber 1.4m2

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000
High Flow By-pass (cubic metres per sec): 100.0000

Storage Properties

Surface Area (square metres): 1.0
Extended Detention Depth (metres): 0.77
Permanent Pool Volume (cubic metres): 0.0
Initial Volume (cubic metres): 0.00
Exfiltration Rate (mm/hr): 0.00
Evaporative Loss as % of PET: 0.00

Estimate Parameters

Outlet Properties

Equivalent Pipe Diameter (mm): 33
Overflow Weir Width (metres): 2.0
Notional Detention Time (hrs): 96.1E-3

☐ Use Custom Outflow and Storage Relationship

Define Custom Outflow and Storage: Not Defined

Re-use... Fluxes... Notes... More

Cancel Back Finish

Modelled Ocean Protect StormFilter Details:

Properties of 2 x 690mm PSorb (MCC Brisbane)

Location: 2 x 690mm PSorb (MCC Brisbane)

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000

High Flow By-pass (cubic metres per sec): 0.00180

Target Element

☒ Flow (cubic metres per sec) ☐ Total Phosphorus (mg/L)

☐ Gross Pollutants (kg/ML) ☐ Total Nitrogen (mg/L)

☐ Total Suspended Solids (mg/L)

Flow (cubic metres per sec)

Transfer Functions

☒ Concentration Based Capture Efficiency ☐ Flow Based Capture Efficiency

☐ Both

Concentration Based Capture Efficiency

Inflow	Outflow
0.0000	0.0000
10.0000	10.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
----------------------------	-----------

Properties of 2 x 690mm PSorb (MCC Brisbane)

Location: 2 x 690mm PSorb (MCC Brisbane)

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000

High Flow By-pass (cubic metres per sec): 0.00180

Target Element

☐ Flow (cubic metres per sec) ☒ Total Phosphorus (mg/L)

☐ Gross Pollutants (kg/ML) ☐ Total Nitrogen (mg/L)

☐ Total Suspended Solids (mg/L)

Total Phosphorus (mg/L)

Transfer Functions

☐ Concentration Based Capture Efficiency ☐ Flow Based Capture Efficiency

☒ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
10.0000	1.3900

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Properties of 2 x 690mm PSorb (MCC Brisbane)

Location: 2 x 690mm PSorb (MCC Brisbane)

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000
High Flow By-pass (cubic metres per sec): 0.00180

Target Element

☐ Flow (cubic metres per sec) ☐ Total Phosphorus (mg/L)
☒ Gross Pollutants (kg/ML) ☐ Total Nitrogen (mg/L)
☐ Total Suspended Solids (mg/L)

Gross Pollutants (kg/ML)

Transfer Functions

☒ Concentration Based Capture Efficiency ☐ Flow Based Capture Efficiency
☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
14.9900	0.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Properties of 2 x 690mm PSorb (MCC Brisbane)

Location: 2 x 690mm PSorb (MCC Brisbane)

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000
High Flow By-pass (cubic metres per sec): 0.00180

Target Element

☐ Flow (cubic metres per sec) ☐ Total Phosphorus (mg/L)
☐ Gross Pollutants (kg/ML) ☒ Total Nitrogen (mg/L)
☐ Total Suspended Solids (mg/L)

Total Nitrogen (mg/L)

Transfer Functions

☒ Concentration Based Capture Efficiency ☐ Flow Based Capture Efficiency
☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
100.0000	44.1000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Properties of 2 x 690mm PSorb (MCC Brisbane)

Location: 2 x 690mm PSorb (MCC Brisbane)

Inlet Properties

Low Flow By-pass (cubic metres per sec): 0.00000

High Flow By-pass (cubic metres per sec): 0.00180

Target Element

☐ Flow (cubic metres per sec)
 ☐ Total Phosphorus (mg/L)
 ☐ Gross Pollutants (kg/ML)
 ☐ Total Nitrogen (mg/L)
 ☒ Total Suspended Solids (mg/L)

Total Suspended Solids (mg/L)

Transfer Functions

☒ Concentration Based Capture Efficiency
 ☐ Flow Based Capture Efficiency
 ☐ Both

Concentration Based Capture Efficiency

Input	Output
0.0000	0.0000
1000.0000	96.0000

Flow Based Capture Efficiency

Inflow (m ³ /s)	% Capture
0.0000	100.0000
1.0000	100.0000

Appendix I Development Codes

8.2.11 Flood overlay code

8.2.11.1 Application

1. This code applies to assessing development in the Flood overlay, if:
 - a. accepted development subject to compliance with identified requirements, where acceptable outcomes of this code are identified requirements in a table of assessment for an overlay (section 5.10); or
 - b. assessable development where this code is an applicable code identified in the assessment benchmarks column of a table of assessment for an overlay (section 5.10); or
 - c. impact assessable development.
2. Land in the Flood overlay is identified on the Flood overlay map and is included in the following sub-categories:
 - a. Brisbane River flood planning area 1 sub-category;
 - b. Brisbane River flood planning area 2a sub-category;
 - c. Brisbane River flood planning area 2b sub-category;
 - d. Brisbane River flood planning area 3 sub-category;
 - e. Brisbane River flood planning area 4 sub-category;
 - f. Brisbane River flood planning area 5 sub-category;
 - g. Creek/waterway flood planning area 1 sub-category;
 - h. Creek/waterway flood planning area 2 sub-category;
 - i. Creek/waterway flood planning area 3 sub-category;
 - j. Creek/waterway flood planning area 4 sub-category;
 - k. Creek/waterway flood planning area 5 sub-category;
 - l. Overland flow flood planning area sub-category.

Editor's note—For the purposes of the overlay, the Pine and South Pine rivers are treated as Creek/waterway flood planning area sub-categories.

Note—The Flood overlay is a 'natural hazard area' for the purpose of the State Planning Policy. Within this area, susceptibility to flooding has been identified. The natural hazard area identified on the Flood overlay map may not reflect the full extent of the flood affected area.

3. When using this code, reference should be made to section 1.5 and section 5.3.3.

Note—The following purpose, overall outcomes, performance outcomes and acceptable outcomes comprise the assessment benchmarks of this code.

Note—Where this code includes performance outcomes or acceptable outcomes that relate to:

- management of flood hazard or hydraulic hazard, guidance is provided in the Flood planning scheme policy;
- filling or excavation within the Creek/waterway flood planning area sub-categories, guidance is provided in the Compensatory earthworks planning scheme policy;
- handling or storage of hazardous materials, guidance is provided in the Management of hazardous chemicals in flood affected areas planning scheme policy;
- standards and specifications for public assets in a park, guidance is provided in the Infrastructure design planning scheme policy;
- standards and specifications for stormwater drainage assets, guidance is provided in the Infrastructure design planning scheme policy.

Editor's note—For a proposal to be accepted development subject to compliance with identified requirements, it must meet all the identified acceptable outcomes of this code that relate to the applicable sub-category

and any other applicable code. Where it does not meet all identified acceptable outcomes, the proposal becomes assessable development and a development application is required. Where a development application is required, only the specific acceptable outcomes that the proposal fails to meet need to be assessed against the corresponding assessable outcomes or performance outcomes and relevant overall outcomes. Other identified acceptable outcomes that are met are not assessed as part of the development application.

8.2.11.2

Purpose

1. The purpose of the Flood overlay code is to:
 - a. Implement the policy direction in the Strategic framework, in particular:
 - i. Theme 2: Brisbane's outstanding lifestyle, and Element 2.3 – Brisbane's healthy and safe communities;
 - ii. Theme 4: Brisbane's highly effective transport and infrastructure networks, and Element 4.3 – Brisbane's coordinated infrastructure planning and delivery.
 - b. Provide for the assessment of the suitability of development in the Flood overlay.
2. The purpose of the Flood overlay code will be achieved through the following overall outcomes:
 - a. Development minimises exposure of people and property to unacceptable risk from flood hazard in all flood events.
 - b. Development and infrastructure mitigates the flood risk through its location, siting, design, construction and operation whilst maintaining amenity.
 - c. Development does not unduly burden the city's counter-disaster response capacity, including emergency services access during a flood emergency.
 - d. Development provides for efficient evacuation and access for evacuation resources including emergency services during flood events, or otherwise plans for the prospect and impact of isolation or hindered evacuation during flooding.
 - e. Development involving essential community infrastructure remains functional during and immediately after flood events.
 - f. Development ensures that emergency community management plans respond to the number and capacity of future users of the development to safely participate in emergency measures such as evacuation.
 - g. Development ensures that essential building services or services essential for the development are designed, located and operated to minimise the flood risk to people, minimise damage to property, disruption to building function, and re-establishment time after a flood event.
 - h. Development involving hazardous materials manufactured, handled or stored in bulk does not adversely impact on public safety and the environment as a result of the impacts of floodwater.
 - i. Development does not, directly or cumulatively, cause or increase adverse impacts on other properties or land within the floodplain from flooding.
 - j. Development and infrastructure mitigates the impacts of hydraulic hazard due to predictable future increases in rainfall intensity on flooding.
 - k. Development prioritises, in order, the safety of people, protection of public infrastructure and protection of private property, in the management of the economic, social and environmental impacts of flooding.

8.2.11.3 Performance outcomes and acceptable outcomes

Table 8.2.11.3.A—Performance outcomes and acceptable outcomes

Performance outcomes	Acceptable outcomes	Comments
Section A—If for accepted development subject to compliance with identified requirements (acceptable outcomes only) or assessable development for a dwelling house including any secondary dwelling Note—Development for a dwelling house does not require assessment against any other sections of this code.		
PO1 Development involving any habitable or non-habitable part of a dwelling house, including any secondary dwelling, is located and designed to: a. minimise the risk to people from flood hazard; b. achieve acceptable flood immunity; c. minimise property impacts from a flood event up to and including the defined flood event; d. minimise disruption to residents, recovery time and rebuilding or restoration costs after a flood event up to and including the defined flood event.	AO1.1 Development for a dwelling house including any secondary dwelling: a. is not located in the Brisbane River flood planning area 1, 2a or 2b sub-categories or the Creek/waterway flood planning area 1 or 2 sub-categories; or b. is only located in these sub-categories, if a Registered Professional Engineer Queensland certifies that the dwelling house and any secondary dwelling are structurally designed to be able to resist hydrostatic and hydrodynamic loads associated with flooding up to and including the defined flood event. AO1.2 Development for a dwelling house and any secondary dwelling complies with the minimum flood planning levels in Table 8.2.11.3.B. Note—If located in an area that has no flood level information available from the Council such as an overland flow path, a Registered Professional Engineer of Queensland with expertise in undertaking flood studies is to certify that the flood level and development levels for the dwelling house and any secondary dwelling achieve the required flood planning levels in Table 8.2.11.3.B.	N/A

P02 Development within the Creek/waterway flood planning area sub-categories or Overland flow flood planning area sub-category: a. maintains the conveyance of flood waters to allow flow and debris to pass predominantly unimpeded through the site; b. does not concentrate, intensify or divert floodwater onto upstream, downstream or adjacent properties; c. will not result in a material increase in flood levels or flood hazard on upstream, downstream or adjacent properties.	A01.3 Development involving a building undercroft complies with the minimum clearance requirements in Table 8.2.11.3.E. Editor's note—For creek/waterway, storm-tide and river flooding, applicable flood planning information is available from Council's FloodWise Property Report. Note—The Flood planning scheme policy provides guidance on undercroft design.	
A02 Development: a. is not located within the Creek/waterway flood planning area 1, 2 or 3 sub-categories or the Overland flow flood planning area sub-category; or b. provides an open undercroft area from natural ground level to habitable floor level for any area inundated by the defined flood event; or Note—This undercroft area is not suitable for providing non-habitable rooms, secure storage of valuables, or future enclosing for storage or car parking. The clear area may include structural elements such as columns and floor substructure. The Flood planning scheme policy provides guidance on undercroft design. Editor's note—An open undercroft design may be achieved through a 'valance' treatment around the perimeter of an otherwise internally clear undercroft. Editor's note—For Creek/waterway, storm-tide and river flooding, applicable flood planning information is available from Council's FloodWise Property Report. c. a report from a Registered Professional Engineer Queensland certifies that the development in the Creek/waterway flood planning area or Overland flow flood planning area sub-categories will not result in a material increase in flood level or flood hazard on upstream, downstream or adjacent properties. Note—Flood studies demonstrate that the development and engineering design methods conform to the principles within the Flood planning scheme policy and the Infrastructure design planning scheme policy.	N/A	

Section B—If accepted development subject to compliance with identified requirements (acceptable outcomes only) or assessable development other than for a dwelling house or reconfiguring a lot			
Note—If development that is accepted development subject to compliance with identified requirements complies with the acceptable outcomes of this part, no further assessment against this code is required.			
PO3 Development: a. is compatible with flood hazard in a defined flood event; b. minimises the risk to people from flood hazard; c. does not reduce the ability of evacuation resources including emergency services to access and evacuate the site in a flood emergency, with consideration to the scale of the development; d. minimises impacts on property from flooding; e. minimises disruption to residents, business or site operations and recovery time due to flooding; f. minimises the need to rebuild structures after a flood event greater than the defined flood event. Note—Where Table 8.2.11.3.C identifies that a flood risk assessment is required, compliance with this performance outcome can be achieved by submitting a flood risk assessment, which may be included within a flood study, addressing the criteria within this performance solution. Preparing flood risk assessments and flood studies is required to be in accordance with the Flood planning scheme policy. Note—An emergency management plan prepared in accordance with the Flood planning scheme policy, which sets out procedures for evacuation due to flooding may be used to demonstrate compliance with this performance outcome.	AO3 Development for a material change of use is identified in Table 8.2.11.3.C as compatible with the flood hazard in the relevant flood planning area.	N/A	
PO4 Development for a park ensures that the design of a park and location of structures and facilities responds to the flood hazard and balances the safety of intended users with: a. maintaining continuity of operations; b. impacts of flooding on asset life and ongoing maintenance costs; c. efficient recovery after flood events;	AO4.1 Development involving a building or structure in a park complies with the flood planning levels specified in Table 8.2.11.3.D. AO4.2 Development involving a building or structure in a park where Table 8.2.11.3.D does not apply: a. is not located within the 20% AEP flood extent of	N/A	

d. recreational benefits to the city; e. availability of suitable land within the park.	any creek/waterway or overland flow path; or b. is located above the 20% AEP flood level of any creek/waterway or overland flow path.	
Section C—If for assessable development other than for a dwelling house		
PO5 Development is located and designed to: - minimise the risk to people from flood hazard on the site; - minimise flood damage to the development and contents of buildings up to the defined flood event; - provide suitable amenity; - minimise disruption to residents, recovery time and the need to rebuild structures after a flood event up to and including the defined flood event.	AO5.1 Development complies with the flood planning levels specified in Table 8.2.11.3.D. Note—If located in an area with no Council-derived flood levels such as an overland flow path, a Registered Professional Engineer Queensland with expertise in undertaking flood studies is to derive the applicable flood level and certify that the development meets the required flood planning levels in Table 8.2.11.3.D. The study is to demonstrate that the development and engineering design methods conform to the principles within the Flood planning scheme policy and the Infrastructure design planning scheme policy. AO5.2 Development is: - not located in the: - Brisbane River flood planning area 1, 2a, or 2b sub-categories; - Creek/waterway flood planning area 1 or 2 sub-categories; - Overland flow flood planning area sub-category; or - only located in these sub-categories if a Registered Professional Engineer Queensland with expertise in undertaking flood studies certifies that: - the development design, siting and any mitigation measures will ensure the development is structurally adequate to resist hydrostatic, hydrodynamic and debris impact loads associated with flooding up to the defined flood event; and - the risk to people is managed to an acceptable level.	Development complies Proposed lot pads will be located above the 1% AEP plus 300mm freeboard. Development not located within Brisbane River flood planning area 1, 2a or 2b sub-categories or the Creek/waterway flood planning area 1 or 2 sub-categories or overland flow flood planning area sub-category.

P06 Development involving essential electrical services or a basement storage area is suitably located and designed to ensure public safety and minimise flood recovery and economic consequences of damage during a flood.	AO6.1 Development ensures that: a. all areas containing essential electrical services comply with the flood planning levels in Table 8.2.11.3.D; or b. if a basement contains essential electrical services or a private basement storage area, the basement is a waterproof structure with walls and floors impermeable to the passage of water with all entry points and services located at or above the relevant flood planning level in Table 8.2.11.3.D. Note—A basement storage area does not include a bike storage room, change room, building maintenance storage and non-critical electrical services. AO6.2 Development involving a basement that relies on a pumping solution to manage floodwater ingress or for dewatering after a flood provides a secondary pump system with a backup power source for the pump.	Development will comply
P07 Development does not directly or indirectly create a material adverse impact on flood behaviour or drainage on properties that are upstream, downstream or adjacent to the development.	AO7.1 Development: a. does not block, or divert floodwaters for any area affected by creek/waterway or overland flow flooding, excluding storm-tide flooding and Brisbane River flooding sources; or b. does not result in a material increase in flood level or hydraulic hazard on upstream, downstream or adjacent properties. Note—Compliance with this acceptable solution can be demonstrated by the submission of a flood study by a Registered Professional Engineer of Queensland with expertise in undertaking flood studies demonstrating that the development and engineering design methods conform to the principles within the Flood planning scheme policy and the Infrastructure design planning scheme policy. AO7.2 Development retains existing overland flow paths and	Development complies Site is located in flood planning category 5 only.

	does not rely wholly on piped solutions to manage major flows.	N/A	
	A07.3 Development which creates a new overland flow path or significantly modifies an existing overland flow path via earthworks does not materially worsen hydraulic hazard on the site from existing conditions. Note—Compliance with this acceptable solution can be demonstrated by the submission of a flood study by a Registered Professional Engineer of Queensland with expertise in undertaking flood studies demonstrating that the development and engineering design methods conform to the principles within the Flood planning scheme policy and the Infrastructure design planning scheme policy.		
P08 Development for filling or excavation in an area affected by creek/waterway flooding does not directly, indirectly or cumulatively cause any material increase in flooding or hydraulic hazard or involve significant redistribution of flood storage from high to lower areas in the floodplain. Note—This can be demonstrated by undertaking earthworks in compliance with the Compensatory earthworks planning scheme policy. Note—This part of the code applies to all development other than a dwelling house and any secondary dwelling which involves filling or excavation, whether or not the development application comprises a separate development application for operational work involving filling or excavation.	A08 Development ensures that no filling or excavation greater than 100mm is located in the Creek/waterway flood planning area 1, 2 or 3 sub-categories if contained in the 5% AEP flood extent of any Creek/waterway flood planning area sub-category for which no waterway corridor has been mapped in the Waterway corridors overlay.	Development complies Development located in flood planning area 5	
P09 Development ensures that the building and site design: a. maintains the conveyance capacity of existing overland flow paths and creek/waterways; b. ensures floodwaters and flood debris can pass predominantly unimpeded under a structure or building to minimise property or building damage, including for a flood larger than the defined flood event; c. mitigates flood impacts by ensuring that filling,	A09.1 Development involving a building undercroft in the Creek/waterway flood planning area sub-categories or the Overland flow flood planning area sub-category: a. complies with the minimum building undercroft clearance requirements in Table 8.2.11.3.E; b. not located directly above any part of a waterway corridor as mapped in the Waterway corridors overlay.	N/A Proposal is ROL	

excavation and location of services are designed to allow for the conveyance of floodwater across the site. Note—The Flood planning scheme policy provides guidance on relevant considerations in determining minimum undercroft clearances and treatment of ground level in undercroft areas where floodwater conveyance is required underneath development.	AO9.2 Development involving a building undercroft in the Creek/waterway flood planning area sub-categories or the Overland flow flood planning area sub-category: - has a ground level within the undercroft area that is free draining; - does not involve excavation below ground level of more than 300mm within the undercroft area.	N/A Proposal is ROL.
PO10 Development for vulnerable uses, difficult to evacuate uses or assembly uses optimises vehicular access and efficient evacuation from the development to parts of the road network unaffected by flood hazard, in order to: - protect safety of users and emergency services personnel; - support efficient emergency services access and site evacuation with consideration to the scale of development. Note—A flood risk assessment may be required to address the performance outcomes or acceptable solutions which deal with evacuation and isolation arrangements, and the ability to take refuge. The Flood planning scheme policy provides information for undertaking flood risk assessments.	AO10 Development for vulnerable uses, difficult to evacuate uses or assembly uses: - is not isolated in any event up to the relevant flood planning level specified in Table 8.2.11.3.L; or - has direct vehicle access to a critical route or interim critical route in the Critical infrastructure and movement network overlay for evacuation in a flood; or - can achieve vehicular evacuation to a suitable flood-free location. Note—A suitable flood-free location is of a size and nature sufficient to provide for the size and characteristics of the population likely to need evacuation to that area.	N/A
PO11 Development has access which, having regard to hydraulic hazard, provides for safe vehicular and pedestrian movement and emergency services access to adjoining roads.	AO11.1 Development provides an access or driveway into the site which is: - trafficable during the defined flood event; - not located in the Creek/waterway flood planning area 1 sub-category; - not located in the Overland flow flood planning area sub-category if the hydraulic hazard is unsafe in the defined flood event; - the access or driveway is not inundated by a 10% AEP flood.	Development complies Proposed site access via Golden Place. BCC Flood mapping indicates the frontage of the site to Golden Place is flood free. Golden Place and connecting Beams Road subject to some inundation and are in flood planning area 4 and area 5. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.

	AO11.2 Development located in the Creek/waterway flood planning area 1, 2, 3 or 4 sub-categories locates any disabled access in the highest part of the site. Note—explanation of hydraulic hazard provided in the Flood planning scheme policy.	N/A Proposal is ROL.
PO12 Development involving a new road, a bridge or culvert is designed to minimise impacts to flood behaviour, minimise disruption to traffic during a flood and allow for emergency access.	AO12 Development involving a new road complies with the flood planning levels in Table 8.2.11.3.F.	N/A
PO13 Development for pedestrian and cyclist paths: a. provides a suitable level of trafficability; b. manages the impacts of flooding on asset life and ongoing maintenance costs; c. balances route availability with recreational and transport connectivity benefits to the city.	AO13.1 Development for cyclist and pedestrian facilities other than on public roads, including those traversing through a park and adjacent to a watercourse and overland flow path, are located above the 39% AEP (2 year ARI) flood immunity from all flooding sources. Note—If the site is subject to more than one type of flooding, the requirement that affords the greatest level of protection will apply. AO13.2 All new on-road cyclist and pedestrian facilities comply with the flood planning levels and trafficability standards for the applicable category of road in Table 8.2.11.3.F or Table 8.2.11.3.K.	Development complies Flood Search report indicates that the site is flood free in the 39% AEP event. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information. N/A Proposal is ROL.
PO14 Development which increases the residential population within the Brisbane River flood planning area sub-categories minimises the risk to people in all flood events with consideration to flood hazard, including warning time.	AO14 Development in the Brisbane River flood planning area sub-categories in areas where the residential flood level is greater than 12.8m AHD involving: a. an increase in the number of residential dwellings; or b. additional residential lots is not subject to an unsafe hydraulic hazard in the 0.2% AEP flood event. Note—Explanation of a hydraulic hazard is provided in the Flood planning scheme policy.	N/A

Additional performance outcomes and acceptable outcomes for essential community infrastructure		
PO15 Development involving essential community infrastructure: a. remains functional to serve community need during and immediately after a flood event, or is part of a network that is able to maintain the function of the essential community infrastructure when parts of the development are unable to function during or after a flood; b. is designed, sited and operated to avoid adverse impacts on the community or the environment due to the impacts of flooding on infrastructure, facilities or access and egress routes; c. is able to remain functional or is part of a network which is able to remain functional even when other infrastructure or services (such as electricity supply) may be compromised in a flood event; d. contains mitigation measures which are not entirely dependent on human activation to respond to a flood event. Note—Protection of function is required up to and including the flood event in Table 8.2.11.3.G.	AO15 Development involving essential community infrastructure: a. is ancillary to and not relied upon for the provision of the essential service during a flood; or b. is located above the flood planning levels in Table 8.2.11.3.G; c. has access to or provides the necessary back-up emergency electricity and communications supply in times of flood; d. is designed and constructed to resist hydrostatic and hydrodynamic forces as a result of inundation by the flood event listed for the development type in Table 8.2.11.3.G; e. that services a local area: i. is able to be accessed in times of flood to service local community needs up to the event listed for that development type in Table 8.2.11.3.G; or ii. has a service continuity plan that demonstrates the continued provision of service during the relevant flood event.	N/A
Additional performance outcomes and acceptable outcomes if development involves the processes in Table 8.2.11.3.H		
PO16 Development involving the storage and handling of hazardous materials avoids or minimises risks to public health and safety and the environment, by: a. protecting underground tanks for hazardous materials against the forces of buoyancy, velocity flow and debris impacts; b. securing above-ground tanks for hazardous materials against flotation and lateral movement;	AO16 a. Development does not include the storage or handling of hazardous chemicals that exceed the hazardous chemicals flood hazard threshold quantities in Table 8.2.11.3.M. b. Development involving the processes listed in Table 8.2.11.3.H: i. where located in the Flood overlay area, occurs only in the Creek/waterway flood	N/A

c. preventing damage to hazardous materials pipework or entry of floodwater into hazardous materials pipework; d. preventing damage to or off-site release of packages, drums or containers storing hazardous materials. Note—A chemical hazards flood risk report prepared in accordance with the Management of hazardous chemicals in flood affected areas planning scheme policy can assist in demonstrating achievement of this performance outcome. Note—A pump drainage system is not an acceptable measure to meet the performance outcome.	planning area 5 sub-category or the Brisbane River flood planning area 5 sub-category; or ii. is consistent with the standards contained in the Management of hazardous chemicals in flood affected areas planning scheme policy and can operate without risk of environmental harm during a flood event. Note—The Management of hazardous chemicals in flood affected areas planning scheme policy sets out further information and processes including risk assessment for the management of hazardous chemicals in flood planning areas.	
Additional performance outcomes and acceptable outcomes for reconfiguring a lot PO17 Development locates and designs all lots resulting from reconfiguring a lot to: a. minimise the risk to people from flood hazard; b. minimise damage to property from flood hazard; c. facilitate safe and efficient evacuation. Note— - Consideration of all floods up to the probable maximum flood is relevant to minimising the risk to people. - Flood warning time is not considered sufficient in the Creek/waterway planning area sub-categories or the Overland flow flood planning area sub-category. - Filling above the flood planning level for a flood event greater than the defined flood event cannot be assumed to mitigate the flood hazard.	AO17.1 Development creating new lots is identified in Table 8.2.11.3.1 as suitable within the relevant flood planning area. AO17.2 Development provides for reconfiguring a lot design that achieves a road and lot layout which: a. provides trafficable vehicular egress for evacuation during a defined flood event; b. optimises hazard-free movement away from sources of flood hazard within the development. Note—Further advice on road and lot layout is contained in the Flood planning scheme policy. AO17.3 Development which creates a new residential lot in an area subject to Brisbane River flooding, if the residential flood level is greater than 12.8m AHD is not subject to a hydraulic hazard greater than 0.6m²/s DV or 0.6m deep in a 0.2% AEP flood. Note—Refer to the Flood planning scheme policy for further explanation on the 0.2% AEP flood.	Development complies Development is located in flood planning area sub category 5 and listed as compatible in Table 8.2.11.3.1. N/A

PO18 Development involving reconfiguring a lot: a. minimises the risk to people from flood hazard; b. creates safe evacuation routes or avoids isolation of the development during a flood greater than the defined flood event; c. minimises damage to property and services; d. provides lots and roads that are not frequently flooded or subject to nuisance ponding or seepage; e. ensures lots created for park or private open space minimise the risk to people from flood hazard and are fit for purpose; f. provides a lot that is not substantially burdened by flood mitigation infrastructure.	AO18.1 Development involving reconfiguring a lot ensures: a. all lots comply with the flood planning levels in Table 8.2.11.3.J; b. a new road complies with the flood planning levels in Table 8.2.11.3.F. AO18.2 Development involving reconfiguring a lot creating more than 6 residential lots or a lot for industry ensures the flood planning levels of a dedicated road fronting the development or providing primary access within 200m of the development: a. complies with Table 8.2.11.3.K; or b. has acceptable trafficability in accordance with the requirements in the Flood planning scheme policy and the Queensland Urban Drainage Manual. Note—The Flood planning scheme policy contains supporting information about trafficability on existing roads and serviceability during floods. AO18.3 Development protects the conveyance of flood hazard area by providing an easement over the: a. 2% AEP flood extent for overland flow flooding; b. 1% AEP flood extent for creek/waterway flooding.	Development complies Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information. N/A N/A
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Table 8.2.11.3.B—Flood planning levels for a dwelling house (BCA building classification 1a)

Flooding source	Minimum habitable floor level	Minimum non-habitable floor level (i.e. utility areas, garage, laundry, storage room and basement entries)
Brisbane River	RFL + 500mm	2% AEP flood level + 300mm
Creek/ waterway	1% AEP flood level + 500mm	1% AEP flood level + 300mm
Overland flow	2% AEP flood level + 500mm	2% AEP level + 300mm

Note—

- Where the site is subject to more than one flooding source, the minimum flood planning level is the highest level determined from these flooding sources.
- Flood planning levels for a dwelling house from storm-tide inundation are located in the Coastal hazard overlay code.
- A flood event with an AEP of 1% is the equivalent of a 100 year ARI flood event.
- A flood event with an AEP of 2% is the equivalent of a 50 year ARI flood event.

Table 8.2.11.3.C—Land use compatibility with flood hazard

C – Land use is compatible with the flood hazard subject to meeting all other relevant requirements.

– Flood risk assessment in accordance with requirements of the Flood planning scheme policy is required to demonstrate the use is compatible with the flood hazard.

Accommodation activities	Brisbane River flood planning area sub-category					Creek/waterway flood planning area sub-category					Overland flow flood planning area sub-category
	5	4	3	2B	2A	1	5	4	3	2	1
Community residence	C	#	#	#	#	#	C	#	#	#	#
Dual occupancy	C	C	#	#	#	#	C	#	#	#	C

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	sub-category							sub-category							planning area sub- category
	5	4	3	2B	2A	1		5	4	3	2	1			
Agricultural supplies store	C	C	#	#	#	#		C	#	#	#	#		C	
Animal husbandry	C	C	#	#	#	#		C	#	#	#	#		C	
Animal keeping	C	C	#	#	#	#		C	#	#	#	#		C	
Aquaculture	C	C	#	#	#	#		C	#	#	#	#		C	
Bulk landscape supplies	C	C	C	C	C	C		C	C	C	#	#		C	
Car park ancillary to another use	C	C	C	C	C	#		C	C	#	#	#		C	
Car wash	C	C	C	C	C	#		C	C	#	#	#		C	
Food and drink outlet	C	C	#	#	#	#		C	C	#	#	#		C	
Function facility	C	C	#	#	#	#		C	#	#	#	#		C	
Garden centre	C	C	C	#	#	#		C	C	#	#	#		C	
Hardware and trade supplies	C	C	#	#	#	#		C	C	#	#	#		C	
Home-based business	C	C	#	#	#	#		C	#	#	#	#		C	
Hotel (where not including accommodation)	C	C	#	#	#	#		C	#	#	#	#		C	
Market	C	C	C	#	#	#		C	C	#	#	#		C	

Nightclub entertainment facility	C	C	C	#	#	#	#	#	#	C	#	#	#	#	#	C	
Office	C	C	C	#	#	#	#	#	#	C	#	#	#	#	#	C	
Outdoor sales	C	C	C	#	#	#	#	#	#	C	#	#	#	#	#	C	
Parking station	C	C	C	C	C	C	C	C	C	C	#	#	#	#	#	C	
Roadside stalls	C	C	C	C	#	#	#	#	#	C	C	C	C	C	C	C	
Sales office	C	C	C	#	#	#	#	#	#	C	C	C	C	C	#	C	
Shop, Adult store	C	C	C	#	#	#	#	#	#	C	#	#	#	#	#	C	
Shopping centre	C	#	#	#	#	#	#	#	#	C	#	#	#	#	#	C	
Showroom	C	C	C	#	#	#	#	#	#	C	C	C	C	C	#	C	
Theatre	C	C	C	#	#	#	#	#	#	C	#	#	#	#	#	C	
Tourist attraction	C	C	C	C	#	#	#	#	#	C	C	C	C	C	#	C	
Veterinary service	C	C	C	#	#	#	#	#	#	C	#	#	#	#	#	C	
Wholesale nursery	C	C	C	C	C	C	C	C	C	C	C	C	C	C	#	C	
Community land uses	Brisbane River flood planning area sub-category									Creek/waterway flood planning area sub-category							Overland flow flood planning area sub-category
	5	4	3	2B	2A	1	5	4	3	2	1						
Childcare centre	C	#	#	#	#	#	C	#	#	#	#	#	#	#	#	#	
Club	C	C	#	#	#	#	C	C	C	C	#	#	#	#	#	C	

	5	4	3	2B	2A	1	5	4	3	2	1	
Air service	C	#	#	#	#	#	C	#	#	#	#	C
Cemetery	C	C	C	#	#	#	C	C	#	#	#	C
Crematorium	C	#	#	#	#	#	C	#	#	#	#	C
Detention facility	#	#	#	#	#	#	#	#	#	#	#	C
Emergency services	#	#	#	#	#	#	#	#	#	#	#	#
Funeral parlour	C	#	#	#	#	#	C	#	#	#	#	C
Landing	C	C	C	C	C	C	C	C	C	C	#	C
Major electricity infrastructure	#	#	#	#	#	#	#	#	#	#	#	#
Port service	C	C	C	#	#	#	C	C	C	C	#	C
Substation	C	#	#	#	#	#	C	#	#	#	#	#
Telecommunications facility	C	#	#	#	#	#	C	#	#	#	#	#
Utility installation	C	#	#	#	#	#	#	#	#	#	#	#
Industry land uses	Brisbane River flood planning area sub-category	Creek/waterway flood planning area sub-category					Overland flow flood planning area sub-category					
	5	4	3	2B	2A	1	5	4	3	2	1	
Extractive industry	C	C	C	#	#	#	C	C	C	#	#	C

Note—Caretaker's accommodation and home-based business are considered ancillary to the dominant land use.

Table 8.2.11.3.D—Flood planning categories for development types

BCA building classification ⁽¹⁾	Development types and design levels, assigned design floor or pavement levels	Category – refer to Table 8.2.11.3.L for flood planning levels
Class 1–4	Habitable room ⁽²⁾	Category A
	Non-habitable room including patio and courtyard	Category B

	Non-habitable part of a Class 2 or Class 3 building excluding the essential services ⁽²⁾ control room	Category B Risk management approach to Brisbane River flooding is permitted (refer to Flood planning scheme policy)
	Parking located in the building undercroft of a multiple dwelling	Category C
	Carport ⁽⁴⁾ , unroofed car park; vehicular manoeuvring area	Category D
	Essential electrical services ⁽²⁾ of a Class 2 or Class 3 building only	Category A ⁽⁶⁾
	Basement parking entry ⁽³⁾	Category C + 300mm
Class 5, Class 6, or Class 8	Building floor level	Category C Risk management approach to Brisbane River flooding is permitted (refer to Flood planning scheme policy)
	Garage or car park located in the building undercroft ⁽³⁾	Category C
	Carport ⁽⁴⁾ or unroofed car park	Category D
	Vehicular access and manoeuvring areas	Category D
	Basement parking entry ⁽³⁾	Category C
	Essential electrical services ⁽²⁾	Class 8 – Category C ⁽⁶⁾ Class 5 & 6 – Category A ⁽⁶⁾
Class 7a	Refer to the relevant building class specified in this table	
Class 7b	Building floor level	Category C Risk management approach to Brisbane River flooding is permitted (refer to Flood planning scheme policy)
	Vehicular access and manoeuvring area	Category D
	Essential electrical services ⁽²⁾	Category C
Class 9	Building floor level	Category A

	Building floor level for habitable rooms in Class 9a or 9c where for a residential care facility	0.2% AEP flood
	Building floor level for habitable rooms in Class 9b where involving children, such as a childcare centre	0.2% AEP flood
	Garage or car park located in the building undercroft ⁽³⁾	Category C
	Carport ⁽⁵⁾ or unroofed car park	Category D
	Vehicular access and manoeuvring areas	Category D
	Essential electrical services ⁽²⁾	Category A
Class 10a	Car parking facility	Refer to the relevant building class specified in this table
	Shed ⁽⁵⁾ or the like	Category D
Class 10b	Swimming pool	Category E
	Associated mechanical and electrical pool equipment	Category C
	Other structures	Flood planning levels do not apply

Notes—

(1) Refer to the Building Code of Australia for definitions of building classifications.

(2) Essential electrical services include any area or room used for fire control panel, telephone PABX, sensitive substation equipment including transformers, low voltage switch gear, high voltage switch gear, battery chargers, protection control and communication equipment, low voltage cables, high voltage cables, and lift or pump controls.

(3) Basement car parks must be suitably waterproofed and all air vents, air-conditioning ducts, pedestrian access and entry and exit ramps into the basement must comply with the applicable flood planning levels in this table.

(4) A shelter for a motor vehicle, which has a roof and one or more open sides, and which can be built against the side of a building.

(5) A slight or rough structure built for shelter and storage; or a large strongly built structure, often open at the sides or end.

(6) Where essential electrical services are proposed in a basement below the specified flood planning level, the flood immunity of all air vents, air-conditioning ducts, pedestrian access, lift shafts and entry/exit ramps at the basement entrance and any other openings into that basement must conform with the flood planning levels for Category A for Residential development, and the relevant basement entry level of all other uses. To ensure flood immunity, basements require a waterproof basement design to prevent flood waters entering the basement.

- A flood event with an AEP of 2% is the equivalent of a 50 year ARI flood event.

- A flood event with an AEP of 0.2% is the equivalent of a 500 year ARI flood event.

- Where a building has a combination of uses that includes a component of classes 2, 3 or 9, the essential services for that building shall comply with the requirements of the building class with the greatest flood planning level requirement.

- Use classes for residential development also include basement storage.

Table 8.2.11.3.E— Building undercroft clearances

Flooding source	Minimum clearance requirement ⁽¹⁾⁽³⁾
Overland flow— Hydraulic Hazard (DV <0.6 m ² /s and depth <600mm in 2% AEP flood event)	Lowest floor level is to be 1.5m ⁽²⁾ above the highest ground elevation in undercroft area
Overland flow— Hydraulic Hazard (DV >0.6 m ² /s or depth >600mm in 2% AEP flood event)	Lowest floor level is to be 2.5m ⁽²⁾ above the highest ground elevation in undercroft area
Creek/waterway (Flood planning area 1, 2 or 3 sub-categories)	Lowest floor level is to be 2.5m ⁽²⁾ above the highest ground elevation in undercroft area
Creek/waterway (Flood planning area 4 sub-category)	Lowest floor level is to be 1.5m ⁽²⁾ above the highest ground elevation in undercroft area

Notes—

- (1) The minimum undercroft only relates to the minimum clearance requirements from ground level to the finished floor level and not minimum flood planning levels. Where the flood planning level requirement with freeboard results in a higher finished floor level that higher level needs to be adopted.
- (2) Refer to the Flood planning scheme policy for explanatory material regarding clearances and considerations.
- (3) The minimum undercroft clearance only applies to the area of undercroft above the relevant flood extent or flood planning area sub-category.

Table 8.2.11.3.F—Flood planning levels for a new road

Flooding source ⁽¹⁾	Minimum design levels at the crown of the road (m AHD) ⁽²⁾	
	Residential development	Industrial or commercial development
Brisbane River ⁽³⁾	Defined flood level	5% AEP flood level
Creek/waterway	1% AEP flood level	2% AEP flood level
Overland flow	2% AEP flood level	2% AEP flood level

Notes—

- (1) Where the road is subject to more than one flooding source, the minimum flood planning level is the highest level determined from these sources.
- (2) Where flood levels are not available from Council's FloodWise Property Report, such as for overland flow flooding, a suitably qualified Registered Professional Engineer Queensland with expertise in undertaking

flood studies is required to estimate the relevant flood level.

(3) A risk management approach determining flood planning levels of roads for Brisbane River flooding can be applied as an alternative to Table 8.2.11.3.F. Typically such roads would have a flood immunity no worse than the surrounding roads that support a similar land use, otherwise a Flood Risk Assessment which complies with the relevant requirements of the Flood planning scheme policy is provided.

Table 8.2.11.3.G—Flood planning levels for essential community infrastructure

Type of essential community infrastructure	Minimum design levels
Emergency services	0.2% AEP flood
Emergency services, where for an emergency shelter	0.5% AEP flood
Emergency services, where for police facilities	0.5% AEP flood
Hospital and health care service where associated with a hospital	0.2% AEP flood
Community facility where involving storage of valuable records or items of historic or cultural significance (e.g. galleries and libraries)	0.5% AEP flood
State-controlled roads Major or minor electricity infrastructure not otherwise listed in this table Utility installation where for rail transport services Air service Telecommunications facility	No specific recommended level but development proponents should ensure that the infrastructure is optimally located and designed to achieve suitable levels of service, having regard to the processes and policies of the administering government agency.
Power stations (as defined in the <i>Electricity Act 1994</i>) or renewable energy facility.	0.2% AEP flood
Major electricity infrastructure where a major switch yard	0.2% AEP flood
Substations	0.5% AEP flood
Utility installation where for a sewage treatment plant	Defined flood event
Utility installation where for a water treatment plant	0.5% AEP flood

Note—A flood event with an AEP of 0.2% is the equivalent of a 500 year ARI flood event.

Note—A flood event with an AEP of 0.5% is the equivalent of a 200 year ARI flood event.

Table 8.2.11.3.H—Table of processes requiring additional assessment in a flood planning area

Process
(1) Oil refining or processing
(2) Producing, refining or processing gas or fuel gas
(3) Power station, including the activity of generating electricity by using fuel
(4) Producing, quenching, cutting, crushing or grading coke
(5) Waste incinerator, including thermal treatment of waste
(6) Pulp or paper manufacturing
(7) Tannery or works for curing animal skins, hides or finishing leather
(8) Textile manufacturing, including carpet manufacturing, wool scouring or carbonising, cotton milling, or textile bleaching, dyeing or finishing
(9) Rendering plant, including meat processing
(10) Manufacturing chemicals, poisons and explosives
(11) Manufacturing fertilisers involving ammonia
(12) Manufacturing polyvinyl chloride plastic
(13) Major hazard facilities for the storage and handling of dangerous goods
(14) Storage of hazardous chemicals in quantities that would exceed the hazardous chemicals flood hazard threshold set out in Table 8.2.11.3.M
(15) Manufacturing medium-density fibreboard, chipboard, particle board, plywood, laminated board or wood veneer products
(16) Manufacturing or processing plaster
(17) Enamelling workshop
(18) Galvanising works
(19) Anodising or electroplating workshop
(20) Powder coating workshop

(21) Treating timber for preservation using chemicals including copper, chromium, arsenic, borax and creosote
(22) Manufacturing soil conditioners by receiving, blending, storing, processing, drying or composting organic material or organic waste, including animal manures, sewage, septic sludges and domestic waste
(23) Manufacturing tyres, asbestos products, asphalt, cement, glass or glass fibre, mineral wool or ceramic fibre
(24) Abattoir, including meat processing
(25) Recycling chemicals, oils or solvents
(26) Waste disposal activity (other than waste incinerator), including waste transfer station operation
(27) Recycling, storing or reprocessing regulated waste, including regulated waste treatment
(28) Manufacturing batteries and battery recycling
(29) Drum and container reconditioning
(30) Water treatment
(31) Sewage treatment

Table 8.2.11.3.1—Suitability of reconfiguring a lot within a flood planning area

C – Reconfiguring a lot is suitable within a flood planning area

– Flood risk assessment in accordance with the requirements of the Flood planning scheme policy is required to demonstrate the mitigation of risk from flood hazard

Flood planning area	Creek/waterway flood planning area sub-categories			Brisbane River flood planning area sub-categories		
	Residential	Industrial	Other	Residential	Industrial	Other
1	#	#	#	#	#	#
2/2a;2b	#	#	#	#	C	#
3	#	#	#	#	C	C

4	C	C	C	C	C	C
5	C	C	C	C	C	C

Notes—

- A flood risk assessment is required for residential reconfiguring a lot development where creating more than two new lots in the overland flow flood planning area sub-category.
- Additional requirements apply for the Brisbane River flood planning area sub-category if the residential flood level is greater than 12.8m AHD.
- Minimum site levels, requirements for no adverse off site impacts and other provisions in the planning scheme still apply.

Table 8.2.11.3.J—Flood planning levels for reconfiguring a lot

Flooding source ⁽¹⁾	Minimum lot levels (m AHD) ⁽²⁾			Other than residential
	Residential (creating 6 or less lots with no new road)	Residential (creating more than 6 lots), or a new road		
Brisbane River	2% AEP flood level + 300mm	RFL + 0.3m		1% AEP flood level
Creek/waterway	Minimum 300m ² area at the 1% AEP flood level + 300mm ⁽³⁾	1% AEP flood level + 300mm		2% AEP flood level
Overland flow	Minimum 300m ² area at the 2% AEP flood level + 300mm ⁽³⁾	2% AEP flood level + 300mm		2% AEP flood level

Notes—

- ⁽¹⁾ Where the site is subject to more than one flooding source, the minimum flood planning level is the highest level determined from these sources.
- ⁽²⁾ Where flood levels are not available from Council's FloodWise Property Report such as for overland flow flooding, a suitably qualified Registered Professional Engineer Queensland with expertise in undertaking flood studies is required to estimate the relevant flood level.
- ⁽³⁾ The 300m² area is considered suitable for siting a dwelling house with open space area at or above the nominated flood planning level.

Table 8.2.11.3.K—Flood planning levels for existing road providing access to or fronting a development

Flooding source ⁽¹⁾	Minimum design levels at the crown of the road (m AHD) ⁽²⁾⁽³⁾	
	Local road	Neighbourhood road
Brisbane River	5% AEP flood level	2% AEP flood level
		District road, suburban road, arterial road
		2% AEP flood level

Creek/waterway	5% AEP flood level	2% AEP flood level	2% AEP flood level
Overland flow	5% AEP flood level	5% AEP flood level	5% AEP flood level

Notes—

(1) Where the site is subject to more than one flooding source, the minimum flood planning level is the highest level determined from these sources.

(2) Where flood levels are not available from Council's FloodWise Property Report such as overland flow flooding a suitably qualified Registered Professional Engineer in Queensland with expertise in undertaking flood studies is required to estimate the relevant flood level. The Flood planning scheme policy sets out the requirements for a flood risk assessment process.

(3) The design standard for industry access is the 5% AEP flood level for all flooding sources.

Table 8.2.11.3.L—Categories of flood planning levels

Flooding source ⁽¹⁾	Minimum design floor or pavement levels (m AHD) ⁽²⁾ (refer to Table 8.2.11.3.D for assignment of these categories)			
	Category A	Category B	Category C	Category D
Brisbane River	RFL + 500mm	RFL + 300mm	DFL	5% AEP flood level
Creek/ waterway	1% AEP flood level + 500mm	1% AEP flood level + 300mm	1% AEP flood level	5% AEP flood level
Overland flow	2% AEP flood level + 500mm	2% AEP flood level + 300mm	2% AEP flood level	5% AEP flood level

Notes—

(1) Where the site is subject to more than one type of flooding that is overland flow flooding, creek or waterway flooding or river flooding, the minimum flood immunity level is the highest level determined from these sources.

(2) Where flood levels are not available from Council's FloodWise Property Report such as overland flow flooding, the applicant will need to engage a suitably qualified Registered Professional Engineer Queensland with expertise in undertaking flood studies required to estimate the relevant flood level. The Flood planning scheme policy sets out the requirements for a flood risk assessment process.

- A flood event with an AEP of 1% is the equivalent of a 100 year ARI flood event.
- A flood event with an AEP of 2% is the equivalent of a 50 year ARI flood event.
- A flood event with an AEP of 5% is the equivalent of a 20 year ARI flood event.

Table 8.2.11.3.M—Hazardous chemicals flood hazard threshold

Hazardous chemicals flood hazard threshold means any of the following:

A hazardous chemical listed in schedule 11 of the Work Health and Safety Regulation 2011 in a quantity that exceeds a threshold quantity stated in column 5 of schedule 11
A chemical classified as hazardous to the aquatic environment under the Australian Dangerous Goods Code in the Acute I or Chronic I category that exceeds 2500 litres or kilograms
A chemical classified as hazardous to the aquatic environment under the Australian Dangerous Goods Code in the Chronic II category that exceeds 10,000 litres or kilograms
A chemical classified as hazardous to the aquatic environment under the Australian Dangerous Goods Code and assigned to Packing Group III that exceeds 10,000 litres or kilograms
A chemical classified as hazardous to the aquatic environment under the Globally Harmonised System of Classification and Labelling of Chemicals that exceeds 10,000 litres or kilograms

9.4.4 Infrastructure design code

9.4.4.1 Application

1. This code applies to assessing a material change of use, reconfiguring a lot or building work if:
 - a. assessable development where this code is identified as a prescribed secondary code in the assessment benchmarks column of a table of assessment for a material change of use (section 5.5), reconfiguring a lot (section 5.6), operational work (section 5.8), or an overlay (section 5.10); or
 - b. impact assessable development, to the extent relevant.

2. When using this code, reference should be made to section 1.5 and section 5.3.3.

Note—The following purpose, overall outcomes, performance outcomes and acceptable outcomes comprise the assessment benchmarks of this code.

Note—Where this code includes performance outcomes or acceptable outcomes that relate to:

- ecological assessment, koala habitat or development design, guidance is provided in the Biodiversity areas planning scheme policy;
- infrastructure design and construction works, guidance is provided in the Infrastructure design planning scheme policy;
- noise and dust impacts during construction and/or demolition, guidance is provided in the Management plans planning scheme policy;
- noise impact assessment, guidance is provided in the Noise impact assessment planning scheme policy;
- refuse and recycling, guidance is provided in the Refuse planning scheme policy;
- parking or servicing management during construction, guidance is provided in the Transport, access, parking and servicing planning scheme policy.

9.4.4.2

Purpose

1. The purpose of the Infrastructure design code is to assess the suitability of infrastructure for development.
2. The purpose of the code will be achieved through the following overall outcomes:
 - a. Development is provided with a safe, connected and efficient transport network for all modes that has a minimal whole-of-life cost.
 - b. Development provides for public utilities and services to the standards acceptable to the Council and the reasonable expectations of service providers.
 - c. Development involving infrastructure which is intended to become a Council asset is safe, aesthetically pleasing, functional, fit for purpose, durable, minimises environmental impacts and has minimal whole-of-life cost.
 - d. Development provides for a public space to be safe and inviting, allowing high levels of pedestrian activity.
 - e. Development ensures that the community and environment are not unreasonably disrupted or impacted by construction or demolition for the development.
 - f. Development involving infrastructure is designed with consideration of, and to integrate with, other related and interfacing infrastructure components.
 - g. Development accessed by common private title is provided with appropriate fire hydrant infrastructure and has unimpeded access for refuse vehicles and for emergency service vehicles to protect people, property and the environment.
 - h. Development ensures major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System is not compromised.
 - i. Development for major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System avoids or otherwise minimises adverse impacts on surrounding land uses.

9.4.4.3 Performance outcomes and acceptable outcomes

Table 9.4.4.3.A—Performance outcomes and acceptable outcomes

Performance outcomes	Acceptable outcomes	Comments
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; f. provide for the amelioration of noise 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.	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.	N/A No new public roads proposed. Access via private driveway.
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.	N/A No new public roads proposed. Access via private driveway. Design to comply with all relevant Australian Standards.

P03 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.	N/A No new public roads proposed. Access via private driveway. Design to comply with all relevant Australian Standards.
P04 Development provides verges which are designed and constructed to: a. provide safe access for pedestrians clear of obstructions and access areas for vehicles onto properties; b. provide a sufficient area for public utility services; c. be maintainable by the Council.	AO4 Development provides verges which are designed and constructed in compliance with the road corridor design and streetscape locality advice standards in the Infrastructure design planning scheme policy.	N/A No new public roads proposed. Access via private driveway. Design to comply with all relevant Australian Standards.
P05 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.	AO5 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 No new public roads proposed. Access via private driveway. Design to comply with all relevant Australian Standards.
P06 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 over channels and verges;	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; b. forming and grading to verges;	Development will comply at detailed design phase.

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; g. effective drainage; h. appropriate conduits to facilitate the provision of required street-lighting systems and traffic signals.	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; 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 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.	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.	Development complies Development provides pedestrian access through site. Refer to Overall Layout Plan by ADG Engineers (Report Ref: 26992 C ESR) for further information. No new roads proposed and thus no new cycle routes.

PO8 Development 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.	AO8.1 Development provides refuse and recycling collection and storage facilities in accordance with the Refuse planning scheme policy. AO8.2 Development ensures that refuse and recycling collection and storage location 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.	Development will comply
PO9 Development ensures that: - land used for an urban purpose is serviced adequately with regard to water supply and waste disposal; - the water supply meets the stated standard of service for the intended use and fire-fighting purposes.	AO9.1 Development ensures that the reticulated water and sewerage distribution system for all services is in place before the first use is commenced. AO9.2 Development provides the lot with reticulated water supply and sewerage to a standard acceptable to the distributor—retailer.	Development complies Refer Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
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: - avoid significant native vegetation and areas identified within the Biodiversity areas overlay map; - minimise earthworks; - avoid crossing waterways, waterway corridors and wetlands or if a crossing is unavoidable, tunnel-boring techniques are used to minimise disturbance, and a 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.	Development will comply at detailed design phase.

	AO10.2 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 Development ensures that land used for urban purposes is serviced adequately with telecommunications and energy supply.	AO11 Development provides land with the following services to the standards of the approved supplier: a. electricity; b. telecommunications services; c. gas service where practicable.	Development will comply
PO12 Development ensures that major public projects promote the provision of affordable, high-bandwidth telecommunications services throughout the city.	AO12 Development provides conduits which are provided in all major Council and government works projects to enable the 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.	Development will comply at detailed design phase.

PO13 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; b. is sited and designed: i. as an integrated part of the project design; ii. as conceptually relevant to the context of the location; iii. to reflect and respond to the cultural values of the community; iv. to promote local character in a planned and informed manner.	AO13 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.	N/A
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 located. Editor's note—Signage is to be in accordance with Local Law Number 1 (Control of Advertisements Local Law).	N/A
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
PO16 Development provides public toilets which: a. are required as part of a community facility or park; b. are located, designed and constructed to be:	AO16 Development that provides public toilets is designed and constructed in compliance with the public toilets standards in the Infrastructure design planning scheme	N/A

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i. safe; ii. durable; iii. resistant to vandalism; iv. able to service expected demand; v. fit for purpose.	policy.	
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: 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. 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.	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 planning scheme policy.	N/A
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	AO18 Development that provides culverts is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	Development will comply. Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for details of preliminary stormwater design.

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levels or flow velocities, and significant change of flood patterns. 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 are designed and constructed using proven methods, materials and technology to provide for: a. safety; 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.	AO19 Development that provides batters, retaining walls, seawalls and river walls is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	Complies. Refer to preliminary earthworks design drawings by ADG Engineers and Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.	
If for development with a gross floor area greater than 1,000m²			
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. Note—The preparation of a construction management plan can assist in demonstrating achievement of this performance outcome. Note—The Transport, access, parking and servicing planning scheme policy provides advice on the management of vehicle parking and deliveries during construction.	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 landscaping is protected from damage; c. safe, legible, efficient and sufficient pedestrian, cyclist and vehicular accessibility and connectivity to the wider network are maintained.	N/A Proposal is for Reconfiguration of Lot. No GFA proposed. Development of lots to be completed under separate development applications.	
PO21 Development ensures that construction and demolition	AO21.1 Development ensures that demolition and construction:	Development will comply at construction phase	

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.	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.	
PO22 Development ensures that: a. construction and demolition do not result in damage to surrounding property as a result of vibration; b. vibration levels achieve the vibration criteria in Table 9.4.4.3.B, Table 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.	AO22 Development ensures that the nature and scale of construction and demolition do not generate noticeable levels of vibration.	Development will comply at construction phase
If for a material change of use or reconfiguring a lot in an urban area (as defined in the Regulation) involving premises that is, or will be, accessed by common private title, where involving buildings, either attached or detached, that are not covered by other legislation mandating fire hydrants		
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. AO23.2	Development will comply at detailed design phase. Refer to preliminary engineering services layout plan 26992_DA05 by ADG Engineers and Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for preliminary water layout proposal.

		Fire hydrants are identified by: a. raised reflectorised pavement markers (RRPM) on sealed roads; 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.		Development will comply.
Development for major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System where not in the Utility services zone precinct of the Special purpose zone			
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
Development potentially impacting on major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System where the infrastructure is not in the Utility services zone precinct of the Special purpose zone			
PO26 Development is sited and designed to: a. avoid safety risks to people or property; 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.	AO26 No acceptable outcome is prescribed.		N/A

Table 9.4.4.3.B—Recommended intermittent vibration levels for cosmetic damage

Type of building	Peak particle velocity (mm/s)		
Reinforced or framed structures; industrial and heavy commercial buildings	50mm/s at 4Hz and above		
Unreinforced or light-framed structures; residential or light commercial type buildings	Below 4Hz	4Hz to 15Hz	15Hz and above
	0.6mm/s	15mm/s at 4Hz increasing to 20mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above

Table 9.4.4.3.C—Recommended blasting vibration levels for human comfort

Type of building	Type of blasting operations	Peak component particle velocity (mm/s)
Residences, educational establishments and places of worship	Operation blasting longer than 12 months or more than 20 blasts	5mm/s for 95% blasts per year 10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply
Residences, educational establishments and places of worship	Operation blasting longer than 12 months or more than 20 blasts	10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply
Industry or commercial premises	All blasting	25mm/s maximum unless agreement is reached with the occupier that a higher limit may apply. For sites containing

			equipment sensitive to vibration, the vibration should be kept below manufacturer's specifications or levels that do not adversely affect the equipment operation.
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Table 9.4.4.3.D—Recommended levels for continuous and impulsive vibration acceleration (m/s^2) 1–80Hz for human comfort

Location	Assessment period ⁽¹⁾	Preferred values ⁽³⁾		Maximum values ⁽³⁾	
Continuous vibration		Z-axis	x and y axes	Z-axis	x and y axes
Critical areas ⁽²⁾	Day or night	0.005 m/s ²	0.0036 m/s ²	0.01 m/s ²	0.0072 m/s ²
Residences	Day	0.01 m/s ²	0.0071 m/s ²	0.02 m/s ²	0.014 m/s ²
-	Night	0.007 m/s ²	0.005 m/s ²	0.014 m/s ²	0.01 m/s ²
Offices, educational establishments and places of worship	Day or night	0.02 m/s ²	0.014 m/s ²	0.04 m/s ²	0.028 m/s ²
Workshops	Day or night	0.04 m/s ²	0.029 m/s ²	0.08 m/s ²	0.058 m/s ²
Impulsive vibration					
Critical areas	Day or night	0.005 m/s ²	0.0036 m/s ²	0.01 m/s ²	0.0072 m/s ²
Residences	Day	0.3 m/s ²	0.21 m/s ²	0.6 m/s ²	0.42 m/s ²
-	Night	0.1 m/s ²	0.071 m/s ²	0.2 m/s ²	0.14 m/s ²
Offices, educational establishments and places of worship	Day or night	0.64 m/s ²	0.46 m/s ²	1.28 m/s ²	0.92 m/s ²
Workshops	Day or night	0.64 m/s ²	0.46 m/s ²	1.28 m/s ²	0.92 m/s ²

(3) Situations exist where vibration above the preferred values can be acceptable, particularly for temporary or short-term events. Further guidance is given in the Noise impact assessment planning scheme policy.

Table 9.4.4.3.E—Recommended vibration dose values for intermittent vibration ($\text{m/s}^{1.75}$) for human comfort

(3) Situations exist where vibration above the preferred values can be acceptable, particularly for temporary or short-term events. Further guidance is given in the Noise impact assessment planning scheme policy.

9.4.9 Stormwater code

9.4.9.1 Application

1. This code applies to assessing a material change of use, reconfiguring a lot or operational work if:
 - a. assessable development where this code is identified as a prescribed secondary code in the assessment benchmarks column of a table of assessment for a material change of use (section 5.5), reconfiguring a lot (section 5.6) operational work (section 5.8) or an overlay (section 5.10); or
 - b. impact assessable development, to the extent relevant.

2. When using this code, reference should be made to section 1.5 and section 5.3.3.

Note—The following purpose, overall outcomes, performance outcomes and acceptable outcomes comprise the assessment benchmarks of this code.

Note—Where this code includes performance outcomes or acceptable outcomes that relate to infrastructure design and construction works, guidance is provided in the Infrastructure design planning scheme policy.

9.4.9.2 Purpose

1. The purpose of the Stormwater code is to assess the suitability of the stormwater aspects of development.
2. The purpose of the code will be achieved through the following overall outcomes:
 - a. Development achieves acceptable levels of stormwater run-off quality and quantity by applying water sensitive urban design principles as part of an integrated stormwater management framework.
 - b. Development protects public health and safety and protects against damage or nuisance caused by stormwater flows.
 - c. Development has a stormwater management system which maintains, recreates or minimises impact to natural catchment hydrological processes.
 - d. Development ensures that the environmental values of the city's waterways are protected or enhanced.
 - e. Development minimises run-off, including peak flows.
 - f. Development maintains or enhances the efficiency and integrity of the stormwater infrastructure network.
 - g. Development minimises the whole of life cycle cost of stormwater infrastructure.

9.4.9.3 Performance outcomes and acceptable outcomes

Table 9.4.9.3.A—Performance outcomes and acceptable outcomes

Performance outcomes		Acceptable outcomes	Comments
Section A—If for a material change of use, reconfiguring a lot, operational work or building work Note—Compliance with the performance outcomes and acceptable outcomes in this section should be demonstrated by the submission of a site-based stormwater management plan for high risk development only.			
PO1 Development provides a stormwater management system which achieves the integrated management of stormwater to: a. minimise flooding; b. protect environmental values of receiving waters; c. maximise the use of water sensitive urban design; d. minimise safety risk to all persons; e. 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.	Development complies Refer to Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.	
		AO2.1 Development does not result in an increase in flood level or flood hazard on up slope, down slope or adjacent premises. AO2.2 Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.	Development complies Area of works not affected by flooding below 1% AEP. Refer to Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
PO2 Development ensures that the stormwater management system and site work does not adversely impact flooding or drainage characteristics of premises which are up slope, down slope or adjacent to the site.			

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 cause nuisance to properties.	AO3.1 Development ensures that the location of the stormwater drainage system is contained within a road reserve, drainage reserve, public pathway, park or waterway corridor.		Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
	AO3.2 Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.		
	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.		
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.		Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
	AO4.2 Development provides sufficient area to convey run-off which will comply with the standards in 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.	AO5 Development ensures the design of stormwater channels, creek modifications or other infrastructure, permits terrestrial and aquatic fauna movement.		N/A

P06 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.	A06.1 Development locates stormwater detention and water quality treatment: a. outside of a waterway corridor; b. offline to any catchment not contained within the development. A06.2 Development providing for stormwater detention and water quality treatment devices are designed in compliance with the standards in the Infrastructure design planning scheme policy.	Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
P07 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.	A07.1 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 site-based stormwater management plan). A07.2 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.	Development complies Development is to be located above the DFL. Refer to Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information. Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
P08 Development designs stormwater channels, creek modification works and the drainage network to protect and enhance the environmental values of the waterway corridor or drainage path.	A08.1 Development ensures natural waterway corridors and drainage paths are retained. A08.2 Development provides the required hydraulic conveyance of the drainage channel and floodway, while maximising its potential to maximise environmental	Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.

		benefits and minimise scour. Editor's note—Guidance on natural channel design principles can be found in the Council's publication Natural channel design guidelines.	
	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.	
	AO8.4	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	Development is designed to manage run-off and peak flows by minimising large areas of impervious material and maximising opportunities for capture and re-use.	AO9 No acceptable outcome is prescribed.	Development will comply
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.	Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
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;	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.	Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.

b. safe management of stormwater discharge from existing and future up-slope development; c. implication for adjacent and down-slope development.	AO11.2 Development ensures that existing stormwater infrastructure that is undersized is upgraded in compliance with the Infrastructure design planning scheme policy.	
PO12 Development provides stormwater infrastructure which: a. remains fit for purpose for the life of the development and maintains full functionality in the design flood event; b. can be safely accessed and maintained cost effectively; c. ensures no structural damage to existing stormwater infrastructure.	AO12.1 The stormwater management system is designed in compliance with the Infrastructure design planning scheme policy. 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.	Development will comply
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. Note—The Infrastructure design planning scheme policy outlines the appropriate measures to be taken into account to achieve the performance outcome.	AO13 No acceptable outcome is prescribed.	Development will comply Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
PO14 Development ensures that: a. unnecessary disturbance to soil, waterways or drainage channels is avoided;	AO14 No acceptable outcome is prescribed.	Development will comply Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.

b. all soil surfaces remain effectively stabilised against erosion in the short and long term.		
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.	Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
Section B—Additional performance outcomes and acceptable outcomes which apply to high-risk 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 values. <i>Note—Prescribed water contaminants are defined in the Environmental Protection Act 1994.</i> <i>Note—Compliance with the performance outcome should be demonstrated by the submission of a site-based stormwater management plan for high-risk development only.</i>	AO16 Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.	Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
PO17 Development ensures that: a. the discharge of wastewater to a waterway or external to the site is avoided; or b. if the discharge cannot practicably be avoided, the development minimises wastewater discharge	AO17 No acceptable outcome is prescribed.	N/A

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 outcomes and acceptable outcomes for assessable development for a material change of use or reconfiguring a lot 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. 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.	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.	Development complies Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information.
PO19 Development provides for the payment of extra trunk infrastructure costs for the following: 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	AO19 No acceptable outcome is prescribed.	N/A

infrastructure plan involving: i. trunk infrastructure that is to be provided earlier than planned in the Local government infrastructure plan; ii. long 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 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 <i>Planning Act 2016</i>.		
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Table 9.4.9.3.B—Categories of flood planning levels

Flooding type ⁽¹⁾	Minimum design floor or pavement levels (m AHD) ⁽²⁾ (refer to Table 9.4.9.3.C for assignment of these categories)				
	Category A	Category B	Category C	Category D	Category E
Waterway ^(A) or open channel	1% AEP flood level + 500mm	1% AEP flood level + 300mm	1% AEP flood level	1% AEP flood level	5% AEP flood level
Overland flow flooding ^(B)	2% AEP flood level +500mm	2% AEP flood level +300mm	2% AEP flood level	2% AEP flood level	5% AEP flood level

Notes—

⁽¹⁾ Where the site is subject to more than one type of flooding that is overland flow flooding, creek or waterway flooding or river flooding, the minimum flood immunity level is the highest level determined from these sources.

⁽²⁾ Where flood levels are not available from Council's Floodwise Property Report such as overland flow flooding, the applicant will need to engage a suitably qualified Registered Professional Engineer Queensland with expertise in undertaking flood studies to estimate the relevant flood level.

Note ^(A) A waterway, including any indicated on the planning scheme maps, is defined as any element of a river, creek, stream, gully or drainage channel, including the bed and banks, typically with a catchment area greater than 30ha.

Note ^(B) Overland flow flooding usually occurs when the capacity of the underground piped drainage system is exceeded and/or when the overland flow path is blocked. Localised overland flow paths generally traverse along roadways, and in the older established areas, through private properties within existing low points and gullies. A localised overland flow path is not characterised by well-defined bed and banks and the contributing catchment is generally less than 30ha.

Note—A flood event with an AEP of 1% is the equivalent of a 100 year ARI flood event.

Note—A flood event with an AEP of 2% is the equivalent of a 50 year ARI flood event.

Note—A flood event with an AEP of 5% is the equivalent of a 20 year ARI flood event.

Note—The flood immunity level in some older inner-city areas is often controlled by local ponding.

Table 9.4.9.3.C—Flood planning level categories for development types

BCA building classification ⁽¹⁾	Development types and design levels, assigned design floor or pavement levels	Category Refer to Table 8.2.11.3.L
Class 1–4	Habitable room	Category A
	Non-habitable room including patio and courtyard	Category B
	Non-habitable part of a Class 2 or Class 3 building excluding the essential services ⁽²⁾ control room	Category B
	Parking located in the building undercroft of a multiple dwelling	Category C
	Carpport ⁽⁴⁾ , unroofed car park; vehicular manoeuvring area	Category D
	Essential electrical services ⁽²⁾ of a Class 2 or Class 3 building only	Category A ⁽⁶⁾
	Basement parking entry ⁽³⁾	Category C + 300mm
	Building floor level	Category C
Class 5, Class 6, or Class 8	Garage or car park located in the building undercroft ⁽³⁾	Category C
	Carpport ⁽⁴⁾ or unroofed car park	Category D
	Vehicular access and manoeuvring areas	Category D
	Basement parking entry ⁽³⁾	Category C
	Essential electrical services ⁽²⁾	Class 8 – Category C ⁽⁶⁾ Class 5 & 6 – Category A ⁽⁶⁾

Class 7a	Refer to the relevant building class specified in this table	
Class 7b	Building floor level	Category C
	Vehicular access and manoeuvring area	Category D
	Essential electrical services ⁽²⁾	Category C
Class 9	Building floor level	Category A
	Building floor level for habitable rooms in Class 9a or 9c where for a residential care facility	0.2% AEP flood
	Garage or car park located in the building undercroft ⁽³⁾	Category C
	Carport ⁽⁴⁾ or unroofed car park	Category D
	Vehicular access and manoeuvring areas	Category D
Class 10a	Essential electrical services ⁽²⁾	Category A
	Car parking facility	Refer to the relevant building class specified in this table
	Shed ⁽⁵⁾ or the like	Category D
	Swimming pool	Category E
	Associated mechanical and electrical pool equipment	Category C
Class 10b	Other structures	Flood immunity standard does not apply

Notes—

⁽¹⁾ Refer to the Building Code of Australia for definitions of building classifications.⁽²⁾ Essential services include any room used for fire control panel, telephone PABX, sensitive substation equipment including transformers, low voltage switch gear, high-voltage switch gear, battery chargers, protection control and communication equipment, low voltage cables, high-voltage cables and lift controls.⁽³⁾ Basement car parks must be suitably waterproofed and all air vents, air-conditioning ducts, pedestrian access and entry and exit ramps at the car park entrance have flood immunity in accordance with this table.⁽⁴⁾ A shelter for a motor vehicle, which has a roof and one or more open sides, and which can be built against the side of a building.⁽⁵⁾ A slight or rough structure built for shelter and storage; or a large strongly built structure, often open at the sides or end.⁽⁶⁾ Where essential services are proposed in a basement below the specified flood planning level, the flood immunity of all air vents, air-conditioning ducts, pedestrian access, lift shafts and entry/exit ramps at the

basement entrance and any other openings into that basement must conform to Category A for Residential development, and the relevant basement entry level of all other uses. This will require a waterproof basement design to prevent floodwaters entering the basement to ensure flood immunity.

Note—A flood event with an AEP of 2% is the equivalent of a 50 year ARI flood event.

Note—A flood event with an AEP of 0.2% is the equivalent of a 500 year ARI flood event.

Note—Where a building has a combination of uses that includes a component of class 2, 3 or 9, the essential services for that building shall comply with the requirements of the building class with the greatest flood immunity requirement.

Note—Use classes for residential development also include basement storage.

Table 9.4.9.3.D—Flood planning levels for a new road

Flooding type ⁽¹⁾	Minimum design levels at the crown of the road (m AHD) ⁽²⁾	
	Residential development	Industrial or commercial development
Waterway ^(A) or open channel	1% AEP flood level	2% AEP flood level
Overland flow flooding ^(B)	2% AEP flood level	2% AEP flood level

Notes—

⁽¹⁾ Where the site is subject to more than 1 type of flooding, the minimum flood planning level is the highest level determined from these sources. It should be noted that the flooding planning level in some older areas is often controlled by local ponding.

⁽²⁾ Where flood levels are not available from Council's Floodwise Property Report, such as overland flow flooding, the applicant will need to engage a suitably qualified Registered Professional Engineer Queensland with expertise in undertaking flood studies to estimate the relevant flood level.

Note ^(A) A waterway including any indicated on the planning scheme maps is defined as any element of a river, creek, stream, gully or drainage channel, including the bed and banks typically with a catchment area greater than 30ha.

Note ^(B) Overland flow flooding usually occurs when the capacity of the underground piped drainage system is exceeded and/or when the overland flow path is blocked. Localised overland flow paths generally traverse along roadways, and in the older established areas, through private properties within existing low points and gullies. A localised overland flow path is not characterised by well-defined bed and banks and the contributing catchment is generally less than 30ha.

Note—A flood event with an AEP of 1% is the equivalent of a 100 year ARI flood event.

Note—A flood event with an AEP of 2% is the equivalent of a 50 year ARI flood event.

Note—A flood event with an AEP of 5% is the equivalent of a 20 year ARI flood event.

Table 9.4.9.3.E—Flood planning levels for essential community infrastructure

Type of essential community infrastructure	Minimum design levels
Emergency services	0.2% AEP flood
Emergency services, where for an emergency shelter	0.5% AEP flood
Emergency services, where for police facilities	0.5% AEP flood
Hospital and health care service, where associated with a hospital	0.2% AEP flood
Community facility where involving storage of valuable records or items of historic or cultural significance (e.g. galleries and libraries)	0.5% AEP flood
State-controlled roads Major or minor electricity infrastructure not otherwise listed in this table Utility installation where for rail transport services Air service Telecommunications facility	No specific recommended level but development proponents should ensure that the infrastructure is optimally located and designed to achieve suitable levels of service, having regard to the processes and policies of the administering government agency.
Power stations (as defined in the <i>Electricity Act 1994</i>) or renewable energy facility.	0.2% AEP flood
Major electricity infrastructure where a major switch yard	0.2% AEP flood
Substations	0.5% AEP flood
Utility installation where for a sewage treatment plant	DFE
Utility installation where for a water treatment plant	0.5% AEP flood

Note—A flood event with an AEP of 0.2% is the equivalent of a 500 year ARI flood event.

Note—A flood event with an AEP of 0.5% is the equivalent of a 200 year ARI flood event.

Table 9.4.9.3.F—Flood planning levels for reconfiguring a lot

Flooding type ⁽¹⁾	Minimum lot levels (m AHD) ⁽²⁾	
	Residential	Other than residential
Waterway ^(A) or open channel	1% AEP flood level + 300mm	1% AEP flood level
Overland flow flooding ^(B)	1% AEP flood level + 300mm	2% AEP flood level

Notes—

⁽¹⁾ Where the site is subject to more than one type of flooding, the minimum flood immunity level is the highest level determined from these sources.

⁽²⁾ Where flood levels are not available from Council's Floodwise Property Report such as overland flow flooding, the applicant will need to engage a suitably qualified Registered Professional Engineer Queensland with expertise in undertaking flood studies to estimate the relevant flood level.

Note ^(A) A waterway including any indicated on the planning scheme maps is defined as any element of a river, creek, stream, gully or drainage channel, including the bed and banks typically with a catchment area greater than 30ha.

Note ^(B) Overland flow flooding usually occurs when the capacity of the underground piped drainage system is exceeded or when the overland flow path is blocked. Localised overland flow paths generally traverse along roadways, and in the older established areas, through private properties within existing low points and gullies. A localised overland flow path is not characterised by well-defined bed and banks and the contributing catchment is generally less than 30ha.

Note—A flood event with an AEP of 1% is the equivalent of a 100 year ARI flood event.

Note—A flood event with an AEP of 2% is the equivalent of a 50 year ARI flood event.

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Guide to Development in a Transport Environment: Rail which provides direction on how to address this code.

Table 2.1 Development in general

Performance outcomes		Acceptable outcomes	Response
Building, structures, infrastructure, services and utilities			
PO1 Development does not create a safety hazard within the railway corridor .		No acceptable outcome is prescribed.	Complies with PO1. No works in rail corridor proposed. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO2 Development does not cause damage to the railway corridor, rail transport infrastructure or other rail infrastructure .		No acceptable outcome is prescribed.	Complies with PO2 No works in rail corridor proposed. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO3 Development does not interfere with, or obstruct, the rail transport infrastructure or other rail infrastructure .		No acceptable outcome is prescribed.	Complies with PO3 No works in rail corridor proposed. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO4 Development does not adversely impact the structural integrity or physical condition of the railway, other rail infrastructure or the railway corridor by adding or removing loading .		No acceptable outcome is prescribed.	Complies with PO4 No works in rail corridor proposed. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO5 Development above a railway is designed to enable natural ventilation and smoke dispersion in the event of a fire emergency.		No acceptable outcome is prescribed.	N/A Development is not above railway.
PO6 Development does not adversely impact the operating performance of the railway corridor .		No acceptable outcome is prescribed.	Complies Development not within railway corridor.
PO7 Buildings and structures in a railway corridor are designed and constructed to protect persons in the event of a derailed train.		No acceptable outcome is prescribed.	N/A
PO8 Buildings and structures in high risk locations and where also located within 10 metres		AO8.1 Buildings and structures , in a railway corridor , including foundations, retaining and other	N/A

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Performance outcomes	Acceptable outcomes	Response
of the centreline of the nearest railway track are design and constructed to protect persons in the event of a derailed train.	support elements, are designed and constructed in accordance with Civil Engineering Technical Requirement CIVIL-SR-012 Collision protection of supporting elements adjacent to railways , Queensland Rail, 2011, AS5100 Bridge design, and AS1170 Structural design actions.	No building and structures proposed in high risk locations.
PO9 Buildings and structures are designed and constructed to protect people from electrocution.	AO9.1 The outermost projection of development is set back horizontally a minimum of 3 metres from the outermost projection of overhead line equipment .	Complies
PO10 Development in the railway corridor is designed and constructed to prevent projectiles being thrown onto the railway .	No acceptable outcome is prescribed.	N/A Development is subdivision only.
PO11 Buildings, and structures with publicly accessible or communal areas within 20 metres from the centreline of the nearest railway track are designed and constructed to prevent projectiles from being thrown onto a railway .	AO11.1 Publicly accessible areas located within 20 metre from the centreline of the nearest railway do not overlook a railway . OR AO11.2 Buildings and structures are designed to ensure publicly accessible areas located within 20 metres from the centreline of the nearest railway track and that overlook the railway may include throw protection screens in accordance with the relevant provisions of the Civil Engineering Technical Requirement – CIVIL-SR005 Design of buildings over or near railways , Queensland Rail, 2011, and the Civil Engineering Technical Requirement – CIVIL-SR008 Protection screens, Queensland Rail.	N/A No buildings or structures proposed.
Stormwater and overland flow		
PO12 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard in a railway corridor .	No acceptable outcome is prescribed.	Complies with PO12 Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information. Specifically refer to section 3.1 which discusses the rail corridor and the stormwater catchment plans provided within Appendix C on the SMP.

Performance outcomes	Acceptable outcomes	Response
PO13 Stormwater run-off or overland flow from the development site does not result in a material worsening of operating performance of the railway corridor, rail transport infrastructure or other rail infrastructure .	No acceptable outcome is prescribed.	Complies with PO13 Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information. Specifically the main catchment from the development C1B is directed to a LPD away from the rail corridor and the land subject to dedication for the rail corridor (Lot 3) will remain as is as part of the this subject development.
PO14 Stormwater run-off or overland flow from the development site does not interfere with the structural integrity or physical condition of the railway corridor, rail transport infrastructure or other rail infrastructure .	No acceptable outcome is prescribed.	Complies with PO14 Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information. Specifically the main catchment from the development C1B is directed to a LPD away from the rail corridor and the land subject to dedication for the rail corridor (Lot 3) will remain as is as part of the this subject development.
Flooding		
PO15 Development does not result in a material worsening of flooding impacts within a railway corridor .	No acceptable outcome is prescribed.	Complies with PO15 The rail corridor is not impacted by flooding from the development side of the rail corridor. Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information. Specifically the main catchment from the development C1B is directed to a LPD away from the rail corridor and the land subject to dedication for the rail corridor (Lot 3) will remain as is as part of the this subject development.
Drainage Infrastructure		
PO16 Drainage infrastructure does not create a safety hazard in a railway corridor .	AO16.1 Drainage infrastructure is wholly contained within the development site. AND AO16.2 Drainage infrastructure can be maintained without requiring access to a railway corridor .	Complies with PO16 Refer Stormwater Management Plan by ADG Engineers (Report Ref: 26992 C SMP) for further information. No new drainage infrastructure proposed in railway corridor.

Performance outcomes		Acceptable outcomes	Response
Construction Impacts			
PO17	Construction activities do not cause ground movement or vibration impacts in a railway corridor .	No acceptable outcome is prescribed.	Complies with PO17 Development will comply at construction phase
Access			
PO18	Development prevents unauthorised access to the railway corridor .	AO18.1 Development abutting the railway corridor incorporates fencing along the property boundary with the railway corridor in accordance with the railway manager's standards. AND AO18.2 A road barrier designed in accordance with Queensland Rail Civil Engineering Technical Requirement CIVIL-SR-007 – Design Criteria for Road Rail Barriers. AND AO18.3 Vehicle manoeuvring areas, driveways, loading areas and carparks abutting the railway corridor incorporate rail interface barriers along the boundary to the railway corridor.	Complies An existing fence is located along the common property boundary of the site/rail boundary. The development is separated by lot 5 which is to be dedicated as a transport corridor.
PO19	Development maintains existing maintenance and authorised access to the railway corridor .	AO19.1 Development does not obstruct existing authorised access points and access routes for maintenance and emergency works to the railway corridor at all times.	N/A No existing access from site.
PO20	Development does not impede the maintenance of a railway bridge or authorised access to a railway bridge .	AO20.1 Buildings and other structures are set back horizontally a minimum of 3 metres from a railway bridge. AND AO20.2 Permanent structures are not located below or abutting a railway bridge. AND	N/A No rail bridge adjacent to site.

Performance outcomes	Acceptable outcomes	Response
	AO20.3 Temporary activities below or abutting a railway bridge do not impede access to a railway corridor .	
Public passenger transport and active transport		
PO21 Development does not compromise the safety of public passenger transport infrastructure and active transport infrastructure .	No acceptable outcome is prescribed.	Complies No works in rail corridor proposed. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO22 Development maintains pedestrian and cycle access to a railway station or other public passenger transport infrastructure and active transport infrastructure associated with the railway .	No acceptable outcome is prescribed.	Complies No works in rail corridor proposed. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO23 Development does not adversely impact the structural integrity or physical condition of public passenger transport infrastructure and active transport infrastructure .	No acceptable outcome is prescribed.	Complies No works in rail corridor proposed. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO24 Development does not adversely impact the operating performance of public passenger transport infrastructure , public passenger services and active transport infrastructure .	No acceptable outcome is prescribed.	Complies No works in rail corridor proposed. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
Planned upgrades		
PO25 Development does not impede delivery of planned upgrades of rail transport infrastructure .	No acceptable outcome is prescribed.	Complies No planned upgrades identified.
Network safety		
PO26 Development involving dangerous goods does not adversely impact on the safety or operations of the railway and rail transport infrastructure .	AO26.1 Development does not involve handling or storage of hazardous chemicals above the threshold quantities listed in table 5.2 of the Model Planning Scheme Development Code for Hazardous Industries and Chemicals, Office of Industrial Relations, Department of Justice and Attorney-General, 2016.	N/A Development does not involve dangerous goods.

Table 2.2 Filling, excavation, building foundations and retaining structures

Performance outcomes	Acceptable outcomes	Response
PO27 Development does not create a safety hazard for users of the railway or other rail infrastructure .	No acceptable outcome is prescribed.	Complies No earthworks proposed in rail corridor. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO28 Development does not adversely impact on the operating performance of the railway or other rail infrastructure within the railway corridor .	No acceptable outcome is prescribed.	Complies No earthworks proposed in rail corridor. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO29 Development does not undermine, damage, or cause subsidence of, the railway corridor .	No acceptable outcome is prescribed.	Complies No earthworks proposed in rail corridor. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO30 Development does not adversely impact the structural integrity or physical condition of the railway, other rail infrastructure or the railway corridor by adding or removing loading .	No acceptable outcome is prescribed.	Complies No earthworks proposed in rail corridor. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO31 Development does not cause ground water disturbance in the railway corridor .	No acceptable outcome is prescribed.	Complies No earthworks proposed in rail corridor. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO32 Development does not adversely impact the railway or other rail infrastructure within the railway corridor .	No acceptable outcome is prescribed.	Complies No earthworks proposed in rail corridor. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO33 Excavation, boring, piling, blasting, drilling, fill compaction or similar activities does not adversely impact the operating performance of the railway or	No acceptable outcome is prescribed.	Complies

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other rail infrastructure within the railway corridor .		No earthworks proposed in rail corridor. Refer to Engineering Services Report by ADG Engineers (Report Ref: 26992 C ESR) for further information.
PO34 Filling and excavation material does not cause an obstruction or nuisance in the railway corridor .	AO34.1 Fill, spoil or any other material is not stored in, or adjacent to, the railway corridor .	N/A Proposal is ROL only.

Table 2.3 Railway crossings

Performance outcomes	Acceptable outcomes	Response
PO35 Development does not require a new level railway crossing .	No acceptable outcome is prescribed.	N/A
PO36 Development does not adversely impact on the operating performance of an existing railway crossing .	No acceptable outcome is prescribed.	N/A
PO37 Development does not adversely impact on the safety of an existing railway crossing .	No acceptable outcome is prescribed.	N/A
PO38 Development is designed and constructed to allow for on-site circulation to ensure vehicles do not queue in a railway crossing .	No acceptable outcome is prescribed.	N/A

Table 2.4 Environmental emissions

Statutory note: Where development is adjacent to a **railway** with 15 or fewer passing trains per day, compliance with table 2.4 is not required.

Performance outcomes	Acceptable outcomes	Response
Reconfiguring a Lot		
Involving the creation of 5 or fewer new residential lots adjacent to a railway or type 2 multi-modal corridor		
PO39 Development minimises free field noise intrusion from a railway .	AO39.1 Development provides a noise barrier or earth mound which is designed, sited and constructed:	Development will comply ROL only. Noise requirements to be further addressed as part of future MCU applications.

	1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: a. Civil Engineering Standard Specification QR-CTS-Part 41 – Part 41, Design and Construction of Noise Fences/Barriers, Queensland Rail, 2018; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO39.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound. OR AO39.3 Development provides a solid gap-free fence or other solid gap-free structure along the full extent of the boundary closest to a railway.	
Involving the creation of 6 or more new residential lots		
PO40 Reconfiguring a lot minimises free field noise intrusion from a railway .		
	AO40.1 Development provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: a. Civil Engineering Standard Specification QR-CTS-Part 41 – Part 41, Design and Construction of Noise Fences/Barriers; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020.	N/A 5 lots proposed only.

	OR AO40.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	
Material change of use (accommodation activity)		
Ground floor level requirements adjacent to a railway or type 2 multi-modal corridor		
PO41 Development minimises noise intrusion from a railway in private open space at the ground floor.	AO41.1 Development provides a noise barrier or earth mound which is designed, sited and constructed: - to achieve the maximum free field acoustic levels in reference table 2 (item 2.2) for private open space at the ground floor level; - in accordance with: - Civil Engineering Standard Specification QR-CTS-Part 41 – Part 41, Design and Construction of Noise Fences/Barriers, Queensland Rail, 2018; - Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; - Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO41.2 Development achieves the maximum free field acoustic level in reference table 2 (item 2.2) for private open space at the ground floor level by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	Development will comply ROL only. Noise requirements to be further addressed as part of future MCU applications.
PO42 Development (excluding a relevant residential building or relocated building) minimises noise intrusion from the railway in habitable rooms at the facade of the ground floor level.	AO42.1 Development (excluding a relevant residential building or relocated building) provides a noise barrier or earth mound which is designed, sited and constructed:	N/A ROL only.

	1. to achieve the maximum building facade acoustic level in reference table 1 (item 1.1) for habitable rooms at the ground floor level; 2. in accordance with: a. Civil Engineering Standard Specification QR-CTS-Part 41 – Part 41, Design and Construction of Noise Fences/Barriers, Queensland Rail, 2018; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019;. c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO42.2 Development (excluding a relevant residential building or relocated building) achieves the maximum building facade acoustic level in reference table 1 (item 1.1) for habitable rooms at the ground floor level by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound. No acceptable outcome is prescribed.	
PO43 Habitable rooms (excluding a relevant residential building or relocated building) are designed and constructed using materials to achieve the maximum internal acoustic level in Table 3 (item 3.1).		N/A ROL only.
Above ground floor level requirements (accommodation activity) adjacent to a railway or type 2 multi-modal corridor		
PO44 Balconies, podiums and roof decks include: 1. a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); 2. highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums and roof decks	No acceptable outcome is prescribed.	N/A ROL only.

PO45 Habitable rooms (excluding a relevant residential building or relocated building) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1).	No acceptable outcome is prescribed.	N/A ROL only.
Material change of use (other uses)		
Ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a railway or type 2 multi-modal corridor		
PO46 Development: - provides a noise barrier or earth mound that is designed, sited and constructed: - to achieve the maximum free field acoustic level in reference table 2 (item 2.3) for all outdoor education areas and outdoor play areas; - in accordance with: - Civil Engineering Standard Specification QR-CTS-Part 41 – Part 41, Design and Construction of Noise Fences/Barriers, Queensland Rail, 2018; - Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; - Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or - achieves the maximum free field acoustic level in reference table (item 2.3) for all outdoor education areas and outdoor play areas by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	No acceptable outcome is prescribed.	N/A ROL only.
PO47 Development involving a childcare centre or educational establishment : - provides a noise barrier or earth mound that is designed, sited and constructed: - to achieve the maximum building facade acoustic level in reference table 1 (item 1.2); - in accordance with:	No acceptable outcome is prescribed.	N/A ROL only.

i. Civil Engineering Standard Specification QR-CTS-Part 41 – Part 41, Design and Construction of Noise Fences/Barriers, Queensland Rail, 2018; or 2. achieves the maximum building facade acoustic level in reference table 1 (item 1.2) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.		
PO48 Development involving: indoor education areas and indoor play areas; or - sleeping rooms in a childcare centre; or patient care areas in a hospital; achieves the maximum internal acoustic level in reference table 3 (items 3.2, 3.3 and 3.4).	No acceptable outcome is prescribed.	N/A ROL only.
Above ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a railway or type 2 multi-modal corridor PO49 Development involving a childcare centre; or educational establishment which have balconies, podiums or elevated outdoor play areas predicted to exceed the maximum free field acoustic level in reference table 2 (item 2.3) due to noise from the railway are provided with: - a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); and - highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums and elevated outdoor play areas.	No acceptable outcome is prescribed.	N/A ROL only.

PO50 Development including: indoor education areas and indoor play areas in a childcare centre or educational establishment; or - sleeping rooms in a childcare centre; or patient care areas in a hospital located above ground level, is designed and constructed to achieve the maximum internal acoustic level in reference table 3 (items 3.2-3.4).	No acceptable outcome is prescribed.	N/A ROL only.
Air, light and vibration		
PO51 Private open space, outdoor education areas and outdoor play areas are protected from air quality impacts from a railway.	AO51.1 Each dwelling or unit has access to a private open space which is shielded from a railway by a building, noise barrier, solid gap-free fence, or other solid gap-free structure. OR AO51.2 Each outdoor education area and outdoor play area is shielded from a railway by a building, noise barrier, solid gap-free fence, or other solid gap-free structure.	N/A ROL only.
PO52 Patient care areas within hospitals are protected from vibration impacts from a railway.	AO52.1 Hospitals are designed and constructed to ensure vibration in the patient treatment area does not exceed a vibration dose value of 0.1m/s^{1.75}. AND AO52.2 Hospitals are designed and constructed to ensure vibration in the ward of a patient care area does not exceed a vibration dose value of 0.4m/s^{1.75}.	N/A ROL only.
PO53 Development is designed and sited to ensure light from infrastructure within, and use of, a railway does not: - intrude into buildings during night hours (10pm to 6am); and - create unreasonable disturbance during evening hours (6pm to 10pm).	No acceptable outcomes are prescribed.	N/A ROL only.

Table 2.5 Development in a future railway corridor

Performance outcomes	Acceptable outcomes	Response
PO54 Development does not impede the planning, design and delivery of rail transport infrastructure in a future railway corridor .	AO54.1 Development is not located in a future railway corridor . OR both of the following acceptable outcomes apply: AO54.2 The intensification of lots does not occur within a future railway corridor . AND AO54.3 Development does not result in the landlocking of parcels once a future railway corridor is delivered.	N/A Development not in a future railway corridor.
PO55 Development, including filling, excavation, building foundations and retaining structures do not undermine or cause subsidence of a future railway corridor .	No acceptable outcome is prescribed.	N/A Development not in a future railway corridor.
PO56 Development does not result in a material worsening of stormwater, flooding, overland flow or drainage impacts in a future railway corridor .	No acceptable outcome is prescribed.	N/A Development not in a future railway corridor.

Appendix J BCC Erosion Hazard Assessment Form



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>

☒ A 'medium' risk site

If the development is approved, the applicant will need to engage a Registered Professional Engineer (RPEQ) or 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

490 Beams Road, Fitzgibbon QLD

Postcode 4018

I certify that:

- ☒ I have made all relevant enquiries and am satisfied no matters of significance have been withheld from the assessment manager.
- ☒ I am a person with suitable qualifications and/or experience in erosion and sediment control.
- ☒ The Erosion Hazard Assessment was completed in accordance with the Erosion Hazard Assessment Supporting Technical Notes and the BCC Infrastructure Design Planning Scheme Policy.
- ☒ 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*

Michael Lapelaar

Certifier's signature

Date

22 / 03 / 2023

Table 1: Low Risk Test

		Yes	No
1.1	is the area of land disturbance > 1000 m ²	☒	☐
1.2	does any land disturbance occur in a BCC mapped waterway corridor	☐	☒
1.3	is there any slope on site (longer than three metres in length) before, during or after construction that is steeper than 5%	☐	☒
1.4	does any land disturbance occur below 5 m AHD	☐	☒
1.5	does development involve endorsement of a staging plan	☐	☒
1.6	is there an upstream catchment passing through the site > 1 hectare	☐	☒

Have you answered 'yes' to any of the questions in Table 1?

Yes	No
☒	☐

If 'No' then site is low risk with respect to erosion and sediment control

If 'Yes' then proceed to Table 2

Table 2: Medium Risk Test

		Yes	No
2.1	is the area of land disturbance > 1 hectare	☒	☐

If 'No' then site is medium risk with respect to erosion and sediment control

If 'Yes' then proceed to Table 3

Table 3: High Risk Test

3.1	is there an upstream catchment passing through the site > 1 hectare	☐	☒
3.2	does any land disturbance occurs in a BCC mapped waterway corridor	☐	☒
3.3	is there any slope on site (longer than three metres in length) before, during or after construction that is steeper than 15%	☐	☒

Have you answered 'yes' to any of the questions in Table 3?

Yes	No
☐	☒

If 'No' then site is medium risk with respect to erosion and sediment control

If 'Yes' then site is high risk with respect to erosion and sediment control

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Ever-mindful of the role we play in shaping places, people, and communities, we are proud to lead strong, best-practice solutions that create a positive legacy for the future.

Driven by passion and vision, courage, and optimism, we truly believe that no project or challenge is beyond us. At ADG, we design with purpose, to make a difference.

