



Memorandum

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Attention: Amberfield project team

Company: Weston Lea Ltd

Date: 16-08-2018

From: Andrew Blayney – Senior Ecologist

Message Ref: Amberfield project – Hamilton City Council s92 response. Terrestrial ecology.

Project No: A17134

Below is a response to the s92 further information request from Hamilton City Council (HCC) regarding terrestrial ecology. Each response is numbered following the HCC s92 Master Schedule – Category 1 document.

Ecological effects

Terrestrial Ecological Effects

Herpetofauna

67. A map of the high, medium, and low value lizard habitat is provided in Appendix 1 of this memo. All areas not specifically mapped are areas of grazed pasture or buildings with little to no debris surrounding them and considered of negligible value. Habitat descriptions and values are consistent with Table 10 in Section 7.2 of the Terrestrial Ecological Assessment (here after referred to as “the assessment”). The development extent of the project is also shown on the map and for the purposes of the assessment it was assumed all habitat was lost within the footprint of this extent¹.

Bats

68. A map of the identified bat roosts and a brief description of the roosts available is provided in Appendix 2 of this memo. Due to topology and lack of safe access to many steep areas of the Waikato River bank many areas of this riparian strip have not been comprehensively surveyed for potential roost trees (these areas are all outside of the development extent). It is likely that there are several cavity bearing willow on the Waikato River water's edge such as that identified at the north of the site as willow is common on the water's edge along the river across this site. Recommendations to carry out intensive roost surveys in areas of vegetation loss and near to construction activities have been made below within this memo to avoid the potential disturbance or destruction of previously undiscovered roosts.

69. An updated vegetation map which includes the development extent is provided in Appendix 3 of this memo. This development extent demonstrates the setback width from existing vegetation however where the buffer width is 1m this is not easily represented at mapping scales (even blown up sections). Therefore, where mapping resolution does not allow representation of the setback a minimum of 1 m of set back from the existing riparian vegetation (as determined by the existing fence location) in the northern end of this site should be maintained for the planting of additional buffer planting at the toe of the batter slopes as per section 10.2.1.1 of the assessment. Also available in Appendix 4 is the “Gully and Esplanade Reserve

¹ It is acknowledged that in the “Knoll Park” area some vegetation may remain but due to the uncertainty of the vegetation retained or lost within this area it has been presumed lost.

Vegetation Strategy” (Refer to the “Amberfield - Open Space Framework” document (Boffa Miskell, 2018) for further detail). This strategy plan depicts where the planting onsite will occur which includes the proposed amenity and buffer planting. Due to the increased buffer width being achieved and described within item 70 below; the northern section of the development extent will be extended towards the river by a minimum of 6m - this may require the removal of additional individual exotic trees (further described below) however this is mitigated by the far greater buffering function of the proposed buffer vegetation for the adjacent sensitive bat habitats. As such we do not consider an update of the ecological assessment is required to account for the few individual trees impacted by this change nor would we consider there would be any change in effect level for this development with regard to vegetation, birds, or herpetofauna.

70. In the context of buffering of the Waikato River corridor and important adjacent habitats from light and noise resulting from urbanisation, the potential impacts on long-tailed bats (It-bats) from ineffective or insufficient buffering of light and noise due to insufficient width, buffering effectiveness, or height are:

The avoidance of areas, impacted by urbanisation, by It-bats would prevent:

- The use of foraging habitats and/or the ability to disperse to foraging habitats;
- The ability of long-tailed bats to commute across the landscape to forage and/or roosting habitats; and
- The ability of juvenile It-bats to disperse away from maternal roost sites or for adult It-bats to access maternal roost sites.

The lighting and noise disturbance may also alter preferred habitats in such a way that while not avoided are less valuable to It-bats such as making foraging less efficient or reducing the pool of acceptable roost sites within an area.

Lighting and noise disturbance which extends into key roosting habitats for the Hamilton It-bats such as Hammond Park also has the potential to alter roost emergent timing and behaviour, disrupt social interactions, and as noted above cause the avoidance of once valuable habitats.

These disturbances may then drive It-bats into less suitable habitats and roosts which may expose them to greater levels of predation, less suitable roosting sites (such as those with sub optimal thermal properties), areas of lower prey abundance, and in general lower quality habitats. This would drive a decline of survival and fecundity of individuals impacted and therefore the Hamilton It-bat population.

The ecological impact assessment regarding It-bats within the assessment report provides an ecological value for It-bats of **Very High**² for the entire site. It also assesses that the pre-mitigation magnitude of effect on It-bats is **Very High** which when combined with the **Very High** ecological value gives an overall level of ecological effect of **Very High**. This pre-mitigation level of effect takes into account the potential offsite impacts discussed above.

The onsite mitigation proposed within the assessment focuses on minimising the potential offsite impacts into the valuable commuting and roost habitats adjacent to the site (detailed in Section 10.2.1 of the Terrestrial Ecological Report). The report assesses the potential magnitude of effect post these mitigation measures as **High** (a reduction from the above pre-mitigation **Very High** magnitude of effect) which when combined with an ecological value of **Very High** results in a **Very High** level ecological effect.

If the mitigation measures of buffering and bat sensitive lighting were insufficient and unsuccessful in significantly reducing/preventing the identified potential impacts of the development described above the

² The ecological values, magnitude of effects, and level of ecological effects stated within this memo follow the “Ecological impact assessment (EclA): EIANZ guidelines for use in New Zealand: Terrestrial and freshwater ecosystems.” (EIANZ, 2015). It is acknowledged that a second edition of these guidelines has been released in 2018 since the authoring of the Terrestrial Ecological Assessment. The scoring stated within this memo has been checked against this second edition and remains consistent with the updated guidelines.

magnitude of effect would be equivalent to the pre-onsite mitigation magnitude of effect of **Very High**. This magnitude of effect when combined with a **Very High** ecological value results in a **Very High** level ecological effect.

The s92 request for this point suggests “The width of the vegetated buffer/set back should also be reconsidered to an appropriate width to ensure effects associated with light spill are appropriately mitigated.”

The project ecologists have considered this point and have worked with the engineers for the project to address the limited buffer planting. The significant constraint for buffer planting in the northern end of the site is the height of the road above the existing ground level and therefore the existing vegetation or any planted additional buffering vegetation at existing ground level (refer to Appendix 5) will be of less benefit compared to planting at road level. In response to this, a further site assessment has been undertaken to confirm the existing vegetation’s location with regards to the existing fence and proposed toe of the batter slope.

The onsite assessment found that there is enough space to extend the toe of the batter slope a minimum of 6 metres closer to the top of the river bank as there is room behind the existing fence before the existing riverbank vegetation or river bank is impacted (Figure 1). Moving the toe of the batter slope closer to the river will allow a minimum³ 7m wide planting strip, elevated at road level, on the river side of the road (Refer to Appendix 6 & 7 - this additional 6m is attached to the 1m wide berm indicated on the river side of the shared path). The planting strip will be able to be planted with several layers of tall structure evergreen vegetation and under planted with dense shrubs to buffer the lighting and noise from the adjacent road and housing. This pushing out of the toe of the batter slope to allow for this additional planting zone may require removal of several exotic trees which are located of the farm side of the existing fence; these trees do not contain any potential roost features and are of negligible ecological value. The removal of these individual trees is more than mitigated by the ability to provide a 7m wide strip of buffering and planting elevated at the road level to more effectively block light than the established trees could. We consider that this approach will significantly reduce the light spill from the development in this area over the Waikato river and into the adjacent sensitive bat habitats and will contribute to a far greater avoidance of potential offsite impacts of the development.



³ To be rationalised during detailed design and maximised where location of riverbank vegetation and room allows.

Figure 1: Grassy strip behind fence that will allow the batter slope to extend beyond existing fence line and provide greater, at road height, buffering vegetation to be established.

71. There is the potential for time lags in establishing effective buffering of light and noise disturbance to valuable offsite commuting, foraging, and roosting habitats. The strategies proposed to manage this effect in the short term are outlined in section 10.2.1 of the assessment. The following excerpt from section 10.2.2.2 of the assessment states:

To compensate for the limited width of buffer planting in this area and ensure light spill into these key habitats is avoided, the below mitigation will be implemented:

- 2.5 m of tall-stature buffer vegetation including under-planting to block gaps will be planted on the western margin of the road to block light from the residential lots immediately to the west;
- Low stature (up to 2 m shrubs) will be planted along the 4 m of 1:1 batter slope on the eastern margin of the road to block the light from car headlights;
- A minimum of 1 m at the toe of the batter slope to plant a dense row(s) of tall, fast growing shelterbelt trees to further block light.
- Streetlights along the eastern road will be designed to minimise light spill including being low to the ground and highly directional (details are subject to lighting specialist report).
- To further buffer light from the inland lots, the residential roads further inland will be planted with evergreen street trees; and
- All buffer vegetation in this northern area, and the tall stature shelterbelt trees in particular, will be planted as soon as it is practicable.

Further to the above we recommend:

- In the detailed design phase, working towards lowering the road to maximise the area of natural batter (as opposed to reinforced earth wall) that can be planted with tall stature tree species. This will allow for plantings that are closer to the road reserve and therefore elevated which will provide more immediate light buffering as opposed to growing from the base of the batter slope below the road;
- Inter-planting the existing riparian vegetation (largely comprised of Chinese privet) with tall stature native trees to infill light gaps; and
- Utilising the batter slope between lots for buffer planting which will provide more light buffering from the terraced residential lots further west.

In the northern end of the site (where there exists the least set-back from the riparian vegetation) the above solution detailed in item 70 will effectively replace the above stated planting strategies but the low impact lighting strategies should still be implemented. The new approach outlined will significantly increase the buffering effectiveness in this area and reduce the lag time as the vegetation is elevated at road level. To further mitigate for time lag the vegetation should be planted at large grade and under planted with dense shrubs to infill any potential gaps. These trees should be planted at the earliest opportunity practicable; based on proposed staging of the development it should be practicable to plant buffering vegetation in advance of occupation of houses in some cases by several years.

An additional consideration for this area is the vegetation along the river is privet and alder which while the privet lacks height to effectively buffer the lighting disturbance the alder does. However, alder is deciduous and therefore buffers effectively only when in leaf. As such the additional buffer planting proposed is intended to supplement the existing vegetation's buffering capacity during the winter months when *It-bats* are less active.

Throughout the rest of the site there are greater amounts of set-back and the riverbank vegetation contains greater density of evergreen higher stature vegetation such as *kanuka* and *mahoe*. In these areas the proposed buffer planting (Ref: Appendix 4) will act as supplement to the existing vegetation rather than as the primary buffer vegetation. Also in these areas the topology of the Waikato River will provide additional

protection from disturbance as it is more incised and at a lower elevation when compared to the development which will assist in retaining a dark foraging and commuting corridor near the water. While there is no best-practice buffering techniques or standard level of illumination to achieve for It-bats to continue using corridor habitats we consider that based on current lighting disturbance in this area and others used by the Hamilton It-bats this should be sufficient to prevent avoidance of the corridor.

With the above proposed mitigation and the existing vegetation, we do not consider that the disturbance levels within the Waikato River corridor will be a complete barrier to It-bat movement and while the proposed buffering is expected to reduce light disturbance in this area we think it unlikely it will completely prevent all lighting disturbance from the proposed urban development reaching the corridor. The continued use of corridors is demonstrated by the use by It-bats of urbanised gullies within the Hamilton south area such as the western branches of the Mangakotukutuku Gully which have sub-urban housing to the gully edges and It-bats commuting throughout the gully system.

With regard to the increased levels of housing density onsite we consider onsite effects are not mitigatable which will likely result in the total loss of current commuting and feeding habitat onsite making it effectively impermeable to bat use hence **“Very High”** level of effect assessed with the assessment.

72. The project ecologists agree with the summary of the mitigation approach to the effects of the project on the long-tailed bat as set out in the Council's request Item 72. Since the application lodgement further progress has been made on this approach.

Adopting an approach common to all environmental effects mitigation it is considered that the following matters need to be addressed:

1. Description of the nature and extent of the adverse effect of the project on the long-tailed bat habitat;
2. Identification of the nature, extent and location of the mitigation proposed for the above effect; and
3. Establishment of the method of delivery of the required mitigation over the time period required to achieve an outcome of no net loss of the species or habitat.

In terms of 1. above it is considered that the assessment has adequately described the nature and extent of the adverse effect.

The most recent advance in terms of matters 2. and 3. above, have taken place at a meeting on 10 August 2018 between the applicant (including the project ecologist) and Council representatives. It is understood from this meeting that Gerry Kessels (Tonkin & Taylor), for Council, will undertake a programme of work to address the effects of the overall development of the Peacocke Structure Plan area on the It bat habitat, and to identify target mitigation areas within Hamilton South. We consider that this comprehensive approach is very important in establishing the residual adverse effect (post onsite mitigation) that any individual project contributes to the cumulative effect of the urbanisation of the Peacocke Structure Plan area on It bats and their habitat and therefore the required mitigation.

It is anticipated that additional information required to be more certain about matters 2. and 3. above will be available as a result of this work prior to the finalisation of a section 42A report. This information should be incorporated into a proposed condition of consent.

Vegetation removal

73. See Appendix 3 for detailed vegetation map with development extent. All vegetation inside the development extent is presumed to be lost.

74. The project ecologists have liaised with the landscape architects with regards to shared path locations. They have confirmed that this will not require additional vegetation loss (despite the scaling of the walking and cycling strategy plan and the width of the path lines making the shared path network to appear to

encroach on existing vegetation). The shared path location will also be rationalised at a local level when constructed to avoid existing non-pasture vegetation.

The one area where the path is located within the polygon depicted for riparian vegetation (directly south of the minor gully confluence to the Waikato river) it will follow an existing benched farm track and not require vegetation removal (see Figure 2). Further information on track locations is also provided in response to item number 63 of the HCC s92 Master Schedule – Category 1 document.



Figure 2: Existing bench track south of minor gully where the shared path will be located.

Construction effects on fauna

75. Construction effects have been considered within the assessment of ecological effects within Sections 9 and 10 of the assessment as such the assessment of ecological effects will not be altered.

Further detail on the construction effects and the proposed management of these effects or the detail from relevant excerpts from the assessment for fauna are detailed below:

Bats: from the assessment section 9.2.1:

In addition to the habitat loss and indirect effects described above the removal of vegetation where it cannot be avoided and the disturbance including noise, vibration, and lighting associated with construction works has the potential to directly impact on long-tailed bats present in the area. This could lead to direct effects on long-tailed bats such as mortality, injury, abandonment of roosts, and/or total avoidance of areas.

In addition to the potential effects noted above the effects discussed within point 70 above would also apply to construction impacts.

From the assessment section 10.2.1:

Develop a bat management plan that addresses the potential effects on bats related to the felling of potential roost trees, where this cannot be avoided, and temporary construction disturbance effects on bats.

It is recommended that the proposed bat management plan should detail (but not be limited to) a demarcation of potential bat roost trees with tape or similar, a tree fell protocol which should also include a requirement for a detailed and comprehensive potential roost survey in all areas of confirmed vegetation loss

(including a 20m buffer zone around the edge of the vegetation removal zone) as well as the protocol for monitoring to ensure lt-bats are not present during tree felling and vegetation removal.

It is standard within a bat management plan to detail exclusion zones around roosts confirmed to be occupied by lt-bats such as: "no work will take place within 100 m of the roost from one hour before dusk to 30 minutes after dawn". However, the recommended restriction of working hours for works detailed below in item 76 will effectively prevent emergence and post emergence impacts. To limit roosting disturbance a 10m radius exclusion zone around the occupied roost should be stipulated which is effective at all times. This buffer should only be removed when the lt-bat/s have been confirmed to be no longer present in the roost either through automatic bat detector monitoring or direct visual survey into roost cavities.

Herpetofauna: From the assessment section 9.2.2:

The development will still have potential impacts on copper skinks which could include direct injury, mortality, due to land clearance, earth works, construction activities, and the associated noise and disturbance as well as the permanent loss of habitat occurring through the conversion of farmland to an urban environment.

In addition to the above effects we consider that areas directly adjacent to vegetation being removed may be avoided by copper skinks due to changes in microhabitats and construction based disturbance.

Management of herpetofauna is detailed within the assessment section 10.3:

With regards to lizard management, it should be noted that lizard survey methods currently available have poor detection rates as a consequence of typically low population densities, species cryptic colouration, difficulty in surveying preferred habitats and behaviour/activity patterns (Anderson et al., 2012). As such, even an intensive lizard survey will not detect all individuals in the population or, possibly all species present. Experience with previous lizard salvage efforts in the wider Hamilton area has consistently resulted in few individuals; even with significant effort and resource inputs in attempts to salvage them from impacted habitats. As such we do not recommend active salvage is undertaken in this area to mitigate for construction and disturbance impacts. Instead lizard management should focus on incidental capture protocol and, although not required to mitigate effects, the creation of high value lizard habitats as this will likely have a greater net benefit for copper skink populations in the area.

The proposed vegetation strategy (Figure 35) includes many areas such as the gully and riparian strips that could be specifically planted and enhanced for the creation of habitats suitable for copper skink. These areas should include plantings and habitat elements which maximise the copper skink's preferred habitat attributes such as: dense vegetation, rotting logs, leaf litter, and any other natural cover that may provide refugia (Peace, 2004). The intention of this is to provide high quality habitat for copper skinks within a short amount of time. Additionally, the large amounts of additional riparian and gully plantings proposed will provide suitable copper skink habitat in the medium to long-term as natural debris and vegetation cover builds.

We do not propose any further management of copper skinks at this site and consider salvage in this instance would not be the most effective and efficient approach in mitigating for the wider copper skink population and recommend instead the focus of resources and time be put into creating high value lizard habitats. We recommended a lizard management plan is drafted which stipulates the recommended incidental capture protocol and the specifications for the created lizard habitats. These habitats should also be detailed within the detailed planting plan suggested within section 10.2 of the assessment.

Avifauna: from the assessment section 9.2.3.:

Additional to the loss/change of habitat type there will be temporary direct and indirect effects on avifauna on site related to the noise and increased activity associated with construction works onsite has the potential to cause disturbance to birds in the vicinity of the works. Given the large amount of riparian vegetation being retained onsite that is suitable as refugia and foraging and the majority of the area of works is currently dominated pasture habitat disturbance impacts are likely to be **Low**.

There exists a potential for an increased magnitude of effect where construction works occur close to the Waikato River corridor while birds are nesting (particularly if the nesting birds are one of the At Risk shag species potentially present in the area). This can have adverse effects such as increasing stress levels, incubating or brooding birds leaving the nest more frequently and for longer periods,

nest desertion and failure. In this circumstance the number of nesting birds likely to be affected is small and the magnitude of the effect would be **Low**.

In addition to the above there is potential for direct nest site destruction and/or abandonment associated with vegetation removal and potentially the direct injury or mortality of birds residing within vegetation removal areas. We do not consider this would contribute to a greater effect level than the previously assessed level of effect of **Low** at this site.

Management of avifauna is detailed within section 10.4 of the assessment:

To manage construction impacts no mitigation is likely to be required, but we recommend pre-construction surveys on the farm side of the Waikato River riparian vegetation to determine whether any shag species are nesting onsite at the time. It is most likely they would nest on the riverside willow and be buffered from effects. However, if at risk shag species are found to be nesting in close proximity to the construction footprint, before works commence, then the area should be avoided until nesting is complete. The shag species potentially present have egg laying time ranges that overlap to the extent where nesting birds can be present any time of year. The approach of pre-construction surveys demonstrates a precautionary approach to this potential impact on avifauna.

In addition, to protect avifauna species during construction the suggested nesting bird surveys should be extended to all areas of vegetation removal prior and carried prior to works commencing. Native birds found to be nesting should be avoided until chicks are fledged and leave the nest. The above recommendations should be detailed within an avifauna management plan for the site which also specifies protocols for managing injured or dead birds encountered during works.

General:

Due to the sensitive habitats and vegetation within and surrounding this proposed development, the vegetation that is to be removed will be marked out onsite prior to construction works and vegetation to be retained likewise marked out to designate no-go areas for construction. The project ecologist should be involved with this designation process and be present when vegetation is cleared to ensure vegetation that is to be retained is not accidentally removed or destroyed. This should be detailed within an environmental management plan for the site.

76. If construction activities were to occur within 30mins before sunset and 30mins after sunrise and are lit, create noise, or vibration there are potential impacts on It-bats the same as those detailed for item 70 above regarding light and noise disturbance.

We recommend that the enabling site works that will effectively establish the subdivision such as earthworks and civil infrastructure works, such as roading, should not to be carried out between 30 mins prior to sunset and 30 minutes' after sunrise to avoid this potential disturbance effect on It-bats. Areas of plant etc. should also not be lit during this period. This should be detailed within a bat management plan for the site.

As the site is incrementally going to become impermeable to It-bats and have long-term effects on their ability to utilise the habitats onsite as discussed above and within the assessment. We do not consider that this restriction would be effective or appropriate if applied during housing construction, post enabling works, as the It-bat habitat onsite at this stage would be lost or of very low quality.

We do not consider that this potential impact would change the assessment of the level of ecological effect stated above in item 70 and within the assessment.



Andrew Blayney – Senior Ecologist.
Boffa Miskell Ltd.

Attachments:

- Appendix 1: Amberfield – Herpetofauna Habitat Value Map.
- Appendix 2: Amberfield – Identified Potential Bat Roosts.
- Appendix 3: Amberfield – Vegetation Map.

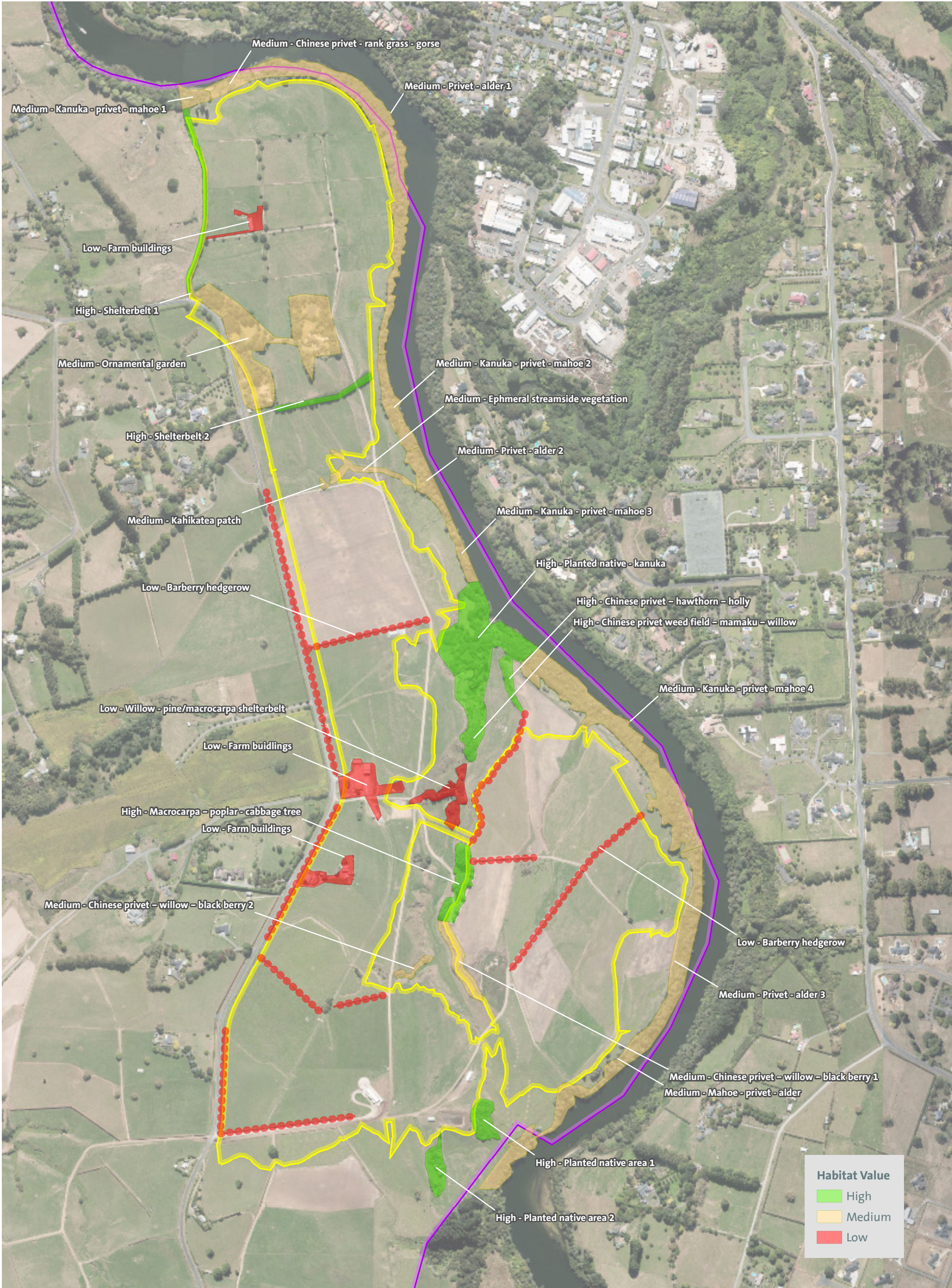
Appendix 4: Gully and Esplanade Reserve Vegetation Strategy.

Appendix 5: Amberfield - Earthworks cut fill plan for North end with road heights above existing ground level.

Appendix 6: Road and vegetation cross section example with measurements

Appendix 7: Road and vegetation cross section example with slope and existing vegetation.

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0 150 300 m
1:7,000 @ A3

Data Sources: LINZ Aerials, Hamilton City Council, Waikato Regional Council, Boffa Miskell.
Projection: NZGD 2000 New Zealand Transverse Mercator

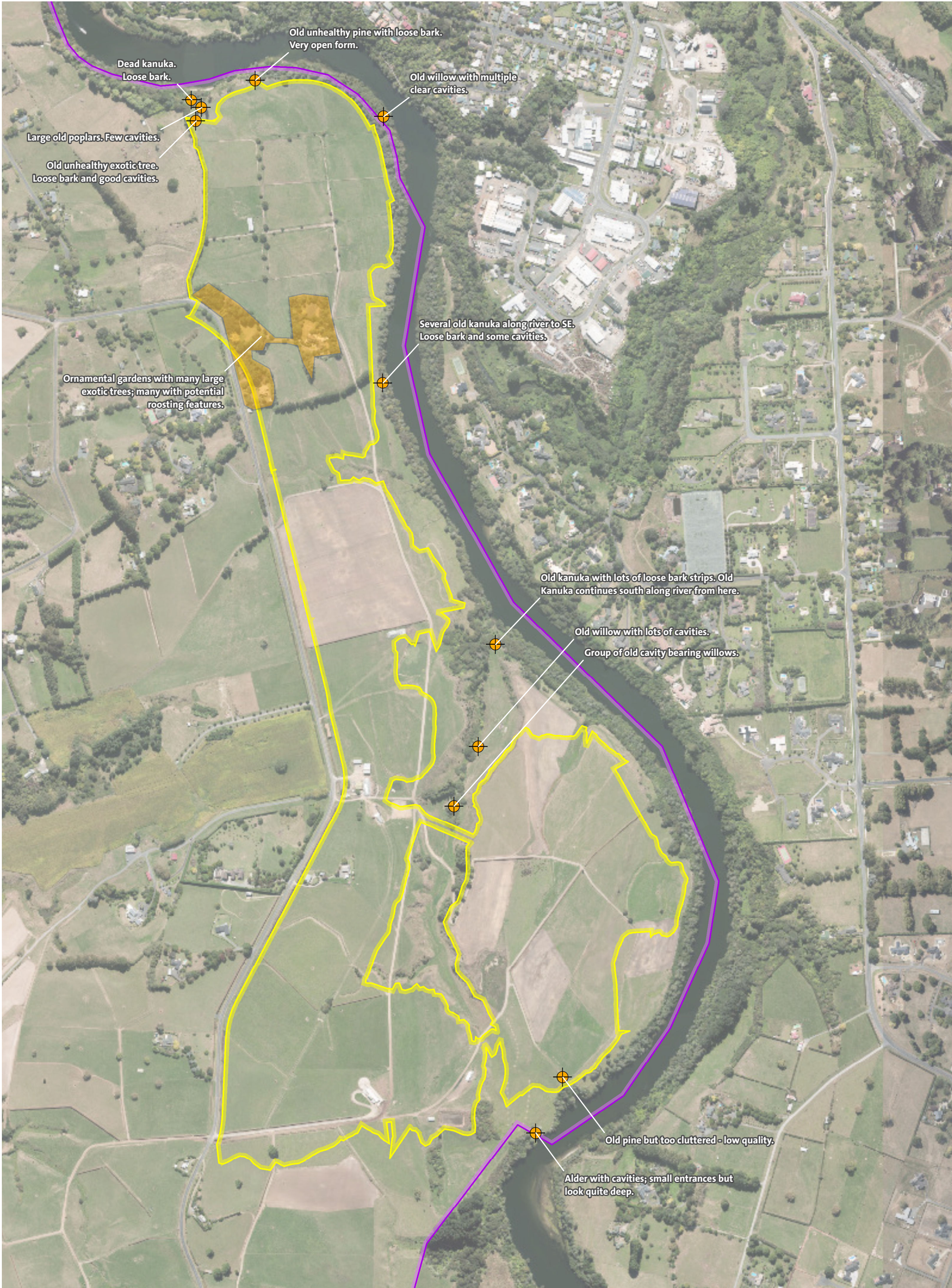
Legend

-  Peacocke Structure Plan
-  Development extent

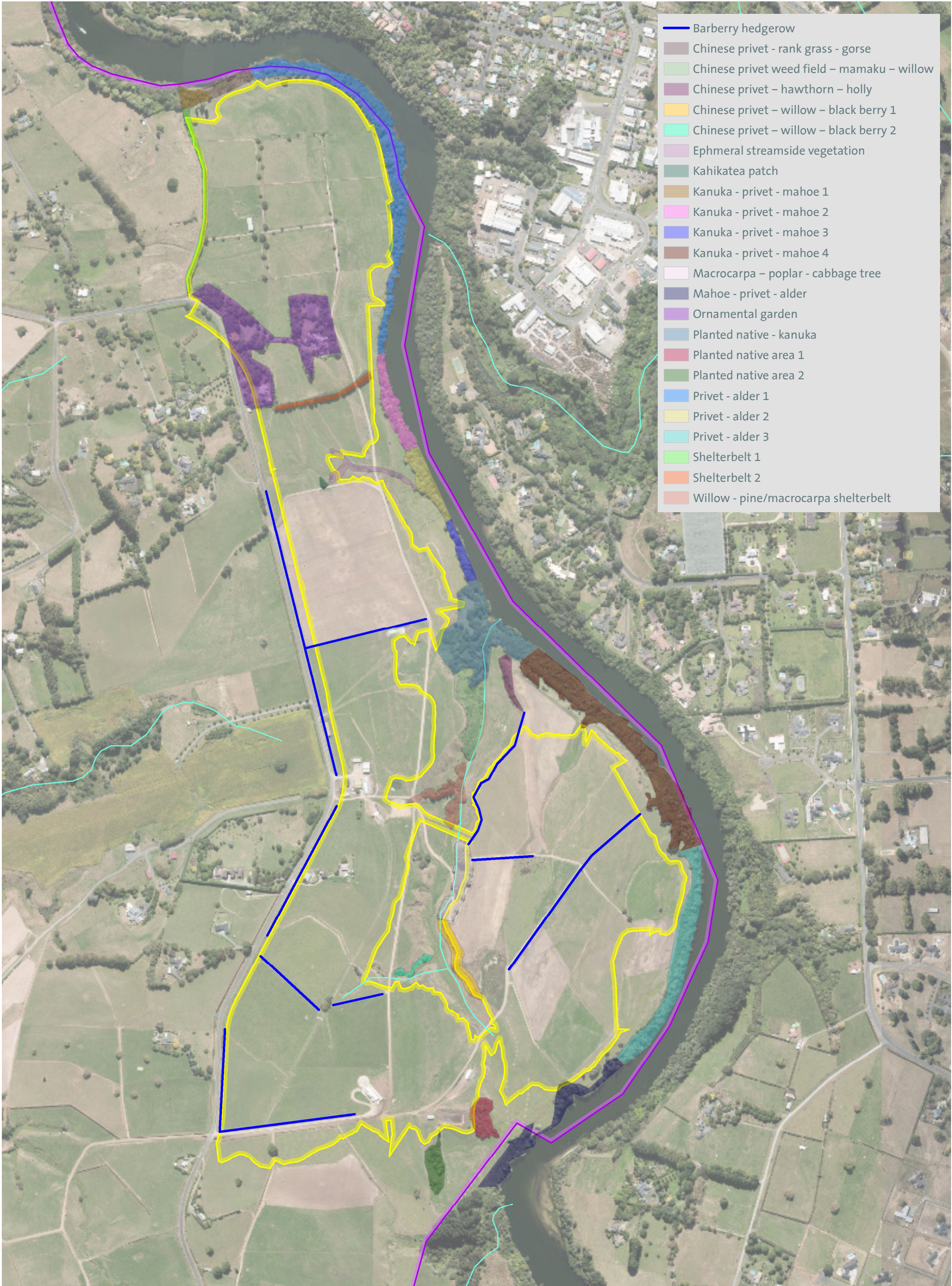
A17134 HAMILTON SOUTH DEVELOPMENT
Amberfield – Herpetofauna Habitat Value Map

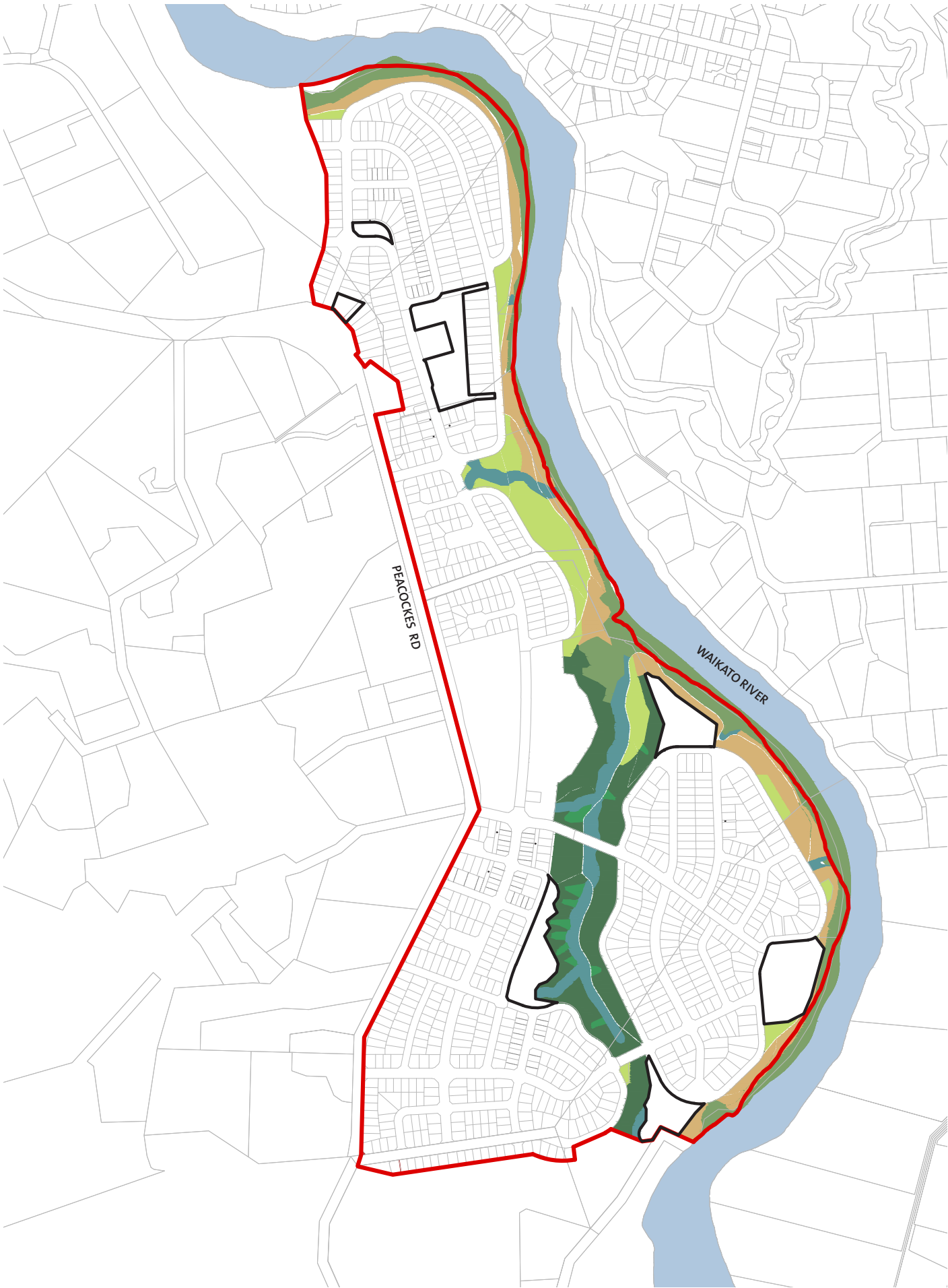
Date: 19 July 2018 | Revision: 0
Plan Prepared by Boffa Miskell Limited
Project Manager: Rachel.deLambert@boffamiskell.co.nz | Drawn: JWa | Checked: ABI

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GULLY AND ESPLANADE RESERVE VEGETATION STRATEGY

1. Existing vegetation along the river bank corridor is to be retained and supplemented with further buffer and amenity planting within the proposed esplanade reserve.
2. Gully and Esplanade Reserve are to be densely planted with native species in best practice with Hamilton City gully and revegetation practices.
3. Lower species of planting are to be utilised toward the upper banks of the gully allowing for views from the street environment and adjacent residential lots to be available over the gully. Taller tree species are to be located on the lower banks of the gully to provide buffering and enclosure while retaining views from upper terraces. Minor valleys within the gully are to be planted with tree fern species and nikau palm to emphasise the landform, provide texture and variation to the gullies and respond to the ground conditions.
4. Areas of existing stream within the Esplanade Reserve and Gully are to be planted with riparian planting 10m either side.
5. Areas of flat to gently rolling grass terraces have been retained for recreation uses and views into the Esplanade Reserve. These are located adjacent to the roads, or, in the case of the terrace in the gully a naturalised grass meadow is proposed to provide a respite area and play space along the recreation trail.
6. Native planting is typically used within the reserves adjacent to the gully and river corridor to complement the gully and reserve planting strategy.
7. For indicative plant species refer to Boffa Miskell A17134_064-065.
8. The streetscape planting strategy builds off these principles and seeks to connect with the amenity in the river and gully through the development to Peacockes Road. Refer Boffa Miskell A17134_201.

KEY

- Indicative Site Boundary
- Reserves
- Amenity and Buffer Planting
- Flat to Gently Rolling Areas of Grass Usable Space
- Gully Slope Planting
- Gully minor valley tree fern & Nikau planting
- Riparian Planting (20m Corridor)
- Existing River and Gully Vegetation



**AMBERFIELD
PEACOCKE STRUCTURE PLAN**

**Gully and Esplanade
Reserve
Vegetation Strategy**

DRAWING NUMBER A17134_054

**Date: 11 May 2018
Revision: G**

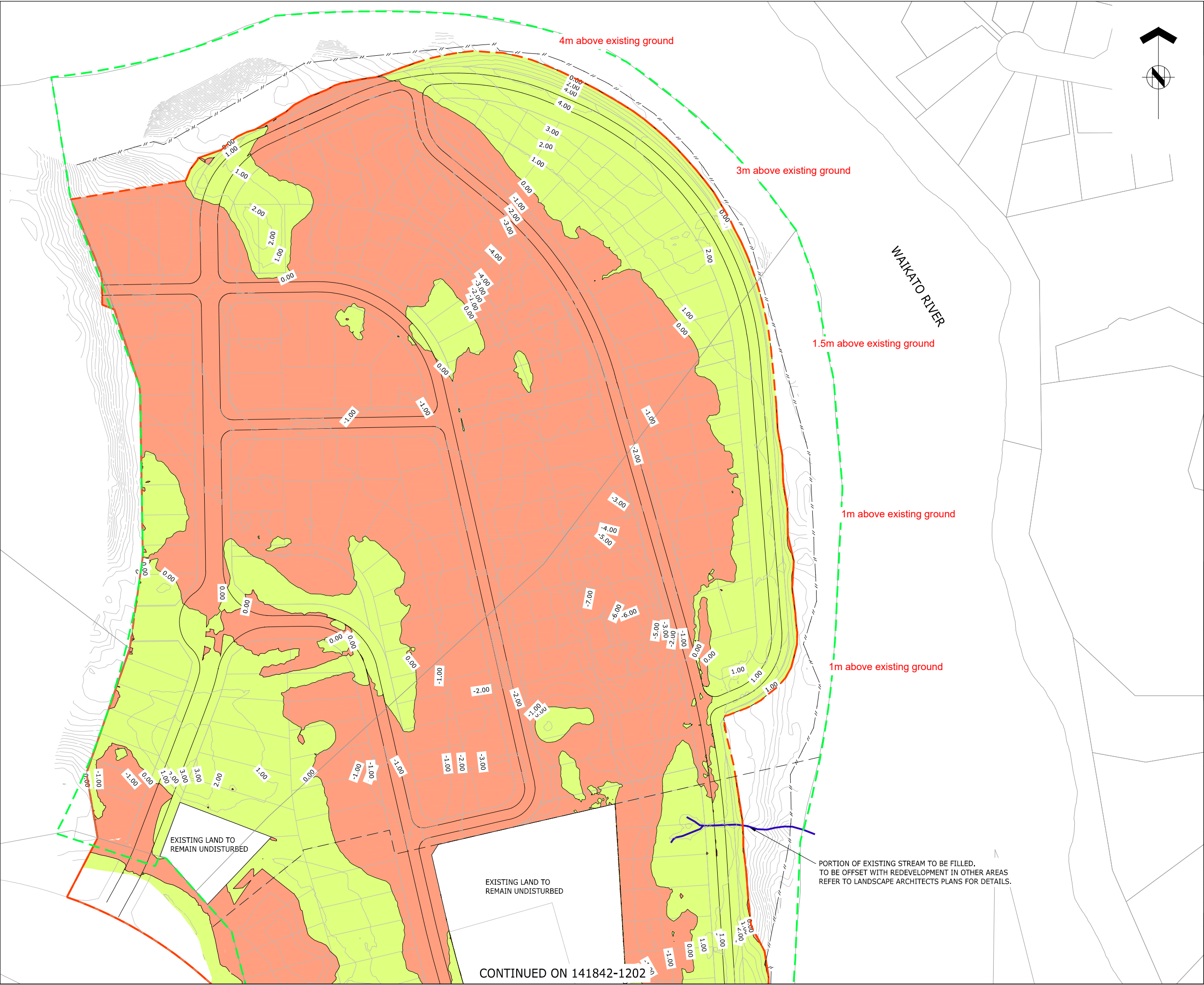
Plan prepared for Weston Lea Ltd
by Boffa Miskell Limited

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Drawn: BCI | Checked: JPo

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NOTES:

- ALL WORK TO BE IN ACCORDANCE WITH HAMILTON CITY COUNCIL STANDARDS.
- FOR PROPOSED CONTOURS AND RETAINING WALL LOCATIONS REFER TO DRG-1211-1216.
- STAGING BOUNDARIES ARE INDICATIVE ONLY TO BE CONFIRMED AT DETAILED DESIGN STAGE
- STAGING BOUNDARIES SHOWN ARE INDEPENDENT FROM DRG 1046 AND CATER FOR EARTHWORKS STAGING

LEGEND:

CUT CONTOURS SHOWN AT 1.0m
INTERVALS

FILL CONTOURS SHOWN AT 1.0m
INTERVALS

EXISTING CONTOURS SHOWN AT 1.0m
INTERVALS

EXTENT OF EARTHWORKS

STAGE BOUNDARY

EXISTING OPEN DRAINAGE CHANNEL /
WATERCOURSE TO BE FILLED WITHIN
EARTHWORKS FOOTPRINT

EXISTING FENCE



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W www.harrisongrierson.com

3	ISSUED FOR RESOURCE CONSENT	KRW	18.05.18
2	ISSUED FOR CONSENT	KRW	27.04.18
1	FOR CLIENT REVIEW	KRW	26.03.18
REF	REVISIONS	BY	DATE

PROJECT:

WESTON LEA LTD
AMBERFIELD
PEACOCKE RD HAMILTON

TITLE:

EARTHWORKS CUT / FILL PLAN
SHEET 1 OF 6

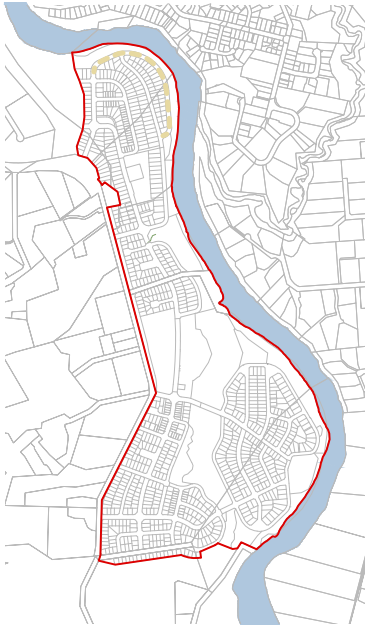
ORIGINATOR:	DATE:	SIGNED:	PLOT BY:
SWK	13.03.18		SWK
DRAWN:	DATE:	SIGNED:	PLOT DATE:
CEA	25.01.18		11.05.18
CHECKED:	DATE:	SIGNED:	SURVEY BY:
KRW	23.03.18		
APPROVED:	DATE:	SIGNED:	SURVEY DATE:
STM	17.03.18		----

ISSUE STATUS:

FOR RESOURCE CONSENT

PROJECT No:	SCALES:	A1
9820-141842-01	1:1000 - A1 1:2000 - A3	
DRAWING No:		REV
141842-1201		3

CONTINUED ON 141842-1202



LOCATION PLAN



AMBERFIELD
PEACOCKE STRUCTURE PLAN

Typical Street Cross
Sections

DRAWING NUMBER A17134_224

Date: 18 August 2018
Revision: -

Plan prepared for Weston Lea Ltd
by Boffa Miskell Limited

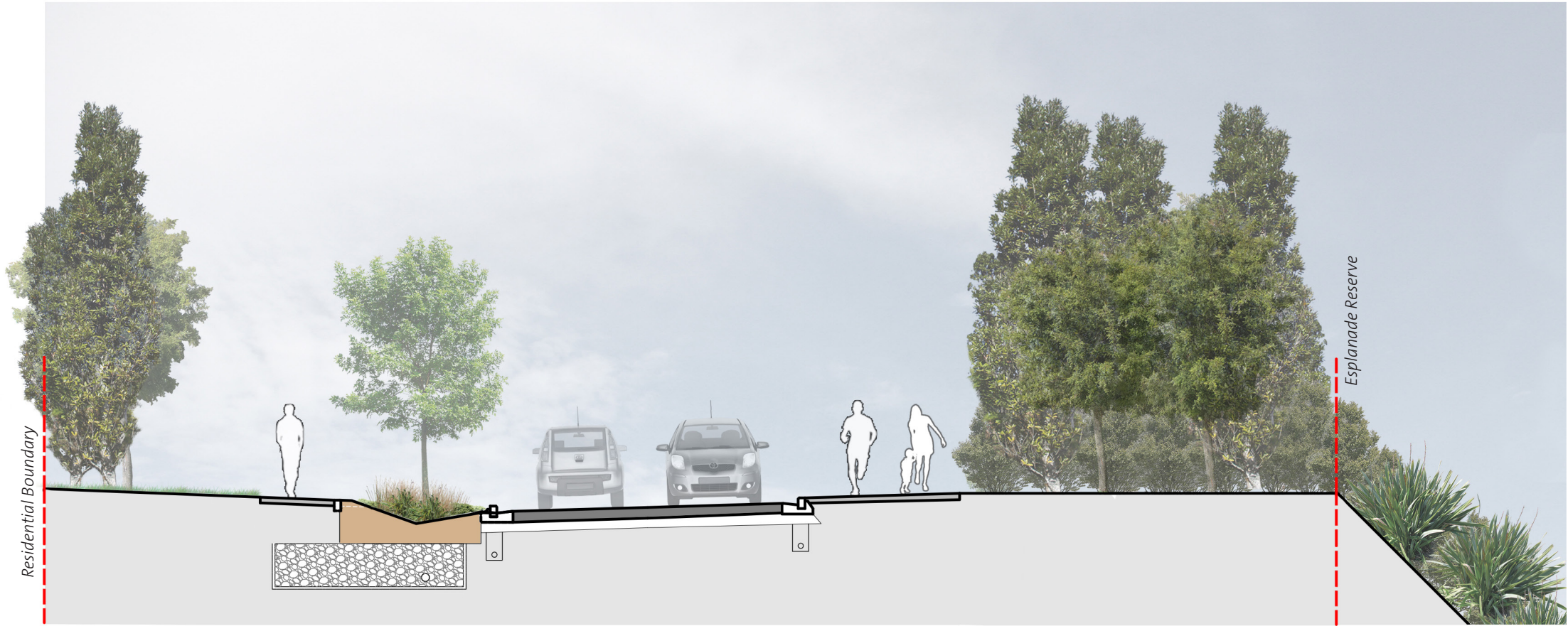
Project Manager: Rachel deLambert
@boffamiskell.co.nz

Drawn: BCI | Checked: RdL

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Residential Light
Screening Berm
Planting
2.50m

Services Berm
1.50m

Footpath
1.50m

Bio Retention
Planting /
Street Tree /
Car Parking
2.90m

Carriageway
5.60m

Shared Path
3.0m

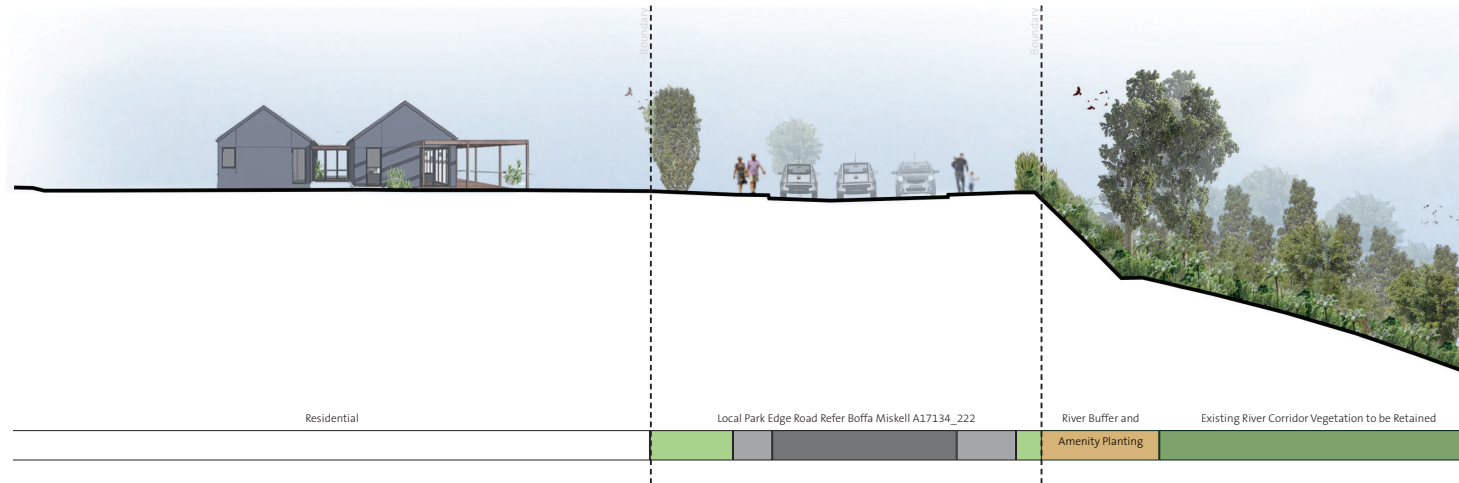
Berm
7.00m
Minimum

Batter
Slope
Planting

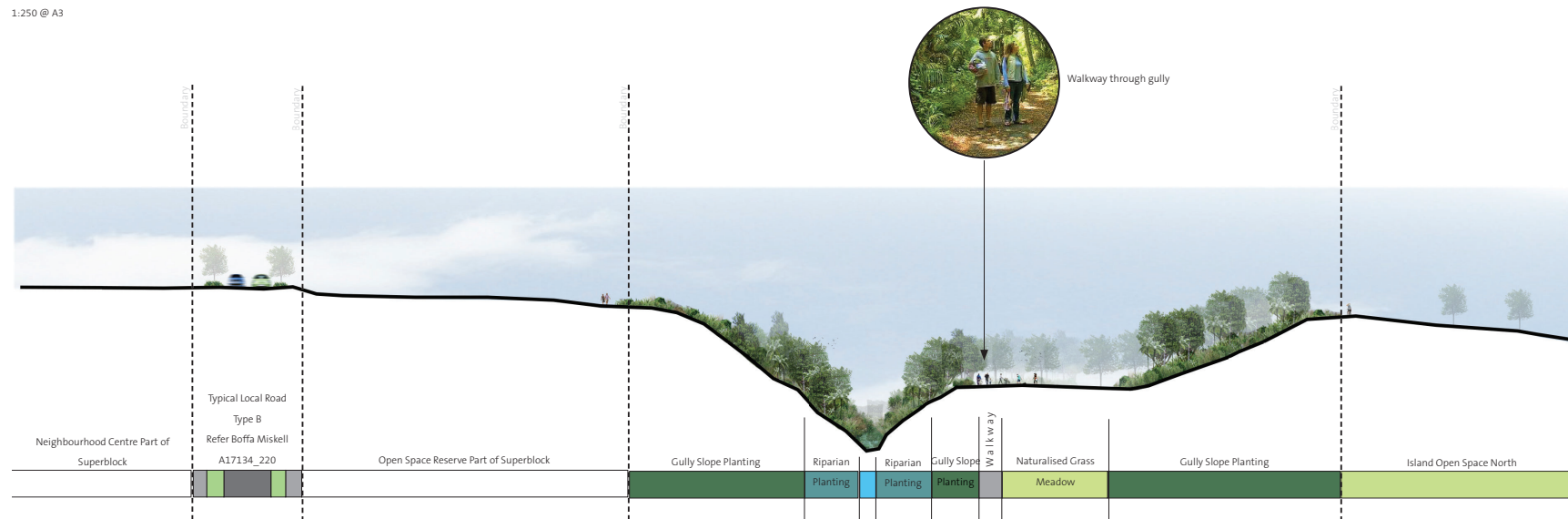
■ ■ ■ TYPICAL LOCAL PARK EDGE ROAD
(TYPE E MODIFIED)

24.00m Road Reserve

Cross section relates to northern Park Edge Road where wider berm width is provided to achieve additional light / noise screening for bat migration and habitat



Section A - A'
1:250 @ A3



Section B - B'
1:800 @ A3

**AMBERFIELD
PEACOCKE STRUCTURE PLAN**

Cross Sections

DRAWING NUMBER A17134_061

Date: 11 May 2018
Revision: B

Plan prepared for Weston Lea Ltd
by Boffa Miskell Limited
Project Manager: Rachel deLambert

@boffamiskell.co.nz

Drawn: BFJ Checked: JPo

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