

TE ARA O WAIRAKEI & WAIRAKEI/TAYLOR RESERVE



Landscape Concept Plan Design Report
Prepared for Tauranga City Council

11 December 2017



Boffa Miskell

Document Quality Assurance

Bibliographic reference for citation: Boffa Miskell Limited 2017. <i>TE ARA O WAIRAKEI & WAIRAKEI/TAYLOR RESERVE: Landscape Concept Plan Design Report</i> . Report prepared by Boffa Miskell Limited for Tauranga City Council.		
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Status: FINAL	Revision / version: 2	Issue date: 11 December 2017
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Template revision: 20150331 0000

File ref: T17010_Te Ara O Wairakei Landscape Design_report_20171211_FINAL_LSA.docx

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Glossary

BML	Boffa Miskell Ltd
BOPRC	Bay of Plenty Regional Council
CMP	Papamoa Catchment Management Plan
CPTED	Crime Prevention Through Environmental Design
CSDC	Papamoa Comprehensive Stormwater Discharge Consent
HNZ	Heritage New Zealand
TCC	Tauranga City Council

1.0 Introduction

Boffa Miskell Ltd (BML) was engaged by Tauranga City Council (TCC) in 2016 to complete a draft landscape concept plan for the Wairakei Stream Stormwater Reserve and Taylor Reserve, following on from the landscape plan developed in 2004. The purpose of the 2016 landscape concept plan was to meet the requirements of Condition 9 of the Papamoa Comprehensive Stormwater Discharge Consent (CSDC) RC63636 for Stage 1 of the stormwater corridor.

Stage 1 refers to the geographical location of the Wairakei Stormwater Corridor extending from Pacific View Road to the boundary of Te Tumu (see Figure 1). Stage 2 refers to the remainder of the stream corridor to the east. A full description of the legislative and policy context of the consents is provided in the Consultation Plan for TCC Wairakei Landscape Plan Stage 1 (Draft) prepared by Beca (Sept 2016). A brief summary is provided in Section 2.0.

The consent conditions set out timeframes within which the Wairakei Landscape Plan must be prepared and implemented as follows:

- The draft of the Stage 1 landscape plan must be completed before 31 December 2016 and the final version by 31 December 2017 (consent condition 9.1).
- Landscape Plan must be fully implemented by 31 December 2025 (consent condition 9.8).

The landscape concept plan was developed over 12 months from January to December 2016, during which workshops were held with tangata whenua representatives to develop the landscape plan principles and cultural recognition elements. Cultural recognition elements were based on the principles, aspirations, and specific guidance provided in the three Cultural Plans prepared in accordance with Condition 10 of Consent RC63636. Internal workshops were also held with TCC departments to ensure consistency with TCC stormwater and reserves levels of service and coordination with proposed projects. Following lodgement of the final landscape concept plan with Bay of Plenty Regional Council (BOPRC) in December 2016, TCC completed public consultation. BML was then engaged from January 2017 to prepare detailed design of the reserve elements to facilitate implementation.

This report summarises the landscape plan requirements, consultation undertaken and main consultation themes. A brief description of the reserve history and characteristics provides the basis for the design vision, elements, and objectives. The design elements specific to each area are supplemented by reserve-wide design elements. The appendices set out tangata whenua workshop (hui) minutes and detailed design plans.

Implementation of the landscape plan will contribute to the two reserves becoming significant recreational assets for Papamoa and the wider Tauranga community, particularly given the expanding local population base. Implementation will also provide strategic cycling route, tsunami escape route, improved visual amenity and ecological value. When linked with the Stage 2 Te Tumu future urban area, the reserve will be a focal point for the new Wairakei Town Centre and lateral integration with the future urban area. The reserve design is aligned with Council's Urban Design Strategy, Smart Living Places, Open Space Strategy principles, best practice for resilient cities, and SmartGrowth.

2.0 Landscape Plan Requirements

Condition 9 of the Papamoa Comprehensive Stormwater Discharge Consent (CSDC) RC63636 (Appendix 1) sets out that landscape plans must be prepared for two distinct reaches of the Wairakei Stream Corridor:

- Stage 1: Pacific View Road to the boundary of Wairakei (Part 1) and Te Tumu (Part 2), i.e. the area encompassed by existing residential development (see Figure 1 below).
- Stage 2: From the boundary of Wairakei (Part 1) and Te Tumu (Part 2) in an easterly direction through Te Tumu (Part 2) to where the Wairakei Stream terminates in a 'back arm', i.e. the area encompassed by future urban development.



Figure 1: Extent of Stage 1 Landscape Plan

The consent conditions set out timeframes within which the Wairakei Landscape Plan must be prepared and implemented as follows:

- The draft of the Stage 1 landscape plan must be completed before 31 December 2016 and the final version by 31 December 2017.
- The draft of the Stage 2 landscape plan must be completed within 12 months of the rezoning of Te Tumu (Part 2) for urban development and a final version within 12 months thereafter.
- Landscape Plan for Stage 1 must be fully implemented by 31 December 2025 (consent condition 9.8).

As in 2004, the purpose of the Wairakei Landscape Plan is to provide specific guidance and direction to reserve development and management through the preparation of integrated concept plans. It provides a template for enhancement of these Reserves over the next 10 years. The Landscape Plans must include both the Wairakei Stormwater Reserve and the coastal Taylors Reserve, the latter being the historic outlet of the original Wairakei Stream.

2.1 Landscape Plan Content

Condition 9.5 sets out that the Landscape Plan must take account of the following:

- The stormwater function of the stream corridor; including the Papamoa CSDC Catchment Management Plan (CMP);
- Cultural matters of relevance to the Wairakei Stream Corridor, determined in consultation with Ngā Potiki a Tamapahore Trust, Te Kapu O Waitaha, Ngai Te Rangi, Tapuika Iwi Authority, Ngati Whakaue, Te Tumu Kaituna 14 Trust, Te Tumu Kaituna 7B2 Trust, Te Tumu Kaituna 8B1 Trust, and Te Tumu Kaituna 7B1 Trust;
- Any available Wairakei Stream Cultural Management Plan prepared per Condition 10;
- Protection and enhancement of ecological values, including indigenous planting appropriate to the stormwater management functions of the Wairakei Stream Corridor;
- Public use and accessibility, including urban design, civil defence, and Crime Prevention Through Environmental Design (CPTED) requirements; and
- The scope of issues and information included in the draft Boffa Miskell May 2005 Design Report 'Wairakei Stream Landscape Development'.

Condition 9.7 specifies that the Wairakei Stream Corridor Landscape Plan shall give effect to the cultural recognition for Stage 1 as required by condition 10, taking into account the factors set out in condition 9.5.

2.2 Cultural Plans

Condition 10 of the variation to Consent RC63636 provides for TCC to facilitate preparation of a staged Cultural Plan which the Stage 1 Wairakei Stream Landscape Plan must give effect to. The purpose of the Cultural Plans is to set out the form and detail of the cultural recognition sought by tangata whenua in the Wairakei Stormwater Reserve and Taylors Reserve.

TCC engaged with tangata whenua (Ngā Potiki a Tamapahore, Te Kapu O Waitaha, Te Runanga o Ngai Te Rangi, Ngāti He and Te Whanau a Tauwhao) to facilitate development of these Plans

by iwi/hapu. Drafts were prepared and submitted by iwi/hapu to TCC by 30 June 2016. Two of the three cultural plans have been finalised by iwi/hapu; one remains draft. Copies of these cultural plans were provided to BOPRC on 28 February 2017 in accordance with condition 10.4.

3.0 Consultation

Consultation was carried out with the community and stakeholders to confirm the landscape concept plan and contribute to detailed design. This section provides a summary of the consultation undertaken and the outcomes.

3.1 Tangata whenua

Under Condition 9.5, TCC is required to report on how any Wairakei Stream Corridor Landscape Plan has taken into account the following:

- Cultural matters of relevance to the Wairakei Stream Corridor, determined in consultation with Ngā Potiki a Tamapahore Trust, Te Kapu O Waitaha, Ngai Te Rangi, Tapuika Iwi Authority, Ngati Whakaeue, Te Tumu Kaituna 14 Trust, Te Tumu Kaituna 7B2 Trust, Te Tumu Kaituna 8B1 Trust, and Te Tumu Kaituna 7B1 Trust;
- Any available Wairakei Stream Cultural Management Plan prepared as per Condition 10;

Throughout the landscape plan development process, TCC has facilitated ongoing consultation to establish the cultural matters of relevance as follows:

- 2016: Draft Landscape Plan and supporting documentation was reviewed and revised at seven joint hui and one iwi/hapu-only hui.
- 2017: Design hui were held to facilitate the translation of the cultural plans (see sections 3.1.1-3.1.3) into specific elements to be installed with a further eight hui which included two iwi/hapu only hui. The landscape plans and elements were further revised as an outcome of these hui.

Over the course of the 16 hui from January 2016 to August 2017, the following items were variously reviewed and discussed:

- landscape plans, planting palette, signage and furniture
- design and location of specific cultural elements
- the korero appropriate to each cultural element
- appropriate reserve management practices
- allocation of costs to cultural recognition elements budget

At each hui, information previously requested was provided and there was extensive korero recorded on histories, mythologies, and cultural values relevant to the landscape design and implementation of the final landscape plan. Each hui was followed by the circulation of minutes (Appendix 2) and further information requested by iwi/hapu. The information provided included archaeological sites, a chronological history of the Wairakei Stream, planting palette, landscape plans, fish survey reports and plans, etc. At hui 13, iwi/hapu requested a final cultural elements

task list with known costings to allow the allocation and costing of weaving/painting/carving and artistic design among the iwi/hapu groups.

3.1.1 Te Kapu O Waitaha Cultural Plan

Waitaha provided a cultural plan that expressed high level cultural values, practices, significance and effects linked to cultural elements.

The following elements presented in the cultural plan are included the landscape plan:

- The cultural plan noted cultural elements or locations of significance as the Wairakei River mouth and its historical path, as well as the importance of recognising Te Okuroa (porpoise) as a kaitiaki at the river mouth (Taylor Reserve). Recognition of Te Okuroa is provided for in the Waitaha pou at the viewing/reflection area (Taylor Reserve).
- The cultural plan notes the importance of water quality and the historical use of the area of weaving, dying and rongoa (medicine), as well as for access via lagoons and wetlands. This is incorporated throughout the landscape plan through the large scale wetland and riparian planting to improve water quality and habitat values. Planting for rongoa and weaving is provided for at the pa harakeke at Fashion Island and Emerald Shores Drive.
- The importance of the area for its abundance of food in proximity to pa sites was noted, as was papakainga occupation, seasonal occupation, and the cultivation of gardens. During the hui process, the re-establishment of gardens in the stormwater reserve was discussed as being incompatible with the floodable nature of the reserve. TCC undertook to engage with Waitaha on providing an alternative neighbourhood reserve space for this purpose.

During the 2016 and 2017 hui, Waitaha supported the inclusion of interpretation panels, especially those for inanga and eel migration, maramataka, and the whare raranga at Emerald Shores Drive to help re-establish cultural practices. In particular, Waitaha supported the re-establishment of large areas of native wetland and riparian planting, to assist the restoration of the waterway from a state of “Waimate” to “Waiora”.

Per hui 7 and 8, Waitaha supported the name change for the stormwater reserve to Te Ara O Wairakei and for the motif incorporated into reserve signage based on a theme of Wai. Per hui 13, Waitaha supported the iwi/hapu choice of bespoke signage for the reserve.

Waitaha subsequently provided an addendum to their cultural plan expressing their support for the viewing platform/reflection area, pataka korero (whare manaaki), cultural elements in the proposed playground, boardwalks and sand ladders, carvings/pou/interpretative panels, and upgrading reserve amenities. Waitaha applauded the project team and endorsed the draft consent application for Taylor Reserve implementation.

The landscape plan gives effect to all cultural recognition elements or locations for cultural recognition identified within the Waitaha cultural plan, where they can be incorporated into a landscape plan. The landscape plan has also documented consultation with iwi/hapu on cultural matters to confirm design and location of such cultural recognition elements, and these are to be located on land in TCC control (refer to Advice Note 21 of the CSDC).

3.1.2 Te Rūnanga o Ngāi Te Rangi and Te Whānau a Tauwhao Cultural Plan

Ngāi Te Rangi and Tauwhao provided a cultural management plan, supported by Ngati He, to form “*the foundations of an ongoing partnership and discussion between Tauranga City Council and tangata whenua*” (Ngai Te Rangi Cultural Plan, pg 2). It sets out an aspiration to “*revive the natural character of the Wairakei*” and for the “*cultural significance of the entire area*” to be recognised by “*reviving the customary practices of days gone by*” (Ngai Te Rangi Cultural Plan, pg 7).

The following elements presented in the cultural plan are included the landscape plan:

- Knowledge of nga atua to be woven through the stream corridor (pages 8-9), particularly through poupou at the whare manaaki and other areas (page 9) to symbolise the Maori worldview of interconnectedness (mana atua): poupou are included (per hui 12) at Taylor Reserve, and either side of Domain Road and Emerald Shores Drive.
- Importance of portraying historical events and korero at appropriate locations (mana tupuna) (page 9): Locations for interpretation of events and korero were agreed during hui 10, 11 and 12 as follows:
 - Area 1: interpretation panels for view shafts to Mangatawa/Papamoa Hills.
 - Harrisons Cut: interpretation panels for inanga migration and recognition of the urupa.
 - Fashion Island and Emerald Shores Drive: interpretation panels for whare raranga and pa harakeke.
 - Domain Road and Emerald Shores Drive: signage and poupou.
 - Area 3: interpretation panels for eel migration and maramataka.
 - Parton Road, Golden Sands Drive, and Te Houhou area: signage and groups of interpretation panels/structures (pending Te Houhou area development).
 - Taylor Reserve: interpretation panels describing the three poupou, one for each iwi/hapu korero, and whare manaaki.
- Importance of achieving co-management to help re-engage the people with their land (mana tangata) (pages 9-10): Cannot be incorporated into a landscape plan.
- Re-establishing a natural outlet for the waterway to the coast and ensuring that the possibility of achieving this is not impeded in future stormwater planning (page 10): Cannot be incorporated into a landscape plan as this is outside the spatial area of the project corridor, but not impeded by the Stage 1 landscape plan.
- Significance of cultural practices (mahinga kai, rongoa, knowledge of taonga species) and the ability to share this knowledge (page 10): Per hui 10, 11, 12 and 13, pa harakeke, hopu tuna, rongoa gardens, interpretation panels, and whare manaaki provided for in the landscape plan.
- Need to improve water and habitat quality, transitioning from an unhealthy “waimate” state to a healthy “waiora” state (page 10-11), and cultural health indicators are suggested to monitor this transition, alongside ecological science measures: a fundamental landscape design principle as set out in the Landscape Design Report accompanying the draft landscape concept plan. The development of cultural health

indicators cannot be incorporated into a landscape plan but are not impeded by the Stage 1 landscape plan.

- Ara Ngahere (page 13) is the provision of vegetation corridors with a priority on fruiting and native species for birds, with pest control methods implemented: incorporated throughout the landscape plan. Per hui 5, landscape plan planting palette (Appendix 4) provides for native plants with nectar and fruit for birds. Pest control is a standard TCC reserve maintenance task.
- Pa Harakeke (page 14) is provision of areas for pa harakeke and a suggested location at Emerald Shores Drive: Pa Harakeke provided for at Fashion Island and Emerald Shores Drive.
- Ara Wai (page 16) is future planning for reinstatement of the stream's headwater and coastal outlet connections: Cannot be incorporated into the Stage 1 landscape plan as this is outside the spatial area of the project corridor but not impeded by the Stage 1 landscape plan.
- Improved native planting for inanga and eel habitat and improved water quality (page 16): incorporated throughout the landscape plan, with riparian planting for inanga spawning at Harrisons Cut and Grant Place weir.
- Whare Manaaki (page 16) noted as a structure for sharing knowledge as planned at Taylor Reserve and providing for the installation of pou atua at Taylor Reserve: whare manaaki and viewing area with cluster of pou pou at Taylor Reserve (viewing platform/reflection area).
- Papa Takaro (page 17) noted as a culturally themed playground as planned at Taylor Reserve: provided for at Taylor Reserve.
- Other cultural elements (pages 17-18) include support for elements in the draft landscape concept plan such as interpretation panels, pou with fencing and gateway features at sites of significance, and cultural elements incorporated into existing or future bridges: As noted above, interpretation panels, gateway features and other cultural elements are provided for in the landscape plan. Per hui 10, 11, 12 and 13 fencing and bridge elements were not subsequently requested by Ngāi Te Rangi/ Tauwhao or other iwi/hapu. Such fencing/bridge elements would need to meet TCC specifications and national standards for safety on road and pedestrian bridges, and can be provided for in later stages of implementation.

Ngāi Te Rangi and Tauwhao subsequently provided an addendum to their cultural plan expressing their support for the viewing platform/reflection area, whare manaaki, cultural elements in the proposed playground, boardwalks and sand ladders, carvings/pou/interpretative panels, and upgrading reserve amenities.

The landscape plan gives effect to all cultural recognition elements or locations for cultural recognition identified within the Ngāi Te Rangi and Tauwhao cultural plan, where they can be incorporated into a landscape plan. The landscape plan has also documented consultation with iwi/hapu on cultural matters to confirm design and location of such cultural recognition elements, and these are to be located on land in TCC control (refer to Advice Note 21 of the CSDC).

3.1.3 Ngā Potiki Draft Draft Cultural Plan

Ngā Potiki prepared a draft cultural plan dated June 2016. At the time of writing, a final Ngā Potiki cultural plan has not been submitted.

During the landscape plan development process, the draft cultural plan was reviewed along with notes of the korero of Ngā Potiki representatives during hui 2, 3, and 4, and the presentation made by Reon Tuanau on behalf of Ngāi Te Rangi and in liaison with Ngā Potiki. These were summarised into notes and subsequently a table attached to the minutes of hui 3 and 4 respectively to confirm the cultural elements requested and locations for installation.

The following elements presented in the draft cultural plan are included the landscape plan:

- Pa Harakeke (page 15) at Fashion Island and Emerald Shores Drive.
- Support structures for pa harakeke (page 17) at Fashion Island (page 18) and Emerald Shores Drive, originally labelled “whare harakeke”, and later amended the request of iwi/hapu to “whare raranga” (hui 13).
- The example image of the cultural shelter (page 19) was closely replicated in the BML draft whare harakeke concept and subsequent iterations of the design. Hui 10, 11 and 12 discussed the artistic components of the whare structure meeting the aspirations of the bottom image page 19 as being the tekoteko (top post), maihe (front barge boards) and pou mua (front support posts).
- Pathways for pa harakeke (page 17) at Fashion Island and Emerald Shores, originally included in the draft landscape design but subsequently removed at the request of iwi/hapu due to pathways being a Reserve asset rather than being considered “cultural recognition” (hui 5).
- Reserve entrance signage and pou pou at Domain Road (page 18).
- Hopu tuna in Area 3 (page 20) to accommodate the need for both access and darkness with good eel habitat.
 - The need to stock the Wairakei Stream with eels for this aspect was investigated at the request of iwi/hapu by carrying out fish surveys which determined that current eel populations are higher than expected and will be increased over time as a result of the improved habitat.
 - The use of pa tuna and other tools for eel harvesting (mauri stones, hinaki, korapa, whare tuna: page 20) were discussed and a potential location in Area 3 identified offline from the main stream channel to minimise potential interference with water flow.
 - A specific management plan for improving water quality (page 21) is addressed through the Papamoa Catchment Management Plan.
- Maramataka in Area 3 (page 20) was discussed using kohatu (page 34-35) with an embedded calendar in Area 3 associated with korero on eel migration and near the hopu tuna.
- Cultural recognition of wahi tapu sites agreed during hui 10, 11 and 12:
 - Harrison's Cut (page 21): interpretation panels for inanga migration and recognition of the urupa.
 - Taylor Reserve (page 22): interpretation panels describing the three pou pou, one for each iwi/hapu korero, and whare manaaki.
 - Te Houhou pa sites (page 22) are on Ngā Potiki and Waitaha lands that are not in TCC control. Development of the stormwater corridor is subject to regulatory

outcomes of subdivision design, and are therefore a design component to be addressed as part of iwi development aspirations as noted on page 22 and 23.

- Signage and structures (page 23) for wahi tapu as noted above and included in the balustrade at Taylor Reserve protecting the poupou.
- Whare “located on kapu sites as memorials... used for ceremonial and wananga purposes” (page 25): whare manaaki at Taylor Reserve.
- Areas specified for cultural recognition:
 - Harrisons Cut (page 26): interpretation panels as noted above.
 - Domain Road (page 27): signage and poupou as noted above.
 - Parton Road and Te Houhou area (pages 27-29): signage and groups of interpretation panels/structures (pending Te Houhou area development as noted above). Also Golden Sands Drive, which is not specified.
 - Emerald Shores Drive area (page 29): signage, groups of interpretation panels and whare raranga as noted above.
- Signage and park furniture (page 29) “reflecting cultural context”. Per hui 13, the iwi/hapu group selected (hui 13) a bespoke signage design and park furniture into which the proposed cultural motif would be incorporated.
- Fencing at bridges and crossings (page 31). Per hui 10, 11, 12 and 13 this cultural recognition element was not subsequently requested by Ngā Potiki or other iwi/hapu. Such fencing would need to meet TCC specifications and national standards for safety on road and pedestrian bridges, and can be provided for in later stages of implementation.
- Pou (page 31) are included (per hui 12) at Taylor Reserve, and either side of Domain Road and Emerald Shores Drive.
- Taylor Reserve (pages 33-35):
 - Whare manaaki
 - Viewing/reflection area/platform reflecting tapu elements (poupou protected by a balustrade).
 - Delineation of noa and tapu elements (existing picnic tables to be moved to the proposed new playground and BBQ area at the eastern end of the site away from the whare manaaki and viewing area).
 - The preferred centrepiece for the viewing platform commemorating the site was a group of three poupou, rather than kohatu as discussed at hui 11 and 12. However, as noted above, kohatu are incorporated into the landscape plan in the maramataka (lunar calendar) in Area 3.
- Whakaterere waka (pages 36-37):
 - Restoring water quality: a fundamental landscape design principle as set out in the Landscape Design Report accompanying the draft landscape concept plan.
 - Native shelter planting: incorporated throughout the landscape plan.
 - Suitable access: this cultural recognition element was not subsequently requested by Ngā Potiki or other iwi/hapu. Such access would need to meet TCC specifications for providing safe watercraft access to water. The draft CMP goes

on to note “*the Wairakei does not have a consistent flow to it, but is more in the nature of a pond*”.

- Koura (crayfish) (page 37-39): Discussed at the 4th hui and acknowledged by Ngā Potiki that it is not currently possible due to the characteristics of the waterway (response minuted) but are not impeded by the Stage 1 landscape plan and may be explored in future as water quality continues to improve.
- Co-governance and reserve management plans: not items that can be incorporated into a landscape plan.

The landscape plan gives effect to all cultural recognition elements or locations for cultural recognition identified within the Ngā Potiki draft cultural plan where they can be incorporated into a landscape plan. The landscape plan has also documented consultation with iwi/hapu on cultural matters to confirm design and location of such cultural recognition elements, and these are to be located on land in TCC control (refer to Advice Note 21 of the CSDC).

3.1.4 Cultural Elements Outcomes

The tangata whenua representatives involved in the hui expressed strong support for the landscape plan and the cultural elements included as discussed. During 2017, the design hui process confirmed specific design for cultural recognition elements at defined locations in the Te Ara O Wairakei corridor and at Wairakei/Taylor Reserve. Tangata whenua nominated cultural artists to confirm the design of a reserve icon and carved/weaved/painted elements.

Hui 10, 11, 12, and 13 documented the specific design, location and korero of agreed cultural elements. This included:

- Specifying particular places for physical cultural elements (structures, pou whenua, signage, interpretation panels).
- Outlining limitations to cultural elements relating to condition 9.5, mainly CPTED issues and conflicts between collecting kaimoana and stormwater function.
- Plant species meeting cultural requirements for harvesting, bird life, and ecological enhancement, including rongoa gardens and pa harakeke.
- Confirming the footprint, location, and form of the two proposed whare raranga (weaving houses) to be located at Fashion Island and Emerald Shores Drive closely aligned to imagery provided in the Ngā Potiki draft cultural plan.
- Identifying appropriate locations for enabling cultural harvest to occur (pa harakeke and pa tuna).
- Providing an interface between management of archaeological resources as required by Heritage New Zealand and aspirations to use and interpret culturally important sites.
- Allowing for cultural elements in reserve signage, using a theme of Wai interpreted as a motif or graphic.
- From a range of design choices, a signage palette was chosen which includes an interpretation panel that will be used to display cultural recognition elements, histories, and mythologies at specific locations.
- Specific aspects of the Wairakei/Taylor Reserve design, particularly the separation of activity types (tapu, noa), and the form, function and footprint of the proposed whare manaaki/pataka korero and associated amphitheatre. The original form of the viewing

platform/reflection area was revised to include three carved pou whenua surrounded by a balustrade and an informal sand ladder/boardwalk network to protect dunes and vegetation.

Based on the final cultural elements or aspirations, there were few conflicts with reserve use. The cultural elements requiring modification were:

- Amending the design and footprint of the proposed whare manaaki/pataka korero to 50m² with an additional grassed amphitheatre for seating to minimise effects on landscape, visual, and reserve amenity values, and
- Maintaining an open permeable structure of the whare manaaki/pataka korero and whare raranga structures to avoid CPTED, graffiti, and health and safety issues.

A key outcome of consultation was that the stormwater reserve be re-named Te Ara O Wairakei, and Taylor Reserve be re-labelled Wairakei/Taylor Reserve on reserve signage to acknowledge the historic path and outlet of the stream.

A question has subsequently been raised about whether all cultural plan elements and cultural matters have been incorporated into the landscape plan and whether all cultural elements are agreed. Until final agreement is reached, the cultural element locations as agreed at hui 10, 11, 12, and 13 are shown indicatively on the detailed design plans. The cultural element descriptions as agreed at hui 10, 11, 12, and 13 are provided throughout Sections 5 and 6 of this report but are currently considered by TCC to be indicative.

For the avoidance of doubt, there is not currently sufficient certainty about agreement on the cultural elements to enable TCC to finalise cultural element design in the landscape plan. It is TCC's preference that the iwi/hapu involved in this consultation process work together to form a consensus on the location and design of cultural elements. When this consensus is communicated to TCC, implementation of the confirmed elements can be progressed, subject to cost, those factors listed in condition 9.5 of the CSDC, and any authorisations required for implementation.

3.2 Community

Condition 9 of Consent RC63636 requires that TCC consult with local community groups and landowners that own land in or adjacent to Te Ara O Wairakei. This consultation was carried out in accordance with Consultation Plan for TCC Wairakei Landscape Plan Stage 1 (Draft) prepared by Beca (Sept 2016).

As well as social media, print media, and TCC website coverage, letters were sent to all landowners with property adjacent to the stormwater corridor and Wairakei/Taylor Reserve. Submission forms were available in hard copy from Papamoa Library as well as online via a web-based submission form.

Two public open days were held at the Papamoa Public Library, one targeted specifically at residents of Wairakei/Taylor Reserve and the other for landowners along the Te Ara O Wairakei stormwater reserve. In addition, Papamoa Progressives Association hosted TCC and BML for a presentation of the landscape concept plan.

Of the 50 submissions received and discussions/feedback, the following main themes emerged:

- Support for the landscape plan.
- Increased rubbish bins, seating, and shade trees.

- Increased/wider paths and signage to improve connectivity, including for tsunami evacuation.
- Installation of cultural elements.
- Improved parking safety for the Palm Beach Boulevard playground.
- Installation of a new playground in Topaz Reserve (outside the scope of the Landscape Plan).
- Installation of fitness stations.
- Improved reserve maintenance, especially planted areas and mowing frequency, and increased planting diversity.
- Plant drain areas to improve poor amenity and water quality.
- Retain some water's edge access (i.e. no riparian planting) in places with water-focused activities, principally parts of Royal Palm Beach Estate.
- Council purchase of stormwater corridor sections in private ownership to complete the corridor.
- Concerns expressed about specific track locations, increase native planting, project expense impacts on rates, and reduced privacy.

The themes from submissions and feedback on Wairakei/Taylor Reserve were:

- Support for the proposed reserve design, except for the location and area of the swale.
- Improved accessibility from the existing carpark to the toilets.
- Problems with existing toilets and need for upgrades and/or new toilets located closer to the existing carpark.
- Improved signage for carpark entry, reducing congestion on Taylor Road, and toilet location.
- Problems with use of the adjacent unsealed carpark (outside the scope of the Landscape Plan).
- Addressing the existing flooding on Taylor Road (outside the scope of the Landscape Plan).
- Changing the location and reducing the area of the proposed swale to allow for existing informal sports use of the open grassed area.
- Increased rubbish bins, seating, and BBQ/picnic facilities.

The installation of all Wairakei/Taylor Reserve elements requires resource consent from TCC to authorise construction in an Important Amenity Landscape and to address significant cultural and ecological overlays, as well as coastal hazard zones. Further consultation with adjacent landowners will occur as part of the consent application process. A consent application will be submitted when final design endorsement has been received from each of the iwi/hapu.

3.3 Tauranga City Council Internal

Consultation was undertaken with TCC internal stakeholders including staff responsible for roading and cycleways, reserve management, stormwater management, natural hazards,

policy/planning, and future urban development planning. An internal workshop was held during 2016 to inform the landscape concept plan, and followed up with meetings or email correspondence with individual staff. The specific information sought related to:

- locations of additional tsunami bridges and connectivity with future patterns of urban growth, especially the future Wairakei town centre,
- policy on litter bins in the reserve,
- future Domain Road upgrades and impacts on the reserve/road interface design, and
- reserve management plan review processes relating to Taylor Reserve.

During May 2017, TCC parks and stormwater operations staff carried out a site walkover with BML to determine detailed design elements. The elements confirmed on site included:

- new walkway and boardwalk locations and pedestrian bridges
- upgrades required to stormwater infrastructure (culverts, balustrades)
- extent and location of planting, and
- extent and location of plant renewal/removal/thinning.

Specific engagement was also carried out with TCC Roding and Infrastructure staff regarding the Domain Road upgrade, Papamoa Beach Road pedestrian safety upgrades, the Golden Sands wastewater pump station, and Emerald Shores Drive stormwater pump station access.

A follow up workshop was completed in July 2017 to confirm departmental allocation of funding for design elements, particularly elements not included in the landscape concept plan but arising from the TCC walkover and public submissions. Parks staff subsequently confirmed that the Taylor Reserve toilets will be replaced rather than being upgraded.

Funding for additional projects arising from the design process was also discussed and determined to be a necessary part of project implementation. These include:

- retrofit fish passage solutions at Grant Place and Harrison's Cut,
- "daylighting" Harrisons Cut from outlet to Papamoa Beach Road,
- landscape design of lateral stormwater swales connecting to the main corridor to improve recreational connectivity and reduce CPTED issues, and
- developing a vegetation management specification specific to wetland and stormwater plantings to protect the significant investment in new wetland plantings.

3.4 Stakeholders

An initial consultation meeting was completed with Heritage New Zealand (HNZ) in 2016 which confirmed HNZ's position that archaeological sites in the drainage reserve are considered to be highly significant and should be retained with minimal disturbance, excavations, or structures. HNZ recommended that TCC engage an archaeologist to assist with Landscape Plan development to minimise the need for Authorities to disturb sites during implementation. TCC engaged InSitu Heritage Ltd, who participated in hui and consulted with HNZ.

An Archaeology Management Framework has been prepared that considers the reserve development activities proposed by the Landscape Plan as well as ongoing maintenance activities. The Framework establishes the risk profile with respect to archaeological resources for

specific activities and locations, and appropriate management responses. This will form the basis of a General Authority application to HNZ encompassing most of the entire Stage 1 reserve area. Specific authorities will still be required for activities in those areas considered to be High Risk with respect to the chance of archaeological discovery and/or intactness of known sites.

Specific consultation was also carried out with stakeholders who requested it. These included Powerco in relation to assets located in the corridor and Bluehaven in relation to the town centre interface with the reserve. Powerco provided information on asset locations to ensure structures are not built and deep rooted shade trees are not planted on top. Bluehaven will continue to discuss proposed levels of service in the corridor immediately adjacent to the proposed town centre as urban design progresses. The reserve design has accounted for a Bluehaven stormwater wetland in the corridor.

3.5 Tauranga City Council Environment Committee

The Te Ara O Wairakei Landscape Design and costings were presented to the Tauranga City Council Environment Committee (a TCC standing committee) on 24 October 2017 in the open section. The purpose of the presentation was to provide councillors with a project update and understanding of project costs to be submitted to the Long Term Plan. The Environment Committee resolved to:

1. Recommend to Council the approval of the final Stage 1 Te Ara O Wairakei Corridor Landscape Plan for submission to the Bay of Plenty Regional Council
2. Recommend to Council that Council support in principle, inclusion in the 2018-28 Long Term Plan of the budgets contained in this Report (DC210).
3. Considers opportunities for public participation in planting.

The resolution was carried unanimously.

4.0 Existing Reserve Characteristics

Condition 9.5 of Consent RC63636 specified that the Landscape Plan must include and/or account for a range of matters including stormwater function, cultural recognition elements, ecological enhancement values, public use and accessibility. Legislative requirements regarding heritage resources (archaeology) and reserve management were also considered.

4.1 Wairakei Stream history

The following is a chronological history of the stream based on published literature and historical accounts.

- **Prior to human inhabitation** - A lowland stream formed by the natural drainage of headwaters in Mangatawa and Papamoia Hills. Based on current topography, the catchment extends from Mangatawa south along Rocky Cutting Road to Te Puke Quarry Road, and northeast along Reid Road including the Papamoia summit to the East Coast Main Trunk railway.

The stream discharged out onto the coastal plains and was diverted laterally by the Papamoia dune system. The stream outlet would have been either to the coast or Kaituna River, depending on flows, coastal sediment movement, sea level, and vegetation cover.

Lowland vegetation was originally swamp forest (kahikatea, pukatea, swamp maire, etc.) within shorter stature flax/raupo/sedge swampland with many pools and oxbows as the stream meandered across the plains over time.

- **1300 - 1400s** - Kaharoa eruption, Maori arrival, and fires caused forest to be almost completely removed leaving dense swampland with many different wetland types, from coastal wetland species through to freshwater, interspersed with patches of coastal and lowland shrubs (mānuka, kāmahī, rewarewa, *Coprosma*, etc.) on higher/drier ground. Swamp birds, crustaceans, shellfish, and fish were a significant food source for Māori.
- **1820s** – Following European arrival, flax became a commodity for trade and flax mills established in Kaituna, Wairakei, and Maketu in the 1870s. At least two flax mills were built near the Wairakei Stream, at the end of Bell Road (Broads) near Te Kopua and near the Kaituna River oxbow (Paroa). The commercialisation of flax results in large scale harvesting programmes, planting faster growing flax varieties, and the commencement of land drainage for planting flax.
- **Late 1800s** – Large scale conversion of swampland to farmland using drainage networks, subsequently developed into community scale assets with a rating base and governance structure known as drainage boards.
- **1910** - Te Puke Land Drainage Board approved funds to improve the Papamoia Main Drain (the channelized Wairakei Stream) and Government approved construction of the Mangatawa rail link.
- **1918** - Te Puke Land Drainage Board began levying rates on landowners for maintaining the Papamoia Main Drain.
- **1920s** - Kaituna River cuts and diversions proposed to improve land drainage.

- **1924** - Bridge over Tauranga Harbour constructed and 1925-28 main trunk railway line constructed. At this time, the Mangatawa drain was constructed to divert Wairakei Stream headwaters into Rangataua Bay. Without its headwaters, the Wairakei Stream mouth at Taylor Reserve and channels would have become more frequently blocked by sediment and weed causing problems with flooding. Harrison's Cut was constructed to alleviate this and help with land drainage in 1920s.
- **1960-1970** - Papamoa beach land development commences. The Wairakei Stream outlet at Taylor Reserve was finally blocked off for land development in the 1970s. The remnant stream was progressively converted to a straight drain pre-1970s in grazed pasture or piped where coastal development occurred.
- **1992** - Grant Place culvert and weir installed to assist with water levels in the stream.

4.2 Wairakei Stormwater Reserve Characteristics

4.2.1 Waterway

The waterway within Wairakei Stormwater Reserve is a highly modified remnant of the original stream which functions primarily for stormwater disposal, treatment and storage. The stream is disconnected from both its original headwaters in the Papamoa Hills and its most recent coastal outlet at Taylor Reserve. There are two artificial outlets to the coast via the Grant Place weir and Harrison's Cut, but no natural outlet at the eastern end. The stream has little natural overland stormwater flow into the waterway and water level changes are in response to local rainfall, stormwater, and shallow groundwater inputs rather than wider catchment-scale hydrology.

In Stage 1, the waterway extends over 10km through the Papamoa relic dune system and functions primarily for stormwater disposal, treatment and storage. Within the Stage 2 area of future urbanisation, the waterway extends over 8km through the Papamoa relic dune system within farmland. In Stage 2, the waterway extends east for almost 4km, before switching back towards Papamoa and terminating in the dunes north of Papamoa Beach Road. Between the waterway and Taylor Reserve, there are channel remnants in drains, pipes and culverts, but there is no longer a complete physical connection between the waterway and its historic coastal outlet.

TCC regularly monitors stormwater discharges and Wairakei Stream water quality. The data shows that stormwater contaminant levels set in Papamoa CSDC were exceeded only once for copper at Harrison's Cut and once for zinc at Emerald Shores. The Papamoa CSDC threshold stormwater contaminant levels are based on protection of 90% of species as set out in the ANZECC guidelines¹, appropriate for a highly modified or disturbed aquatic ecosystem. However, it is worth noting that if a 95% threshold for species protection was applied, there would only have been two additional exceedances for zinc and one additional exceedance for copper. These theoretical exceedances were only slightly above the 95% threshold. The Wairakei Stream biological community composition is therefore more likely to be driven by physical habitat characteristics, including fish passage obstacles, and water quality values than by stormwater contaminants.

¹ ANZECC. 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.

Despite channel recontouring and riparian planting in some areas, aquatic habitat quality is typically poor. Although urban stormwater contaminant concentrations are low (copper, lead, and zinc), water quality is poor with elevated nutrients and microbial pathogens, and low dissolved oxygen. Summer water temperatures exceed the thermal tolerances of many aquatic organisms, exacerbated by the open water areas created during land development. The stream contains resident populations of hardy fish species (shortfin eel, longfin eel, bullies, goldfish, mosquito fish², and managed grass carp). Small numbers of whitebait can occasionally enter the waterway but are unlikely to survive to adulthood. Improving riparian and aquatic habitat is therefore one of the fundamental principles of landscape design.

4.2.2 Existing Reserve Amenity

The Wairakei Stormwater Reserve is long and flat, narrow in parts, and has few distinguishing landscape features and low visibility beyond the immediately adjacent properties. It is well used by the community although levels of service vary markedly and connectivity is hindered by inconsistent tracks, signage, and pedestrian refuges. Walkways are affected by wet ground conditions (drainage and contour) in some areas and some walkways do not meet TCC minimum specifications for shared use. At the interface of walkways with roads, the lack of alignment with pedestrian refuges³ creates safety issues for pedestrians and cyclists. There are few seats or litter bins, and some of those that are available are poorly positioned.

Recognition of archaeological resources and cultural values is limited, and recreational and ecological opportunities remain largely untapped. Conflicts between maintenance, amenity, and ecology are largely unresolved. For instance the need to remove aquatic weed from the waterway impedes tall riparian vegetation from being established that would improve instream ecology values. Mowing grass in boggy or flooded areas is ongoing maintenance problem that results in poor amenity and misses the opportunity to re-create wetlands that would contribute to improved water quality. Some indigenous plantings are shading and reducing visibility for walkways, and have been subject to maintenance that is unsuitable for the vegetation type.

The relationship between reserve vegetation and the waterway varies markedly along the reserve. In some places the waterway is an artificial drain, with little or no vegetation besides grass. In other places the waterway is a highly manicured pond or artificial lake environment with no natural riparian vegetation and poor recognition of the original stream environment. In some places, the re-creation of a stream meander has not yet been accompanied by riparian planting, while in others the riparian planting has matured without being supplemented by understorey vegetation, creating amenity, safety, and maintenance issues.

4.3 Taylor Reserve Characteristics

Taylor Reserve is the highly modified historic outlet of the Wairakei Stream to the coast. It retains some of the original channel topography at the south eastern corner of the site, but most of the reserve is flat grass. The dune system between the reserve and Papamoa coastline is relatively natural and has dune vegetation some indigenous cover mainly due to CoastCare planting. At the western end of the reserve is a parking area and vehicle beach access follows the dune low point where the stream channel outlet would once have existed.

Taylor Reserve has a toilet, picnic tables, limited amenity planting, and sub-surface stormwater soakage devices, but no other amenities for reserve users. The reserve has a poorly defined

² *Gambusia affinis* - Pest species.

³ Outside the scope of the landscape design. Pedestrian refuge design and construction to be commissioned by TCC.

interface with the adjacent unsealed carpark and boat ramp area, presenting safety and access problems for reserve users.

5.0 Landscape Design

5.1 Design Vision

The Wairakei stormwater reserve has the potential to become a significant reserve asset for Papamoa and the wider Tauranga community. The extensive inland Wairakei reserve network benefits from its close proximity and connection to the sweeping Papamoa coastline. A landscape concept plan should build on that connectivity to allow the Reserve to become a truly multifunctional reserve space, integral to the fabric of the Papamoa community.

As well as providing its fundamental stormwater function, the Reserve should provide for a high-use recreational asset, strategic cycling route, and tsunami escape route. It should have high visual amenity, continuously improving ecological values, and enable the re-establishment of cultural practices. When linked with the Part II Te Tumu future urban area, the reserve should become a celebrated focal point for the new Wairakei Town Centre and encourage lateral integration with the future urban area.

This vision for the enhancement of Wairakei Reserve, implemented as part of integrated development, is fully aligned with Council's Urban Design Strategy, Smart Living Places, Open Space Strategy principles, best practice for resilient cities, and SmartGrowth.

5.2 Design Elements

Summarised from the required content set out in Section 2.0 and condition 9.5 of the CSDC, the Wairakei Landscape Plan design elements must consider:

- Maintaining stormwater function in accordance with CMP requirements.
- Cultural matters of relevance to the Wairakei Stream Corridor determined in consultation with tangata whenua and Maori landowners.
- Integrating cultural recognition elements in accordance with any available Cultural Plans.
- Protecting and enhancing ecological values, particularly indigenous planting, appropriate to the stormwater management functions of the Wairakei Stream Corridor.
- Enhancing public use and accessibility, with particular regard to urban design, civil defence, and CPTED requirements.

Other design elements to be considered include:

- Interface with the proposed Wairakei Town Centre east of Emerald Shores Drive.
- Future urbanisation of Stage 2 and lateral integration within the stormwater corridor.
- Impact on archaeological resources.

5.3 Design Objectives

On the basis of the above, the draft landscape concept plan was developed over 12 months from January to December 2016. The landscape concept plan was completed in conjunction with tangata whenua consultation to achieve integration of cultural recognition elements. Cultural recognition elements were based on the principles, aspirations, and specific guidance provided in the three Cultural Plans prepared in accordance with Condition 10 of Consent RC63636. Internal workshops were also held with TCC departments to ensure consistency with TCC stormwater and reserves levels of service and coordination with proposed projects. The landscape concept plan for Stage 1 was lodged with BOPRC in December 2016. The plans are provided in Appendix 3.

The landscape plan objective for the entire reserve corridor is:

- Significantly enhance the existing reserve as reference point and locational marker within the suburban environment by:
 - Recognising cultural and heritage elements.
 - Creating a more natural appearance and enhanced ecological function.
 - Increasing accessibility for active and passive recreation.

This will be achieved with the following design elements:

- Comprehensive signage network throughout reserve with consistent style and theme, creating identity and enhancing wayfinding.
- Interpretive panels, pou whenua and cultural markers installed at important ecological, historical and cultural sites.
- Enhanced shared walkway network for improved circulation, safety, neighbourhood access, and connectivity to tsunami evacuation routes.
- Increased park seating and carparks at collector road access points.
- Re-vegetation programme to improve safety and amenity, reduce reserve maintenance, provide for cultural harvest, treat stormwater, improve ecological function, and improve water quality.
- Modify swale form and function to provide stormwater treatment.

The landscape concept plans formed the basis on which the detailed design plans were prepared, supplemented by walkovers with TCC reserves and stormwater operations staff to ground truth the locations of walkways, signage, planting, seats and bridges. The detailed design plans will be lodged with BOPRC no later than 31 December 2017 and are provided in Appendix 4.

The following sections set out how the landscape design meets the specific requirements of condition 9.5 of the consent.

5.3.1 Stormwater function

TCC stormwater operations and infrastructure staff attended the hui to ensure that the landscape plan and cultural elements take account of the stormwater function of the reserve and that CMP objectives and actions were recognised. Specific examples of stormwater function incorporated into the landscape plan include:

- Inclusion of micro-sediment basins at stormwater outlets into the waterway. These small planted sediment basins are intended to reduce the thermal enrichment and sedimentation problems experienced in the corridor from these untreated discharges.
- Upgrades and/or installation of culvert balustrades are included to bring stormwater asset safety up to TCC specifications.
- Plant stature in each area provides for stormwater conveyance under bridges and through culverts.
- Large areas of wetland planting reduce mowing maintenance and the effects of grass clippings on water quality (nutrients, thermal enrichment, CBOD, faecal coliforms).

5.3.2 Cultural matters and cultural plans

The cultural matters raised by iwi/hapu during hui and those matters included in the cultural plans are incorporated into the landscape plan as set out in Section 3.0 and as documented in the hui minutes and supporting documentation. Until tangata whenua consensus is reached on cultural elements, these elements are denoted as indicative on the detailed design plans.

On the basis of the information provided in the hui and cultural plans, the landscape concept plans (lodged Dec 2016) and the detailed design landscape plans (to be lodged Dec 2017) have given effect to cultural recognition by providing for the location of cultural recognition elements throughout both reserves and allowing for the inclusion of a cultural design motif on bespoke reserve signage. Most cultural recognition elements have been costed and included in the TCC Long Term Plan budgets based on the consensus of tangata whenua at the conclusion of hui 13.

Costs for artistic elements such as carving, weaving, painting, design, and the content of interpretation panels and maramataka have not been confirmed by iwi/hapu. Cultural recognition elements can be implemented when a consensus has been reached on location and design of confirmed elements, subject to cost, those factors listed in condition 9.5 of the CSDC, and any authorisations required for implementation.

5.3.3 Ecological values

BML ecologists attended the hui to ensure that the landscape plan takes account of the protection and enhancement of ecological values of the reserve. Specific examples of ecological values incorporated into the landscape plan include:

- Large scale indigenous wetland and riparian planting (25ha) to reduce effects of mowing, reduce thermal enrichment through shading, enhance instream habitat values through organic matter, and increase biodiversity.
- Inclusion of micro-sediment basins at stormwater outlets into the waterway as described above.
- Riparian planting at Harrisons Cut and Grant Place weir for inanga spawning.
- Inclusion of future projects to improve fish passage for inanga.
- Confirmation through fish survey of the species diversity present in the corridor.

5.3.4 Public use and accessibility

BML landscape architects and TCC reserve staff attended the hui to ensure that the landscape plan takes account of public use and accessibility of the reserve, including consideration of urban design, civil defence, and CPTED. Specific examples of public use and accessibility incorporated into the landscape plan include:

- Tsunami bridges included at appropriately spaced locations.
- Vegetation removal from existing walkways or changes to existing walkway locations to improve sightlines for users and reduce, removal or avoid vegetation overshadowing walkways.
- New walkways and vegetation location and stature designed with appropriate separation to avoid vegetation overshadowing of walkways and maintain sightlines.
- A comprehensive new signage network proposed to provide high quality wayfinding and locational markers throughout the reserve.
- Walkway connections proposed to improve connectivity with surrounding reserve access points, adjacent reserves, and adjacent community facilities.

5.3.5 Boffa Miskell Design Report 2005 Scope of Issues

The BML design report prepared in 2005 identified the same key issues in the Wairakei Reserve as have been identified during the 2016/2017 design process. These issues include amenity values, recreational use, walkway connectivity and improved safety at street crossings, ecological enhancement and biodiversity, stormwater function, maintenance issues, public safety, signage with a bespoke reserve theme, seating and bins, entrance features and interpretation panels. The issues raised during consultation with stakeholders, tangata whenua, and the community during 2005 are virtually identical to the issues raised during the 2016/2017 consultation processes, and indeed several of the 2017 submitters also made submissions in 2005. The full scope of the issues and information included in the 2005 design report have been included in the 2016 draft landscape concept plan and 2017 final landscape plan for Te Ara O Wairakei.

6.0 Area-Specific Design

To facilitate the design process, the reserve was divided into 6 areas based on existing amenity and reserve infrastructure, enhancement opportunities, CPTED issues, and connectivity as follows:

- Area 1: Pacific View Road to Royal Palm Beach Estate
- Area 2 comprised of
 - Area 2a Royal Palm Beach Estate to Gravatt Road
 - Area 2b Gravatt Road to Domain Road
- Area 3 comprised of
 - Area 3a Domain Road to Longview Drive

- Area 3b Longview Drive to Parton Road
- Area 4 comprised of
 - Area 4a Parton Road to Mandalay Key
 - Area 4b Mandalay Key to Golden Sands Drive
- Area 5: Golden Sands Drive to Stage 2 Te Tumu boundary.
- Taylor Reserve

The following sections set out the design for each Area, followed by sections describing design elements applicable throughout the reserves.

Of note, parts of the Area 4 are not in TCC ownership and/or management. Conceptual landscape design has been undertaken for these areas. Detailed design will be completed when management of the reserve corridor has transferred to TCC.

6.1.1 Area 1 – Pacific View Road to Royal Palm Beach Estate

This narrow section of reserve consists of a concrete stormwater channel with no aquatic habitat for fish, mown grass, and small shrubland areas framed by mature poplar trees providing a strong vertical element. Mowing of wet areas reduces water quality and amenity. The existing shrub vegetation reduces the visual width of the reserve in some places and overshadows neighbouring properties at Evans Road and the footpath at Pacific View Road.

Some poplars create a nuisance for neighbours when flowering/seeding, and removal of individual trees may be necessary. Wetland plants have been planted in isolated clusters beneath the poplars, interplanted with kahikatea.

Instead of bollards, the interface with roads is post and rail barriers which visually truncate the reserve and reduce the sense of length. The reserve has lateral connections with stormwater reserves extending to Gravatt Road, but no signage for connectivity or to reduce CPTED issues. There is no cultural recognition or stormwater interpretation, and no recognition of Papamoa Hills or Mangatawa sightlines.

The reserve has a low level of surveillance from adjacent properties, which are dominated by impermeable fencing and houses oriented away from the reserve. Few properties have gates allowing direct access into the reserve. The footpath is narrow until it reaches Hartford Avenue, and is only installed on one side of the reserve, reducing circulation options for recreation.

Landscape Design Features

Connectivity:

- Walkway upgrade to shared use and new footpaths will improve circulation and connectivity with access points to neighbourhood reserves and the street network.
- A new footpath linkage to Hayley Grove and Barbara Grove will improve neighbourhood connectivity.
- A small footbridge over the new swale will provide circulation options upstream of the Royal Palm Beach Estate ponds.
- Post and rail road/reserve interface treatments will be replaced with bollards to improve amenity and visual connectivity.

Vegetation Management:

- The concrete channel will be removed and replaced with a meandering swale densely planted with indigenous wetland species to provide stormwater treatment, improved amenity and biodiversity.
- Wetland planting will extend to adjacent wet areas and to the existing sedge planting so mowing is required only on dry grass.
- Crown lifting and/or vegetation removal in close proximity to or overshadowing tracks or neighbouring properties will improve sightlines, reduce shading, reduce CPTED hazards, and improve amenity.
- If vegetation replacement is necessary, this will consist of short stature indigenous shrubland, connecting with adjacent wetland planting.

Cultural Recognition:

- Culturally important sightlines to Papamoa Hills and Mangatawa along the lateral stormwater reserves can be recognised with interpretation panels or sculpture.

6.1.2 Area 2a – Royal Palm Beach Estate to Gravatt Road

The existing highly manicured park environment in Area 2a is wider than in Area 1, and has visual connectivity with the coast at Harrisons Cut. This area is dominated by exotic plants and the private gardens occasionally extend into the reserve. The reserve has a high level of surveillance from adjacent private properties and a high proportion of permeable fencing. Council reserve maintenance and planting is actively supplemented by neighbours.

An indigenous riparian margin and wetland planting in the ponds is absent, so there is little aquatic habitat for fish entering the reserve from Harrisons Cut. In particular, there is no habitat for whitebait spawning. Mowing to the water's edge reduces amenity and water quality. The lack of a defined pond edge, or pond edges becoming submerged when water levels are high, presents a public safety hazard.

The reserve forms a circle through the community centred on Palm Beach Boulevard, but there is no signage or footpaths to encourage connectivity or circulation within the reserve network, and no visual cues to promote connectivity with the coast at Harrisons Cut.

Pedestrian bridges over the ponds often have no footpath linkages and there is no footpath linkage to Palm Beach Plaza and the drain has poor amenity. There is stormwater-related interpretation material in this area of the reserve but no cultural recognition of the coastal connection or adjacent urupa. Where it runs parallel to Santa Barbara Drive, the reserve has sightlines to Papamoa Hills and Mangatawa, but no interpretation of these views.

Landscape Design Features

Connectivity:

- New footpaths will improve circulation and connectivity with access points to the reserve network, Palm Beach Plaza, pedestrian bridges, and the street network.
- Signage will indicate circulation options between reserve sections on opposite sides of the Santa Barbara Drive/Gravatt Road intersection, and to the coast at Harrisons Cut.
- Options to improve connectivity with the coast across Papamoa Beach Road will be investigated as part of the road upgrade.

Vegetation Management:

- Along all pond margins, short stature wetland and lake margin planting will provide whitebait spawning areas and fish habitat, and reduce mowing impacts.
- Landward of marginal planting, a band of short amenity plants will provide an interface with mown areas.
- Planting will extend to adjacent wet areas and areas that are periodically submerged so mowing is required only on dry grass.

Cultural Recognition:

- A cultural interpretation panel at the Harrisons Cut outlet structure can describe the glass eel migration and importance of coastal connections.
- A cultural recognition element at Papamoa Beach Road could acknowledge the connection with the urupa and historical events in the Harrisons Cut area.

Ecology:

- Options for improving fish passage through the pond outlet structure will be investigated.
- The feasibility of daylighting the pipe connection between Papamoa Beach Road and the base of the outlet structure to improve fish passage will be investigated.

6.1.3 Area 2b – Gravatt Road to Domain Road

Less manicured than the adjacent Royal Palm Beach area, this reserve area is dominated by the expanse of open water separating residential properties to the south from the large-scale Fashion Island commercial area to the north. Property boundaries and fences extending to the water line currently preclude public access or circulation around the reserve from Waimarama Close to Domain Road. Circulation is also limited by the lack of footpaths. There is no defining entrance feature or signage at Domain Road to provide community visibility of the reserve.

The reserve is very wide but is visually enclosed in parts by the extensive mature flax plantings, and there is a CPTED hazard where plantings encroach on sharp bends in the footpaths. The reserve has a high level of surveillance from adjacent private properties where flax does not obscure visibility. There is no defining entrance feature or signage at Domain Road to provide community visibility of the reserve and no recognition of cultural values.

Buffering between Fashion Island and the reserve is poor, with the planted bund being poorly maintained and pedestrian traffic moving freely between the footpath and the service lane. Stormwater enters the ponds without treatment and an indigenous riparian margin or wetland planting is absent, so there is little aquatic habitat for fish. Mowing to the water's edge and mowing wet areas reduces water quality and amenity.

Landscape Design Features

Connectivity:

- New footpaths will improve circulation and connectivity with access points to pedestrian bridges and the street network.
- Reserve entrance feature signage installed on either side of Domain Road will heighten the reserve visibility to the community and visitors.
- Roadside parking bays installed on either side of Domain Road as part of the road upgrade will improve the safety of reserve access for users.

Vegetation Management:

- Along all pond margins, short stature wetland and lake margin planting will provide whitebait spawning areas and fish habitat, and reduce mowing impacts.
- Planting will extend to adjacent wet areas and areas that are periodically submerged so mowing is required only on dry grass.
- Stormwater outlet channels will be bunded and densely planted with indigenous wetland species to provide stormwater treatment, improved amenity and biodiversity.

Cultural Recognition:

- Cultural recognition could be provided in carved elements or pou whenua incorporated into new reserve entrance signage at Domain Road.
- Pa harakeke (plantings of flax cultivars specific to cultural uses) undertaken adjacent to existing flax plants accessed by grass pathways will allow re-establishment of harakeke harvest traditions, supported by interpretive panels.
- A whare raranga (house of weaving) structure may be installed near the intersection of Beachwater Drive and Gravatt Road will enable flax harvesting, supported by interpretive panels exploring the history of the flax harvesting industry and cultural uses.
- Rongoa varieties can be incorporated into the existing shrubland adjacent to Fashion Island.

6.1.4 Area 3a – Domain Road to Longview Drive

In contrast to the Areas 1 and 2, Area 3a has a waterway more closely resembling a natural lowland stream, with mature riparian shrubland. The waterway has pools, meanders, and channels, and has moderate values for fish. Aquatic weed is abundant and requires regular removal. Although shaded in parts, stream water quality is affected by the lack of cover and an indigenous riparian margin or wetland planting is absent from a high proportion of the stream margin. Stormwater generally enters the waterway without treatment. Mowing to the water's edge and mowing wet or regularly submerged areas reduces water quality and amenity.

There is no defining entrance feature or signage at Domain Road to provide community visibility of the reserve and no recognition of cultural values. Area 3a has a footpath network connecting to neighbourhoods via adjacent reserves, but has a footpath on only one side of the reserve between Opal Drive and Longview Drive, reducing circulation options for recreation.

The reserve is very wide but is visually enclosed in parts by the mature plantings, and there is a CPTED hazard where plantings encroach on the footpaths. The reserve has a variable level of surveillance from adjacent private properties where plantings do not obscure visibility. Older subdivisions have a higher proportion of impermeable fencing and houses oriented away from the reserve, whereas more recent development has a higher proportion of permeable or short fencing and houses facing the reserve.

Landscape Design Features

Connectivity:

- New footpaths and new pedestrian bridge across the waterway between the Corinth Grove and Carrington Drive reserve access points will improve circulation and connectivity with access points to pedestrian bridges and the street network.
- Reserve entrance feature signage installed on either side of Domain Road will heighten the reserve visibility to the community and visitors.

- Roadside parking bays installed on either side of Domain Road as part of the road upgrade will improve the safety of reserve access for users.
- Footpaths will be moved to higher ground to reduce CPTED issues and improve maintenance.
- Post and rail road/reserve interface treatments will be replaced with bollards to improve amenity and visual connectivity.

Vegetation Management:

- Where it impinges on retained footpaths and near pedestrian bridges and road crossings, tall vegetation will be reduced or removed to allow open water views and reduce CPTED issues.
- Where open water views are created, dense short stature wetland and lake margin planting will provide whitebait spawning areas and fish habitat, and reduce mowing impacts. Planting will extend to adjacent wet areas and areas that are periodically submerged so mowing is required only on dry grass.
- Riparian shrubland extended to provide shade to at least 50% of the watercourse will improve water quality and fish habitat. Existing mature riparian shrubland interplanted with understorey species will improve diversity and amenity.
- Stormwater outlets will have bunded channels densely planted with indigenous wetland species to provide stormwater treatment, improved amenity and biodiversity.

Cultural/Community Recognition:

- Cultural recognition can be provided in carved elements or pou whenua incorporated into new reserve entrance signage at Domain Road.
- Memorial specimen trees will be allowed for in Topaz Reserve and perpendicular to Opal Drive to provide for a long standing community aspiration to memorialised loved ones in this reserve.
- Enabling hopu tuna (cultural harvest of eels) undertaken near existing wetland areas opposite Carrington Drive will allow re-establishment of tuna harvest traditions, supported by interpretive panels.

6.1.5 Area 3b – Longview Drive to Parton Road

In Area 3b, the watercourse has similar characteristics to Area 3a, but riparian and wetland vegetation is much more extensive and better developed. As for Area 3a, the waterway has pools, meanders, and narrow channels, as well as aquatic weed requiring removal. Fish habitat is diverse and has moderate values, but more shade is required to improve water quality.

As for Area 3a, stormwater enters Area 3b without treatment. Indigenous marginal vegetation at the Grant Place stormwater outlet is limited. While there is aquatic habitat for fish entering the reserve from Grant Place, there is no habitat for whitebait spawning. Mowing to the water's edge, and mowing wet areas reduces water quality and amenity in some places.

Area 3b has a footpath network connecting to neighbourhoods via access points only on the northern side of the reserve, reducing circulation options for recreation. Pedestrian bridges provide access to Gordon Spratt reserve but connectivity between the reserves is poor. There is no signage at Gordon Spratt reserve to provide community visibility of the reserve.

The reserve is wide but is visually enclosed in parts by the mature plantings, and there is a CPTED hazard where plantings encroach on the footpaths and bridges. Surveillance from adjacent private properties where plantings do not obscure visibility is good in some places.

There is no interpretive signage associated with the Grant Place outlet highlighting the fish passage and stormwater function, or recognition of cultural activities associated with the historic wetland and stream environment.

Landscape Design Features

Connectivity:

- New footpath and pedestrian bridge across the waterway between Longview Drive and Gordon Spratt Reserve footpaths, and between Blake Boulevard access point and Gordon Spratt Reserve, will improve circulation and connectivity.
- Reserve signage installed on the Gordon Spratt Reserve bund and parking area will heighten the reserve visibility to the community and visitors.

Vegetation Management:

- Where it impinges on retained footpaths and near pedestrian bridges and road crossings, tall vegetation will be reduced or removed to allow open water views and reduce CPTED issues.
- Where open water views are created, dense short stature wetland and lake margin planting will provide whitebait spawning areas and fish habitat, and reduce mowing impacts. Planting will extend to adjacent wet areas and areas that are periodically submerged so mowing is required only on dry grass.
- Riparian shrubland extended to provide shade to at least 50% of the watercourse will improve water quality and fish habitat. Existing mature riparian shrubland interplanted with understorey species will improve diversity and amenity.
- Stormwater outlets will have bunded channels densely planted with indigenous wetland species to provide stormwater treatment, improved amenity and biodiversity.

Cultural Recognition:

- Sculpture formed within a kohatu stone representing the lunar harvesting calendar can provide cultural recognition of customary harvest traditions.
- Enabling hopu tuna (cultural harvest of eels) undertaken near existing wetland areas opposite Larissa Grove will allow re-establishment of tuna harvest traditions, supported by interpretive panels.

Ecology:

- Options for improving fish passage through the Grant Place outlet structure will be investigated.

6.1.6 Area 4a – Parton Road to Mandalay Key

At the time of writing, the reserve area from Parton Road to the end of Enterprise Drive is in TCC ownership, but the remainder is in private ownership and remains undeveloped farmland. The waterway in the TCC-owned portion has been excavated to create ponds and meanders, but the riparian planting is minimal and there are no pathways or pedestrian bridges. The reserve consists mainly of mown grass, and mowing occurs in low-lying wetland areas. The waterway through privately owned land remains a farm drain with no riparian vegetation.

The new residential development on the northern side has good surveillance over the reserve, as does part of the mixed use development on the southern side, but the interface with commercial and industrial property has poor amenity and no landscape buffer planting. From Parton Road east, the corridor (including TCC-owned reserve, the assumed future reserve corridor, and

adjacent relic dune ridges) includes nationally significant swamp pa and archaeological landscape that currently has no interpretation or public access.

The following design features are based on the following assumptions:

- TCC will seek to acquire ownership and/or management of a reserve corridor extending through all of Area 4a, and the landscape design features set out below will be implemented subject to TCC acquisition/management.
- The waterway will be excavated to a width no greater than the narrowest channels of Areas 3a and 3b, without large areas of open water.
- The presence of significant archaeological heritage may limit reserve development to some extent including footpath and bridge installation, planting of tall vegetation, and installation of interpretive signage or sculpture requiring excavation.

Landscape Design Features

Connectivity:

- New footpaths and pedestrian bridges will create connectivity along at least one side of the reserve, with access to interpretation of archaeological sites and connectivity to future neighbourhood access points.
- Reserve signage installed at Parton Road will heighten the reserve visibility to the community and visitors specifically related to the archaeological landscape features.

Vegetation Management:

- Riparian shrubland providing shade to at least 50% of the watercourse will improve water quality and fish habitat.
- Open water views adjacent to road crossings and bridges will have dense short stature wetland and lake margin planting to provide whitebait spawning areas and fish habitat, and avoid mowing impacts. Planting will extend to adjacent wet areas and areas that are periodically submerged so mowing is required only on dry grass.

Cultural Recognition and Heritage:

- Interpretive panels, pou whenua, and sculpture can provide cultural recognition of the historical and cultural significance of the area, and its whakapapa.
- Appropriate reserve management of archaeological resources inside reserve boundaries will be formalised through an archaeological management framework in consultation with Heritage New Zealand.

Ecology:

- Waterway excavation will result in narrow meandering channels with small pools, without large areas of open water, to allow riparian and wetland vegetation to provide shade and aquatic habitat similar to the historical stream environment.
- Stormwater treatment will occur offline (i.e. not within the main channel) to maintain low stormwater contaminant concentrations.
- Provision of stormwater storage will not result in large expanses of shallow open water either on-line or immediately adjacent to the waterway where these will increase water temperature and decrease dissolved oxygen concentrations.
- All stormwater storage and treatment devices will be densely planted with indigenous wetland species to provide stormwater treatment, improved amenity and biodiversity.

6.1.7 Area 4b – Mandalay Key to Golden Sands Drive

The reserve area from Mandalay Key to Golden Sands Drive is in TCC ownership. The waterway throughout has been excavated to create ponds and meanders, but riparian planting is minimal and wetland vegetation is recolonising low lying areas.

The new residential development generally has good surveillance over the reserve with permeable or no fencing and houses oriented towards the reserve. Some garden encroachment is occurring. There are no pathways or pedestrian bridges except from Calypso Drive to Golden Sands Drive. The reserve consists mainly of mown grass and mowing occurs in low-lying wetland areas.

As for Area 4a, the reserve corridor includes nationally significant archaeological resources on relic dune ridges that dominate the landscape in some places but currently have no interpretation.

Landscape Design Features

Connectivity:

- New footpaths will create connectivity on both sides of the reserve, with access to interpretation of archaeological sites and connectivity to neighbourhood access points.

Vegetation Management:

- Riparian shrubland providing shade to at least 50% of the watercourse will improve water quality and fish habitat.
- Open water views adjacent to road crossings and bridges will have dense short stature wetland and lake margin planting to provide fish habitat, and avoid mowing impacts. Planting will extend to adjacent wet areas and areas that are periodically submerged so mowing is required only on dry grass.
- Stormwater outlets will have bunded channels densely planted with indigenous wetland species to provide stormwater treatment, improved amenity and biodiversity.

Cultural Recognition and Heritage:

- Interpretive panels, pou whenua, and sculpture can provide cultural recognition of the historical and cultural significance of the area, and its whakapapa.
- Appropriate reserve management of archaeological resources inside reserve boundaries will be formalised through an archaeological management framework in consultation with Heritage New Zealand.

6.1.8 Area 5 – Golden Sands Drive to Stage 2 Te Tumu

Area 5 is very similar to the developed portions of Area 4, with almost complete residential development on the northern side and partial residential development on the southern side. The waterway is excavated with ponds and meanders, but minimal or no riparian planting and wetland vegetation. As for other areas, stormwater enters Area 5 with little treatment.

The new residential areas generally have good surveillance over the reserve with permeable or no fencing and houses oriented towards the reserve. There is a footpath on the northern side along the full reserve length to the eastern Gibson Place reserve access and one pedestrian bridge, but currently no footpath on the southern side. The reserve consists mainly of mown grass and mowing occurs in low-lying wetland areas, but flooding outside the channel occurs frequently throughout this area.

There are two significant archaeological sites near Golden Sands Drive and likely to be others in the adjacent dune ridges that will require sensitive landscape treatment but these currently have no interpretation. There is no recognition of cultural activities associated with the historic wetland and stream environment.

Emerald Shores Drive is not yet formed and the design of the proposed Wairakei Town Centre to the east of the future road is underway. It is intended that the town centre will integrate with the Wairakei Reserve, but the nature of the interface is not yet understood.

Landscape Design Features

Connectivity:

- New footpaths and pedestrian bridges will create connectivity on both sides of the reserve, with access to interpretation of archaeological sites and connectivity to neighbourhood access points.

Vegetation Management:

- Wetland planting providing shade to at least 50% of the watercourse will improve water quality and fish habitat, while allowing for town centre integration with the reserve.
- Open water views adjacent to road crossings and bridges will have dense short stature wetland and lake margin planting to provide fish habitat, and avoid mowing impacts. Planting will extend to adjacent wet areas and areas that are periodically submerged so mowing is required only on dry grass.
- Stormwater outlets will have bunded channels densely planted with indigenous wetland species to provide stormwater treatment, improved amenity and biodiversity.

Cultural Recognition and Heritage:

- Pa harakeke (plantings of flax cultivars specific to cultural uses) undertaken adjacent to riparian and/or wetland plantings accessed by grass pathways will allow re-establishment of harakeke harvest traditions, supported by interpretive panels.
- A whare raranga (house of weaving) structure may be installed west of Emerald Shores Drive will enable flax harvesting, supported by interpretive panels exploring the history of the flax harvesting industry and cultural uses.
- Rongoa varieties can be incorporated into riparian planting near the whare harakeke.
- Interpretive panels, pou whenua, and sculpture can provide cultural recognition of the historical and cultural significance of the area, and its whakapapa.
- Appropriate reserve management of archaeological resources inside reserve boundaries will be formalised through an archaeological management framework in consultation with Heritage New Zealand.

6.1.9 Taylor Reserve

Taylor Reserve is an under-developed coastal reserve with few amenities. The reserve is comprised principally of open space between Taylor Road and the informal car park area. The toilet block is dated, in poor condition, and presents CPTED issues. The picnic tables are placed in an ad hoc fashion not located close to shade or shelter, and planting is minimal and dated. There is no provision for recreation and poor connectivity with the coast.

Signage is minimal and there is no cultural recognition of the significant historical events or the significance of the site to tangata whenua. There is also no recognition of the reserve's historic

relationship to the Wairakei Stream where it once flowed out to sea. Sub-surface stormwater storage modules preclude some surface development.

Landscape Design Features

Connectivity:

- New footpaths and boardwalks will encourage movement through the reserve connecting with formed beach access points (sand ladders), and provide a link between cultural recognition elements, the carparking area and recreational facilities.
- Reserve entrance signage installed at Taylor Road and at the carpark will heighten reserve visibility to the community and visitors.

Vegetation Management:

- New screen, shade, and amenity planting consisting predominantly of native species will provide a more pleasant reserve environment for users and outlook for adjacent properties. Amenity planting at property boundaries will consist of short stature species with a mature height no greater than existing fences to avoid shading.
- The remnant stream channel will be excavated (deepened and widened) as a meandering swale from Taylor Road around the southern perimeter of the reserve and north to the northern corner of the carpark. It will be densely planted with indigenous dune wetland species to provide improved amenity and biodiversity, and supported by interpretive panels explaining the history of the stream outlet.

Cultural Recognition, Heritage, and Amenity:

- Toilets upgrade, BBQ tables placement, new seating, and a new BBQ will create a cohesive reserve experience with users centred around the new footpaths and beach access point.
- A new playground integrated with the BBQ area will improve the level of service for reserve facilities for the community. The playground can incorporate themes representing the cultural significance of the site (in particular the importance of the porpoise, Te Okuroa).
- A whare manaaki/pataka korero (learning house) structure has been proposed and is under consideration. The potential location is the landward part of the dunes east of the carpark, nestled within the dune contour and not visible from the beach. The whare manaaki/pataka korero could be supported by interpretive panels exploring the structure's traditional uses.
- A distinctive reflection/viewing area, interpretive panels, and pou whenua can provide cultural recognition of the historical and cultural significance of the area, and its whakapapa. These may be located overlooking the historic stream outlet to the coast north east of the carpark.

6.2 Reserve-Wide Design

There is a range of detailed design features that will apply throughout the entire reserve⁴. These will contribute to consistency in the level of service and a cohesive design theme underlying the individual features of each stage. These features include connectivity, vegetation management, signage, seating, and streetscape elements.

⁴ In parts of the corridor not currently in TCC ownership or management, implementation will occur when land ownership or management transfers to TCC.

6.2.1 Connectivity

Low boardwalks over stormwater discharge points or wet/boggy areas intersected by footpaths will allow all-weather and all-season access for pedestrians and cyclists throughout the reserve regardless of stormwater runoff or groundwater levels, except during extreme events.

All footpaths will be constructed in accordance with TCC Track and Walkway Development and Maintenance Manual for shared use walkways.

All pedestrian bridge locations and construction specifications confirmed with TCC with regard to their requirement to provide for tsunami evacuation, links with vertical evacuation structures, and the most direct links between neighbourhood access points. Bridge placement specifically considered tsunami evacuation routes⁵ and distances from other available waterway crossing points and walkways.

6.2.2 Vegetation Management

Planting design considered existing ground conditions and waterway edge conditions for plant species selection, to enhance habitat, to improve water quality (particularly temperature), and to ensure inappropriate mowing is avoided. In two locations, planting design provides for inanga spawning habitat. Planting design also included renewal of existing planting (thinning or interplanting), plant maintenance requirements, and plant stature to allow water views, provide increased waterway shade, and/or avoid CPTED issues at the interface with bridges and walkways. The main features of planting design include:

- Planting out all wet, boggy, or periodically submerged areas with wetland plants. This will reduce the area required to be mown, improve amenity, eliminate potential for mowers to get bogged, enhance the biodiversity of the reserve, enhance shade cover, improve water quality, and increase the area of ecologically valuable habitat.
- Planting canopy trees and understorey species within existing shrubland for structure, diversity and stream cover. Over time, this will improve the appearance of the shrub plantings, and provide additional habitat and food sources.
- Thinning or removing overgrown vegetation where it restricts the footpath or bridge visibility, shades footpaths or neighbouring properties, or restricts footpath sightlines. This will address CPTED issues and improve reserve amenity.

6.2.3 Signage

Signage design is based on a hierarchy of bespoke signage, rather than using standard TCC signage specifications. Signage design was carried out in conjunction with tangata whenua consultation and considered costs to produce and maintain bespoke signage. Signage design plans are provided in Appendix 4.

Large reserve entrance signage will be provided as the main reserve access points. Smaller reserve entrance signs with wayfinding and reserve use information will be provided at each road crossing point. Wayfinding signage will be provided at major walkway intersections and pedestrian access signage will be provided at walkway access points from adjacent residential areas. Interpretation panels are provided for at points of interest or for cultural recognition based on tangata whenua consultation.

⁵ Bridge design is outside the scope of the landscape design. Tsunami and pedestrian bridge design and construction to be commissioned by TCC.

The reserve signage is located as follows:

- Reserve entrance features combined with cultural recognition elements, parking, bins, seating and interpretation panels will be located at the town centre locations of Domain Road and Emerald Shores Drive. These will enhance the reserve visibility to the community and visitors, while providing information on cultural, recreational, and heritage values throughout the reserve.
- Road crossing signage will have detailed information for wayfinding including:
 - road name
 - distance to the next road crossing, amenities in close proximity, recreational resources, and fitness information
 - maps and QR codes linked to web-based map resources
 - standard information restricting reserve uses (e.g. no fishing, no golf, no motorised vehicles, etc.)
- Interpretive and wayfinding located at key footpath intersections and pedestrian bridges including:
 - distance to the next road crossing, amenities in close proximity, and recreational resources.
 - maps and QR codes (Quick Response Code) linked to web-based map resources.
 - interpretation panels relating to the site specific korero, sightlines, ecological values, reserve functions, archaeology, and history.
- Neighbourhood access points indicating the adjacent street name and/or distance to connecting streets or reserves.
- All signage will be designed using a style palette and materials unique to the Wairakei Reserve (see Appendix 4) with a theme as set out in Section 4.9.4 below. A consistent signage theme will provide a unique reserve identity recognisable to users, improving reserve navigability for pedestrians and cyclists in the absence of other landscape features.

At Wairakei/Taylor Reserve, signage at Taylor Road and on Papamoa Beach Road will highlight the location of the carpark to reduce congestion for Taylor Road residents. Signage at the carpark/reserve interface will highlight the location of the toilets.

6.2.4 Seating

In the earlier reserve design consultation process, one of the most common requests was for seating, particularly from elderly residents adjacent to the reserve. Seating placement considered distances from road crossings, views, and proximity to existing or proposed walkways. Seat design is based on a slight variation to the standard TCC seat, differing in the paint colour used and the addition of a panel inserted into the armrest laser cut with the reserve logo/icon.

The landscape design incorporates progressive installation of seats under specimen trees beside footpaths or where there are special views, generally at a spacing of not more than 300-500 metres. The detailed design placed seats to enable quiet contemplation of the reserve environment, supervision of children and dogs, views over areas of open water, and shaded

seating during summer. Seats will be located above the 100 year flood level wherever practicable.

6.2.5 Streetscape

6.2.5.1 Bollards

Currently the reserve interface with some streets is comprised of timber post and rail fencing to TCC specification T220 or T320. Although this is intended to restrict access by motorised vehicles, it has the visual effect of creating a vertical barrier across the reserve. Most existing fencing built to these specifications is aging and repair or upgrade is required. All road/reserve interface berms will have bollards installed to TCC specification T215 or T315 to maintain or restore visual connectivity along the reserve while restricting motorised vehicle access. Where the bollards intersect footpaths, bollard placement will be at sufficient width to allow a double stroller and mobility scooter to pass with a minimum clearance of 200mm on either side.

6.2.5.2 Pedestrian Refuges

Although road reserves are outside the stormwater reserve area, all points at which pedestrian refuges are required to provide safe access across roads for existing or new footpaths have been identified. The location and design of pedestrian refuges will be completed by the TCC roading team. Early feedback indicates some proposed refuges have constraints resulting from driveway placement or street layout. Detailed landscape design will ensure that footpaths terminate immediately opposite refuges to minimise the potential for future footpath replacement.

6.2.5.3 Parking

Reserve use by the wider Papamoa community including the future residential areas is anticipated. This will entail a proportion of reserve users driving to reserve access points. Parallel parking is available on most minor street crossings. However, the high traffic volume on Domain makes parking hazardous. The TCC Roding team has identified the need for parking on either side of Domain Road as part of the proposed road upgrade project, integrated with cycleway design and the Te Ara O Wairakei landscape design. Community consultation has identified the road safety issues associated with access to the Palm Beach Boulevard playground. TCC Roding will consider design options to remedy this and provide safe parking for families using the playground.

6.2.6 Cultural Recognition

Tangata whenua representatives have engaged in consultation throughout the landscape design process. The iwi/hapu group has discussed a design theme of “Wai” or “translucent waters”. When developed and agreed with TCC and suppliers, a design motif or logo reflecting the theme of Wai can be incorporated into signage, entrance features and furniture. This theme has historical and cultural significance to Te Ara O Wairakei Reserve at a number of levels.

Tangata whenua can prepare the content to be shown on interpretation panels placed at agreed locations for cultural recognition throughout both reserves, as well as providing carved poupou and the painted or weaved elements for proposed structures. Areas of flax for harvesting (pa harakeke) could be supported by shelters (whare raranga) for preparing the flax and/or weaving. At Wairakei/Taylor Reserve, a larger structure and amphitheatre may provide an open venue for learning and cultural performance, sited below the three carved poupou representing the three iwi/hapu groups whose cultural histories are intertwined at the historical mouth of the Wairakei Stream.

These cultural recognition elements are under consideration by the respective iwi/hapu groups to confirm final design details and location.

The Te Houhou Heritage area east of Parton Road has a rich history of Maori occupation reflected in well preserved archaeological resources associated with life along this coastal pathway. The area provides strong visual and historical linkages to Mauao and the people of Tauranga Moana, the Kaituna, Maketu and Te Arawa Waka area, inland to the pa of Te Rae o Papamoa. There are significant opportunities to enhance tangata whenua heritage relationships to Papamoa, Wairakei and Te Tumu by interpreting the local oral history of the three large swamp pa, numerous middens and pits as well as providing archaeological interpretation and management of these heritage resources. Such interpretation will be developed following the transfer of ownership or management of the corridor between Enterprise Drive and Mandalay Key to TCC.

Entwined with the interpretation of cultural values in this area is the restoration of the ecological values historically found in the area. Planting has an opportunity to replicate historic vegetation and cultural use with plantings of flax, medicinal plants and wetland plants interspersed with stands of kahikatea, pukatea and swamp maire interpreted for recreational users with signage and interpretation panels.

6.3 Related Projects

As part of the landscape design process, TCC will complete a number of related projects as follows:

6.3.1 Harrison's Cut new stream

The Harrison's Cut outlet between Royal Palm Beach Estate lakes and Papamoa Beach Road currently consists of a piped outlet to the stream and a grassed overland flow path. The overland flow path has maintenance problems due to high winter groundwater resulting in odour, amenity issues, and inaccessibility for mowers. The piped outlet reduces fish passage. TCC will facilitate design of a new stream between a new weir at the lake and the existing stream at the road. The stream channel will be stabilised to avoid erosion, and supplemented with riparian planting to replace the grass and maintenance problems. The new stream will enhance fish passage and replace the piped outlet as the main flow path connection to the sea. The piped outlet will be modified to take only high flows.

6.3.2 Wetland/riparian planting maintenance specification

TCC will make a substantial investment into wetland planting within Te Ara O Wairakei. TCC also manages numerous stormwater wetland assets and riparian margins around the City. There is no specification specific to contractor establishment maintenance of wetlands, including stormwater wetlands and riparian wetlands. TCC's experience is that vegetation management using the current TCC specifications tends to result in plant losses and poor amenity because the specifications are not fit for purpose in the context of stormwater assets. The existing vegetation management specifications used by contractors for reserve maintenance tasks will be reviewed to identify changes required to deliver better outcomes for vegetation in stormwater assets, development of a draft specification for consultation with TCC staff, and hold a contractor workshop to discuss the draft and identify changes required. At the time of writing this specification is almost complete.

6.3.3 Harrison's Cut & Grant Place fish passage retrofit design

As part of the Te Ara O Wairakei landscape plan development process, TCC has identified that the waterway provides habitat for a high abundance of native fish, principally eels. The fish survey also identified that inanga (a threatened species) are endeavouring to access the waterway from the sea via the Grant Place outlet and weir and the Harrisons Cut pond outlet. However, inanga have not been captured within the waterway, indicating that fish passage obstacles prevent consistent passage of the species into the reserve. Combined with improved planting to facilitate inanga spawning (incorporated into detailed design planting schedules) and the new Harrison's Cut waterway, TCC seeks to identify and implement retrofit options to remove or reduce fish passage barriers at the two outlets.

6.3.4 Te Ara O Wairakei Lateral Corridors

At several Te Ara O Wairakei project meetings and hui, the existing problems and potential of the approximately 5.5 kilometres of stormwater corridors connecting with the Wairakei Stormwater reserve have been identified and discussed. To leverage off the contractor activities for the main project implementation, TCC proposes to complete the following:

- Assessment of each of the nine existing stormwater corridor or recreation reserves connecting to the Stormwater Reserve.
- Consideration of CPTED issues, signage, and connectivity with reserves, road corridors, neighbourhood centres, and circulation options.
- Existing planting and maintenance issues.
- For each lateral corridor or reserve, concept design broadly consistent with Te Ara O Wairakei to address CPTED, improve connectivity, and improve amenity, including alternative uses.

7.0 Next Steps

Following presentation of project to Tauranga City Council Environment Committee on 24 October 2017, the final landscape design plans and this design report underwent minor amendments prior to formal submission to BOPRC in fulfilment of the consent requirements.

TCC awaits consensus from iwi/hapu of the cultural recognition elements and agreed costings and design for artistic cultural elements to complete the landscape plan before proceeding with implementation of cultural elements. Recent communication indicates iwi/hapu will complete hui separately to reach agreement on cultural elements and design.

Ngai Te Rangī and Waitaha have provided cultural plan addenda confirming their support for the Wairakei/Taylor Reserve proposal for cultural recognition elements and landscape design. On receipt of the Ngā Potiki cultural plan addendum in support of the Wairakei/Taylor Reserve design, TCC will apply for the necessary resource consents needed to authorise the reserve implementation.

The funding allocated for Te Ara O Wairakei reserve development for the financial year 2017/18 will be used to commence landscape development in Area 1. Provided that Long Term Plan

funding applications are successful, implementation of the remaining reserve development will be programmed over the years 2018 - 2025.

TCC has submitted an application for a General Authority from Heritage NZ for implementation of the design in low risk areas of the reserve on the basis of a draft Archaeological Management Framework for Te Ara O Wairakei. When the Authority is granted and the Framework endorsed by Heritage NZ, implementation will commence in low risk areas of the reserve in early 2018. In accordance with the draft Framework, TCC will apply for Authorities for work in high risk archaeological areas prior to work being scheduled in those areas.

Structure planning of the Te Tumu Urban Growth Area is currently underway. The project timeframes are currently for the formal plan change process to commence by mid year 2018. Stage 2 of the Wairakei Landscape Plan will be undertaken generally in parallel of the plan change process. Funding for the Wairakei Landscape Plan is proposed in the LTP for the 2018/2019 financial year to commence this work.