PEACOCKES WHATUKOORURU DRIVE PROJECT

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Landscape Architecture :: Urban Design :: Environmental Planning

CONTENTS

1 INTRODUCTION

1.1 Purpose of the Report

This Landscape Management Plan (LMP) has been developed by Adrian Morton Landscape Architects Ltd (AMLA) and Bloxam Burnett & Olliver Ltd (BBO) on behalf of Hamilton City Council as supporting documentation for the detail design stage of the Whatukooruru Drive project and includes the Peacockes Road upgrade works (Project).

The objective of the LMP is to outline the Project deliverables and how they contribute to the urban fabric of the area while maintaining and enhancing the landscape, amenity and ecological values within the Project locality. The LMP has been developed in line with the initial Peacockes Concept Landscape Management Plan (CLMP) and incorporates requirements from the consultation of key stakeholders.

The LMP provides supporting documentation in relation to the detailed urban, environmental and landscape design elements associated with the Project for Local Authority approval.

1.2 Requirements of the Landscape Management Plan

The LMP is the development of the overarching Peacockes CLMP and is a requirement of Condition 6.0 and 14.0 of the Southern Links Project (Refer to Fig 1.0) and is required to be submitted prior to the construction commencement. The LMP is a technical document that aims at removing any ambiguity within the detailed design package that has been developed for the Project. The LMP provides information in relation to landscape, ecological and urban design elements of the project, while incorporating the requirements of NZTA's Bridging the Gap and Landscape Guidelines plus incorporates feedback from consultation with key stakeholders.

Condition 14.0 of the Southern Links Designation, requires the LMP to include at minimum the following:

a) The proposed landscape and urban design theme to be adopted for the entire length of the Project, including for overbridges, underbridges and noise barriers;

b) Landscape plans that identify any vegetation to be retained, areas of landscape mitigation and ecological enhancement planting (taking into account the requirements of the Ecological Management and Monitoring Plan required by Condition 15), and the type and density of planting to be undertaken;

c) Provision where practicable for the use of earth bunding with gently undulating forms for noise barriers and measures to integrate the design of noise mitigation measures;

d) Integration of the landscape design with the design of noise mitigation measures so that the combined measures can be implemented in a co-ordinated manner;

e) Measures to minimise clearing work to conserve soil and protect any existing vegetation to be retained;

f) Measures to ensure the appropriate disposal of any invasive or noxious weeds cleared from the site;

g) Measures to integrate cut and fill batters with the existing topography;

h) Measures to be undertaken for topsoil and subsoil management so as to provide a viable growing medium for the areas to be planted with trees, shrubs and grass;

i) The nature, programme and methods of rehabilitation to be implemented within borrow and spoil disposal areas and any areas identified as being required for the treatment of otherwise unsuitable earth material;

j) A schedule of the species to be planted including botanical name, average plant height at time of planting and at maturity, and planting density;

k) A planting specification, including planting and mulching techniques;

l) Planting maintenance requirements over a five-year period following planting and reinstatement of road verges and gullies;

m) An implementation programme for all remedial and mitigation measures;

n) Post-construction monitoring measures;

o) Site specific planting and screening measures developed after consultation with directly affected property owners;

p) Planting and screening measures developed after consultation with landowners of Riley Place and Montgomery Crescent adjoining the designation; and

q) All plant species used in the Landscape Management Plan shall be selected to ensure that at their full maturity they do not protrude through the Hamilton Airport Obstacle Limitation Surface height restrictions as set out in the Hamilton City District Plan.

The LMP will be in general accordance with the indicative landscape and mitigation measures and urban design proposals outlined within the Southern Links Urban Design and Landscape Framework prepared by Opus, dated 5th August 2013.

The Conditions specifically requires consultation with the Tangata Whenua Working Group (TWWG) and NZTA, which has been undertaken throughout the design development.

1.3 Project Scope

The Project is proposed to connect to SH3 at the Ohaupo roundabout (eastern leg) and Peacocke Road to tie into the Peacocke PST project alignment to support future residential and the proposed town center development within the Peacockes Structure Plan Area (refer to Figure 1.2). The provision of providing the road infrastructure is in response to the rapid growth Hamilton is experiencing and will provide connection to allow progress development of the Peacockes area and in particular in relation to the Amberfield development area.

The proposed design accords with the originally designated route developed as part of the Southern Links Project and will form part of a strategic road linking the southern aspect of Hamilton to the Peacocke PST infrastructure and the Waikato rive crossing to link with Wairere and Cobham Drive.

The Project will incorporate the following features:

- Mangakotuktuku Gully Bridge(s)
- Whatukooruru Drive (East-west minor arterial)
- Upgrade of Peacockes Road to a Minor Arterial with a controlled intersection at Whatukooruru Drive
- Bus priority lanes
- Cycle and pedestrian facilities
- Stormwater attenuation systems including wetlands, swales and rain garden structures
- Pocket Parks with recreational, play facilities and play on the way footpath enhancements
- Street furniture including lighting, barriers and safety features
- Landscape and ecological interventions
- Urban design interventions to bridges and other structures
- Incorporation of cultural aspects associated with the Project area

The detail design stage of the Project has engaged with a number of key stakeholders including the TWWG, Hamilton City Council Parks and Open Space, Hamilton City maintenance operatives plus HCC Transportation Department.

Fig 1.0 SOUTHERN LINKS - ULDF

1.4 Principles and Guiding Documentation

The Project's landscape and urban design approach aims at achieving quality urban and environmental outcomes and utilises guidance documentation that includes the following:

- Bridging the Gap, NZ Transport Agency Urban Design Guidelines, 2013
- NZTA Landscape Guidelines, 2014
- NZTA's Urban Design and Landscaping Principles
- Waikato Local Authority Shared Services Regional Infrastructure Specifications (RITS)
- The Southern Links Environmental Management and Monitoring Plan April 2019 (EMMP)
- HCC Sign Brand Manual
- Waikato-Tainui Environmental Plan
- Waikato River Plan
- HCC Open Spaces Plan and Play Strategy
- Waikato Regional Policy Statement
- Peacockes Infrastructure Project Concept Landscape Management Plan, April 2019 (Peacockes CLMP), and the
- Southern Links Urban and Landscape Design Framework (ULDF), 2013.

1.5 Southern Links ULDF Guidance

The Southern Links ULDF provided the initial guidance for the development of the Project area within the Southern Links project. It recognised that the Project area is located in a peri-urban environment located on the fringe of residential area with extensive open space to south. The ULDF recognised the Mangakotukutuku Gully as a major feature within the landscape, particularly as it links to the Waikato River.

The ULDF provides specific guidance and design principles for the Southern Links project, which are relevant to the Whatukooruru Drive Project project as follows:

- Ensuring that urban dwellers have access to open spaces and recreational opportunities
- Design is environmentally sensitive and reinforces the local landscape character
- Good urban design outcomes, utilising creative and innovative solutions to integrate sustainable design measures in relation to transport modes, drainage and ecology aspects
- Vegetation clear zones and/or frangible plant species giving a high degree of visibility while maximising safety (CPTED)
- Design is context sensitive, in terms of acknowledging local Maori the Mangakotukutuku Gully System and Waikato River environment and associated landforms, the undulating landscape and current and future land use.
- Planting to frame views and responds to local topography including:

  - Ridgetop views over Waikato basin maintained
  - Cultural feature such as the Pa site
  - The views into gully systems and rolling hill land, and
  - Distance views to hills
- Protecting and enhancing natural or semi-natural environments
- Creating a contiguous or linked habitat network for fauna and flora
- Ensuring wetland ponds create habitats and biodiversity
- Linkages to existing habitats between the Waikato River and Mangakotukutuku Gully system and remnant bush stands
- Specific tree/plant species for food sourcing
- Use of exotic and indigenous trees for long term ecological and bat habitat, and
- Cultural planting to reflect past land uses - Maori and European.

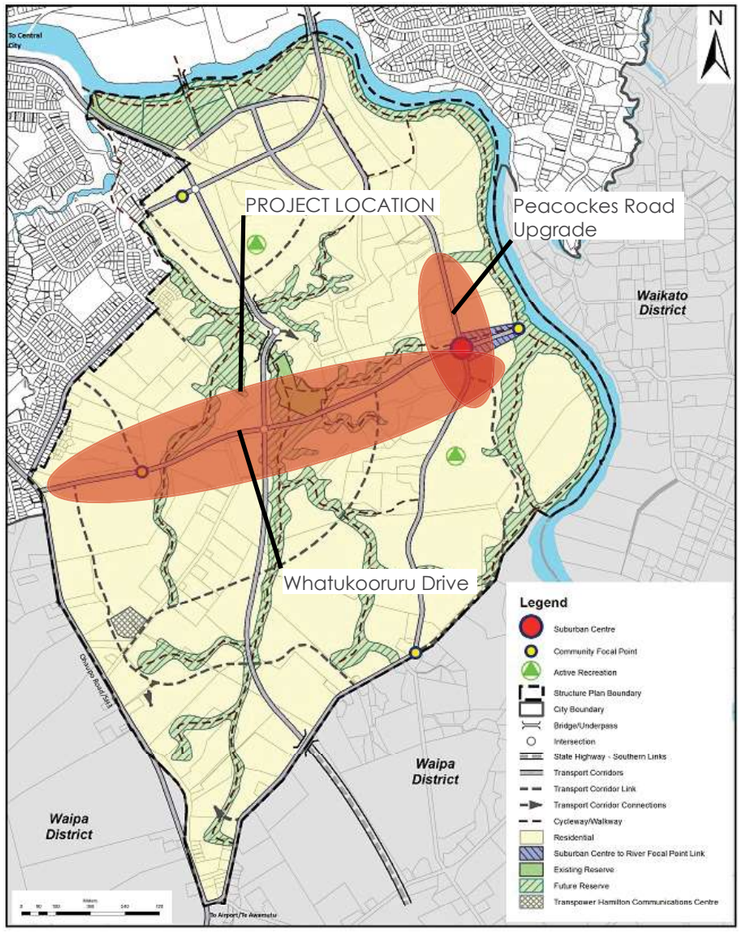


Fig 1.2 SOUTHERN LINKS - Peacocke Structure Plan Area

1.6 Peacocke CLMP

The Peacocke's CLMP is a guidance document that provides a platform for the integrated urban and landscape design requirements for the Peacockes Structure Plan area. It focuses on principles and outcomes sought with information on potential design responses (but avoids quantifying specific designs) for the subsequent detail design stages.

In addition, the Peacocke CLMP overview included a cultural theme/narrative that was developed in conjunction with TWWG, which helped define the landscape and urban design interventions, which has been carried forward into the Project.

The document provides clear directives in terms of the design outcomes sought for the various Project components, including cycleway and pedestrian requirements, bridge design elements, landscape and ecological interventions and stormwater management. These requirements have been integrated into the Peacockes PST project.

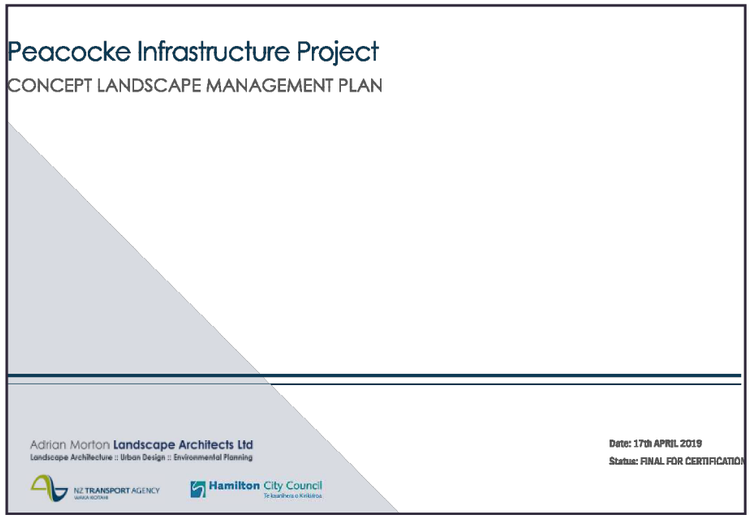


Fig 1.3 PEACOCKE CONCEPT LANDSCAPE MANAGEMENT PLAN

2 CONSULTATION AND PARTNERSHIPS

A broad range of stakeholders have been identified and consulted with during the detail design stages of the Project. Extensive stakeholder consultation has ensured knowledge sharing, identifying concerns and issues while enabling stakeholder aspirations and inputs to be incorporated into the Project where appropriate.

The following provides a summary of consultation discussion and outcomes with key stakeholders:

2.1 Consultation with Hamilton City Open Spaces and Facilities / Community Planning and Policy

Consultation and design discussion has been undertaken with various HCC departments to assist in ensuring the design approach meets their various requirements. The majority of feedback points have been responded to by either adjusting the design or providing clarification on the design approach.

Discussion and feedback from the HCC Open Spaces and the HCC Play Co-ordinator has focused on ensuring safe quality public realm, pedestrian and cycle facilities and connections, the integration and development of open space areas with appropriate play and recreational facilities.

Other feedback included the appropriate selection and positioning of shrub and tree species within open spaces, pedestrian and cycle facilities and streetscape environments. Design features that have been developed in conjunction with HCC include the integration of walk and play activities, plus building on the approaches used and developed for other Peacocke projects to improve the overall outcomes where possible.

2.2 Hamilton City Operations Department and Street Landscapes

Ongoing discussion and dialogue with HCC City Parks and Infrastructure Alliance has occurred since the development of the CLMP and during the construction and development of other Peacocke projects has helped inform and influence the landscape design approach, particularly around the selection of plant material to ensure a robust and appropriate palette of plants are utilised. Consideration to ensure that plants are selected for ease of maintenance and to allow accessibility to planted areas can be achieved with minimal traffic control. Plant schedules have been adjusted within the detail design stage to incorporate feedback that was received.

2.3 Mana Whenua Liaisons, Tangata Whenua Working Group (TWWG)

During the detail design phase of the Project, a number of consultation hui have been undertaken to set the context of the Project and build upon the cultural themes (as outlined in the Peacockes CLMP), and present design approaches and opportunities. Cultural design opportunities and locations were established early in the design process in partnership with the TWWG cultural advisor (professional artist), which will be developed during the construction stage.

The specific landscape and urban design features that have been incorporated and developed through our close working partnership within the detailed design phase include:

- Development of the cultural theme that incorporates the idea of habitation, movement networks and trading activities, which focus on site specific locations associated with the Project
- Inclusion of the above cultural themes into the bridge abutment design and will also the installation of Pou Maumahara around the bridge area to represent the many Pa sites associated with the area
- The development of the wetland area to incorporate a cultural reserve with cultural planting plus Pou Tupua (Supernatural beings), to act as kaitiaki (guardians) of the reserve and the wildlife in it. In addition, a Waharoa (wide entranceway) will be positioned to represent the intent of the reserve with the potential for the reserve to develop into a sculptural trail over a period of time (as encompassed in the Peacocke Blue Print)
- Development of cultural symbols within pathways and opportunities for naming and development of information for interpretive signage
- The development of cultural themes associated with the play on the way footpath interventions
- The selection of suitable plant material for stormwater wetlands and swales to support water quality and habitat biodiversity
- Selection of plant material that is culturally appropriate
- Site monitoring involvement during construction, and
- Road and bridge naming

2.4 Consultation with Waka Kotahi

The Project has embraced Waka Kotahi's various design guidelines to ensure high quality design outcomes are achieved. In addition, Waka Kotahi has been involved during the various stakeholder meetings and have included inputs into some technical aspects of the Project.

Inputs that have been incorporated into the Project include 'best practices in relation to pedestrian/cycleway' and via the use of 'Bridging the Gap; design guidelines and Urban Design and Landscape principles. Discussions will remain ongoing with the Agency throughout the construction phase of the Project.

3 VISION AND PRINCIPLES

3.1 The Vision

The vision for the Whatukooruru Drive infrastructure is to ensure a high-quality urban approach to the streetscape(s) that will provide exemplary pedestrian and cycle facilities, high quality open spaces that embraces ecological linkages and enhancements and the incorporation of cultural sensitive design solutions.

3.2 Project Principles

The following principles have been developed to align with Hamilton City Council (HCC) and Waka Kotahi requirements, which are consistent with the Southern Links and the Peacocke CLMP objectives:

- Ensure an integrated road network, linking Whatukooruru Drive with SH3/Ohaupo Road and Peacocke Road to achieve a reliable, efficient transport network that is safe for all road users
- Integrate adjacent land uses and anticipated future development with particular focus on providing future access points, integrating existing housing and ensuring the development potential of 'active' street frontages.
- Reduce congestion with alternate transport modes and improve vehicle journey time reliability and provide efficient traffic flows
- Support high quality transport choices through the provision of safe and user-friendly and easily accessible cycle and pedestrian facilities, plus the inclusion of integrated bus facilities
- Ensure integration with future project stages
- Incorporate significant cultural aspects of the area into the Project
- Incorporate design treatments that moderate the scale of the Project while providing quality aesthetic design outcomes that contribute and reinforces the character of the area
- Uphold the requirements of the EMMP to ensure suitable ecological mitigation and enhancement contributes to maintaining and increasing wildlife habitat and improved water quality

3.3 Landscape and Urban Design Objectives

To support the vision and design principles a set of objectives has been developed for the Project. The Project area (Refer to Fig 3.3-1) has its own specific context and features, however the design strategies and objectives remain consistent with the Southern Links ULDF and the Peacockes CLMP documentation.

Objectives include:

- Ensure high design quality of the streetscapes in terms of amenity, aesthetics of the experience, accessibility, safety and landscape context
- Develop the hierarchy of streetscapes that integrates with the overall Peacocke infrastructure projects, the surrounding environment and land uses while avoiding severance
- Integrate separated cyclist and pedestrian networks that provide direct and safe linkages
- Integrate existing landscape features such as the Bird Park, Whatukooruru Pa and the Mangakotukutuku gully system
- Design earthworks and structures to complement the surrounding landform
- Relate to the future development proposals within the area
- Connect, retain and improve access between the existing built environment, open spaces and future development
- Integrate storm water design and ecological planting in an informal/'natural' manner
- Incorporate a variety of ecological interventions that maintain and improves wildlife habitat to support the EMMP requirements
- Provide quality open spaces that incorporate informal play and recreation opportunities
- Provide a robust and integrated planting design that is attractive, coherent, durable and innovative, and
- Ensure secondary elements and detailing are part of the integrated design.

3.4 Landscape and Urban Design Elements

The specific environmental and urban design elements that are specific to the Project include:

- Urban design treatments of the bridges and abutment structures
- Integration of engineered elements, including landform and slope management
- Incorporation of cycling and pedestrian facilities and linkage to existing and proposed facilities
- Integration of surrounding land uses and open space
- Landscape and ecological planting treatments
- Local community, cultural and heritage consideration and integration
- The treatment of highway and open space furniture, for example street lights, seating and signage
- Storm water treatment including wetland pond, swales and rain garden/retention facilities
- Consideration to both short and long-term maintenance requirements

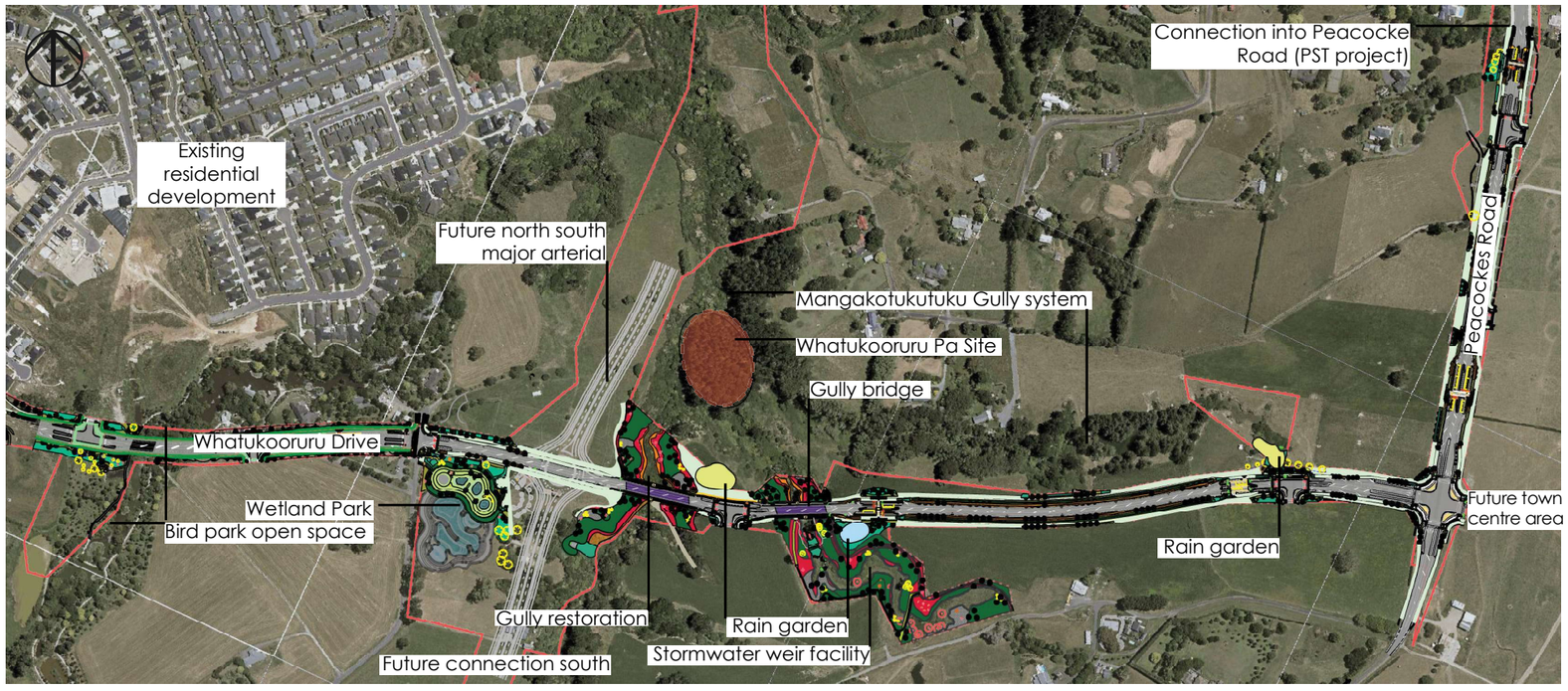


Fig 3.3-1 WHATUKOORURU DRIVE PROJECT AREA

4 Developed Urban & Landscape Design

4.1 Design Context

The Project area includes a number of site-specific features and activities that have been important in terms of developing the landscape, urban and ecological design response. The following sections provide a brief analysis of the area and identifies constraints and opportunities in relation to the Project.

4.2 Character Areas

The Project is currently located in a peri-urban environment on the southern outskirts of Hamilton. The area can be characterised by the Waikato River terraces, the undulating topography, incised gully systems plus recent residential development and a variety of residential lifestyle properties blocks.

The area is further defined by the landform, vegetation types and current land use, which have been used to inform the design proposals to ensure the Project physically and visually sits within the landscape. The character areas associated with the Project include the following:

- The Mangakotukutuku Gully and tributary gully system
- Areas of historical significance that contain cultural and heritage features, including the Whatukooruru Pa site and associated gardening areas
- The Shaw's bird park sanctuary and wetland areas
- Vegetation patterns and existing trees across the landscape
- Areas of recent residential development plus existing properties that are scattered across the landscape

4.3 Constraints and Opportunities

The existing physical, environmental and cultural context leads to constraints as well as providing opportunities to be considered for the urban and landscape design approach and is captured in Figure 4.3-0 with description as follows:

1 The Mangakotukutuku Gully provides (degraded) wildlife habitat and corridor, providing opportunities to focus on native planting to improve and connect ecological habitat within the area and bat hop overs

2 Shaw's bird park consists of wetland areas, open bodies of water, formed gravel paths and planting. This area provides opportunities to link into the area and provide public open space and enhanced planting to further benefit ecological aspects of the area

3 The Whatukooruru Pa Site is located nearby the project and provides opportunities to integrate the Project's cultural narrative and provide public access to the area

4 Landforms provide opportunities for the integration of stormwater facilities, open space and recreational opportunities, but provides challenges to ensure accessible gradients for all users

5 The existing vegetation plays an important role in terms of providing a variety of wildlife habitat and linkages. The Project will aim at retaining as many trees as possible with further planting to strengthen the ecological corridors and habitat potential

6 Residential properties and future development areas will be integrated into the project with suitable and safe access points with facilities to ensure access between areas (minimise severance)

7 Storm water wetland, rain gardens and swales to treat and manage runoff and provide potential for a variety of plant species and habitat creation

8 The stormwater gully weir system to manage flows, but also provides opportunities for open space and informal paths to link to pedestrian and cycle facilities

9 Allowance for the incorporation of the future north-south major arterial to connect to Hamilton City/Cobham Drive and Wairere Drive

10 The integration of dedicated, safe and efficient cycle and pedestrian facilities

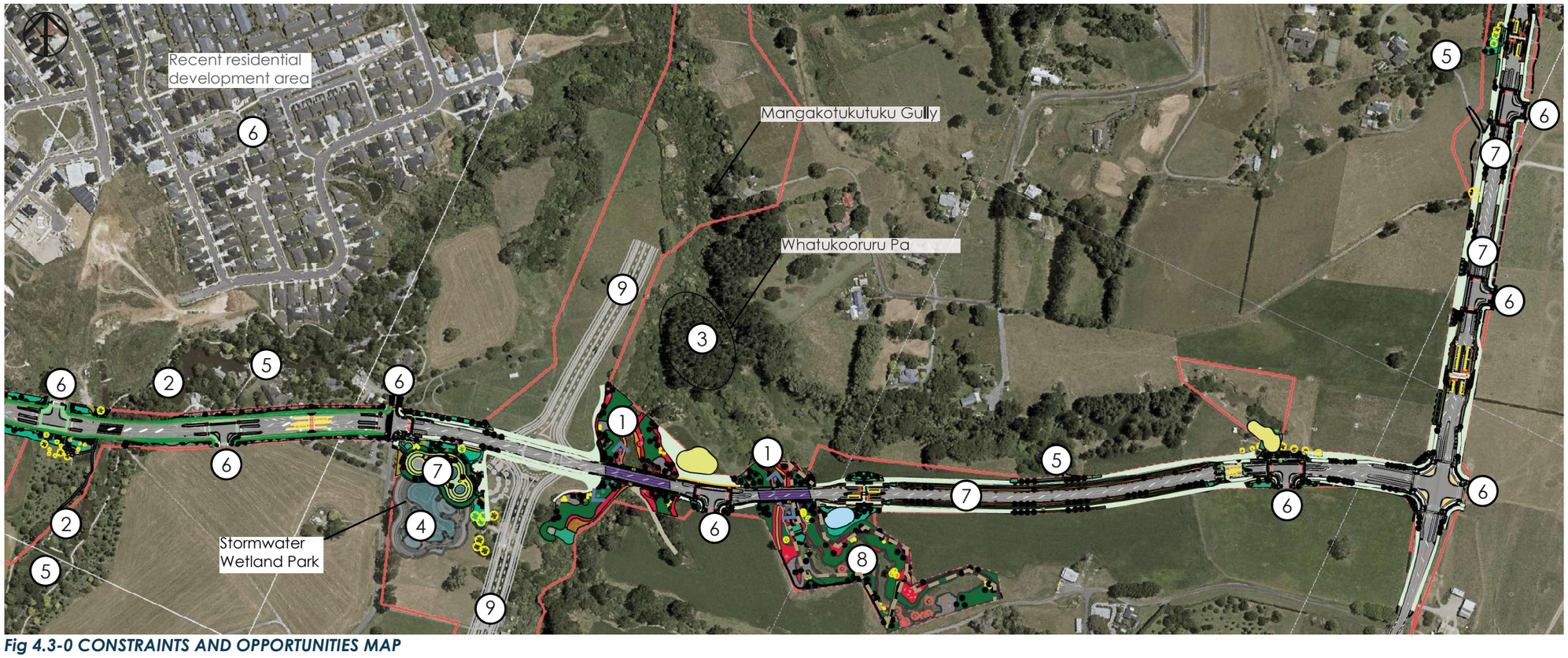


Fig 4.3-0 CONSTRAINTS AND OPPORTUNITIES MAP

4.4 Cultural Design Theme Strategy

The Waikato area has a long and rich heritage of both Maaori and European settlement and associated activities. Movement across the land and by river has changed from tracks to rail and road. The use of the land has changed from hunting to gardens and cropping, from the flax industry to agriculture and mineral extraction, and to an ever-increasing built environment.

As identified in the Peacockes CLMP, there are physical and spiritual marks on the land which needs to be carefully read and managed as part of the Project. To this extent it is proposed to re-establish this heritage and connection where these threads can be drawn to the surface through liaison and collaboration with stakeholders. Therefore, the cultural narrative developed for the Peacock's area has been continued throughout the Project area for consistency while demarcating culturally important locations.

The Peacocke Infrastructure's overarching vision is to 'celebrate the past cultural habitation, trade and movement that has occurred across the Hamilton area'. The theme has been developed at workshop presentations with TWWG and in conjunction with the TWWG cultural artist advisor to develop the narrative and specific responses. This theme approach is complementary to other interventions incorporated into the Peacockes projects, which have also been developed in conjunction with TWWG.

The diagram in Figure 4.4-1 illustrates some of the settlement and use patterns associated with the landscape that have been derived from trade movement networks, convergence points and associated activities. These patterns provide a prompt in being able to create and reinforce these features within the urban design elements of the Project. In terms of the historical landscape context, much of the area to the south of Hamilton was formerly covered in extensive and dense wetland vegetation including kahikatea podocarp forest with remnant stands of kahikatea and totara vegetation remaining as reference points in the landscape acting as wayfaring markers. In addition to the traditional pathways current development are forging new networks across the landscape, which provides opportunities to enhance these patterns.

To support the Peacockes cultural vision, the following narrative provides the overarching framework to aid the development of cultural interventions as shown in Figure 4.4-2.

Trade and Transport

The recognition of traditional path networks and confluence points provide the overarching cultural story that celebrates the connectivity of places, landmarks and settlement. To express this narrative the incorporation of wayfaring markers in the forms of mass native tree planting (reflecting remnant tree stands), nodes along transport routes that utilise paving patterns and interpretive signage and standalone art work will be integrated to 'tell' the area's story of paths and networks.

Gardening and Settlement Patterns

The pathways and trade routes were means of supporting settlement and gardening activities that have occurred across the Hamilton area with subsequent European settlement adding further layers of cultivation patterns. To reflect these aspects particularly of Maori settlement, opportunities to add an additional layer of narrative into the Project (and Southern Links) can be undertaken in relation to these garden activities and may include aspects of the following:

- The incorporation of plants that are important as rongaa medicine
- The incorporation of wetland species that support native wildlife including lizards, insects, birds and bats
- Paved nodal areas that utilise paving patterns to tie into and support the cultural narrative
- The development of street furniture that supports the cultural and natural themes, and
- Naming of roads, bridges and parks

Guardians of the Land

Maori symbolism and traditions are rich and important parts of the Waikato area and provide additional opportunities to add further cultural layers to the area. The inclusion of art work, particularly around carving and Pou forms to represent Maori deities that are associated with cultivation (Rongo Maa Taane), sky father (Ranginui), earth mother (Papatuuaanuku) etc provide the opportunity to 'weave' a complete cultural narrative into the landscape.

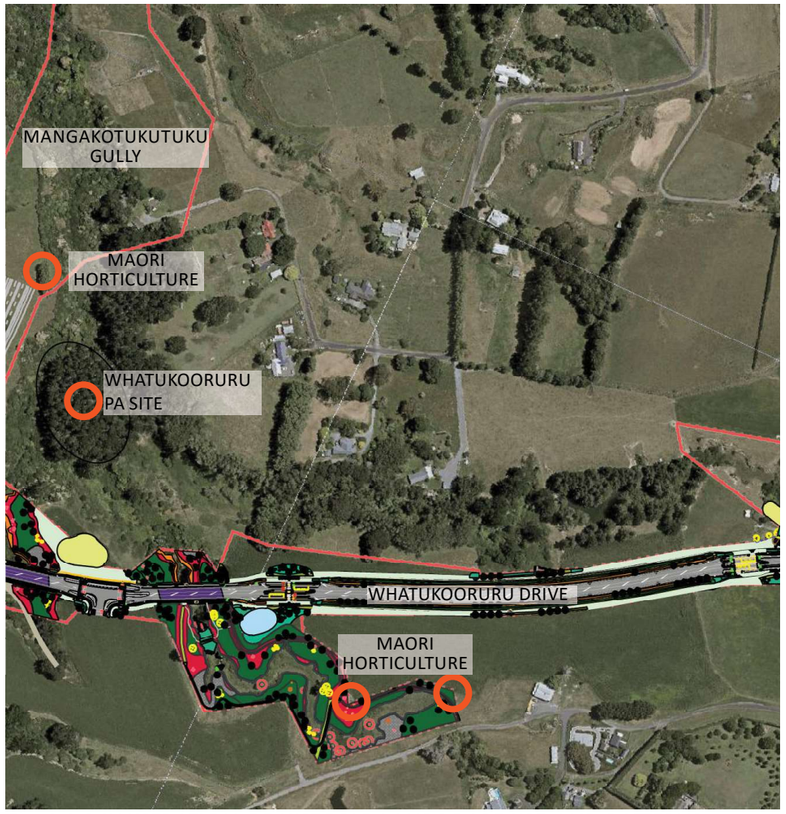


Fig 4.4-1 ILLUSTRATION OF HISTORIC LANDSCAPE USE AND PATTERNS

Fig 4.4-1.1 EXAMPLE OF POR MAUMAHARA

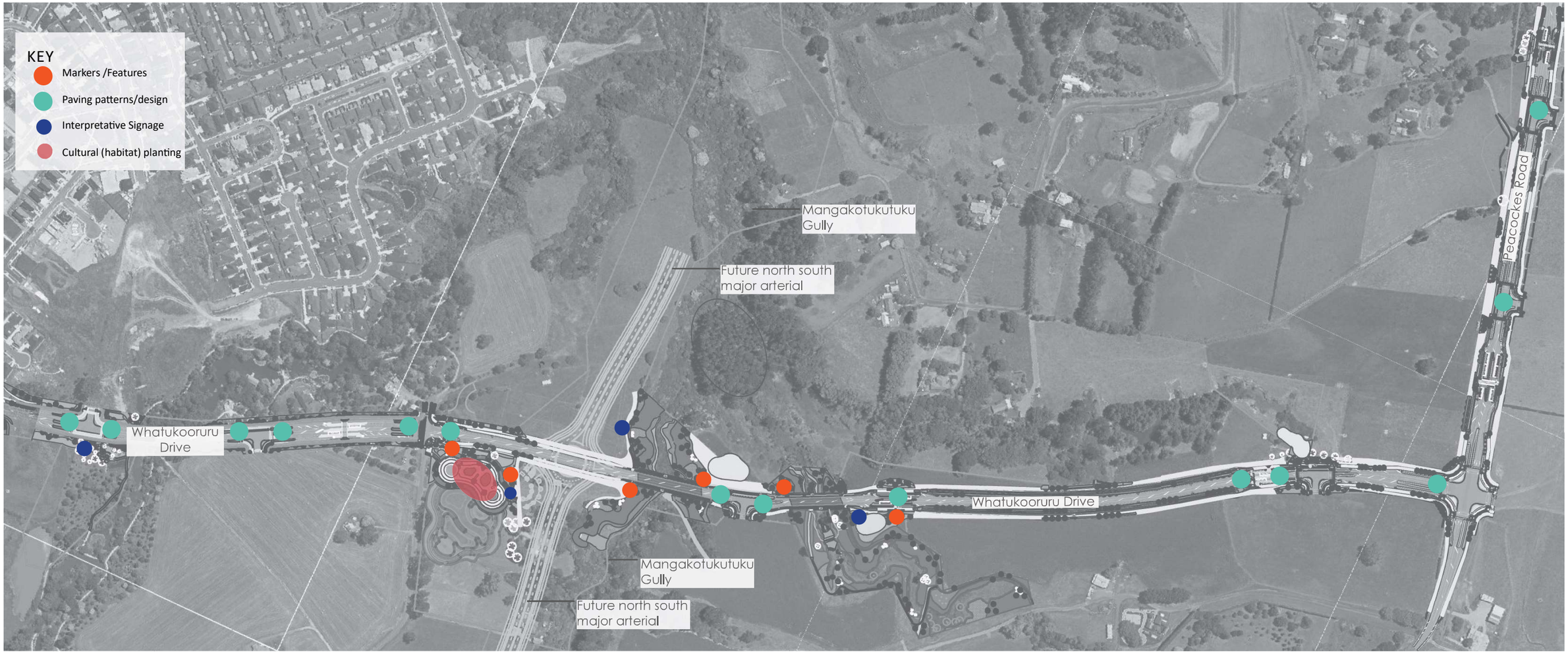


Fig 4.4-2 ILLUSTRATION OF CULTURAL INTERVENTION LOCATIONS ACROSS THE PROJECT

Example of Pou Whenua/ Maumahara or Taonga Kowhatu

Example of Pou Tupua

Example of contemporary cultural patterns used at Ohaupo roundabout

Interpretation Signage

Interpretation Signage

4.5 Infrastructure Component Design and Form

4.5.1 Design Principles

Hamilton City Council (HCC) is focused on setting a high level of service for public transport operations in the Peacockes Development area.

Therefore, a strong focus and design outcome of the Project is to ensure the following:

- Adopting Vision Zero: A transportation system with features to minimise the risk of deaths and serious injuries, such as grade separation of all movements
- Promotion of public transport and encouraging active modes, if necessary, at the expense of reduced performance of the network from the point of view of private car users
- A strong focus on cycling and pedestrian networks with safe and efficient links with grade separation, signalised intersections with signalised crossings for active modes
- Maximising the people moving capacity of the road, by enabling efficient use of the network by buses (including priority at intersections) and high occupancy vehicles.
- Providing flexibility in the design to cater for evolutionary and step changes in the transportation system.
- Maintaining good neighborhood linkages and connectivity

4.5.2 Whatukooruru Drive

Whatukooruru Drive has been designed to meet HCC's desire to reduce reliance on private vehicles and encourage the use of public transport and active modes. As such, the layout provides a separated cycle lane and one traffic lane in each direction, with the traffic lane shared by cars and public transport vehicles as illustrated in Figures 4.5-1 through to 4.5-4. This approach is consistent with the project objectives and aligns with PWRB project.

To improve safety and efficiency for public transport vehicles, bus stops will not be indented into the roadside. Instead, buses will stop within the lane while setting down and picking up passengers. Operational levels of service for cars on this carriageway will be reduced (to LOS E during peak periods) as a result. However, the advantage is that public transport vehicles can operate more efficiently and safely as they do not have to enter and leave the traffic stream at each stop and overall the safety and people moving capacity of the road corridor will be increased.

Active modes will be accommodated by separate 2.5m wide paths on each side of the road for pedestrians and a 2.3m wide on-road cycle lane that are separated from the vehicle lane with raised "zebra/ armadillo" separators. Landscape and paving interventions will be part of the urban fabric of this road to enhance the user experience.

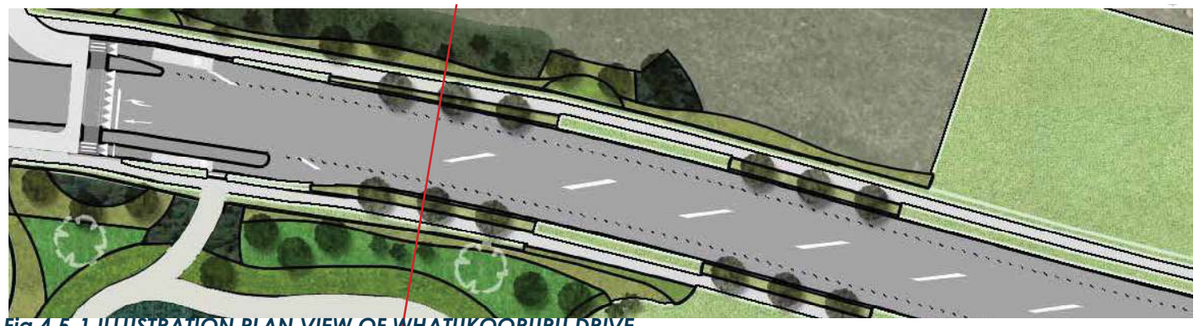


Fig 4.5-1 ILLUSTRATION PLAN VIEW OF WHATUKOORURU DRIVE

Fig 4.5-2 ILLUSTRATION CROSS SECTION OF Whatukooruru DRIVE

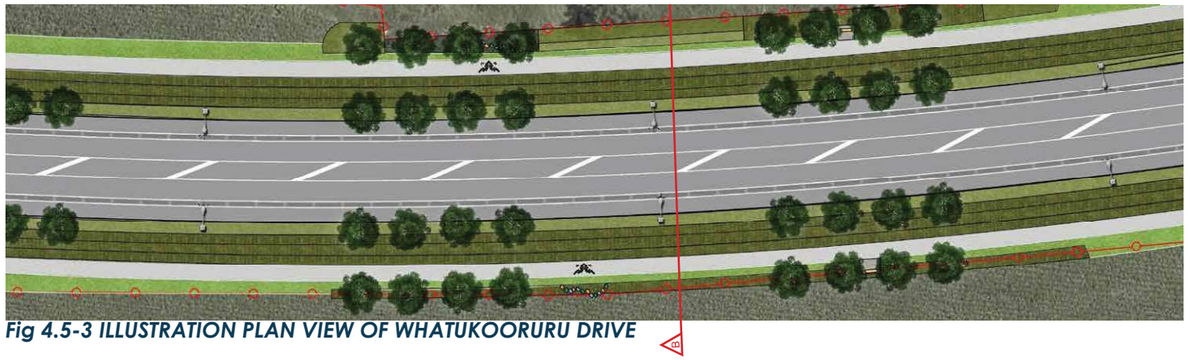


Fig 4.5-3 ILLUSTRATION PLAN VIEW OF WHATUKOORURU DRIVE

Fig 4.5-4 ILLUSTRATION PLAN VIEW OF WHATUKOORURU DRIVE

4.5.3 Peacockes Road

The Peacockes Road upgrade ties into the PST project section and will have a similar traffic flow rate of Wairere Drive, but with a Minor Arterial status. It will have a reduced level of service as a result of side friction from adjoining access points and intersections, parking, bus stops and pedestrian crossings.

Peacockes Road will have a separated cycle lane and one traffic lane in each direction, with the traffic lane shared by cars and public transport vehicles. To improve safety and efficiency for public transport vehicles, bus stops will not be indented into the roadside, and instead buses will stop within the lane while setting down and picking up passengers. Operational levels of service for cars on this carriageway will be reduced, but the advantage is that public transport vehicles can operate more efficiently and safely as they do not have to enter and leave the traffic stream at each stop and overall the safety and people moving capacity of the road corridor will be increased.

Active modes will be accommodated by a 2.5m wide off-road shared/pedestrian path on each side, and 2.0m wide on-road cycle lanes that are separated from the vehicle lane with raised "zebra/armadillo" separators (Refer to Figures 4.5-5 and 4.5-6).

Landscape planting has been implemented immediately adjacent to the carriageway to allow the future development of adjoining land (residential and light commercial), which in turn will allow for regarding and the built form to play an active role in defining the character of the street

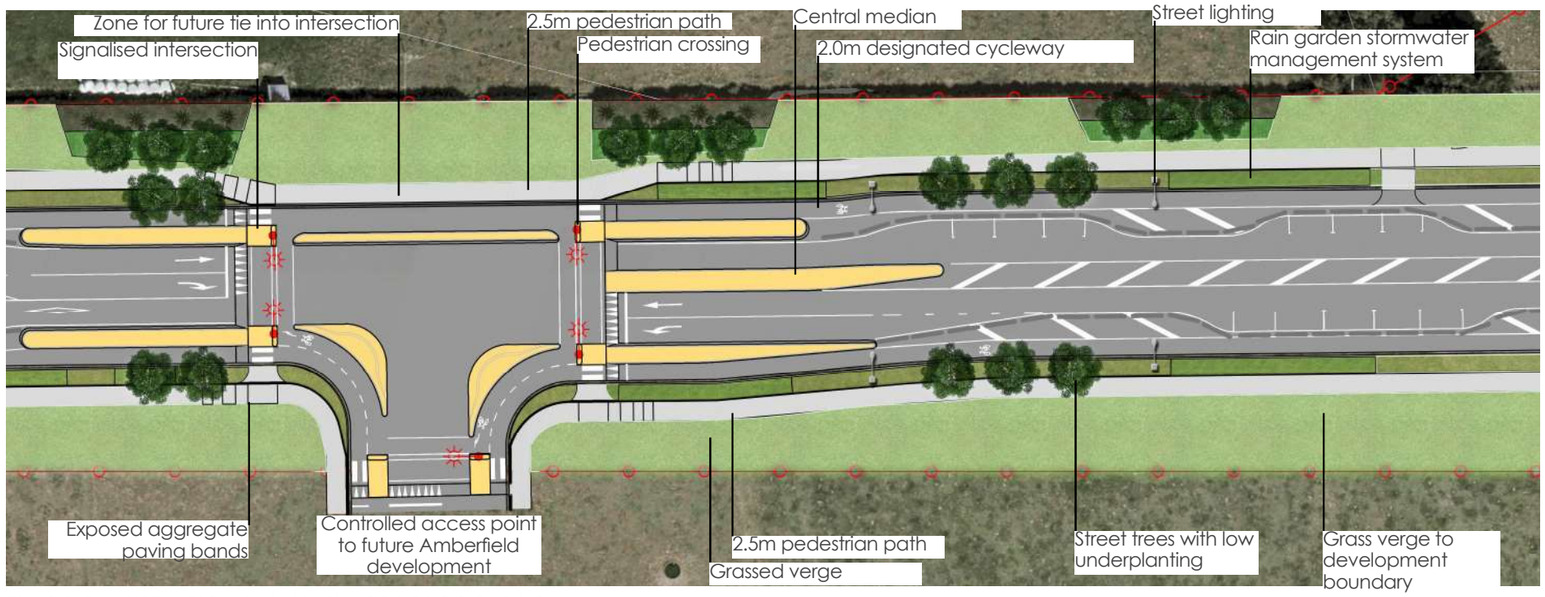


Fig 4.5-5 ILLUSTRATION PLAN VIEW OF PEACOCKE ROAD

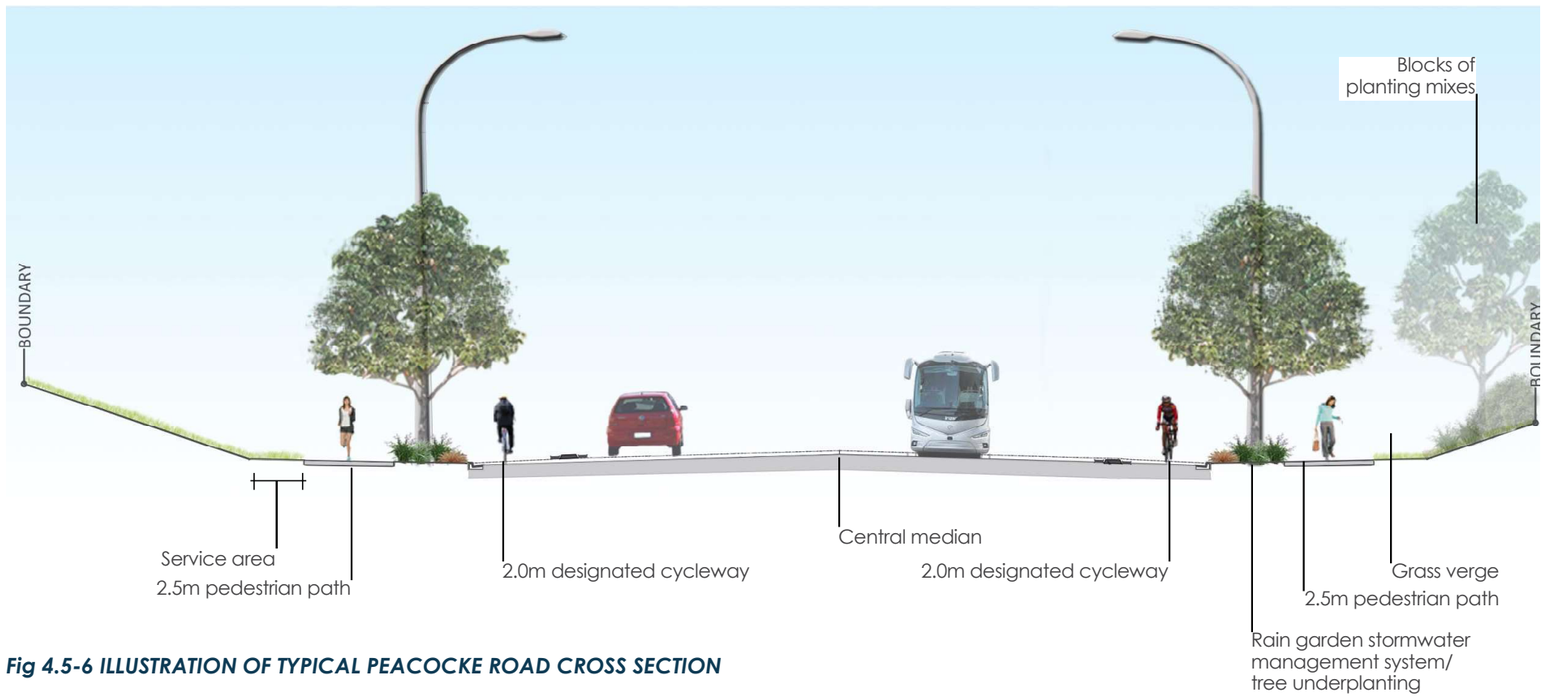


Fig 4.5-6 ILLUSTRATION OF TYPICAL PEACOCKE ROAD CROSS SECTION

4.5.4 Intersection Principles

The Project contains one main controlled intersection at Whatukooruru Drive and Peacockes Road. A number of access point intersections have been provided, which give access to future development areas along both Whatukooruru Drive and Peacocke Road.

The intersection designs have included the following key factors:

- Context sensitive approach where factors such as location, safety, urban setting, visibility, proximity to housing, vegetation, open space and pedestrian and cycling user requirements are considered
- Cost efficiency, which considers whole of life cost
- Aesthetics and visual effects, and
- Durability and maintenance

Intersection at Whatukooruru Drive and Peacockes Road

A new controlled intersection will be formed at Whatukooruru Drive and Peacockes Road to meet future development demand (Refer to Figure 4.5-7) and connection in to the future town center area. Both Whatukooruru Drive and Peacockes Road increases from a single lane to three lanes at the intersection with dedicated left and right turning lanes. Cycle facilities are separated from the carriageway with a divider median and islands to establish priority turning and crossing points with the aim of providing a safe environment for cyclists.

Planting in and around the intersection utilises low growing material to ensure sight lines and visibility splays are maintained. Trees are integrated into the corner areas of the intersection to provide visual markers and denote a change in road environment·

'T' intersection along Whatukooruru and Peacockes Road

A number of 'T' intersections and been integrated along Whatukooruru Drive and Peacockes Road to service the future development areas that include three raised pedestrian crossing points to provide a safe and well-connected walking and cycling network (Refer to Figure 4.5-8). The intersection include low level planting and street trees to provide a visual reference to drivers, while maintaining visibility splays and providing an attractive environment. Lighting columns in and around the intersection provides light levels to meet standards requirements.

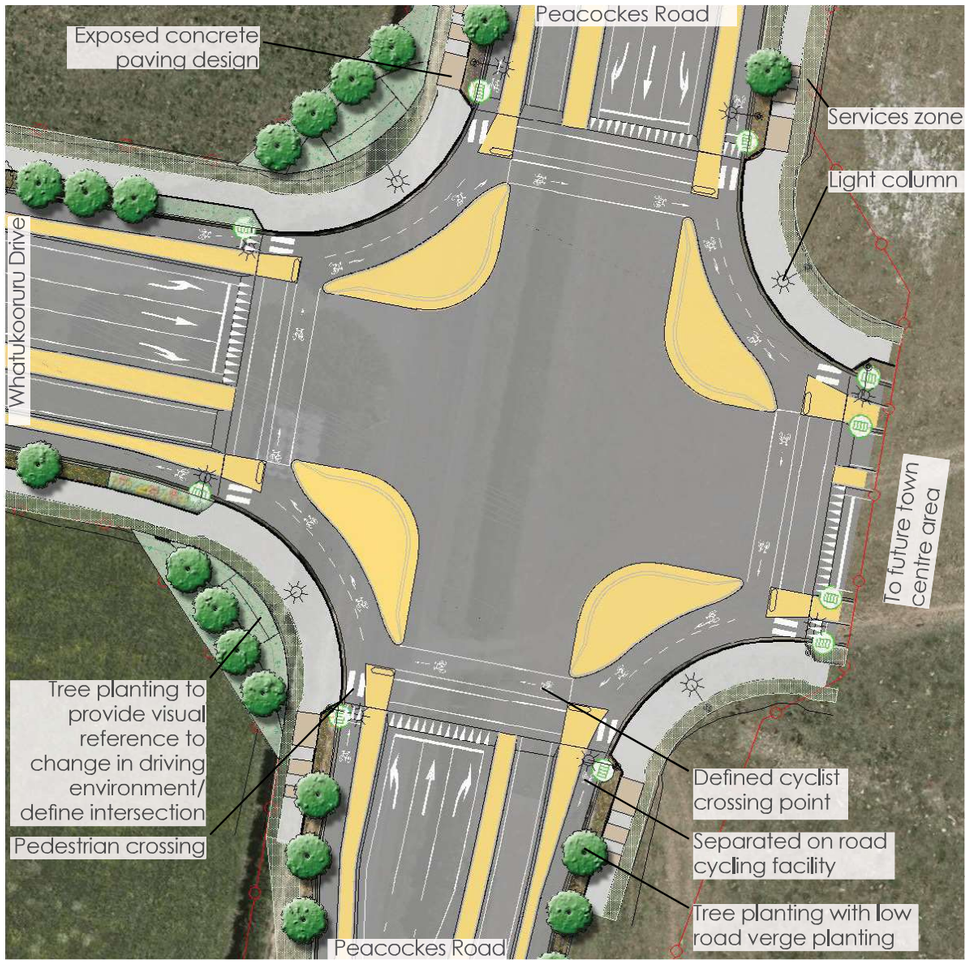


Fig 4.5-7 ILLUSTRATION OF WHATUKOORURU DRIVE AND PEACOCKES ROAD INTERSECTION

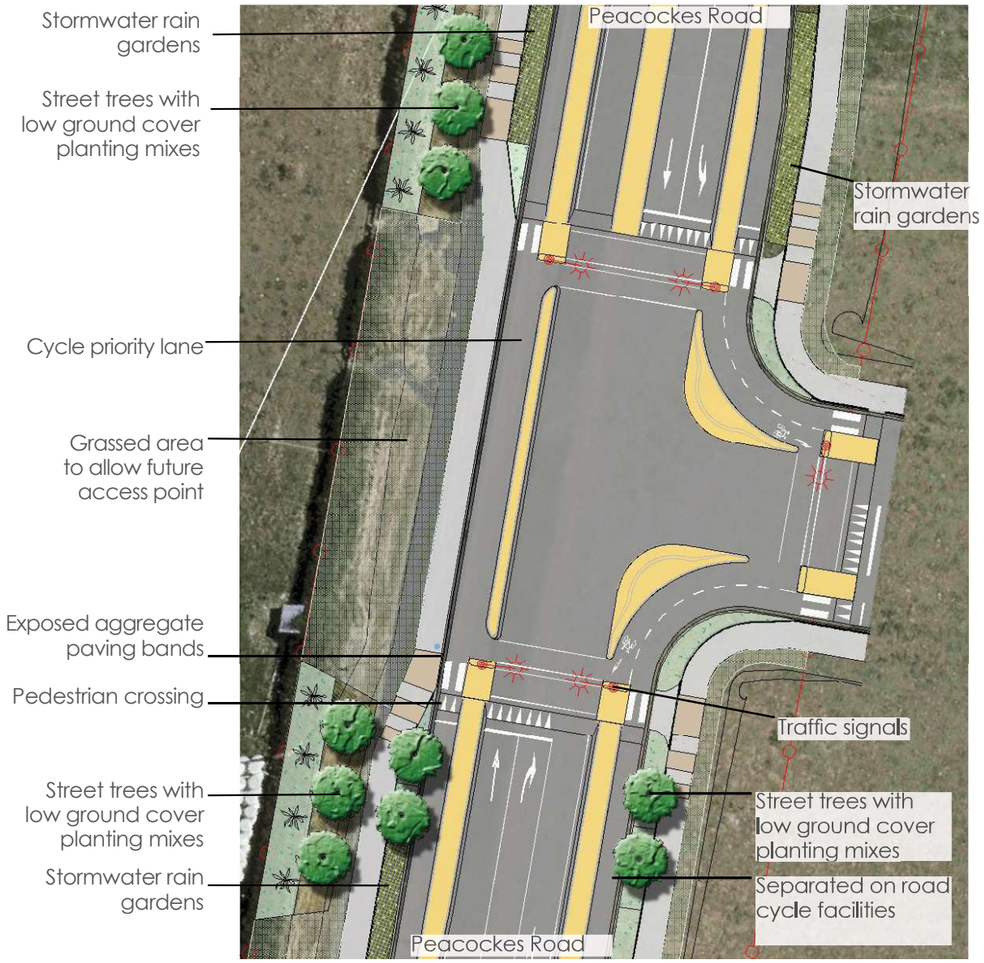


Fig 4.5-8 ILLUSTRATION OF TYPICAL 'T' INTERSECTION

4.6 Bridge Design

The Project incorporates two structures that includes a two-span bridge forming a new crossing of the Mangakotukutuku Gullies. The bridge designs embrace a consistent design approach that utilises a family of materials, which combines with a cultural design to the abutment to enhance the local iwi narrative of the corridor.

4.6.1 Design Philosophy

The bridge design philosophy has embraced the following aspects:

- The bridge(s) provide a simple and elegant form that sits well within the surrounding landscape context
- The bridge(s) provide a quality user experience for all users with a barrier and railing design at allows views into the gully system.
- The bridge(s) embrace multi-modal transport (mass transit, cycle and pedestrian) with full safe pedestrian accessibility (i.e. people with prams, wheelchairs, mobility scooters etc).
- The design approach embraces notions of care and protection by considering minimising effects on the Gully and stream, vegetation and conserving and protecting wildlife.
- The bridge(s) tie in with the surrounding landforms and are anchored by abutments with appropriate cultural design incorporated to connect he bridge to place

4.6.2 Design Principles

The detail design of the Mangakotukutuku Gully bridge structures (Refer to Figure 4.6-1 and 4.6-2) has applied the following design principles and objectives to achieve quality design outcomes:

- A consistent design approach has been applied to ensure the bridge structure(s) utilise common form, materials and design features where possible
- Central pier that avoids placement within the main stream channel
- Utilise a simple bold design that is efficient to construct and allows maximum flexibility to the long term deck use
- Full accessibility for pedestrian and cyclist facilities with generous facilities to both sides of the bridge(s)
- Incorporation of open barriers/railing arrangement to ensure the visual amenity and views are considered within the design
- Drainage and/or lighting has been integrated into the bridge with no drainage pipes or services located on the outer faces
- Lighting embraces the EMMP requirements to minimise light spill and to mitigate effects on bat flight paths
- The integration of services (water, telecom, sewerage and water mains) between concrete beams (avoiding outer edges)
- The abutment walls will incorporate cultural details and design features that add to the visual amenity and character of the area. Professional iwi artists have been engaged to provide inputs into theming and design across the Project, which will be an ongoing process during construction.
- Maintenance considerations have been considered to ensure durable materials and finishes are used that will not degrade in appearance over time. A clear anti-graffiti coating has been specified and will be applied to the full extent of the pier base and abutment walls to provide graffiti protection
- Planting has been designed with suitable species utilised on the embankments and areas beneath the bridge either maintain the vegetated integrity and provide bat fly over zones.

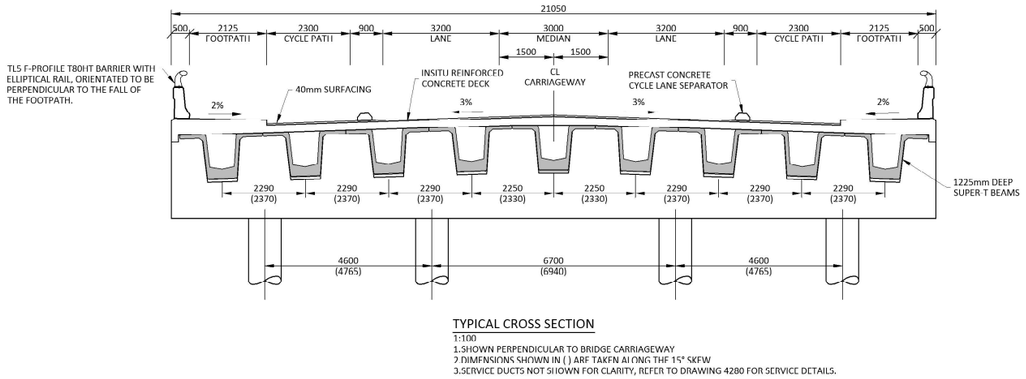


Fig 4.6-1 TYPICAL BRIDGE CROSS SECTION

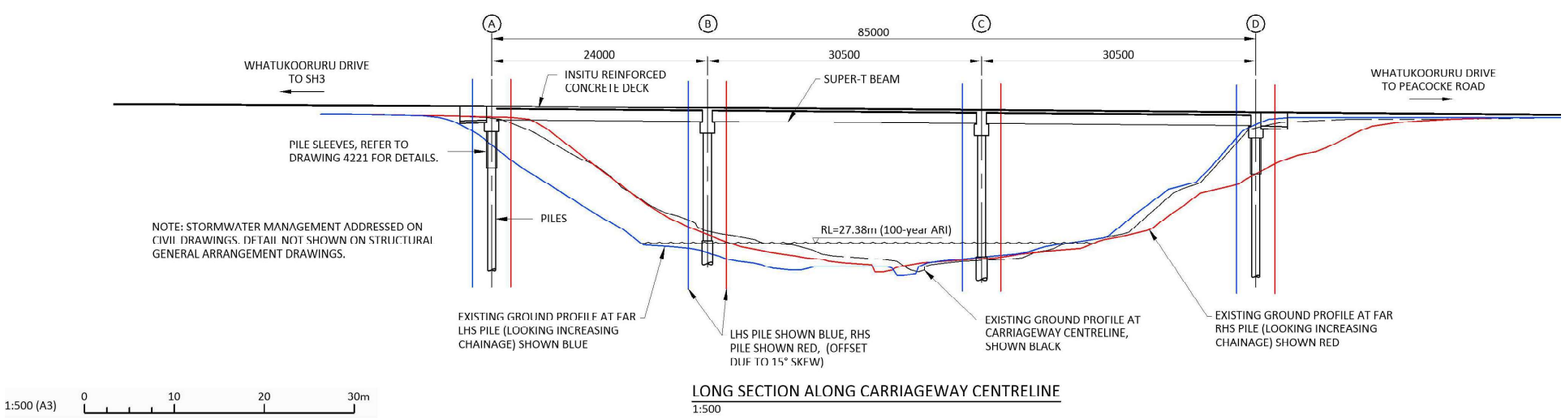


Fig 4.6-2 TYPICAL BRIDGE ELEVATION

4.7 Bridge Design

The bridge(s) provide a simple three span structures that launches close to existing grade to span the gully systems. The bridge form has been selected to balance cost, long term maintenance requirements but still maintains a high aesthetic appearance (Refer to Figure 4.6-1 and 4.6-2).

The design focuses on a simple bridge form with a four pier arrangement, head-beam and super T beams with deck over that incorporates a raised kerb with path beyond.

Pedestrian and Cycle Facilities

The bridge deck is arranged with kerb separated shared pedestrian path and a designated on road cycle facility to both sides of the bridge that will tie in seamlessly at either end of the bridge to the path/cycle network.

Barrier Components

The edge of bridge will incorporate a TL5 concrete F-profile section barrier with an elliptical steel top rail. The railing will incorporate horizontal wires due to provide safety for children crossing the bridge, which would meet the Building Regulations, including Section F4 Safety from Falling requirements. The railing will be beneficial in minimising the height of the concrete barrier and provide open views into the gully.

Abutment Design

The bridge abutments will be benched at both ends and integrate vertical concrete (precast) block units that incorporate a recessed cultural pattern.

The following features have been incorporated into the detailed design:

- The use of a standardize precast concrete block panel with textured surface incorporating a cultural patterns to reflect the cultural narrative being utilised within the Project
- The use of return vertical abutment walls to maximise the adjacent open space area
- Application of anti-graffiti coatings will be applied 1.2m from all accessible top edges and areas accessible up to 2.7m from base or adjacent ground level.
- The use of a (fall) railing detail above the abutment to prevent fall hazard.

Services

The bridge accommodates the services, which are concealed within between the bridge beams and are accessible for inspection and maintenance.

Fig 4.7-1 PLAN OF THE MANGAKOTUKUTUKU GULLY BRIDGE

Fig 4.7-2 ELEVATION OF THE MANGAKOTUKUTUKU GULLY BRIDGE

4.8 Pedestrian and Cycle Facilities

The HCC Transport Strategy, aims to get "more people cycling more often", plus aims at encouraging other forms of transport. To support this, the Project has developed a hierarchy of pedestrian and cycle paths while linking with existing facilities and neighborhoods to improve linkages and connectivity.

The Project fully embraces Hamilton City's current cycling and pedestrian approach to provide a well-designed network that is an efficient, safe and desirable alternative to vehicle-based transport. The cycle and pedestrian network sets the standard and provides a hierarchy of facilities to meet the future requirements of residential development that will occur in the area. Other considerations include the whole of life expectancy and maintenance requirements of the facilities.

The Design Approach

Figure 4.8-1 provides a diagrammatic illustration of the public transport, cycle facilities and pedestrian/shared paths plus linkages that connect to adjacent neighborhoods. The design approach locates facilities separated from the road to ensure an efficient and safe route.

Design Principles

- Develop a hierarchy of facilities that provide an attractive and well-connected network that is a safe and efficient alternative to vehicle-based transport
- Long lasting and suitable for high pedestrian and cyclist volumes with good slip resistance
- Suitable gradients for ease of use with cross falls to ensure good drainage
- Ensure safety for users through wide unimpeded paths with low edge planting or grassed edge zones with maintaining forward views
- Future proofing facilities to enable easy connection with future development.

Design Objectives

Design outcomes for cycle and pedestrian facilities incorporate the following aspects:

- Gradients along the shared off-road facility that meet NZ accessibility standards
- Continuous linkage with existing and planned open space and pedestrian/cycle network
- Good connections with existing roads and open space
- Provision of nodes/open space areas to create quality cycling/pedestrian facilities and help with orientation/ wayfinding while incorporating cultural aspects
- Cycle facilities provide regular connections from road to paths
- Shared paths are generally separated by planting from the roadway
- Provision of adequate space for landscape treatment around transitions
- Positive drainage of surfaces to avoid puddling and deviation from path
- Provisions for safe crossings for both cyclists and pedestrians in and around the road network
- CPTED principles will be applied, which will encompass informal surveillance by road users and from other adjoining residential and adjacent public open spaces. The use of low growing species or grass adjacent to paths will assist open surveillance, and
- Path alignment and appropriate planting treatment to enable forward visibility and minimising potential for pedestrian-cyclist conflicts

Fig 4.8-1 PEDESTRIAN AND CYCLE PATH HIERARCHY

4.8.1 Street Pedestrian and Cycle Approaches

Shared Off Road Cycle and Pedestrian Facilities

A continuous shared 2.5m path is typically set away from the main carriageway and is included on both side of Whatukooruru Drive and Peacockes Road that are direct/efficient and well connected. These facilities tie into the Ohaupo/SH3 roundabout facilities to enable onward journey to Hamilton CBD.

Path widths

- Shared Path: 2.5m
- Planted/grassed Median: typically 1.8m
- Feature points along route to denote change in environment, exist points or merge of facilities

Material: Brushed concrete with black oxide to reduce glare

On Road Facilities

Both Whatukooruru Drive and Peacockes Road incorporate dedicated 2.0m wide kerb-side cycle facilities with occasional on street carparking beyond in locations along Peacockes Road only. Separated lanes are provided at intersections to allow safe movement for cyclists, which are independent of pedestrian crossing facilities to minimise conflict.

The footpath is set back from the back of kerb by 1.8m , which allows a combination of low level planting and trees to provide a safe and interesting environment.

Tertiary Informal Paths

Tertiary paths have been integrated into the open space areas to provide informal paths, that typically are located in planted areas for people to explore and appreciate the natural environment. These paths are between 1000mm to 1200mm wide and are constructed from either gravel with timber edging or exposed aggregate. Where paths cross stormwater channels simple stepping stones set within the channels will allow users to crossing at these points.

4.8.2 Pathway Parameters

A hierarchy of paths has been developed for the Project and is illustrated in 4.8-1. Path width design are as follows:

- Primary off road shared path: 2.5m wide paths
- Separated on road cycling facility: 2.0m wide with safety demarcation
- Tertiary/Trail path: 1.2m to 1.5m, in gravel with timber edging

Gradients - Long Falls and Cross Falls

Gradients will be less than the maximum gradient of 1:14 along the length of paths. Where steeper gradients are required, they have been adjusted to a maximum of 1:12, which complies with HCC/RITS requirements.

The cross fall of paths should be as flat as practical while allowing ensuring rainwater drains off the surface.

- Cross falls applied for impervious surfaces is 1:50
- Cross falls for permeable surfaces is 1:60

Safety from Falling

Risk from fall has largely been designed out of the Project, however, several locations have provisions incorporated to eliminate the risk of falling from the paths. The following has been employed to minimise fall risk:

- Balustrade - to be provided for all falls over 900mm – Balustrades to the Mangakotukutuku Gully Bridge(s) plus abutments
- Vegetated Barrier - utilising low edge mix adjacent to steeper slopes (gully edges / slopes of 1:2).

Surface Design

The predominant material for the Project path network is brushed concrete with feature areas of exposed aggregate (utilising river pebbles to reflect the Waikato river environment) with black and red oxides to reduce glare and denote paving patterns (Figure 4.8-2).

Informal pedestrian trail paths utilise gravel to communicate a more informal environment and to denote to users that the path is not for all modes with a focus on walking.

EXPOSED AGGREGATE

Insitu exposed aggregate concrete pavement to be used for bands / patterns and tertiary paths in open space areas.

Insitu concrete pavement to be utilised at entrance / exit points and intersections to contrast with primary surface treatment and provide visual cue to help alert users of the path of a potential upcoming hazard/change in environment

ON-ROAD MARKINGS

Evergreen painted surface is proposed for all road markings with appropriate slip resistance and flush thresholds.

BRUSHED CONCRETE

Insitu concrete pavement with 10% black oxide forms the majority of the path surface.

PATH MARKINGS - CULTURAL

The path surface provides an opportunity for creative cultural expression. Insitu concrete pavement patterns will be utilised at entrance / exit points and intersections to contrast with primary surface treatment and provide visual cue to help alert users of the change of environment.

BOLLARDS

Removable hardwood bollards to be used at access points used for maintenance to prevent general public vehicle access.

Fig 4.8-2 IMAGES OF FINISHES AND MATERIALS

4.9 Open Space Park Areas

The Project has incorporated opportunities to include a variety of open spaces to provide a unique community environment. Typically, the spaces are associated with stormwater wetlands and retention structures, which provide opportunities for informal open space and a connection with nature. The spaces include either informal tertiary paths, recreational or play installations (structured equipment and informal play items) and seating within the landscape, plus where appropriate fruit trees.

4.9.1 Shaw's Bird Park

The Shaw's Bird Park (Park) is located towards the western end of Whatukooruru Drive, and bridges across the low-lying gully that forms part of the Park. The Park consists of a number of paths around various water bodies and planted areas, which have been implemented by the (former) land owner. The Park lends itself to be integrated into the urban fabric of the Project, with new paths and planting to allow public access to enjoy the ecology and amenity of this facility.

Path connections from Whatukooruru Drive that connect with the existing facilities have been incorporated into the Project landscape design. In addition, a small pocket park play and seating areas to activate the space and invite people into experience the open spaces (Refer to Fig 4.9-1).

4.9.2 Wetland Ecological Park

The Wetland Ecological Park is located adjacent to the end of Hall Road/west of the Mangakotukutuku Gully and will provide attenuation and treatment of stormwater runoff (Refer to Fig 4.9-2), prior to release into the Mangakotukutuku Gully Stream.

The area will provide a focal public open space area that will contribute to the character and visual amenity of the road network and provide quality open space for surrounding (future) communities. Therefore, focus has been made on developing the incendiary spaces to incorporate informal tracks, seating areas, plus structured and informal play features.

Planting will utilise a variety of wetland and riparian planting mixes to suit the growing conditions in and around the ponds. Additional planting will utilise ecological mixes to further enhance wildlife habitat, including insect/bee mixes that integrate with low growing edge mixes to minimise concealment areas and to ensure a safe environment for users to meet CPTED requirements.

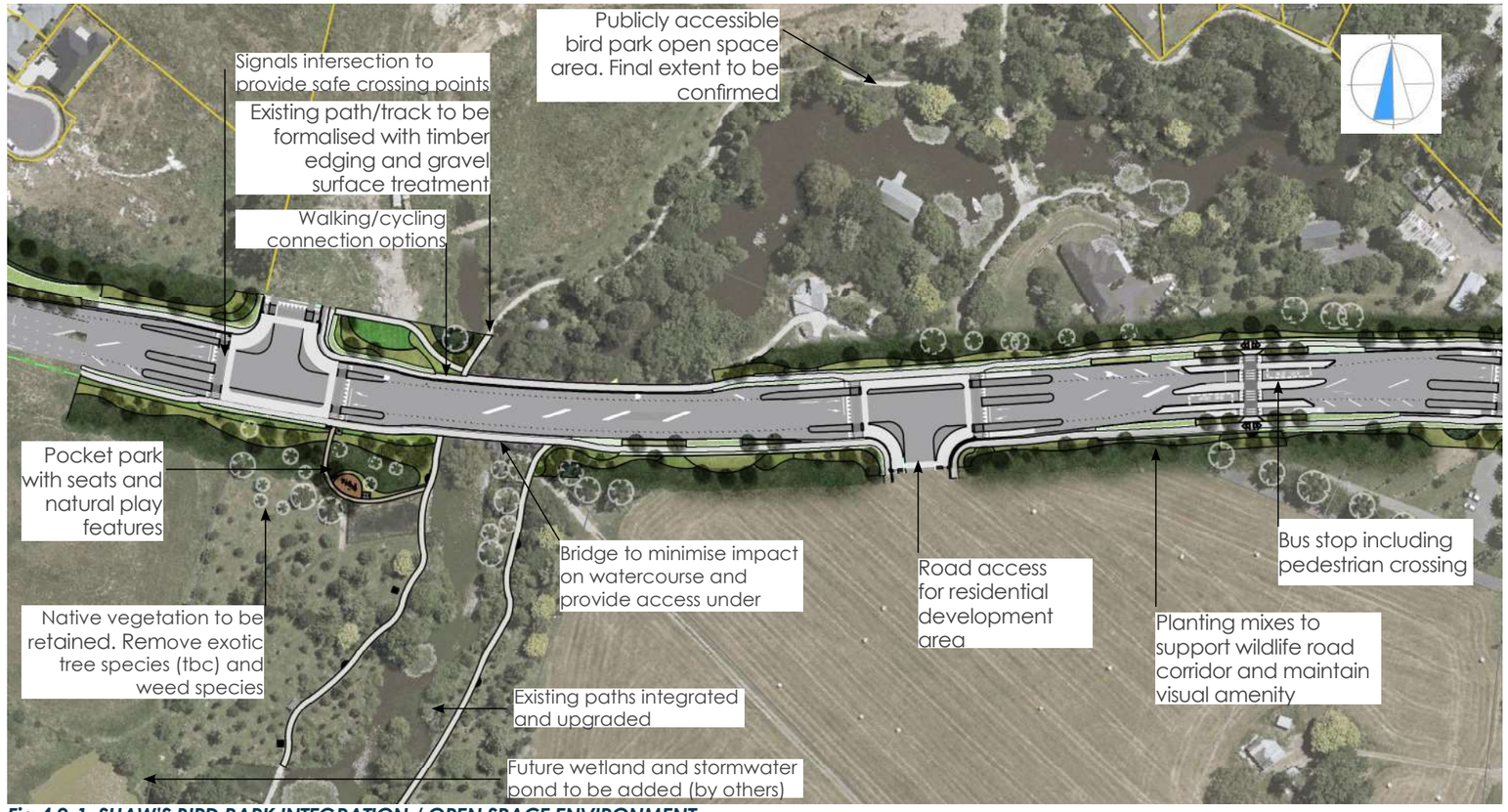


Fig 4.9-1 SHAW'S BIRD PARK INTEGRATION / OPEN SPACE ENVIRONMENT

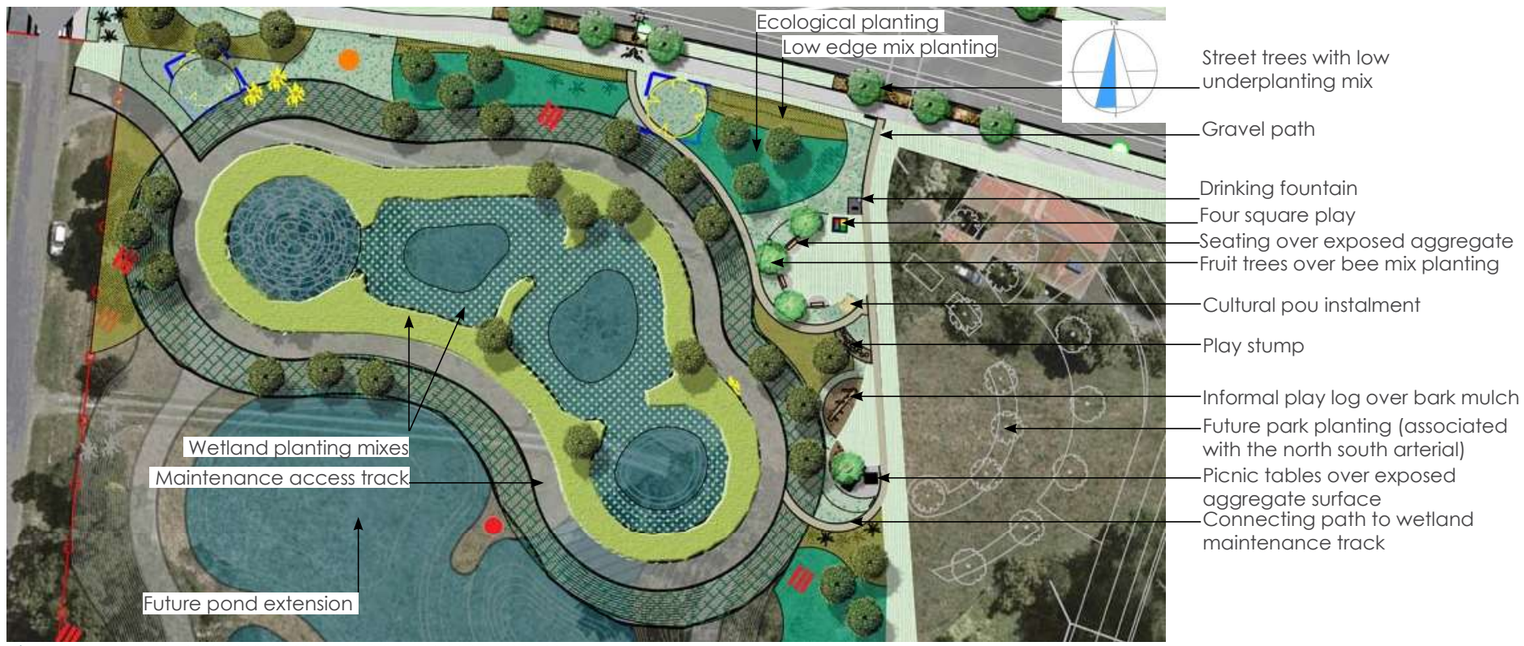


Fig 4.9-2 WETLAND ECOLOGICAL PARK AND OPEN SPACE

4.9.3 Gully Detention Pond Open Space

The existing Mangakotukutuku gully branch is located to the south of the alignment and extends beneath the proposed bridge structure (Refer to Fig 4.9-3). A weir will be introduced into the gully to manage stormwater events, with water being detained for slow release back into the Gully stream over time.

The existing exotic weed species will be removed from the gully, and will thereafter be extensively planted with ecological mixes to reinstate wildlife habitat that includes a variety of mixes including a lizard habitat mix. In general the planting will respond to the different growing environments associated with the gully system, which emulates what would have been present prior to being significantly modified.

The area provides opportunities to introduce informal gravel paths, seating and informal play features that will also provide public access between future development areas and Whatukooruru Drive

A rain garden is also integrated into the area with planting that includes a variety of wet and dry tolerant plant species that are suited to the periodic inundation. Additional ecological enhancement includes insect hotel log stacks, lizard stumperies and stone stacks.

Fig 4.9-3 GULLY DETENTION POND OPEN SPACE

4.10 Open Space Play Equipment

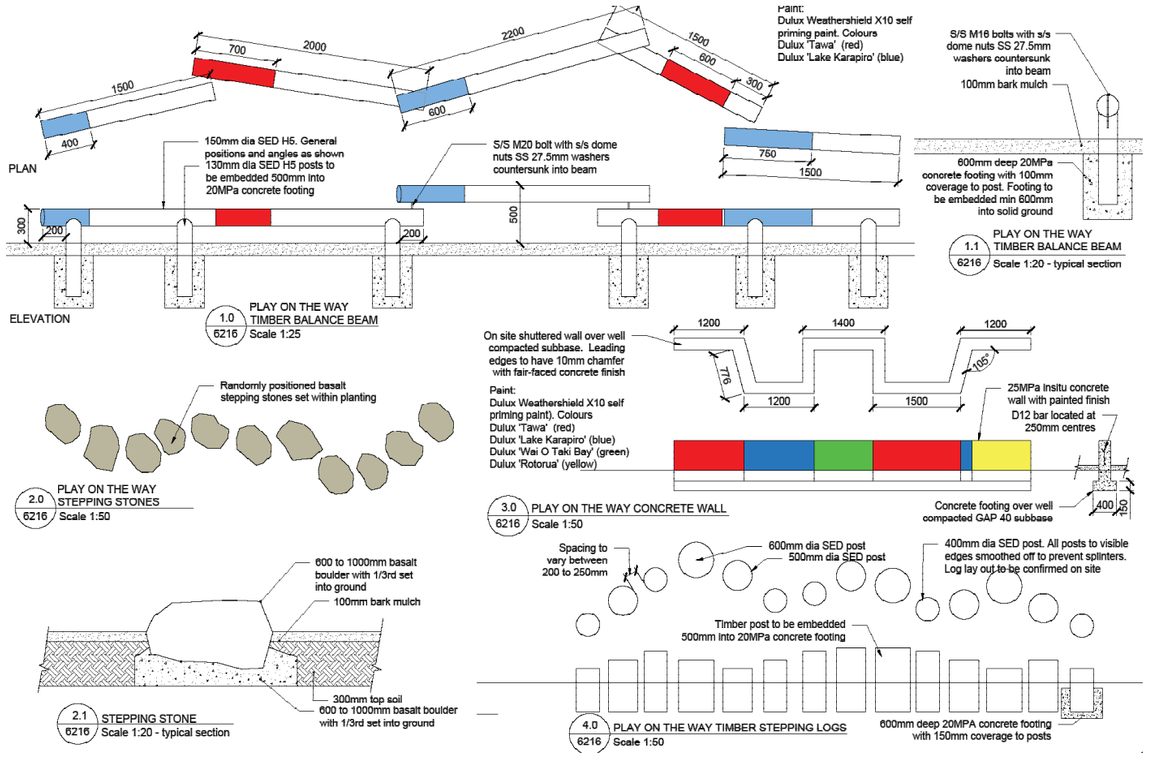
To develop a sense of community, the open space areas have incorporated a number of structured and unstructured play facilities (Refer to Fig 4.10-1). These are focused within the Wetland Pond Ecological Park and along the Whatukooruru Drive as play features to engage children to be active.

Wetland Ecological Park

The Wetland Park incorporates a number of informal play equipment / natural play items. The informal play equipment aims at more 'free' play includes items such as upright log climbers, stepping logs and climbing trunks, which will include a 100mm depth of bark mulch to provide a safety surface.

Play on the Way

Play on the way utilises a number of informal and unstructured features integrated adjacent to the foot path. The intent is to make the journey interesting for children to walk and explore enroute to the destination and aim at removing them from vehicle-based transport. Simple features include timber stepping logs, stepping stones balance beams and walls, which will also improve children's balance and confidence skills (Refer to Appendix B for additional information).



POST CLIMBING

INFORMAL LOG CLIMB WITH FALL SAFETY SURFACE

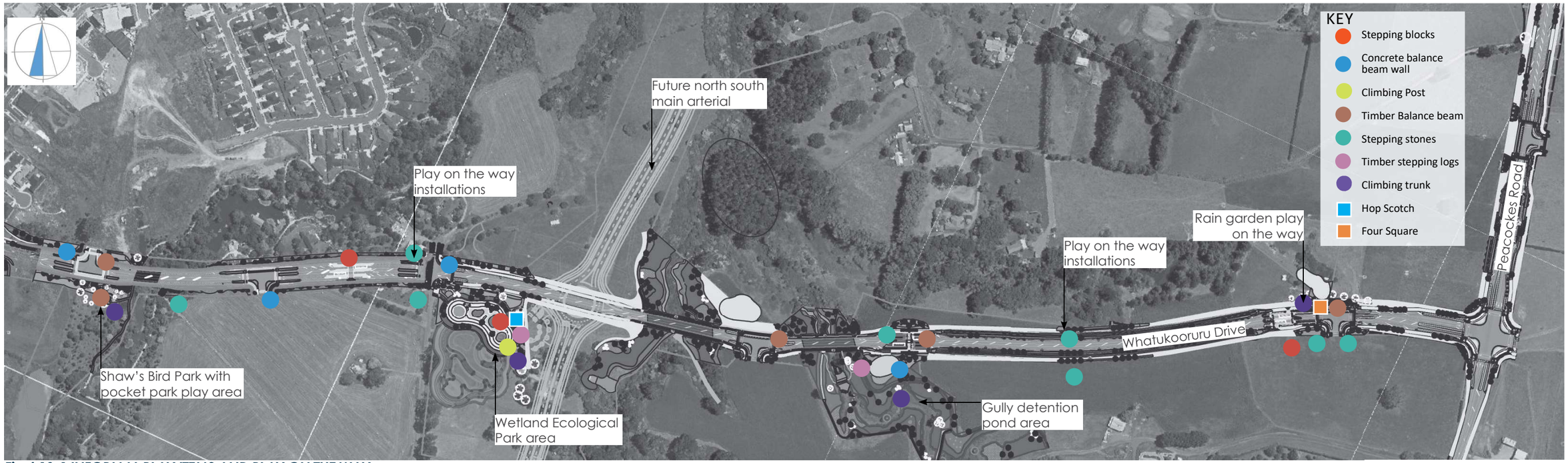


Fig 4.10-1 INFORMAL PLAY ITEMS AND PLAY ON THE WAY

4.11 Open Space Park Furniture

A variety of park and street furniture will be provided across the Project and includes standard seats, benches, picnic tables, water fountains, bike racks and bins. These products have been selected in consultation with HCC, as these units are robust and have been widely used across Hamilton. Components are readily available for repair and maintenance. A mix of bench seats and seats that includes backs and arm rests have been included to ensure units can be used by a wide range of people with varying abilities.

4.12 Street Furniture

Street furniture including barriers, signage and lighting will be located in accordance with NZTA and HCC roading requirements. Street furniture will utilise standardised items that are readily available to ensure ease of maintenance and replacement (Refer to Fig 4.11-1).

Secondary signage for open spaces, cyclist and pedestrian paths will utilise HCC Brand Manual to provide wayfaring and interpretation signage to be incorporated into the Project. Open space seating, play and exercise equipment will also be provided as part of the development of features and facilities for future communities.

4.13 Lighting

All road infrastructure including the roundabout, intersections and streets will be lit to provide suitable standards of lighting. The roads will utilise 8.0m columns with 1.0m outreach arms with suitable lenses to provide a consistent level of lighting to the carriageway and foot/cycle paths.

Specific lighting consideration has been given to the gully bridges to ensure the requirements of the EMMP in relation to bat flight paths is upheld. Therefore, the bridges will incorporate 8.0m column lights set on the outer edge of the pedestrian path. The bridge street lights will incorporate lenses that ensure minimal light spill.

4.14 Signage

Street signage across the Project is consistent with NZTA's State Highway requirements and will accord with HCC guidelines. Planting adjacent to and in front of signage will include low grow edge mix to prevent signs being obscured and minimise ongoing maintenance requirements.

The HCC Brand Manual for signage types (Refer to Figures 4.14-1 and 4.14-2), uses and technical specifications has been utilised for open spaces, pedestrian and cycle signs to ensure consistency and reinforcement of visual identity. In addition, interpretative signage will be developed based on the HCC Brand Manual to deliver topics on natural and cultural heritage. Final designs and information will be developed with inputs from HCC graphics department and TWWG where appropriate.

SEATING - BENCH SEAT UNIT

Waihi bench seat (limited to 30% of seating) with balance utilising seat unit

RUBBISH BINS

Refer to River Plan furniture Suite.

BIKE STANDS

'D' shaped bike stands set onto exposed aggregate base. Located in open space areas near seats and tables

SEATING - PICNIC SET

Waihi seat with back rest and arm rests

SEATING - PICNIC SET

Timber picnic set anchored to exposed aggregate concrete base

DRINKING FOUNTAINS

Drink fountain with dog water bowl at base located in open space areas.

Fig 4.11-1 OPEN SPACE AND STREET FURNITURE

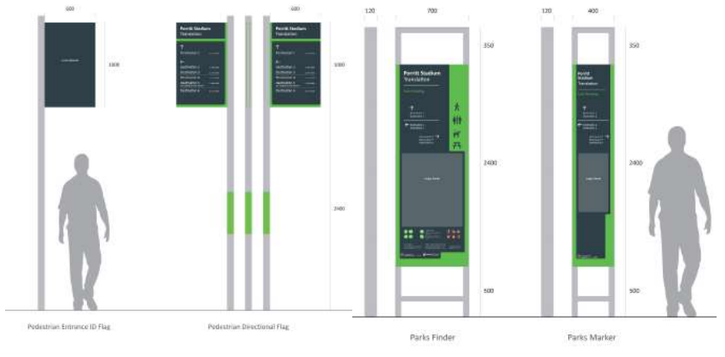


Fig 4.14-1 HAMILTON CITY COUNCIL WAYFARING SIGNAGE

Fig 4.14-2 HAMILTON CITY COUNCIL INTERPRETATIVE SIGNAGE

4.15 Barriers

Road safety barriers are limited to areas where there is a need to protect a vehicle from a significant hazard. 'W' section steel barriers provide transitions and terminations that tie into the concrete barriers of the gully bridges.

Where the limited use of road safety barriers is required, these comply with NZTA M23, the various NZTA Technical Memorandum, Technical Advice Notes and RSB standard drawings and the interim acceptance notices listed on the NZTA M23 web page.

Barriers are not provided to protect point hazards such as specimen trees, road signs or light columns as the likelihood of an errant vehicle striking the barrier is much greater than the point hazard itself.

At bus stop areas, pedestrian balustrade hand rails are provided to aid safe and easy access at the stopping areas.

4.16 Fencing

The urban design approach is to avoid the use of noise walls or hard boundary fencing, which aims at encouraging future development to have open housing frontages to contribute visually to the streetscape. Therefore, the Project will not utilise closed board fencing and will reinstate boundaries utilising a simple post and wire fence line where required.

4.17 Ecological Features

Bird song posts

The bird song posts have been developed to be included within the wetland and rain garden areas. The design and final form of these features will be developed in conjunction with the TWWG to provide an additional layer of cultural theming. The bird posts provide opportunities for a variety of birds to mark territory and provides a safe location for birds to survey the environment. In addition, it will provide people the opportunity to connect with nature and observe local bird life (refer to Fig 4.17-3).

Insect Hotels and Stumps

A number of insect hotels and stumps have been incorporated across the Project and are typically situated within the stormwater wetlands, outlet structure and in the ecological planting areas. The 'hotels' utilise trunks and branches of felled trees and are secured in stacks with posts to ensure stability and are aimed at providing insect refuge and habitat (refer to Fig 4.17-1&2). The 'stumps' will be retained on site to minimise disposal costs and the carbon footprint, while providing habitat for insects and reptiles.

4.18 Landform and Earthworks

The proposed earthworks follow the Southern Links ULDF and Peacockes CLMP guidance in that the earthworks will tie in with the undulating local landform that occurs within the area. Earthwork formations and gradients have been considered to ensure overland and storm water flows efficiently, with run off being captured and treated in an environmentally sensitive manner.

Batter slopes are typically 3h:1v and no more than 2.5h:1v with rounded profiles that will be graded out to integrate with the surrounding topography. All slopes will be planted and will received 300mm of quality topsoil to ensure a suitable growing medium is provided for plant material to establish and thrive. For flatter grassed areas these will receive 100mm of topsoil, which will be graded to tie into the existing open space areas prior to grass/hydro-seeding.

Both topsoil and structural soils will be stripped and stored on site in separate piles for re-use where possible. Topsoil strip will be undertaken to minimise damage to soil health and structure by minimising top soil handling and timing of soil movement (avoiding wet and water-logged soils) and avoid overrun by heavy machinery. Topsoil stock piles be between 1.5 to 2.5m maximum to maintain soil quality and health, which will undergo soil testing prior to spread to inform amelioration if required.

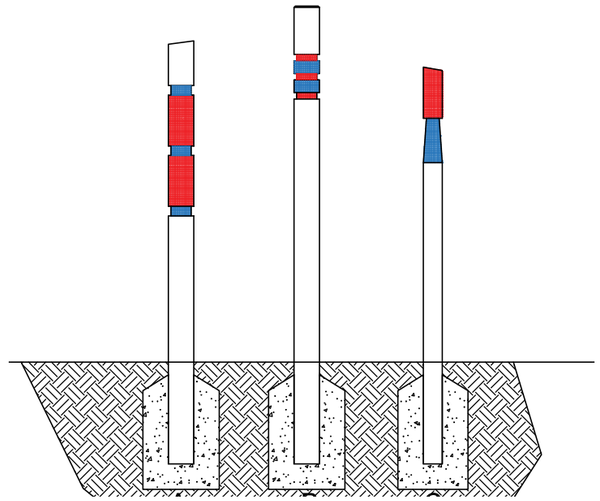


Fig 4.17-3 BIRD SONG POST

Fig 4.17-1 EXAMPLE SHOWING LOG STACK INSECT HOTEL

Fig 4.17-2 EXAMPLE SHOWING INSECT STUMP HOTEL

4.19 Landscape Planting Proposals

The planting proposals includes planting that promotes ecological enhancement and biodiversity of the area, which builds upon the key design principles set out in the Peacocke's CLMP document.

The plant mixes are made up of low growing verge, amenity mixes to the public realm spaces, which will allow views along the street to provide passive surveillance for users. Where practical, areas of ecological planting will enhance biodiversity and provide habitat links along the corridor.

The landscaping plan has been developed in consultation with mana whenua and have incorporated feedback from the group during a series of Project design hui.

4.20 Planting Design Principles

The planting design theme(s) are integral to achieving a cohesive experience for road users including pedestrians, cyclist and adjacent residential properties. Key planting principles include:

- Context sensitive plant selection, utilising naturally occurring native plant material, which are distinctive and reinforce the local vegetation character
- Use of both linear and clusters of native trees within the streetscapes to provide strong visual streetscapes while supporting/providing habitat linkages and bat hop overs
- The use of large-scale trees to complement and maintain the Peacockes area's character and identify paths and junctions to aid wayfaring, plus for long term bat habitat (cavities)
- Utilise planting to help integrate the road form (cut and batter formations) and structures into the landscape
- Reflect character and ecological areas with a focus on native species
- Improve biodiversity, wildlife habit and ecology to support the EMMP
- Eco source native plants where practicable
- Ensure planting does not affect or impede on safety
- Minimise the whole of life costs with a selection of robust plant material and mixes to minimise maintenance requirements
- Follow CPTED guidelines, and
- Reflect local cultural aspects (iwi) including rongoaa

The methodology for the implementation will utilise a practical approach to ground preparation, planting, mulching and weed management, which will be based on the RITS and The Transport Agency's P39 specification requirements. Plant material with plant grades and spacings will be consistent with the planting schedules (refer to Appendix B for planting plans).

4.20.1 Planting Design Approach

Appendix B contains the detailed landscape plans that illustrate the specific locations, planting types and also contains the plant schedules.

The design process has been undertaken with co-ordination between design disciplines and in consultation with key stakeholders to ensure a comprehensive and robust design approach has been achieved. The supporting details and cross sections have been produced to ensure the intent of the design is followed through during the implementation stage, particularly in relation to safety, planting layout and maintenance.

The planting design (Refer to Fig 4.20-1) follows the general approach that was developed within the Southern Links ULDF designation landscape plans. The planting types can be divided into the following types:

Landscape and Ecological Restoration

1. Gully restoration planting
2. Stormwater planting including wetlands, swales and rain gardens
3. Bat habitat and fly over planting
4. Bee and insect habitat planting

Amenity and Visual Mitigation Planting

5. Streetscape planting
6. Footpath and Cycle facilities

Open Space Planting

7. Native and exotic tree planting
8. Use of fruit trees in open space areas

Ecological mix

Mass planting

Low edge mix

Fig 4.19-1 EXAMPLES OF PLANTING TYPES AND FORMS

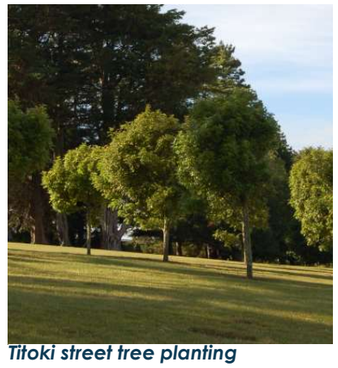
Platanus x acerfolia (London Plane)

Podocarpus totara

Knightia excelsa

Quercus palustrus (pin oak)

Kahikatea street tree planting clumps



Titoki street tree planting

4.20.2 Landscape and Ecological Re-vegetation

Mangakotukutuku Gully Re-vegetation

The use of a variety of native mixes have been utilised within the gully environment with a number of different mixes being implemented to respond to the different growing environments and ecological habitat outcomes sought.

The various mixes utilised include a low edge mix that will be utilised along the top of the gully, plus a reptile habitat planting mix and general slope and slope toe mixes will be used. Overall plant material has been selected for its appropriateness of growing location, habitat potential and growing conditions. Additional ecological initiatives have included the installation of stumps and log stacks to provide insect and invertebrate habitat. The gully base has not been specified for planting to avoid potential risk of disturbing mud-fish habitat.

Stormwater Planting including Wetlands, Swales and Rain Gardens

A number of stormwater management systems have been integrated into the Project to provide attenuation and treatment prior to water being released into the Mangakotukutuku Gully, which leads into the Waikato River. The stormwater systems include the use of rain gardens, planted conveyance swales and wetland ponds to treat run off water.

Wetland Ponds

A wetland pond has been located near Hall Road, which will provide stormwater capacity for the Project while allowing expansion to accommodate future roading and development of the area. This has provided the opportunity to enhance the public experience by including pedestrian paths in and around the wetland to enable people to appreciate the diversity of planting, while providing opportunities for play and recreation facilities.

The wetlands will contain a permanent water body with profiled sides to allow a variety of planting types to be incorporated. Planting types include wetland species suitable to long periods of submersion, which in turn will aid water filtration and treatment. Riparian species have been specified to withstand variable water level conditions and to enhance wildlife habitat. Large growing trees have been positioned in and around the pond to provide shading while contributing to wildlife habitat. Tree positioning has considered the location of access tracks that avoids conflict during future maintenance activities.

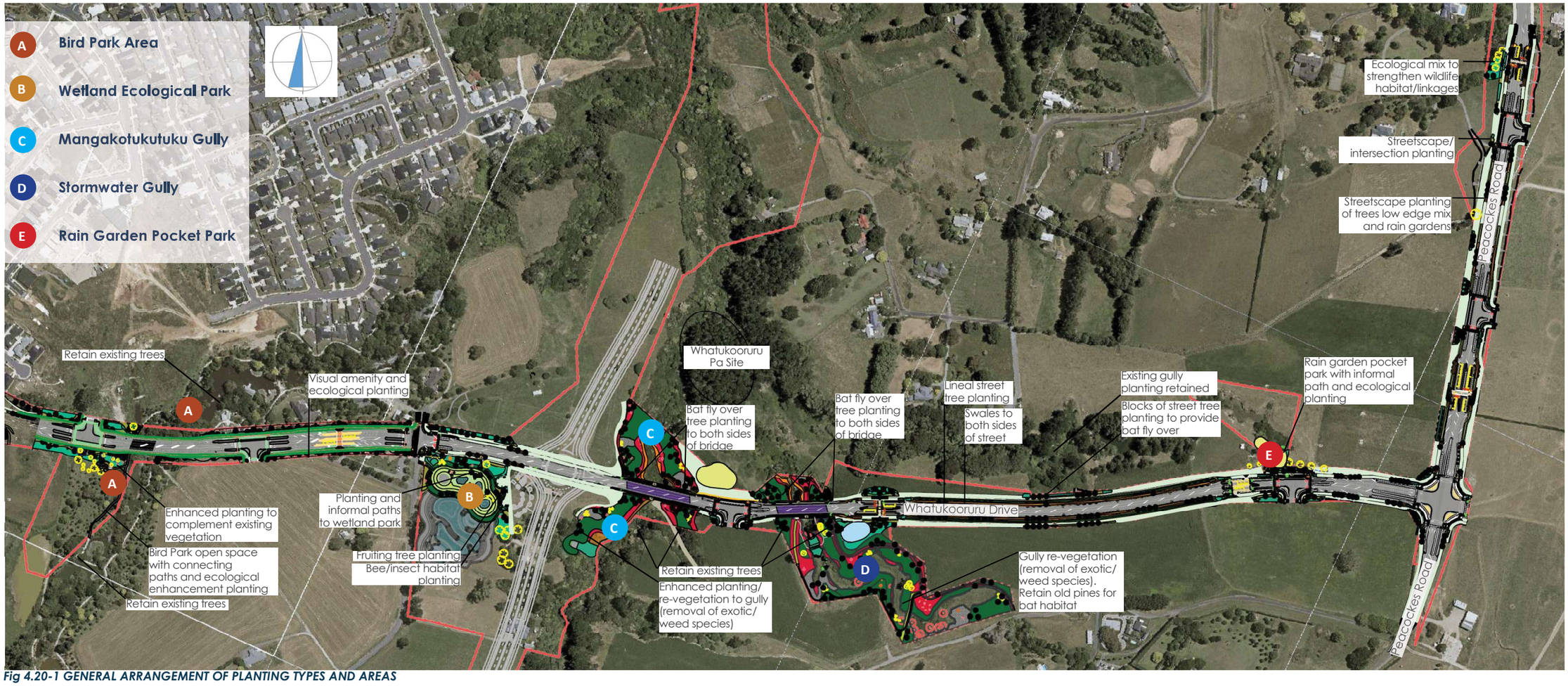


Fig 4.20-1 GENERAL ARRANGEMENT OF PLANTING TYPES AND AREAS

Rain Garden

A number of rain gardens have been located at three locations along Whatukooruru Drive, which have been designed to attenuate stormwater runoff from the road infrastructure. The stormwater will be collected and piped into the shallow raingarden and will be released back into the Mangakotukutuku Gully stream, which will help minimise excessive peak flows during rain events.

The raingardens have been integrated into various open spaces. The rain gardens are typically shallow with a maximum depth of 200mm, which incorporates appropriate plant species that will withstand the periodic inundation. Gravel vehicle tracks will provide access to allow periodic maintenance activities to be undertaken.

Further rain gardens have been integrated within the streetscape along Peacockes Road that will collect and treat water prior to being released into the outlet structure, which will convey water to the Mangakotukutuku Gully system. These will be planted to aid water treatment and provide a 'soft' green verge along the side of Peacockes Road.

Swales

The Project has two long planted swales, situated along Whatukooruru Drive (between Peacockes Road running west to the first gully bridge). The swales have been designed to collect and treat water prior to being piped to the outlet structure that will deliver water cleaned back into the Mangakotukutuku Gully system. Appropriate swale species have been included, which will assist in treating runoff water, prior to release into the gully.

Bat habitat and fly over planting

Tree retention (trees identified as potential bat roosts) combined with tree planting responds to the EMMP requirement for 'bat fly' over and connectivity of wildlife habitats. To achieve bat fly overs, the landscape planting has included clumps of trees at the gully bridge structure locations, plus street trees to create linkages/hop over locations.

Specific areas where bat fly over planting occurs include either side of Whatukooruru Drive, The bird park area the upper slopes adjacent to the gully bridge structures (Refer to Fig 4.20-7) for linkages). In addition, potential cavity forming trees have been selected to contribute to long term bat roosting environments.

Bee habitat planting

Within open spaces across the Project, a number of bee and insect mixes have been integrated to promote biodiversity and provide food source (Refer to Fig 4.20-4). These mixes include species that are either self-propagating annuals, perennials or flowering shrubs that are beneficial to a variety of insects and bees. It is envisaged that these areas will remain largely 'natural' with little maintenance other than occasional replacement of the woody shrubs.

Fig 4.20-2 EXAMPLE OF MASS RAIN GARDEN PLANTING

Fig 4.20-3 EXAMPLE OF ROADSIDE RAIN GARDEN

Fig 4.20-4 EXAMPLE OF BEE HABITAT PLANTING

Fig 4.20-5 EXAMPLE OF PLANTED SWALE

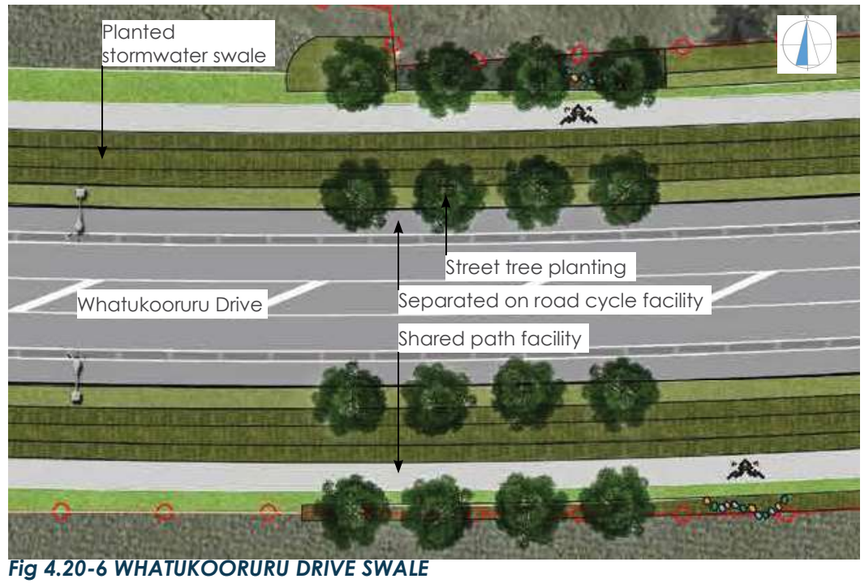


Fig 4.20-6 WHATUKOORURU DRIVE SWALE

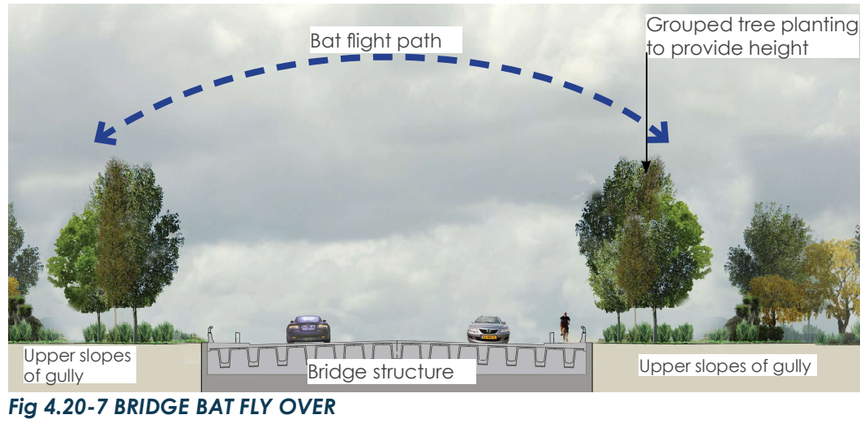


Fig 4.20-7 BRIDGE BAT FLY OVER

4.20.3 Amenity and Visual Mitigation Planting

A varying selection of tree types has been utilised to distinguish between Whatukooruru Drive and Peacockes Road. In addition, plant material and trees have been selected to support the EMMP requirement for habitat creation and connectivity between existing vegetation areas, plus visual amenity and mitigation.

Whatukooruru Drive

The Whatukooruru Drive planting incorporates a combination of formal rows of trees with groups of trees set beyond the footpath area which will contribute to the streetscape and visual amenity (Refer to Fig 4.20-8 & 9). Further planting that contributes to the street corridor also occurs at the Bird Park, the stormwater wetland pond and the gullies, which will add to the ecological corridor. The planting strategy also incorporates extensive planting of ecological mixes at the Bird Park, Wetland and gullies that will contribute to wildlife habitat and help create and maintain connectivity between existing habitat within the area, while enhancing the visual amenity of the Project.

Peacockes Road

Peacockes Road streetscape planting incorporates lineal groups of trees that are underplanted with low growing native shrubs and grasses (Refer to Fig 4.20-10). The grouping of trees will provide a strong visual form to the street. The streetscape integrates raingarden planting and low verge planting to set the scene for future development to the immediate eastern boundary aspect (Amberfield) of the street.

Tree clusters are typically underplanted for ease of maintenance, with the selection of planting typically low level and compact to prevent spill over onto paths and cycleways. Consideration to tree planting in relation to light columns and underground services has been undertaken to remove potential conflicts and enable future maintenance operations.

Footpath and Cycle Facilities

The separation of pedestrian and cycle facilities aligns with the 'Vision Zero' objectives and serves to provide an improved level of service for both users. The separation of facilities is typically 1.8m, which allows sufficient space to plant a suitable mix of low growing compact plant species and grass (Refer to Fig 4.20-9).

The low and compact mixes and grass strips have been incorporated to maintain open and clear views for users, which also supports CPTED principles by providing a safe environment for users. Areas of grass have also been utilised to allow for overspill or escape routes if required. Where taller ecological plant species have been integrated into the streetscapes, these have been set back from paths and utilise a low grow edge mix to avoid encroachment of planting onto paths and to minimise maintenance.

The selection of plant material also aims at minimising long term maintenance issues once established, plus allows sufficient space for mowers and maintenance vehicles to access the planting and work 'off road'.

Fig 4.20-8 TYPICAL WHATUKOORURU DRIVE STREETSCAPE

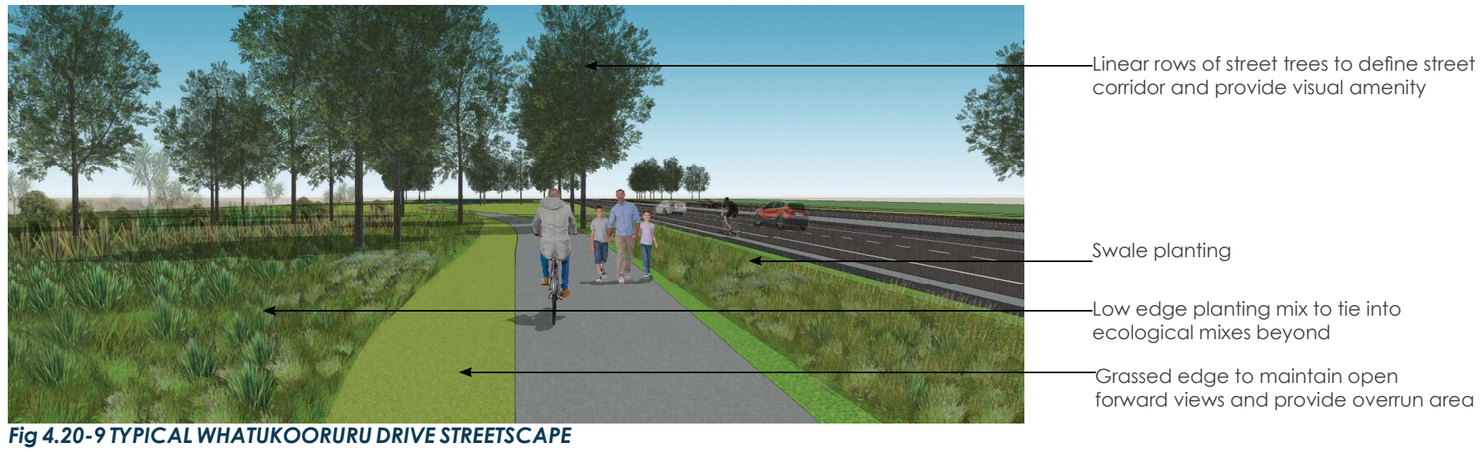


Fig 4.20-9 TYPICAL WHATUKOORURU DRIVE STREETSCAPE

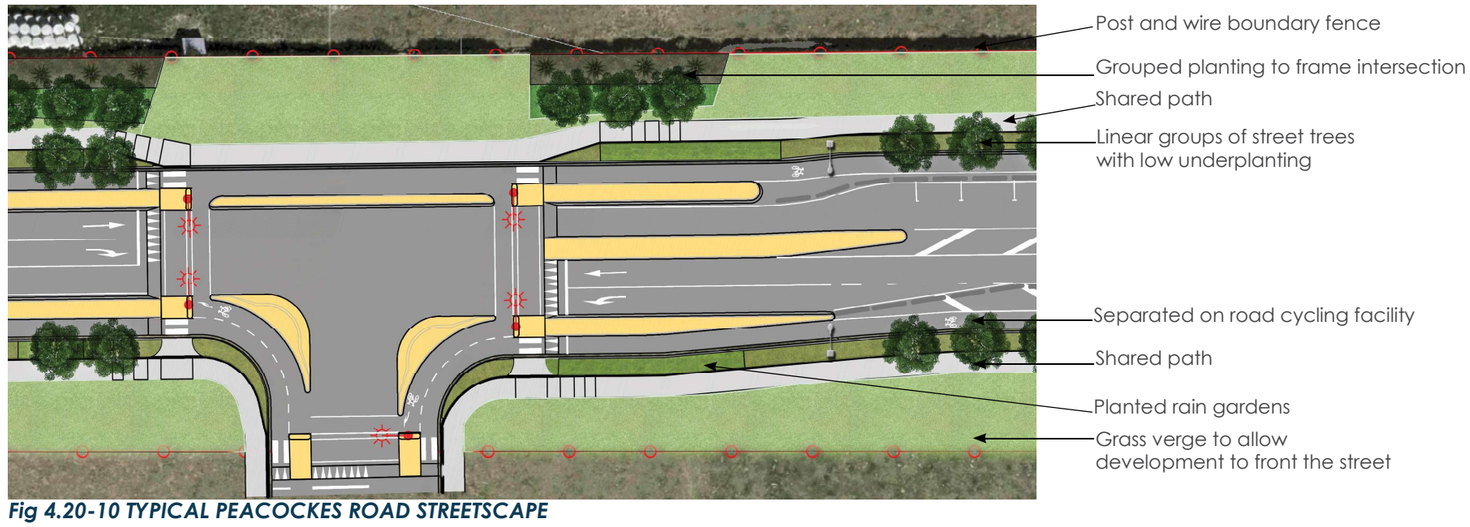


Fig 4.20-10 TYPICAL PEACOCKES ROAD STREETSCAPE

Open Space Planting

The development of open spaces is focused on the areas in and around the bird park, the wetland and along the gully stormwater park area, which incorporates native 'naturalistic' re-vegetation planting within these publicly accessible areas.

Extensive ecological restoration, wetland and raingarden planting zones combined with streetscapes will contain a diverse range of native and exotic shrubs and trees. The planting will provide an attractive community orientated environment, while contributing significantly to biodiversity and linked up wildlife habitat.

Native and exotic tree planting

The Project predominantly utilises native trees across the Project, but a selection of exotic trees has been selected from HCC preferred tree list to complement the existing tree types that are scattered across the landscape.

The use of exotics will help maintain the existing character of the area, while providing long term interest, visual amenity and potential wildlife habitat. The strategy for using exotic trees includes locating them in open space areas or to denote features in the landscape, such as path or road intersections to assist in way-faring.

Fruit Trees in Open Space Areas

To develop community identity and neighborhood resilience, the wetland park has incorporated fruiting trees. Trees have been set back from paths and are located in grassed areas to prevent issues with falling fruit on pathways.

4.21 Landscape Specification

The landscape specification for vegetation clearance, subsoil preparation works, top soiling, eco-sourcing of plant material, planting preparation, planting, installation of grass, pest control and maintenance utilises the RITS specification with additional reference to the Agency's P39 Specification, where a more robust requirement is deemed necessary. Where appropriate supplementary pages/appendices provide exclusions or further information, particularly in relation to the HCC design manual requirements to achieve a high level of industry standard.

4.22 Crime Prevention Through Environmental Design (CPTED)

The Project has considered CPTED aspects through out the design approach reviewed and encompasses the CPTED principles to provide a safe environment and minimise the incidence and fear of crime. The key areas where CPTED principles have been applied relate to public paths and cycling facilities and open spaces where users are most vulnerable.

CPTED principles that include access, surveillance and sightlines, layout, activity mix, sense of ownership, quality environments and physical protection have been incorporated into the Project. The following provides a brief description on how these have been incorporated:

1. Access:

Wayfaring signage and markers at key locations and entrance points to paths and junctions have been incorporated into the design and will utilise HCC signage

2. Surveillance and Sightlines:

Where possible areas which are deemed more remote have vegetation arranged to provide views/passive surveillance from the road network and adjacent residential properties. Paths have been designed with forward views and low growing plant species to minimise concealment opportunities

3. Layout:

Path layouts and open space are intrinsically linked to ensure long views, alternate 'escape' points and clear route options. Wayfaring signage is also integrated at key locations to aid safe movement.

4. Activity Mix:

Where ever possible, paths and adjacent facilities/properties have been considered to provide a mix of activities and provide visual links where possible to provide a sense of security.

5. Sense of Ownership:

The incorporation of Hamilton City suite of furniture has been utilised throughout the area to ensure robustness plus ease of maintenance/replacement. Open space areas such as the wetland park and rain garden pocket park are located near the carriageway with simple and clear path routes coming through the space. The incorporation of cultural themes in and around the project aims at creating a distinct place that people can connect with.

6. Quality environments:

Well considered plant selection has been incorporated into the scheme to create a quality environment. Furniture locations are located in visible locations providing good surveillance from the road. Paths have been developed in conjunction with HCC to enable maintenance vehicle access for maintenance and upkeep.

7. Physical Protection:

Key cycle and pedestrian routes (main linking/commuter routes) will be lit with areas near the carriageway benefiting from light sufficient level from street lighting. At this stage CCTV has not been included with the aim of good design avoiding the requirement. The bridge structure and abutments will have anti-graffiti coatings to enable ease of maintenance/removal of graffiti.

4.23 Implementation Program

The implementation program for landscape features will be related to the completion of key arts of infrastructure:

- The completion of the Whatukooruru Drive and Peacockes Road
- The implementation of the wetland, raingardens and the swales
- Gully restoration post gully bridge(s) construction

The program for the landscape works will follow the completion of sections of work. It is anticipated that stormwater devices will be constructed early in the program and will be planted within the next available planting season. Street planting will be undertaken as each carriageway is completed to avoid damage to street planting, with large ecological areas being planted as soon as practicable. Access tracks and reinstatement earthworks will be undertaken prior to planting.

Typically, planting will be undertaken at the completion of earthworks and construction activities to avoid jeopardising new planting. Planting will be undertaken during the planting season between April and September to help achieve the best outcomes in relation to plant establishment and growth.

Maintenance will occur for a period of 5 years from the end of practical completion prior to being handed over to HCC. The maintenance activities will include weed maintenance and plant replacement where failures occur. It is anticipated that the weed management and plant replacement will be more intensive in the initial two years during the establishment period. However, as planting establishes and canopy closure starts to occur the level of weed and plant maintenance will diminish, as weed control will to a degree occur naturally once plants form a canopy.

REPORT END

APPENDIX A

LANDSCAPE GENERAL LAYOUT PLANS
(6100 Drawing Series)

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WHATAKOORURU DRIVE

LANDSCAPE ARCHITECTURE DRAWING SET

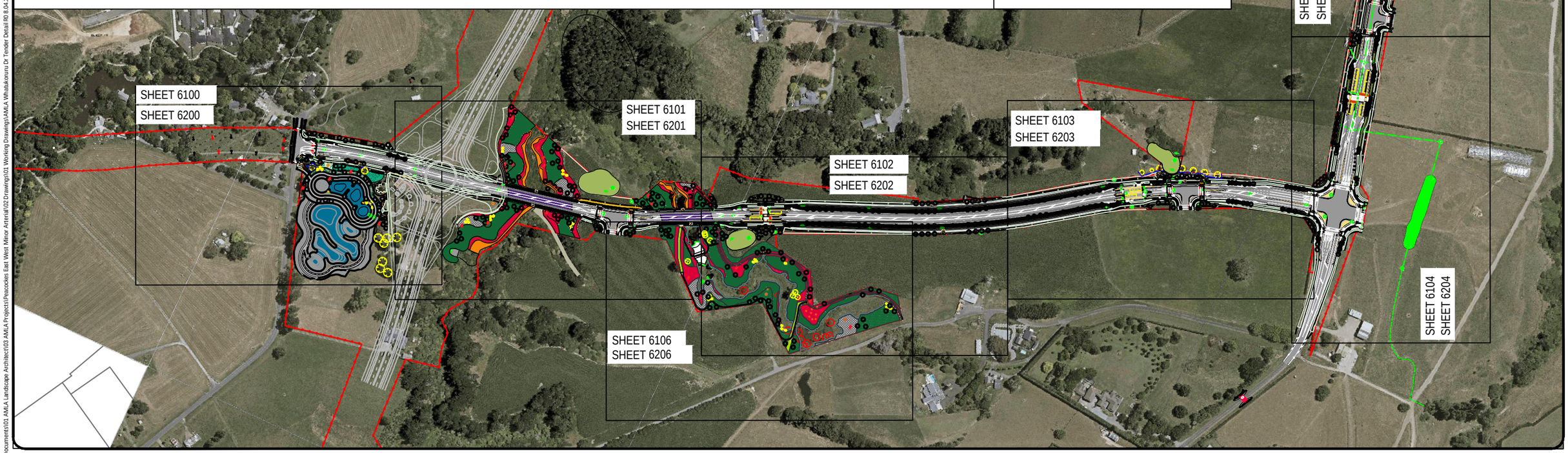
TENDER DRAWINGS

LEGEND

- Open Space / Grass
- (WSE) Wetland Mix (shallow zone 0.3 to 0.6m)
- (RM) Riparian Mix (Wet margin 0-0.3m)
- (PEM) Pond Edge Mix (Predominantly dry)
- (RGP) Rain Garden Planting Mix
- (SBM) Swale Base Mix
- (SEM) Swale Edge Mix
- (LGE) Low Grow Edge Mix (A & B)
- (RVM) Road Verge Mix
- (ERMS or ERMD) Ecological Renegotiation Mixes (medium tall ht)
- Single Plant Species
- (WLFP) Wetland Fringe Planting
- (GFP) Gully Footslope Planting
- (HSC-SLA) Hill Slope and Crest - Slope Areas
- (HSC-SSA) Hillslope and Crest – Shoulder and Summit Areas
- (LHLGA) Lizard Habitat Low Grow Areas
- (GLGG) General Low Growing Groundcover

- Native Specimen Tree
- Exotic Specimen Tree or Fruit Tree
- Trees to be Retained
- Trees to be Removed
- Concrete Cycle and Pedestrian Paths
- 1.5m wide gravel or exposed aggregate path
- Insect and Lizard Log Stack
- Stump Insect 'Hotel'
- Cultural Design Location
- Play on the way facilities
- Interpretative signage
- Removable bollards
- Water fountain with dog bowl over exposed aggregate base (with drainage point)
- Ground mounted Bicycle stand
- Light column and lamp unit
- Seating with bin over exposed aggregate base
- Tree protection fence
- Designation

GENERAL NOTES
- All vegetation/tree removal to be approved and instructed by Engineer (consent condition).
- Stumps to be either removed (for reuse) or stump ground
- For Play Equipment information refer to Drawing 6300 series
- For tree protection refer to Engineer's drawings and RITS specification



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PROJECT: PEACOCKE WHATUKOORURU DRIVE PROJECT

DRAWING: GENERAL OVERVIEW PLANS LANDSCAPE PROPOSALS

STATUS: TENDER
DATE: 11.04.2022
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DRAWING NUMBER: 146000-002A-6000
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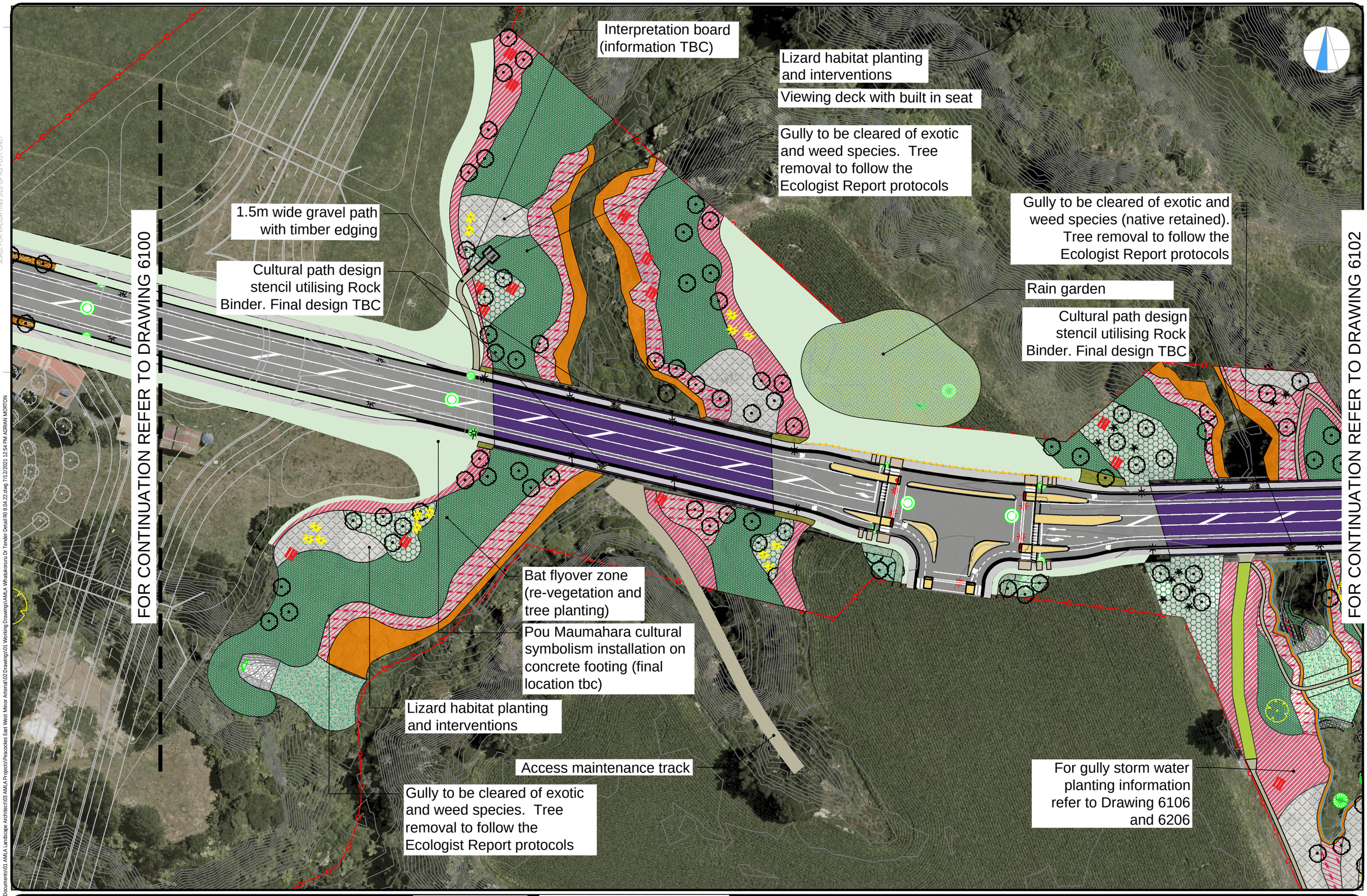

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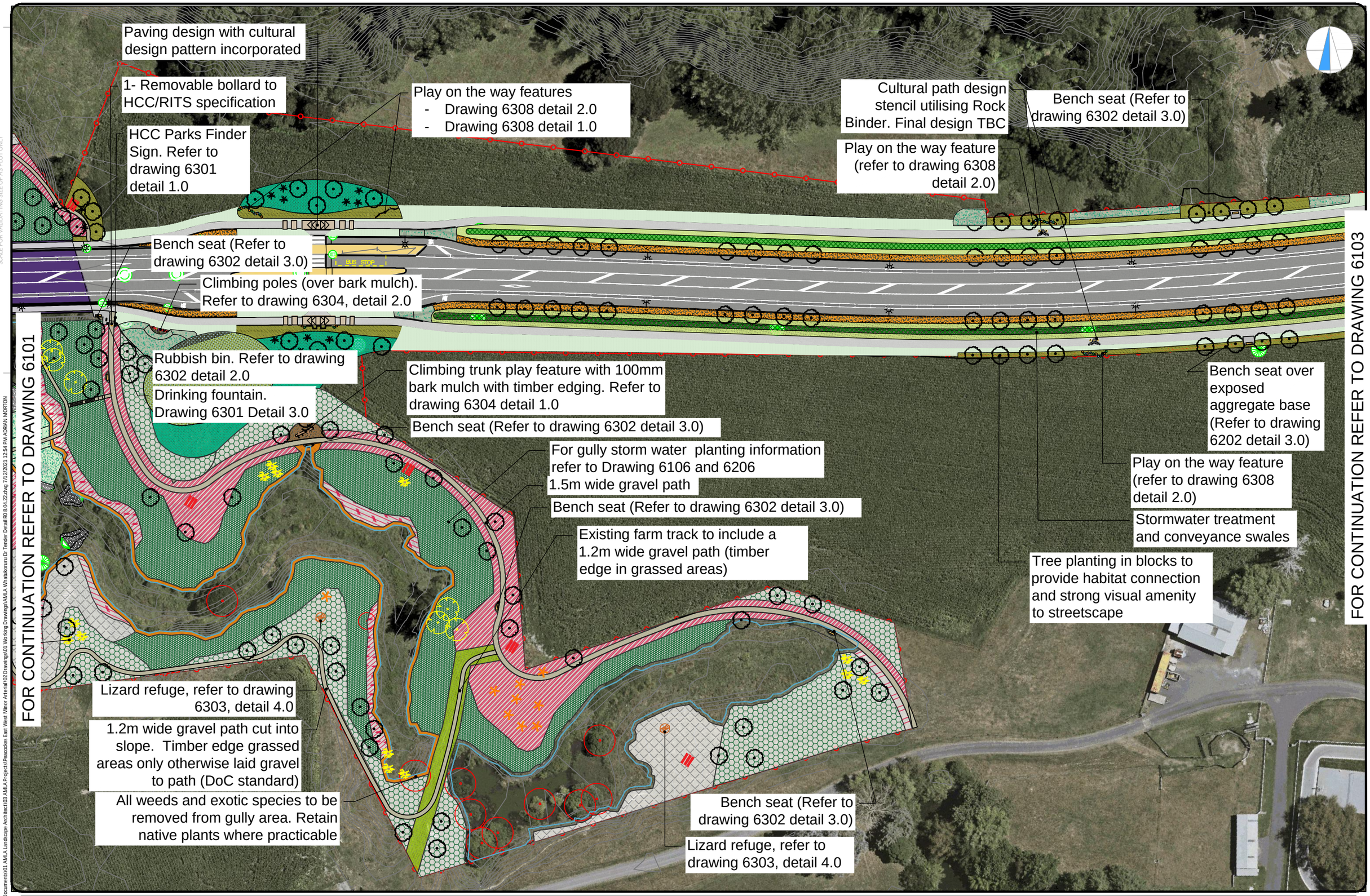

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FOR CONTINUATION REFER TO DRAWING 6102

FOR CONTINUATION REFER TO DRAWING 6104

Planted rain garden

Paving design with cultural design pattern incorporated

Bench seat (Refer to drawing 6302 detail 3.0)

Play on way hop scotch (over concrete path)

Climbing trunk play feature with 100mm bark mulch with timber edging. Refer to drawing 6304, detail 1.0

Play on way hop scotch (over concrete path)

Rubbish bin. Refer to drawing 6302 detail 2.0

Play on the way feature

Shrub and tree planting to denote intersection / change of environment

HCC Parks Finder Sign. Refer to drawing 6201 detail 1.0

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PROJECT: PEACOCKE WHATUKOORURU DRIVE PROJECT

DRAWING: GENERAL OVERVIEW PLAN LANDSCAPE PROPOSALS

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FOR CONTINUATION REFER TO DRAWING 6103

PEACOCKE ROAD

Carriageway to tie into existing road

Separable portion break line

Tree planting in blocks to provide habitat connection and strong visual amenity to streetscape

Rubbish bin. Refer to drawing 6202 detail 2.0

Link to future development area

Paving design with cultural design pattern incorporated

FOR CONTINUATION REFER TO DRAWING 6105

SW

BUS STOP

100mm

SCALE FOR VALIDATING SIZE OF A3 PLOT ONLY

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Planting to embankment/slope areas

Rubbish bin.
Refer to drawing
6202 detail 2.0

Bat hop over vegetation to provide link to riverside

future connection to Amberfield development

FOR CONTINUATION REFER TO DRAWING 6104

future connection to Amberfield development

Paving design with cultural design pattern incorporated

Extent of works

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FOR CONTINUATION (MAIN ALIGNMENT) REFER TO DRAWING 6102

Bat flyover zone (re-vegetation and tree planting)

Offset planting around existing trees by 2.0m from trunk

Gravel access maintenance track

Insect log stack hotel (refer to drawing 6306, detail 2.0)

Insect stump hotel (refer to drawing 6306, detail 1.0)

Climbing trunk play feature with 100mm bark mulch with timber edging. Refer to drawing 6304 detail 1.0

1.5m wide gravel path

Existing farm track to include a 1.2m wide gravel path (timber edge in grassed areas)

Lizard refuge, refer to drawing 6303, detail 4.0

1.2m wide gravel path cut into slope. Timber edge grassed areas only otherwise laid gravel to path (DoC standard)

All weeds and exotic species to be removed from gully area. Retain native plants where practicable

Lizard refuge, refer to drawing 6303, detail 4.0

100mm

0

SCALE FOR VALIDATING SIZE OF A3 PLOT ONLY

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APPENDIX B

LANDSCAPE PLANTING PLANS
(6200 Drawing Series)

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REVISION: 0

100mm

0

SCALE FOR VALIDATING SIZE OF A3 PLOT ONLY

3- Dac cup
305- ERDM 02
125- LGE(A)
6- Rha sap
1- Vit luc
125- LGE(A)
1- Vit luc
25- Lib gra
45- Car tes
5- Fra ray
4- Sop tet
2420- SEM
1400- SBM
45- FIP
45- Cal Lj
60- Ros fcr
70- LGE (B)
4- Sop tet
4- Que rub
70- LGE (B)
4- Sop tet
4- Que rub
35- FIP
125- LGE(A)
5- Beil tar
65- RVM
135- LGE(A)
85- RVM
25- Car tes
22- Lib gra
52- Pho ten
30- Heb ins
38- Car tes
5- Beil tar
1170- RVM
1150- RVM
BUS STOP
BUS STOP
1- Vit luc
3- Dac cup
7- Rha sap
660- ERDM 02
2170- RGP
5- Fra ray
4- Sop tet
1450- SBM
2470- SEM
4- Que rub
4- Sop tet
190- LGE (B)
4- Que rub
4- Sop tet
FOR GULLY PLANTING REFER TO DRAWING 6206

FOR CONTINUATION REFER TO DRAWING 6201

FOR CONTINUATION REFER TO DRAWING 6203

C:\Users\ADRIAN MORTON\Documents\01 AMLA Landscape Architect\03 AMLA Projects\Peacockes East West Minor Arterial\02 Drawings\01 Working Drawings\AMLA Whatukooruru Dr Tender Detail R0 8.04.22.rlwg 7/12/2021 12:54 PM ADRIAN MORTON

0	11.04.2022	Issued for tender	AM	AM	JG	
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PROJECT
PEACOCKE
WHATUKOORURU DRIVE
PROJECT

DRAWING
PLANTING PLAN
LANDSCAPE PROPOSALS

STATUS: TENDER
DATE: 11.04.2022
SCALE (ORIGINAL SIZE A3): 1:1000
DRAWING NUMBER: 146000-002A-6202
REVISION: 0

FOR CONTINUATION REFER TO DRAWING 6202

FOR CONTINUATION REFER TO DRAWING 6204

2380- RGP
27- Pho ten
3- Gin bil
100- LGE (C)
170- ERDM 01
2- Vit luc
35- FIP
3- Rha sap
95- RVM
6- Sop tet
27- Pho ten
50- FIP
3- Rha sap
25- Lib gra
40- Car tes
5- Sop tet
13- RVM
40- Dia nig
5- Fra ray
4- Sop tet
2- Vit luc
20- Lib gra
46- Car tes
20- Lib gra
BUS STOP
BUS STOP
3- Rha sap
100- LGE (C)
200- ERDM 01
3- Til cor
35- FIP
32- Car tes
18- Lib gra
5- Fra ray
4- Sop tet
3- Rha sap
3- Til cor
100- ERDM 01
90- RVM
6- Sop tet
40- Dia nig

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STATUS: TENDER
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SCALE (ORIGINAL SIZE A3): 1:1000
DRAWING NUMBER: 146000-002A-6203
REVISION: 0

FOR CONTINUATION REFER TO DRAWING 6203

82- FIP
13- Heb ins
18- Rs fcr
30- Lir mus
18- Heb ins
4- Fra Ray

64- RVM
3- Ale exc

64- RVM
3- Ale exc

13- Heb ins
34- Rs fcr
50- Lir mus
14- Heb ins

82- FIP
4- Fra Ray
30- RVM
1- Ale exc

30- RVM
1- Ale exc

30- RVM
1- Ale exc
72- RGP

35- RVM
2- Ale exc
240- RGP

5- Pod tot
90- LGE(A)
58- Cal Lj

46- RVM
2- Ale exc
18- Lib per

98- RGP

50- RVM
3- Ale exc

75- LGE(A)
90- Pho eg
4- Rha sap
3- Pod tot
115- RGP

12- Art cir
28- Lib per

50- RVM
2- Ale exc

18- Lib per
72- RGP

140- RVM
3- Ale exc

72- RGP
12- Heb ins
18- Art cir
2- Ale exc
45- Lib per

BUS STOP
SW

FOR CONTINUATION REFER TO DRAWING 6205

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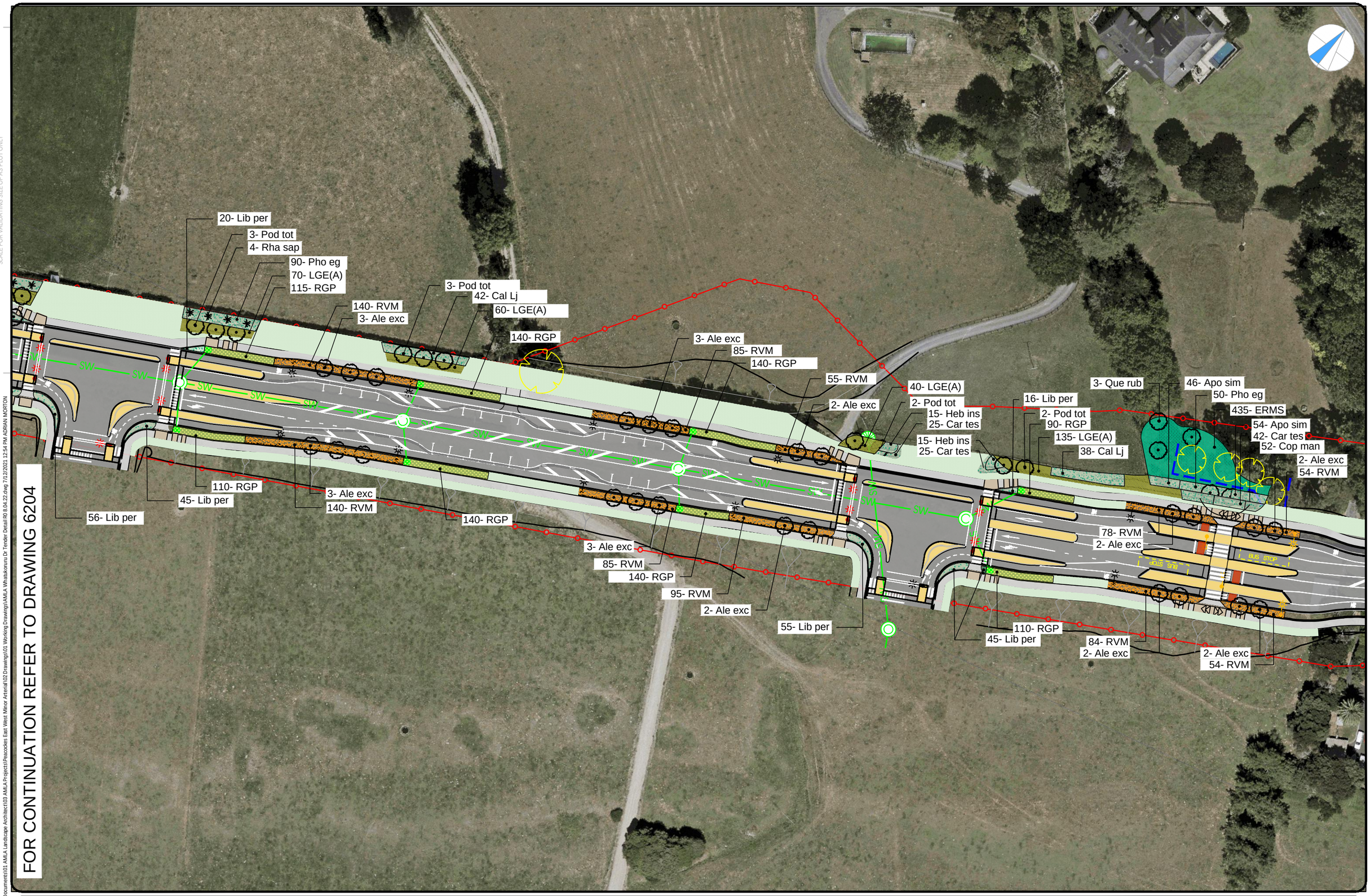
DRAWING
PLANTING PLAN
LANDSCAPE PROPOSALS

STATUS: TENDER
DATE: 11.04.2022
SCALE (ORIGINAL SIZE A3): 1:1000
DRAWING NUMBER: 146000-002A-6204
REVISION: 0



FOR CONTINUATION REFER TO DRAWING 6204

0	11.04.2022	Issued for tender	AM	AM	JG	
	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR	

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PROJECT

DRAWING
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STATUS: TENDER
DATE: 11.04.2022
SCALE (ORIGINAL SIZE A3): 1:1000
DRAWING NUMBER: 146000-002A-6205
REVISION: 0

FOR CONTINUATION (MAIN ALIGNMENT) REFER TO DRAWING 6102

3- Beil tar
3- Dac dac
4- Beil tar
450- HSC-SSA
1.2m wide gravel track
410- GLGG
64- Pho ten
110- Ca vir
Planting to weir embankments
70- Pho ten
230- HSC-SLA
190- GFP
1090- GLGG
225- GFP
3- Dac dac
650- LHLGA
82- GFP
50- GFP
3- Phy tri
350- HSC-SSA
340- GLGG
700- HSC-SSA
3- Dac cup
100- GFP
560- GLGG
3- Nes cun
910- GLGG
780- GLGG
1320- HSC-SLA
DO NOT DISTURB ANY AREAS OF ARCHAEOLOGICAL SIGNIFICANCE. ARCHAEOLOGIST TO CONFIRM AND DEMARCATE FEATURES WITHIN RESTORATION SITE.
560- HSC-SLA
3- Beil tar
xx- GLGG
3- Phy tri
3- Dac cup
850- HSC-SLA
100- GFP
1075- HSC-SSA
3- Dac cup
650- LHLGA
775- HSC-SSA
3- Dac cup
220- HSC-SSA

0	11.04.2022	Issued for tender	AM	AM	JG
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STATUS: TENDER
DATE: 11.04.2022
SCALE (ORIGINAL SIZE A3): 1:1000
DRAWING NUMBER: 146000-002A-6206
REVISION: 0

LEGEND

- Open Space / Grass
- (WSE) Wetland Mix (shallow zone 0.3 to 0.6m)
- (RM) Riparian Mix (Wet margin 0-0.3m)
- (PEM) Pond Edge Mix (Predominantly dry)
- (RGP) Rain Garden Planting Mix
- (SBM) Swale Base Mix
- (SEM) Swale Edge Mix
- (LGE) Low Grow Edge Mix (A & B)
- (RVM) Road Verge Mix
- (ERMS or ERMD) Ecological Renegotiation Mixes (medium tall ht)
- Single Plant Species
- (WLFP) Wetland Fringe Planting
- (GFP) Gully Footslope Planting
- (HSC-SLA) Hill Slope and Crest - Slope Areas
- (HSC-SSA) Hillslope and Crest – Shoulder and Summit Areas
- (LHLGA) Lizard Habitat Low Grow Areas
- (GLGG) General Low Growing Groundcover
- Native Specimen Tree
- Exotic Specimen Tree or Fruit Tree
- Trees to be Retained
- Trees to be Removed
- Concrete Cycle and Pedestrian Paths
- 1.5m wide gravel or exposed aggregate path
- Insect and Lizard Log Stack
- Stump Insect 'Hotel'
- Cultural Design Location
- Play on the way facilities
- Interpretative signage
- Removable bollards
- Water fountain with dog bowl over exposed aggregate base (with drainage point)
- Ground mounted Bicycle stand
- Light column and lamp unit
- Seating with bin over exposed aggregate base
- Tree protection fence
- Designation

GENERAL NOTES
- All vegetation/tree removal to be approved and instructed by Engineer (consent condition).
- Stumps to be either removed (for reuse) or stump ground
- For Play Equipment information refer to Drawing 6300 series
- For tree protection refer to Engineer's drawings and RITS specification

MASS INDIVIDUAL PLANT SPECIES

Common name	Botanical name	Code	Min. size	Min. Density (plants/m2)
Oioi	Apodasmia similis	Apo sim	1l	2.0/m²
Rengarenga	Arthropodium cirratum	Art cir	1l	1.25/m²
Toetoe	Austroderia fulvida	Aus ful	1l	0.64/m²
Bottlebrush	Callistemon viminalis 'Little John'	Cal Lj	1l	0.64/m²
Sedge	Carex testacea	Car tes	1l	1.8/m²
Sedge	Carex virgata	Ca vir	1l	1.8/m²
Coprosma var	Coprosma 'Kirikiri'	Cop kir	1l	1.25/m²
Coprosma var	Coprosma acerosa	Cop ace	1l	1/m²
Coprosma var	Coprosma 'Manaitarai'	Cop man	1l	1.55/m²
Turutu	Dianella nigra	Dia nig	1l	2/m²
Hebe	Hebe 'Inspiration'	Heb ins	1l	1/m²
Manuka	Leptospermum "Nanum Kiwi'	Lep nan	1l	1.25/m²
Manuka	Leptospermum 'Wiri Donna'	Lep wd	1l	0.64/m²
Nz Iris	Libertia grandiflora	Lib gra	1l	1.8/m²
Nz Iris	Libertia peregrinans	Lib per	1l	2.8/m²
Lily turf	Liriope muscari	Lir mus	1l	2.8/m²
Lomandra grass	Lomandra tanikii	Lom tan	1l	1/m²
Muhlenbeckia	Muhlenbeckia astonii	Mul ast	1l	1.25/m²
Harakeke/flax	Phormium cookianum 'Emerald Gem'	Pho cg	1l	1.25/m²
Harakeke/flax	Phormium tenax	Pho ten	1l	0.64/m²
Golf ball pittosporum	Pittosporum 'Golf Ball'	Pit gol	1l	0.64/m²
Pittosporum	Pittosporum 'Little Kiwi'	Pit LK	1l	1/m²
Carpet rose	Rosa 'Flower Carpet Red'	Ros fcr	1l	1.25/m²
Total				

(FIP) FEATURE INFILL MIX (equal spacing)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Harakeke/flax	Phormium cookianum 'Emerald Gem'	40	1l	1/m²
Muehlenbeckia	Muehlenbeckia astonii	20	1l	1/m²
Lomandra grass	Lomandra tanikii	40	1l	1/m²
Total				

(BPM) BEE PLANTING MIX (in blocks)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Echinacea	Echinacea angustifolia	10	1l	1.8/m²
Calendula officinalis	Calendula officinalis	5	1l	1.8/m²
Rosemary	Rosmarinus officinalis	15	1l	1.8/m²
Lavender	Lavandula angustifolia 'Hidcote'	20	1l	1.8/m²
Thyme	Thymus vulgaris	10	1l	1.8/m²
Bottlebrush	Callistemon splendens	10	1l	1.8/m²
Grevillea	Grevillea spp (Clearview or Victoria)	10	1l	1.8/m²
Hebe	Hebe species	20	1l	1.8/m²
Total				

LGE(A) - LOW GROWING EDGE MIX A (plant in groups of 7 to 11 with bleeded edges)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Oioi	Apodasmia similis	10	1l	1/m²
Coprosma	Coprosma acerosa 'Kirikiri'	30	1l	1/m²
Pohuhue	Muehlenbeckia astonii	25	1l	1/m²
Harakeke/flax	Phormium cookianum 'Emerald Gem'	20	1l	1/m²
Pittosporum spp	Pittosporum 'Little Burger'	15	1l	1/m²
Total				

LGE(B) - LOW GROWING EDGE MIX B (plant in groups of 7 to 11 with blended edges)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Coprosma	Coprosma repens 'Poor Knights'	10	1l	1/m²
Sand coprosma	Coprosma acerosa	10	1l	1/m²
Turutu	Dianella nigra	10	1l	1/m²
Iris	Dietes grandiflora	10	1l	1/m²
Hebe	Hebe 'Wiri Charm'	10	1l	1/m²
Compact Manuka sps	Leptospermum "Wiri Kerry'	15	1l	1/m²
Lomandra grass	Lomandra tanikii	15	1l	1/m²
Flax	Phormium 'Emerald Green'	15	1l	1/m²
Dwarf Kowhai	Sophora 'Dragons Gold'	5	1l	1/m²
Total				

LGE(C) - LOW GROWING EDGE MIX C (plant in groups of 7 to 11 with blended edges)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Coprosma	Coprosma 'Mangitoroi'	25	1l	1/m²
Banglora variety	Braggylottis 'Otari Cloud'	15	1l	1/m²
Hebe	Hebe 'Wiri Mist'	5	1l	1/m²
Pohuhue	Muehlenbeckia astonii	25	1l	1/m²
Harakeke/flax	Phormium cookianum 'Emerald Gem'	10	1l	1/m²
Carex grass	Carex flagellifera 'Bronzie'	20	1l	1/m²
Total				

(RVM) - ROAD VERGE MIX (plant in groups of 11 to 15)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Coprosma	Coprosma acerosa 'Hawera'	20	1l	1.55/m²
Coprosma Taiko	Coprosma Taiko	30	1l	1.55/m²
Turutu	Dianella nigra	15	1l	1.55/m²
Prostrate Manuka sps	Leptospermum "Mercury Island'	25	1l	1.55/m²
Pohuhue	Muehlenbeckia astonii	10	1l	1.55/m²
Total				

ERMS- ECOLOGICAL REVEGETATION SHADE MIX (planted in groups of 7 to 11)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Toetoe	Austroderia fulvida	5	1l	1/m²
Crown fern	Blechnum discolor	2	1l	1/m²
Kiokio	Blechnum novae-zelandiae	3	1l	1/m²
Aceake	Carpodetus serratus	10	1l	1/m²
Karamu	Coprosma robusta	5	1l	1/m²
Cabbage tree	Cordyline australis	5	1l	1/m²
Black ponga (spread though mix)	Cyathea medullaris	1	1l	1/m²
Putaputaweta	Dicksonia squarrosa	4	1l	1/m²
Koromiko	Hebe stricta	8	1l	1/m²
Manuka	Leptospermum "Electric Red"	10	1l	1/m²
Red Matipo	Myrsine australis	10	1l	1/m²
Flax	Phormium tenax	10	1l	1/m²
Karo	Pittosporum crasifolium	5	1l	1/m²
Totara	Podocarpus totara	5	1l	1/m²
Miro	Prumnopitys ferruginea	2	1l	1/m²
Puahou/five finger	Pseudopanax arboreus	10	1l	1/m²
Kowhai	Sophora microphylla	5	1l	1/m²
Total				

ERMD 01 - ECOLOGICAL REVEGETATION DRY MIX 1 (planted in groups of 7 to 11)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Toetoe	Austroderia fulvida	5	1l	1/m²
Cabbage tree	Cordyline australis	5	1l	1/m²
Wheki-ponga (spread though mix)	Dicksonia fibrosa	2	1l	1/m²
Aceake	Dodonaea viscosa	10	1l	1/m²
Koromiko	Hebe stricta	10	1l	1/m²
Rewarewa	Knightia excelsa	5	1l	1/m²
Manuka	Leptospermum "Electric Red"	10	1l	1/m²
Pohuehue	Muehlenbeckia axillaris	5	1l	1/m²
Red Matipo	Myrsine australis	10	1l	1/m²
Flax	Phormium tenax	10	1l	1/m²
Karo	Pittosporum crasifolium	5	1l	1/m²
Miro	Prumnopitys ferruginea	3	1l	1/m²
Puahou/five finger	Pseudopanax arboreus	10	1l	1/m²
Kowhai	Sophora microphylla	10	1l	1/m²
Total				

ERMD 02 - ECOLOGICAL REVEGETATION DRY MIX 2 (planted in groups of 7 to 11)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Kiokio	Blechnum novae-zelandiae	3	1l	1/m²
Rangiora	Brachyglotis repanda	10	1l	1/m²
Putaputaweta	Carpodetus serratus	5	1l	1/m²
Mingimingi	Coprosma propinqua	5	1l	1/m²
Corokia	Corokia x virgata 'Geenty's Green'	10	1l	1/m²
Black ponga (spread though mix)	Cyathea medullaris	2	1l	1/m²
Kapuka	Griselinia littoralis	5	1l	1/m²
Napuka	Hebe speciosa	10	1l	1/m²
Laccbark	Hoheria populnea	5	1l	1/m²
Rewarewa	Kightia excelsea	5	1l	1/m²
Ramarama	Lophomyrtus bullata	5	1l	1/m²
Kaikomako	Pennatia corymbosa	5	1l	1/m²
Whararīki	Phormium cookianum	5	1l	1/m²
Kohuhu	Pittosporum tenufolium	15	1l	1/m²
Puahou/five finger	Pseudopanax arboreus	10	1l	1/m²
Total				

WETLAND PLANTING

(WSE) Wetland Pond Mix / Submerged Zone (0.3 to 0.6m planting depth)				
Jointed twig rush (-0.3 to -0.6)	Baumea articulata	35	0.5l	2.8/m²
Kauwa / Lake club rush (-0.3 to -0.6m depth)	Schoenoplectus tabernaemontani	30	0.5l	2.8/m²
Kuta/sharp spike sedge (-0.3 to - 0.5m depth)	Eleocharis sphacelata	30	0.5l	2.8/m²
Manihi (-0.6)	Potamogeton cheesemanii	5	0.5l	2.8/m²
Total				

(RM) Wet Margin / Shallow Marsh) Mix (0 to 0.3m planting depth)				
Sedge (plant between -0.1 to -0.3)	Machaerina articulata	30	1l	1.8/m²
Purei (plant between 0 to -0.15)	Carex secta	15	1l	1.8/m²
Sharp spike sedge (plant between 0 to -0.15)	Eleocharis acuta	25	1l	1.8/m²
Baumea (plant between 0 to -0.1)	Machaerina rubiginosa	15	1l	1.8/m²
Giant rush (plant between 0 to -0.2)	Juncus pallidus	15	1l	1.8/m²
Total				

(PEM) Pond Edge Mix (Litoral/Riparian zone) - above permanent water level				
Toetoe (low to upper slope)	Austroderia fulvida	5	1l	1/m²
Sedge (low to upper slope)	Carex virgata	10	1l	1/m²
Putaputaweta (upper to mid)	Carpodetus serratus	10	1l	1/m²
Hebe (mid to upper slope)	Hebe stricta	10	1l	1/m²
Pukatea (mid to upper slope)	Laurelia novae-zelandiae	4	1l	1/m²
Manuka (low to upper slope)	Leptospermum scoparium	15	1l	1/m²
Kahikatea (mid to upper slope)	Dacrycarpus dacrydioides	6	1l	1/m²
Mahoe (low to upper slope)	Melicytus ramiflorus	4	1l	1/m²
Cabbage tree (low to upper slope)	Cordyline australia	6	1l	1/m²
Karamu (mid to upper slope)	Coprosma robusta	10	1l	1/m²
Harakeke (low to upper slope)	Phormium tenax	20	1l	1/m²
Total				

SWALE PLANTING

(SBM) Swale Base plants				
Jointed twig rush	Baumea articulata	60	0.5L	2.04/m²
Wiwi	Juncus edgariae	20	0.5L	2.04/m²
Giant rush wiwi	Juncus pallidus	20	0.5L	2.04/m²
(SEM) Swale Edge/Side Mix				
Carex grass	Carex geminata	20	0.5L	2.04/m²
Pukio	Carex virgata	20	0.5L	2.04/m²
Oioi	Apodasmia similis	60	0.5L	2.04/m²
Total				

(RGP) RAIN GARDEN PLANTING MIX (Plant in randomn pattern)

Common name	Botanical name	% age	Min. size	Min. Density
Oioi , jointed wire rush (base and sides)	Apodasmia similis	60	0.5l	2.8/m²
Purei	Carex virgata	15	0.5l	2.8/m²
Shore leptinella	Leptinella dioica	5	0.5l	2.8/m²
Native iris	Libertia grandiflora	20	0.5l	2.8/m²
Total				

EXOTIC SPECIMEN TREES (OPEN SPACE AREAS)

Common name	Botanical name	Code	Min. size	Min. Density (plants/m2)
Red Oak	Quercus rubra	Que rub	PB150/160l	spot
Gingko	Gingko Biloba	Gin bil	PB150/160l	spot
London Plane	Platanus x acerifolia	Pla ace	PB95	spot
Claret Ash	Fraxinus angustifolia 'Raywoodii'	Fra ray	PB150/160l	spot
Linden tree	Tilia nobilis	Til cor	PB150/160l	spot
Total				

NATIVE SPECIMEN TREES (SPACED WITHIN PLANTING MIXES AND AS STREET TREES)

Common name	Botanical name	Code	Min. size	Min. Density (plants/m2)
Cabbage tree	Cordyline australis	Cor aus	PB12	spot
Titoki	Alectryon excelsus	Ale exc	Pb95	spot
Tairere	Beilschmiedia tarairi	Beil tar	Pb95	spot
Kahikatea	Dacrycarpus dacrydioides	Dac dac	Pb95	spot
Rimu	Dacrycarpus cupressiodes	Dac cup	Pb95	spot
Rewarewa	Knightia excelsor	Kni exc	Pb95	spot
Black Maire	Nestegis cunninghamii	Nes cun	Pb28	spot
Totara	Podocarpus totara	Pod tot	Pb28	spot
Nikau Palm	Rhapalostylis sapida	Rha sap	Pb28	spot
Kowhai	Sophora tetraphylla	Sop tet	Pb28	spot
Tanekaha	Phyllocladus trichomanioides	Phy tri	Pb28	spot
Puriri	Vitex lucens	Vit luc	Pb28	spot
Total				

Common name	Botanical name	Code	Min. size	Min. Density (plants/m2)
Apple Peasgood Non Such	Malus 'Peasgood Non Such'	Mal pns	PB28	spot
Apple Monty's Surprise	Malus 'Monty's Surprise'	Mal ms	Pb28	spot
Pear Beurre Bosc	Pyrus 'Beurre Bosc'	Pyr bb	Pb28	spot
Plum Billington	Prunus 'Billington'	Pru bill	Pb28	spot
Total				

Gully Restoration

(WLFP) WETLAND FRINGE PLANTING (Plant in randomn pattern)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Baumea	Baumea rubiginosa	19	T2B	4/m²
Swamp sedge	Carex secta	19	T2B	4/m²
Swamp sedge	Carex virgata	19	T2B	4/m²
Mingimingi	Coprosma propinqua	5	1.3L	1/m²
Swamp coprosma	Coprosma tenuicaulis	5	1.3L	1/m²
Ti kouka / Cabbage tree	Cordyline australis	19	1.3L	4/m²
Whararīki	Phormium cookianum	5	1.3L	1/m²
Harakeke / Flax Trees	Phormium tenax	5	1.3L	1/m²
Kahikatea	Dacrycarpus dacrycioides	1	1.3L	0.05/m² 5m spacing
Poroka/whiri / Pigeonwood	Hedycarya arborea	1	1.3L	0.05/m² 5m spacing
Pukatea	Laurelia novae-zelandiae	1	1.3L	0.05/m² 5m spacing
Waiwaka / Swamp maire	Syzygium maire	1	1.3L	0.05/m² 5m spacing
Total				

(GFP) GULLY FOOTSLOPE PLANTING (Plant in randomn pattern)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Mikimiki	Coprosma rigida	18	0.5l	1/m²
Karamu	Coprosma robusta	18	0.5l	1/m²
Ti kouka	Cordyline australis	18	1.3L	1/m²
Koromiko	Hebe stricta var. stricta	18	0.5l	1/m²
Trees				
Titoki	Alectryon excelsus	1	1.3L	0.05/m² 5m spacing
Tawa	Beilschmiedia tawa	1	1.3L	0.05/m² 5m spacing
Putaputaweta	Carpodetus serratus	1	1.3L	0.05/m² 5m spacing
Kahikatea	Dacrycarpus dacrycioides	1	1.3L	0.05/m² 5m spacing
Rimu	Dacrydium cupressinum	1	1.3L	0.05/m² 5m spacing
Kotukutuku / Tree fuchsia	Fuchsia excorticata	1	1.3L	0.05/m² 5m spacing
Pukatea	Laurelia novae-zelandiae	1	1.3L	0.05/m² 5m spacing
Manatu	Plagianthus regius	1	1.3L	0.05/m² 5m spacing
Totara	Podocarpus totara	1	1.3L	0.05/m² 5m spacing
Kowhai	Sophora microphylla	18	1.3L	1/m²
Waiwaka / Swamp maire	Syzygium maire	1	1.3L	0.05/m² 5m spacing
Total				

(HSC-SLA) HILL SLOPE AND CREST - SLOPE AREAS (Plant in randomn pattern)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Makomako	Aristotelia serrata	10.5	1.3L	1/m²
Mikimiki	Coprosma rigida	10.5	1.3L	1/m²
Karamu	Coprosma robusta	10.5	1.3L	1/m²
Akeake	Dodonaea viscosa	10.5	1.3L	1/m²
Koromiko	Hebe stricta var. stricta	10.5	1.3L	1/m²
Houhere	Hoheria sextylosa	10.5	1.3L	1/m²
Kanuka	Kunzea robusta	10.5	1.3L	1/m²
Tarata	Pittosporum eugenioides	10.5	1.3L	1/m²
Kohuhu	Pittosporum tenufolium	10	1.3L	1/m²
Trees				
Titoki	Alectryon excelsus	1	1.3L	0.05/m² 5m spacing
Tawa	Beilschmiedia tawa	1	1.3L	0.05/m² 5m spacing
Ranniora	Brachyglottis repanda	1	1.3L	0.05/m² 5m spacing
Poroka/whiri / Pigeonwood	Hedycarya arborea	1	1.3L	0.05/m² 5m spacing
Rewarewa	Knightia excelsa	1	1.3L	0.05/m² 5m spacing
Pukatea	Laurelia novae-zelandiae	1	1.3L	0.05/m² 5m spacing
Total				

(HSC-SSA) Hillslope and Crest – Shoulder and Summit Areas (Plant in randomn pattern)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Makomako	Aristotelia serrata	11	1.3L	1/m²
Mikimiki	Coprosma rigida	11	1.3L	1/m²
Karamu	Coprosma robusta	11	1.3L	1/m²
Akeake	Dodonaea viscosa	11	1.3L	1/m²
Koromiko	Hebe stricta var. stricta	11	1.3L	1/m²
Houhere	Hoheria sextylosa	11	1.3L	1/m²
Kanuka	Kunzea robusta	11	1.3L	1/m²
Tarata	Pittosporum eugenioides	11	1.3L	1/m²
Kohuhu	Pittosporum tenufolium	12	1.3L	1/m²
Total				

(LHLGA) Lizard Habitat Low Grow Areas (Plant in randomn pattern)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Rengarenga	Arthrocodium bifurcatum	4	1.3L	1/m²
Toetoe	Austroderia fulvida	4	1.3L	1/m²
Toetoe	Austroderia richardii	4	1.3L	1/m²
Carex sp.	Carex comans	15	1L	4/m²
Thick leaved coprosma	Coprosma crassifolia	4	1.3L	1/m²
Mingi(ming)	Coprosma propinqua	4	1.3L	1/m²
Turutu / New Zealand blueberry	Dianella nigra	4	1.3L	1/m²
Rasp fern	Doodia australis	14.5	1L	4/m²
Koromiko	Hebe stricta var. stricta	4	1.3L	1/m²
Shrubby tororaro	Muehlenbeckia astonii	4	1.3L	1/m²
Pōhuehue	Muehlenbeckia complexa	4	1.3L	1/m²
Whararīki	Phormium cookianum spp. Hookeri	4	1.3L	1/m²
Harakeke / New Zealand flax Trees	Phormium tenax	4	1.3L	1/m²
Thin-leaved coprosma	Coprosma areolata	0.5	1.3L	0.05/m² 5m spacing
Karamū	Coprosma lucida	4	1.3L	1/m²
Karamu	Coprosma robusta	4	1.3L	1/m²
Mingi(ming)	Coprosma propinqua	4	1.3L	1/m²
Coprosma sp.	Coprosma rotundifolia	0.5	1.3L	0.05/m² 5m spacing
Karaka	Corynocarpus laevigatus	0.5	1.3L	0.05/m² 5m spacing
Kohekohe	Dysoxylum spectabile	0.5	1.3L	0.05/m² 5m spacing
Kānuka	Kunzea robusta	4	1.3L	1/m²
Mānuka	Leptospermum scoparium var. scoparium	4	1.3L	1/m²
Māhoe	Melicytus ramiflorus	4	1.3L	1/m²
Maaou	Myrsine australis	0.5	1.3L	0.05/m² 5m spacing
Total				

(GLGG) General Low Growing Groundcover (Plant in randomn pattern)

Common name	Botanical name	% age	Min. size	Min. Density (plants/m2)
Rengarenga	Arthrocodium bifurcatum	6.5	1.3L	2/m²
Swamp Astella	Astella grandis	7	1.3L	2/m²
Toetoe	Austroderia fulvida	7	1.3L	2/m²
Carex sp.	Carex comans	13	1L	4/m²
Kiokio	Blechnum novae-zelandiae	7	1.3L	2/m²
Mikimiki	Coprosma rigida	6.5	1.3L	2/m²
Turutu	Dianella haematica	6.5	1.3L	2/m²
Turutu / New Zealand blueberry	Dianella nigra	6.5	1.3L	2/m²
Rasp fern	Doodia australis	13	1L	4/m²
Square-stemmed sedge	Lepidosperma australe	6.5	1.3L	2/m²
Tuhara, Pepese	Machaerina sinclairii	6.5	1.3L	2/m²
Shrubby tororaro	Muehlenbeckia astonii	7	1.3L	2/m²
Whararīki	Phormium cookianum spp. Hookeri	7	1.3L	2/m²
Total				

	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
0	11.04.2022	Issued for tender	AM	AM	JG

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Hamilton City Council
Te kaunihera o Kirikiriroa

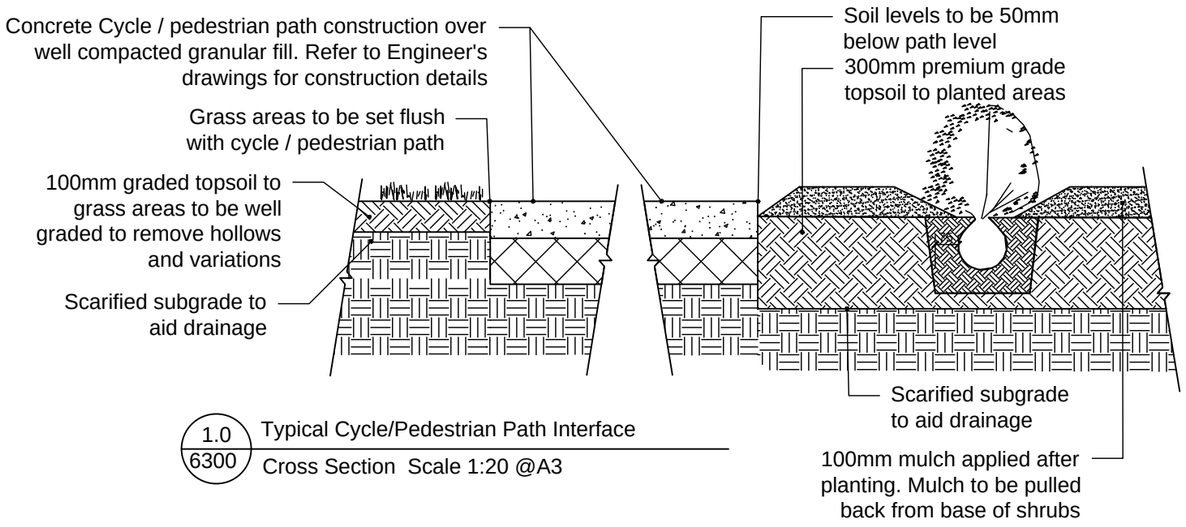
PROJECT: PEACOCKE WHATUKOORURU DRIVE PROJECT

DRAWING: PLANTING SCHEDULE LANDSCAPE PROPOSALS

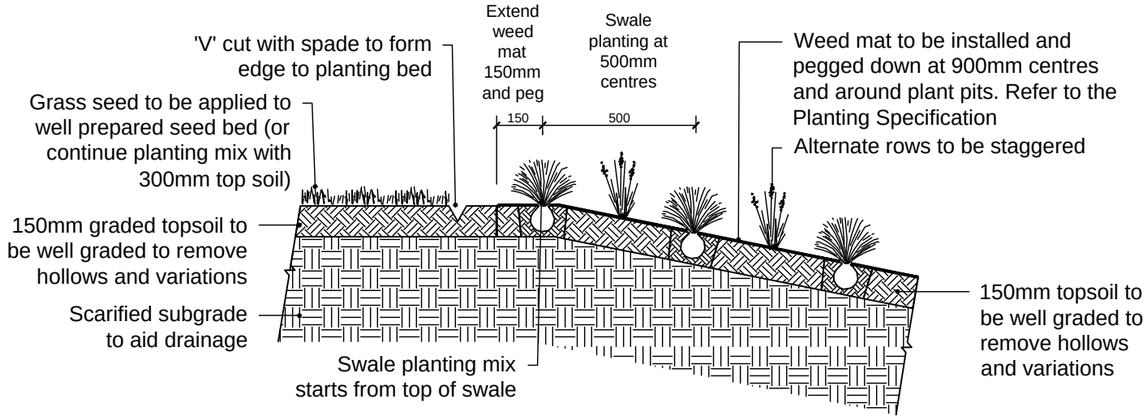
STATUS: TENDER
DATE: 11.04.2022
SCALE (ORIGINAL SIZE A3): NTS
DRAWING NUMBER: 146000-002A-6207
REVISION: 0

APPENDIX C

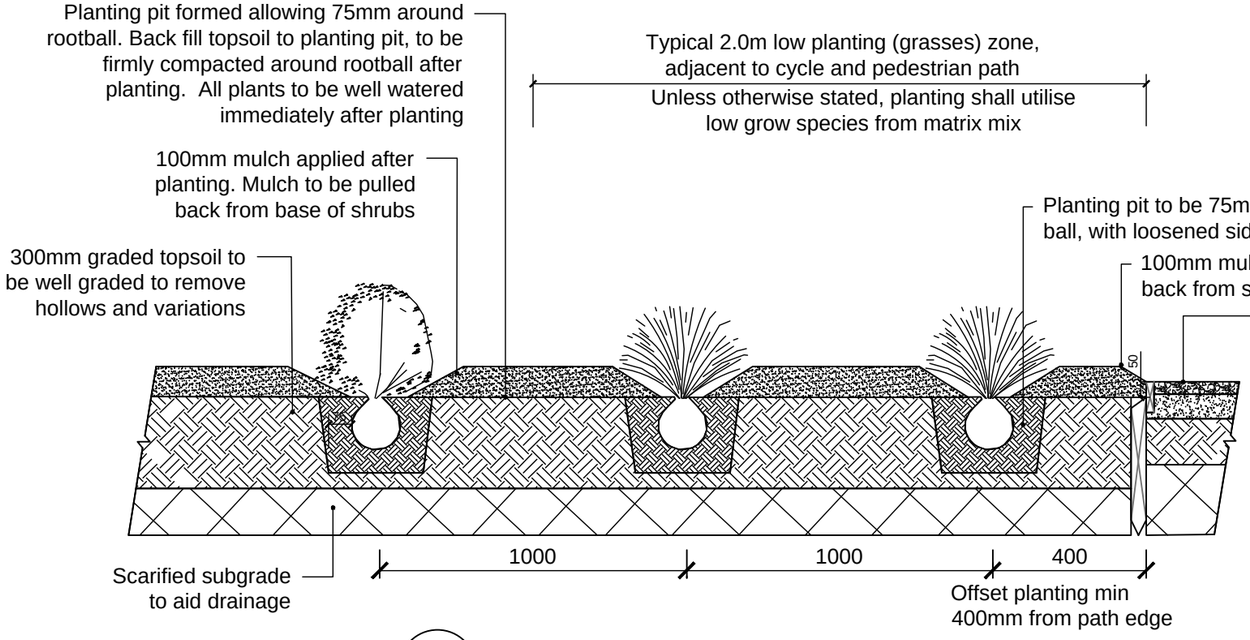
LANDSCAPE DETAIL DRAWINGS
(6300 Drawing Series)



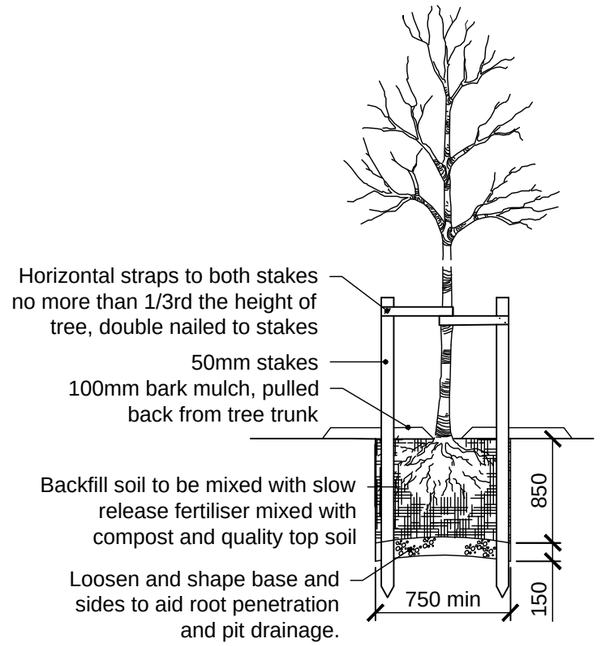
1.0 / 6300 Typical Cycle/Pedestrian Path Interface
Cross Section Scale 1:20 @A3



6 / 6300 GRASS ADJACENT TO PLANTED SWALE
Cross Section Scale 1:20 @A3



3.0 / 6300 Planting Layout Adjacent to Cycle / Pedestrian Path
Cross Section Scale 1:20 @A3



4.0 / 6300 TREE STAKING DETAIL
SCALE 1:50 @ A3

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0	11.04.22	Issued for tender	AM	AM	JG

DESIGNED: AM | CHECKED: JG | DRAWN: AM | APPROVED: JG | mx model version:

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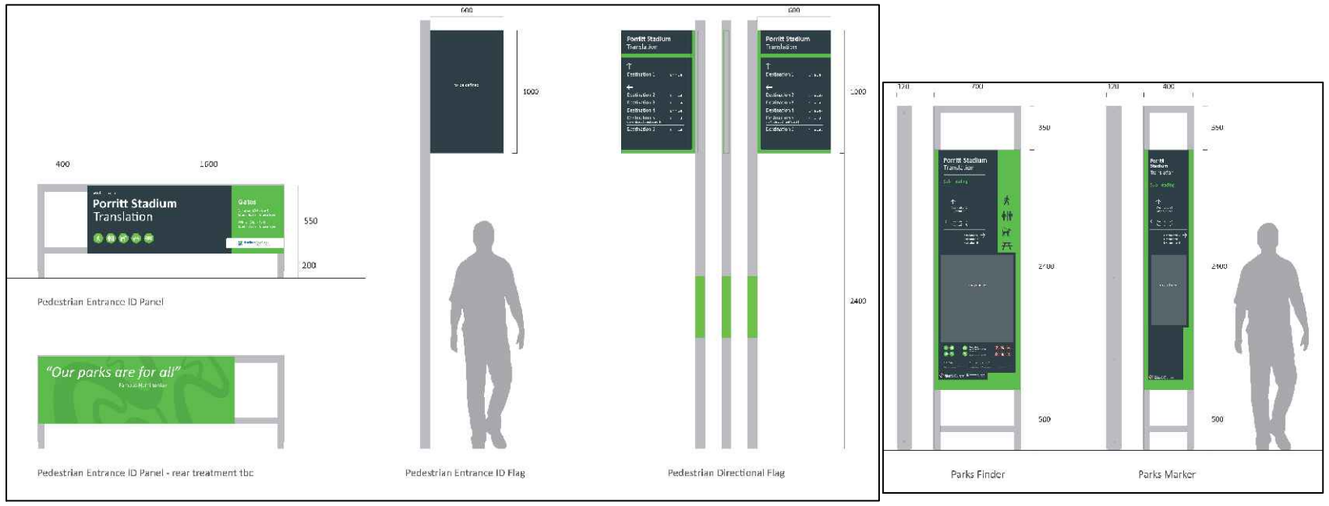
PROJECT: WHATUKOORURU DRIVE STRATEGIC TRANSPORT PROJECT

DRAWING: LANDSCAPE DETAILS CONSTRUCTION DETAILS

STATUS: TENDER
DATE: 11.04.2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6300
REVISION: 0



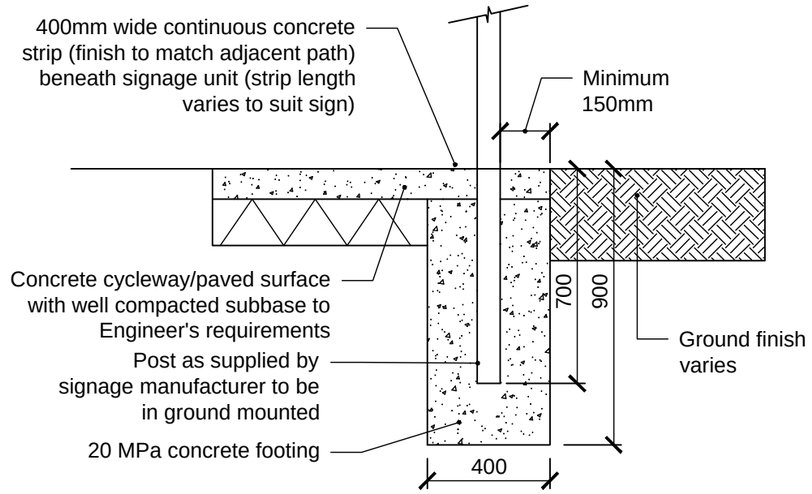
HCC Entrance ID Panel

HCC Directional Flag

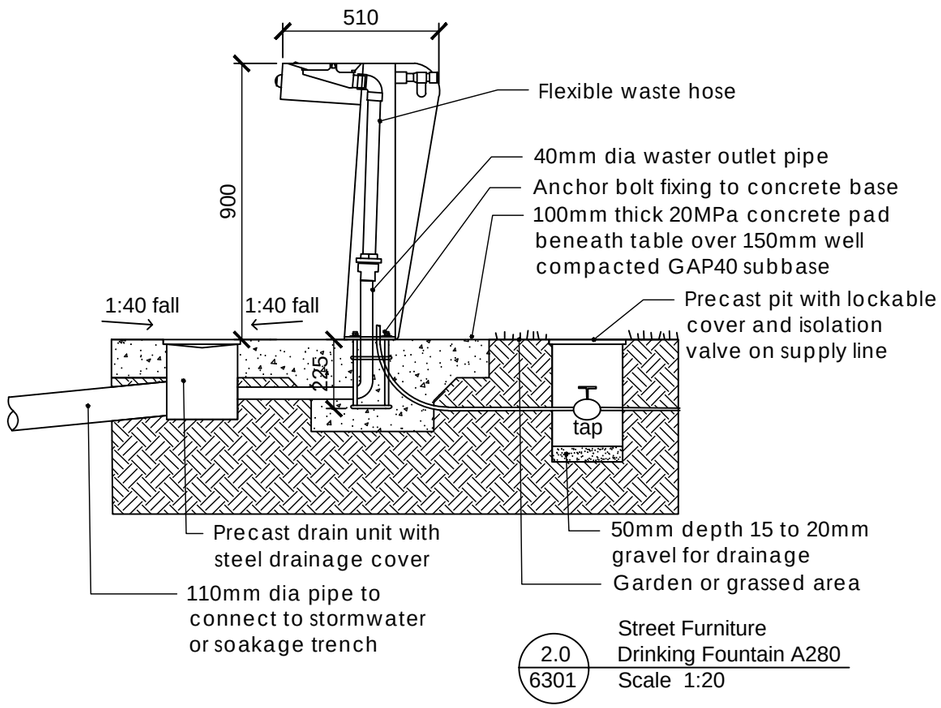
HCC Finder Sign

1.0 / 6301 HCC Signage Types
Scale 1:50

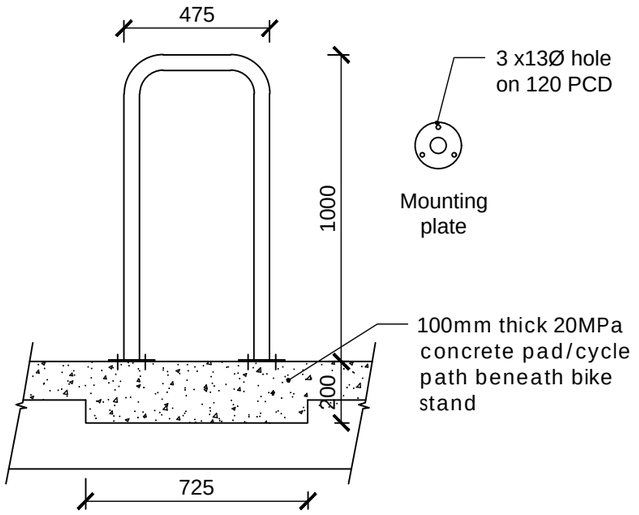
NOTE: Final location, wording and graphic layout to be co-ordinated with HCC Parks and Open Space



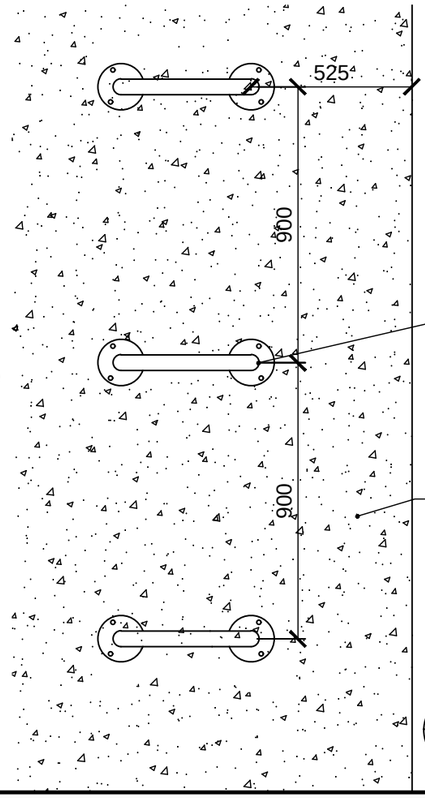
1.1 / 6301 HCC Signage Typical Footing Detail
Scale 1:20



2.0 / 6301 Street Furniture
Drinking Fountain A280
Scale 1:20



3.0 / 6301 Street Furniture
Type D Cycle Stand
Scale 1:20



3.1 / 6301 Street Furniture
Type D Cycle Stand
Plan Scale 1:20

0	11/04/2022	Issued for tender	AM	AM	JG	
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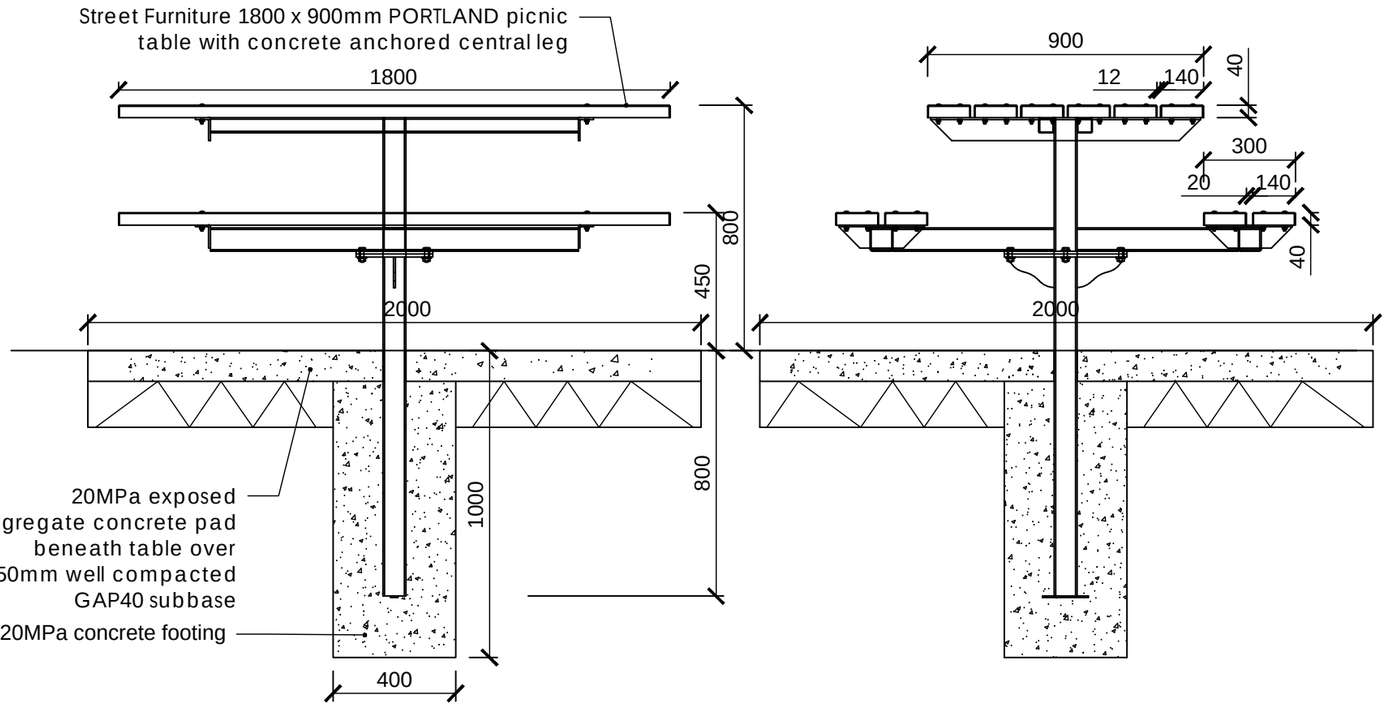
Te kaunihera o Kirikiriroa

PROJECT: WHATUKOORURU DRIVE STRATEGIC TRANSPORT PROJECT

DRAWING: LANDSCAPE DETAILS CONSTRUCTION DETAILS

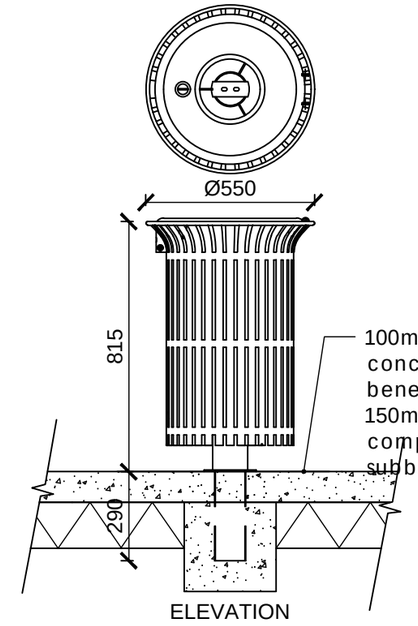
STATUS: TENDER
DATE: 11.04.2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6301
REVISION: 0



FRONT ELEVATION

END ELEVATION

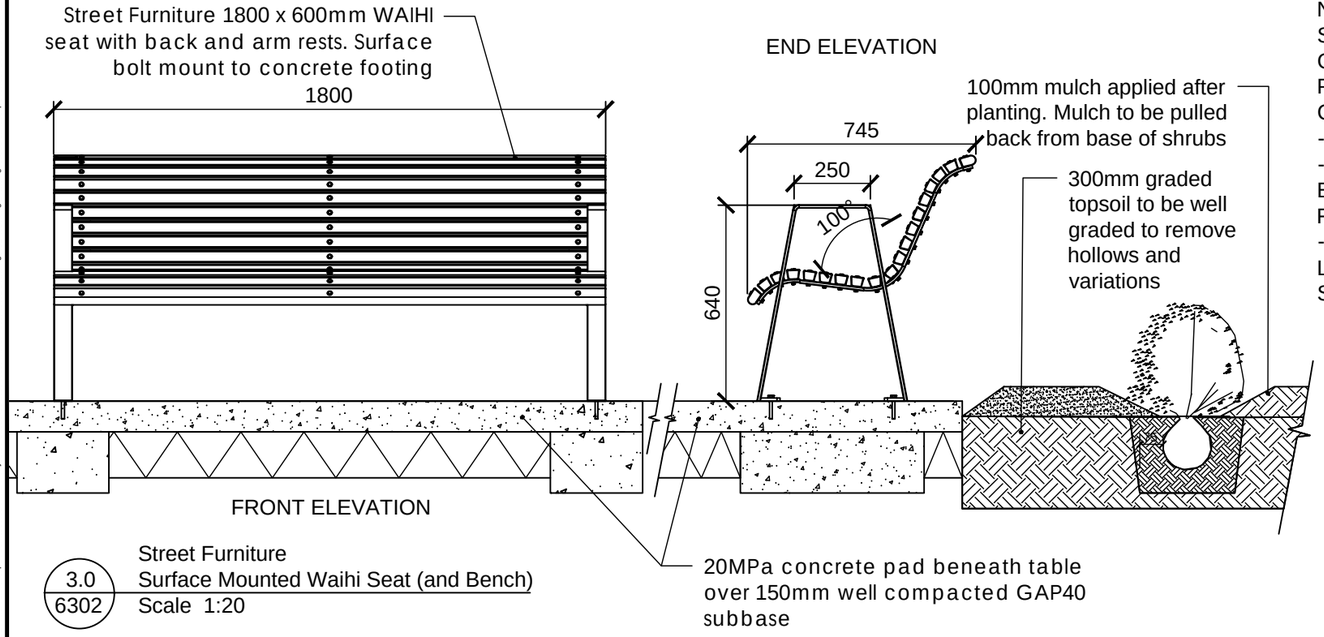
1.0 / 6302 Street Furniture Portland Picnic Set with Central Leg
Scale 1:20



ELEVATION

NOTE:
HCC to confirm finish
Material 316 s/s
electro polish
or bead blast
finish
or ms galv powder
coat finish

2.0 / 6302 Street Furniture
Spinnaker Bin
Scale 1:20

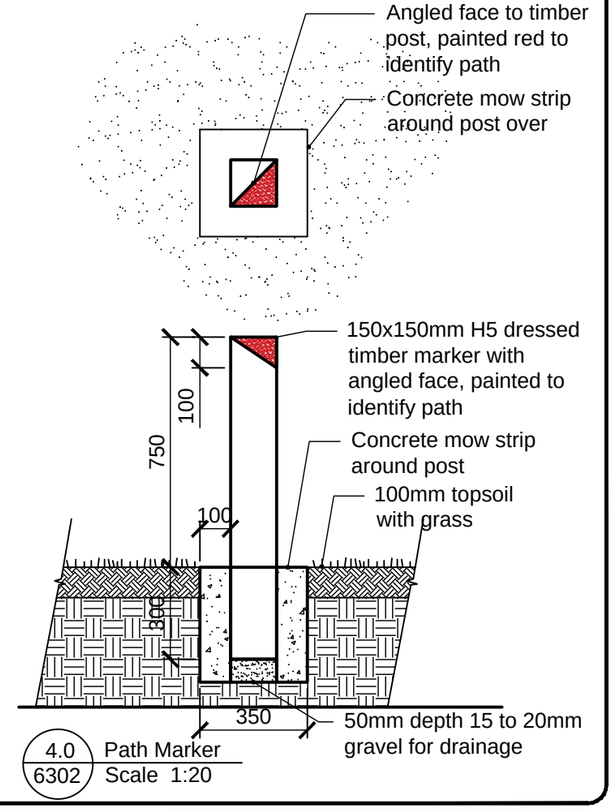


END ELEVATION

FRONT ELEVATION

3.0 / 6302 Street Furniture
Surface Mounted Waihi Seat (and Bench)
Scale 1:20

NOTES:
STANDARD STEELWORK HOT DIP GALVANISED AFTER FABRICATION - POWDER COAT IN DULUX MATT CHARCOAL 09/17
- ALL FASTENERS STAINLESS STEEL
- STANDARD HARDWOOD EUCALYPTUS SALIGNA - NATURAL FINISH
- WAIHI BENCH UNIT TO BE USED IN LOCATIONS AS SHOWN ON GA's. USE SAME FIXING DETAILS



4.0 / 6302 Path Marker
Scale 1:20

	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
0	11/04/2022	Issued for construction	AM	AM	JG

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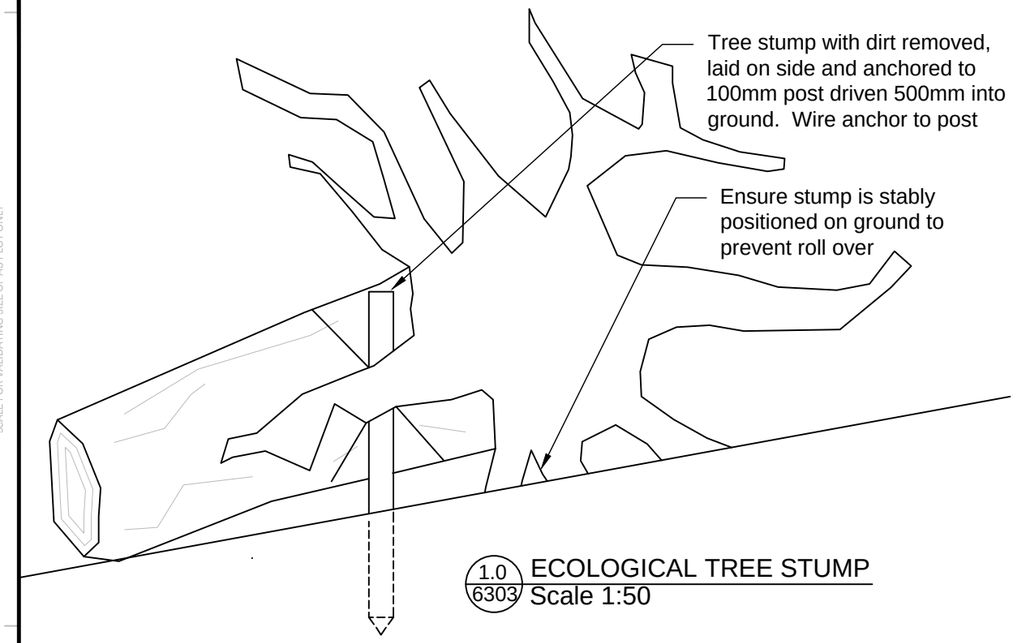
PROJECT
WHATUKOORURU DRIVE
STRATEGIC TRANSPORT
PROJECT

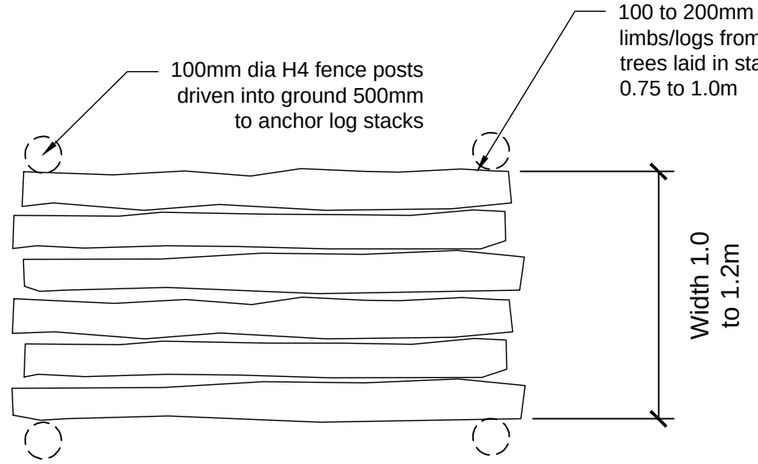
DRAWING
LANDSCAPE DETAILS
CONSTRUCTION DETAILS

STATUS: TENDER
DATE: 11/04/2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6302
REVISION: 0

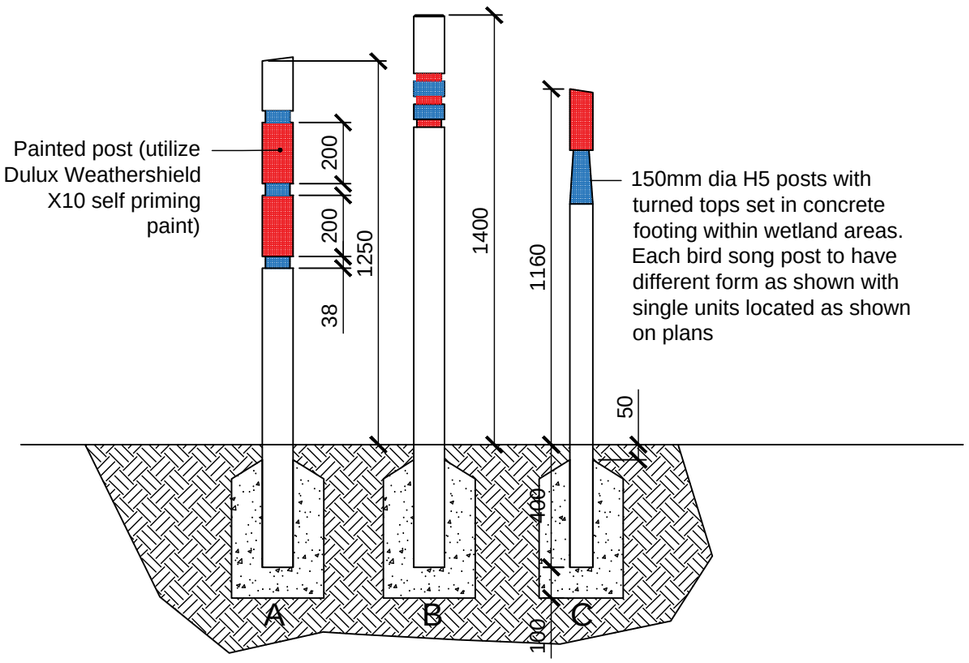
Version 3.0 - September 2017



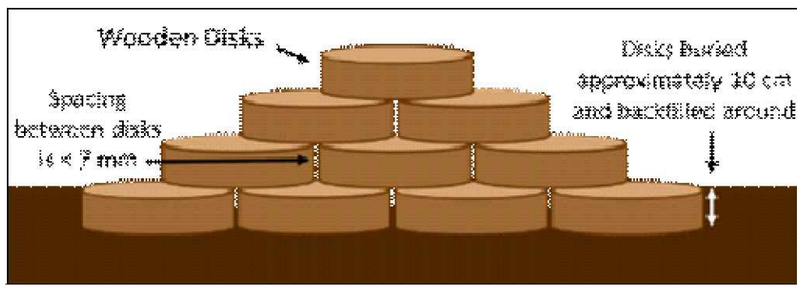
1.0 / 6303 ECOLOGICAL TREE STUMP
Scale 1:50



2.0 / 6303 LOG STACK DETAIL
Scale 1:25



3.0 / 6303 BIRD SONG POST
Scale 1:20



4.0 / 6303 LIZARD REFUGIA DETAIL
Scale NTS

						DESIGNED AM	CHECKED JG	
						DRAWN AM	APPROVED JG	
						mx model version:		
0	11/04/2022	Issued for tender	AM	AM	JG			
	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR			

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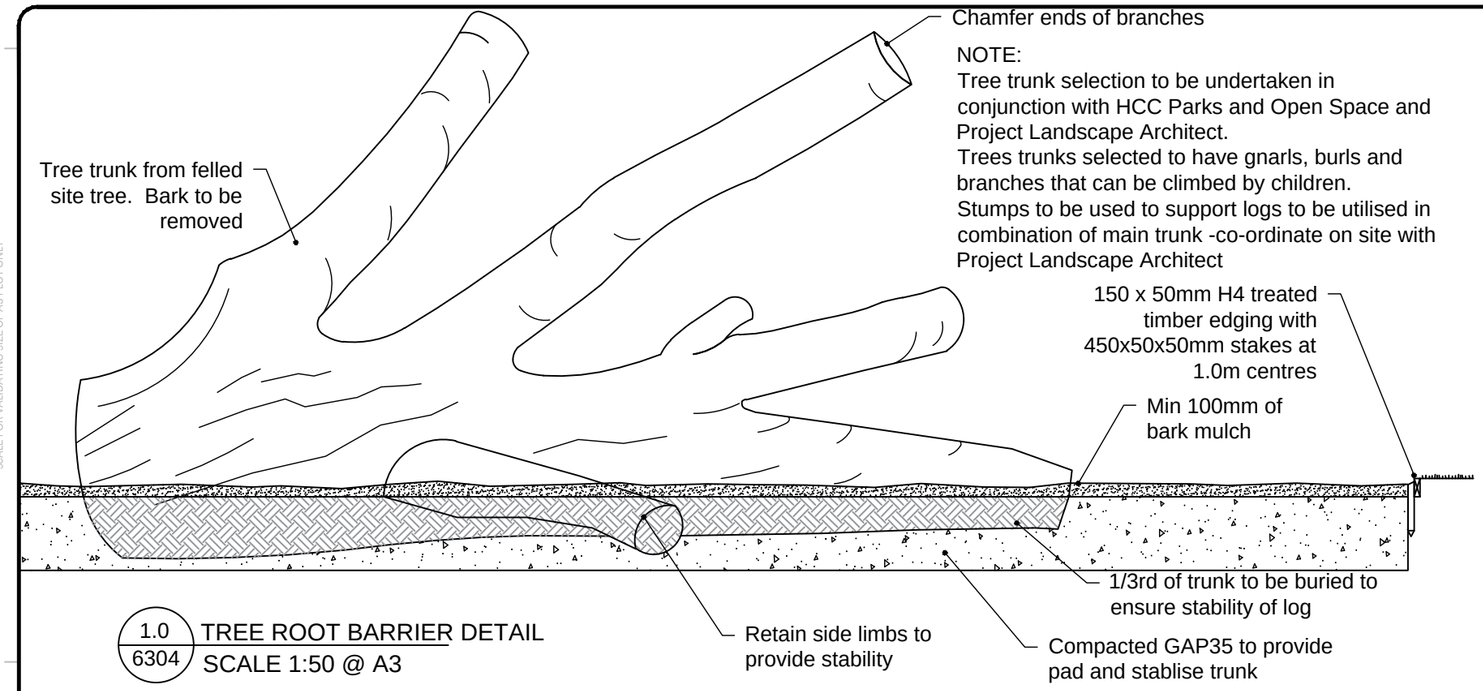
PROJECT
WHATUKOORURU DRIVE
STRATEGIC TRANSPORT
PROJECT

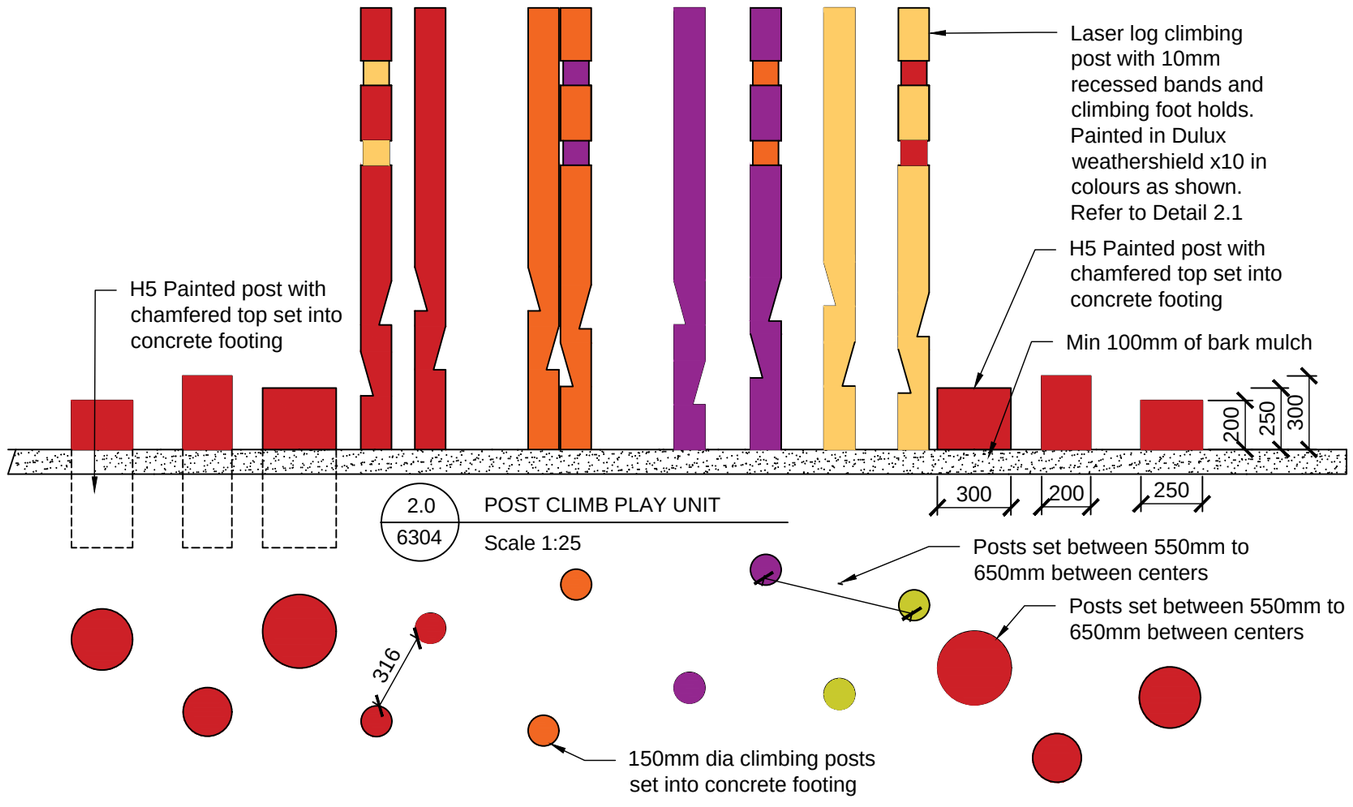
DRAWING
LANDSCAPE DETAILS
ECOLOGICAL ENHANCEMENT DETAILS

STATUS: TENDER
DATE: 11/04/2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6303
REVISION: 0

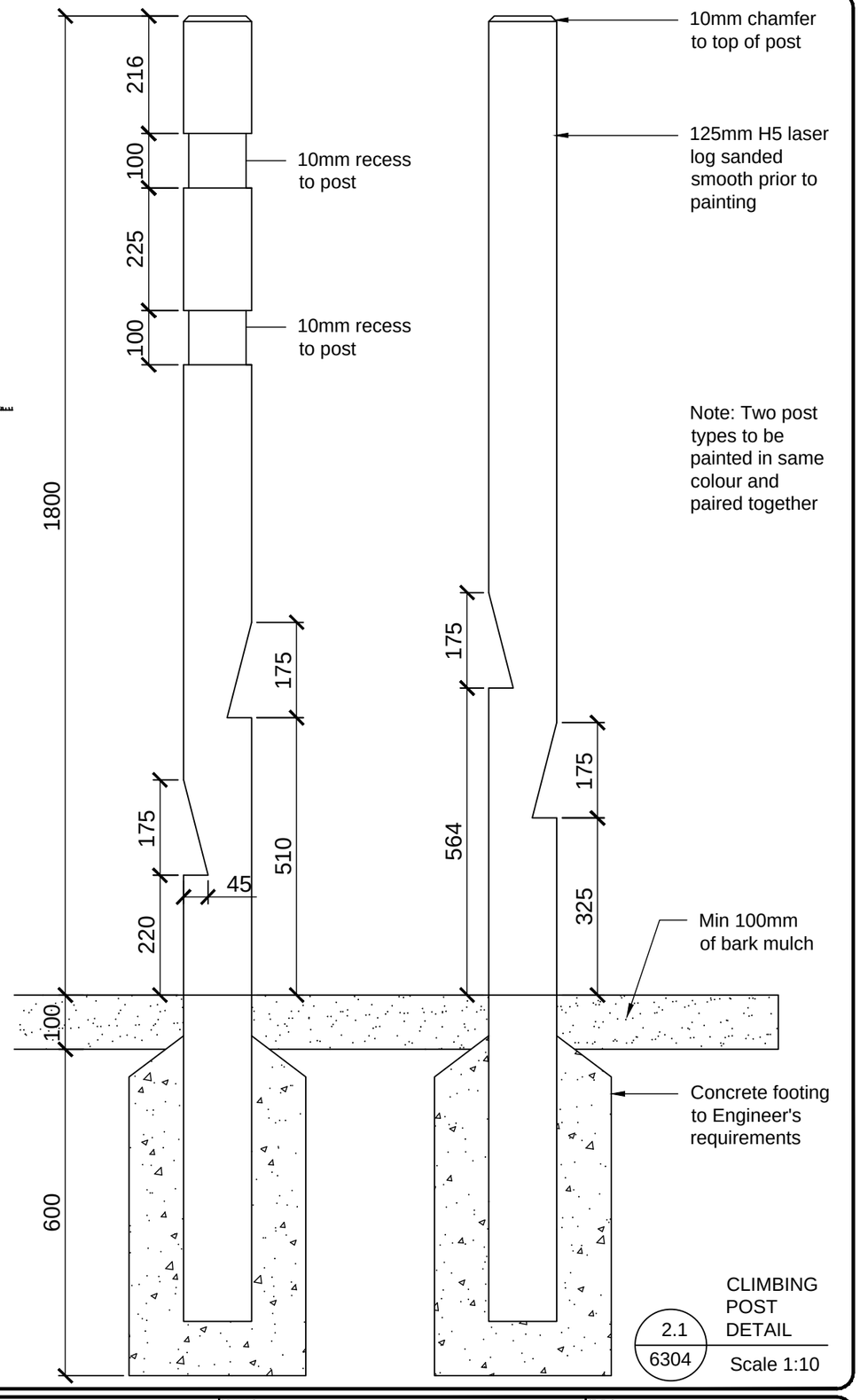
Version 3.0 - September 2017



1.0 / 6304 TREE ROOT BARRIER DETAIL
SCALE 1:50 @ A3



2.0 / 6304 POST CLIMB PLAY UNIT
Scale 1:25



2.1 / 6304 CLIMBING POST DETAIL
Scale 1:10

	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
0	11/04/2022	Issued for tender	AM	AM	JG

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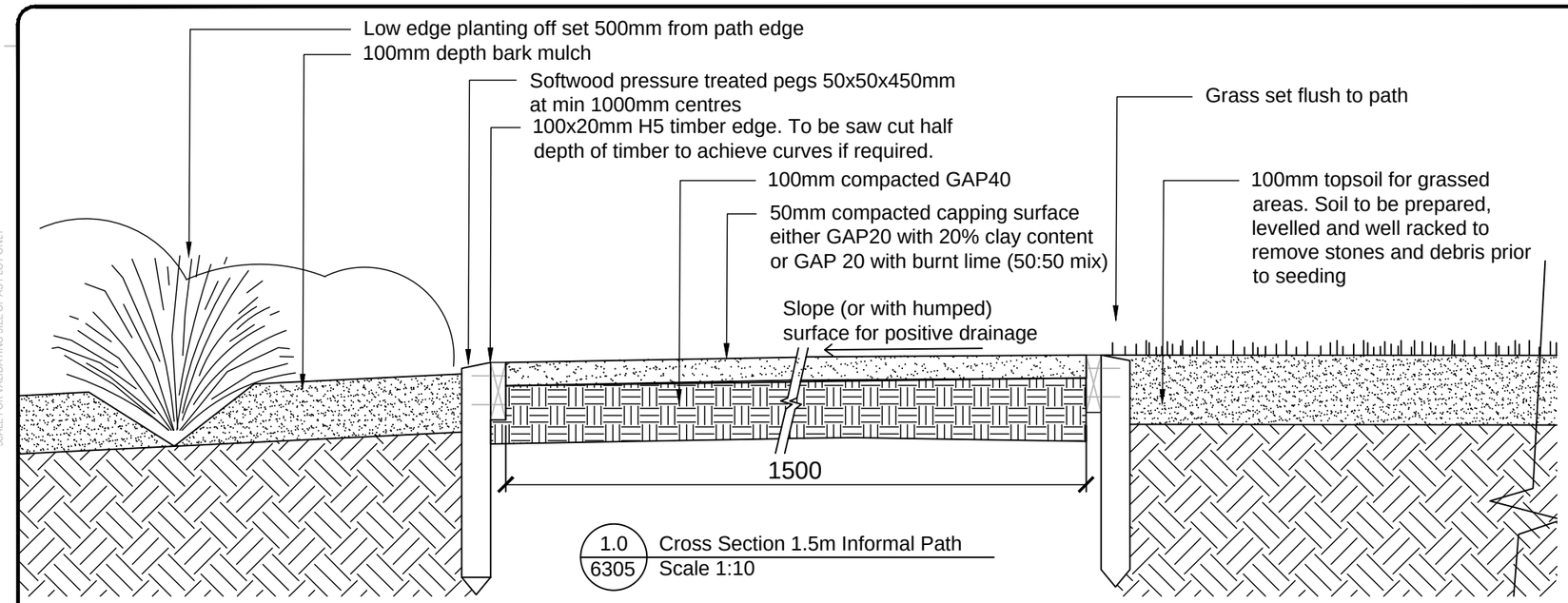
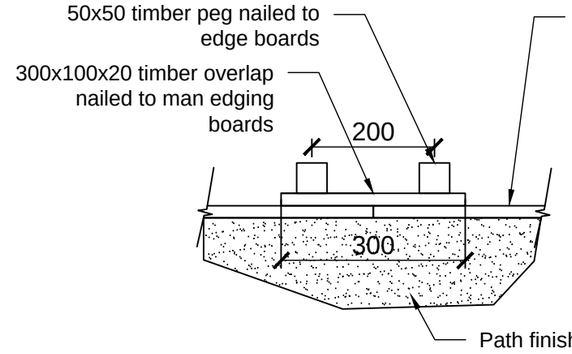
PROJECT: WHATUKOORURU DRIVE STRATEGIC TRANSPORT PROJECT

DRAWING: LANDSCAPE DETAILS PLAY EQUIPMENT

STATUS: TENDER
DATE: 11/04/2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6304
REVISION: 0

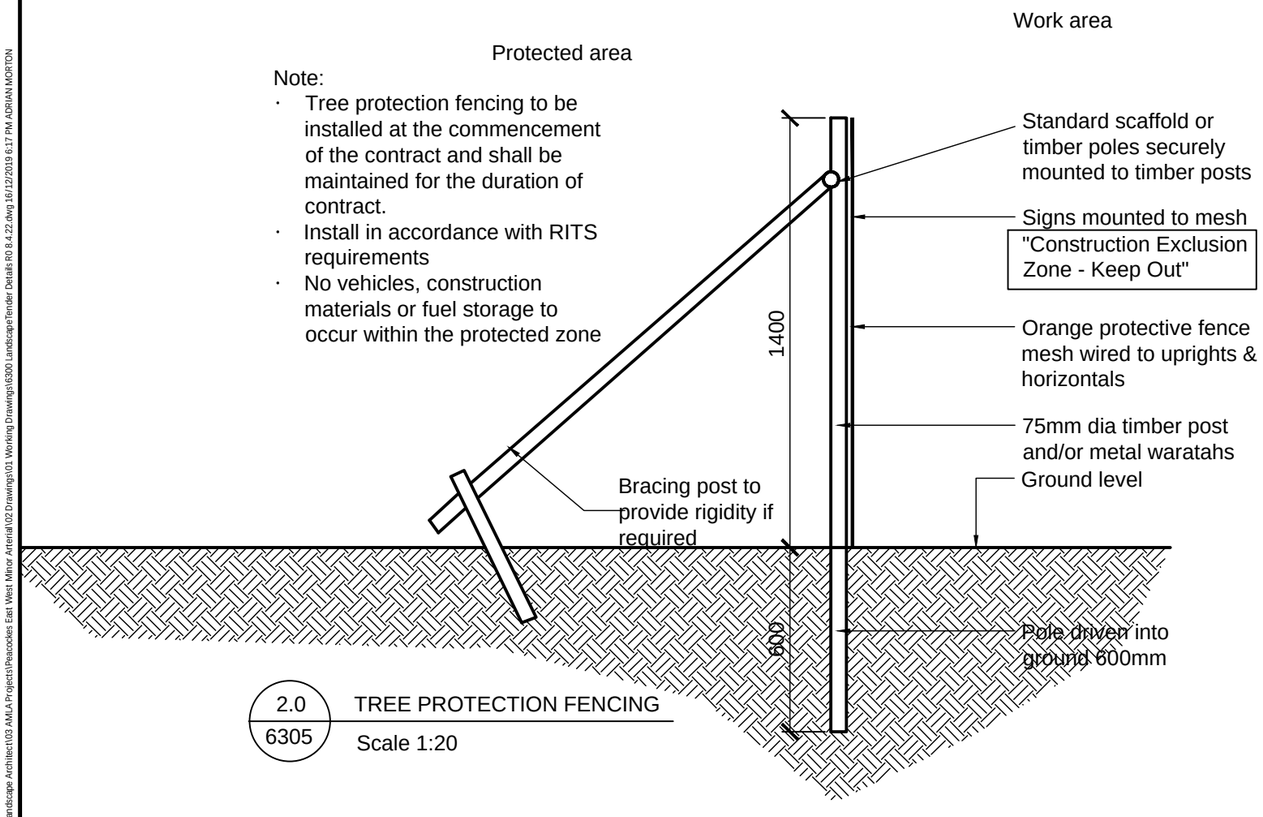


1.0 / 6305 Cross Section 1.5m Informal Path
Scale 1:10

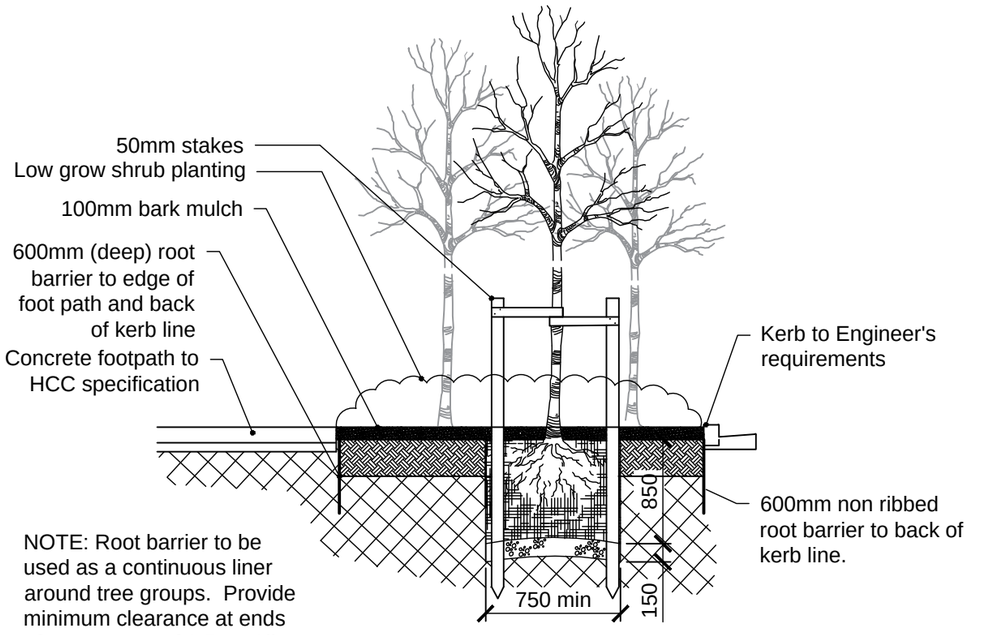


1.1 / 6305 Timber Path Edge Join Detail
Scale 1:10 Plan View

Note:
- Tree protection fencing to be installed at the commencement of the contract and shall be maintained for the duration of contract.
- Install in accordance with RITS requirements
- No vehicles, construction materials or fuel storage to occur within the protected zone



2.0 / 6305 TREE PROTECTION FENCING
Scale 1:20



NOTE: Root barrier to be used as a continuous liner around tree groups. Provide minimum clearance at ends of tree groups of 1.5m. All joints to be taped.

3.0 / 6305 TREE ROOT BARRIER DETAIL
SCALE 1:50 @ A3

	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
0	11/04/2022	Issued for tender	AM	AM	JG

DESIGNED: AM | CHECKED: JG | DRAWN: AM | APPROVED: JG | mx model version:

BLOXAM BURNETT & OLLIVER

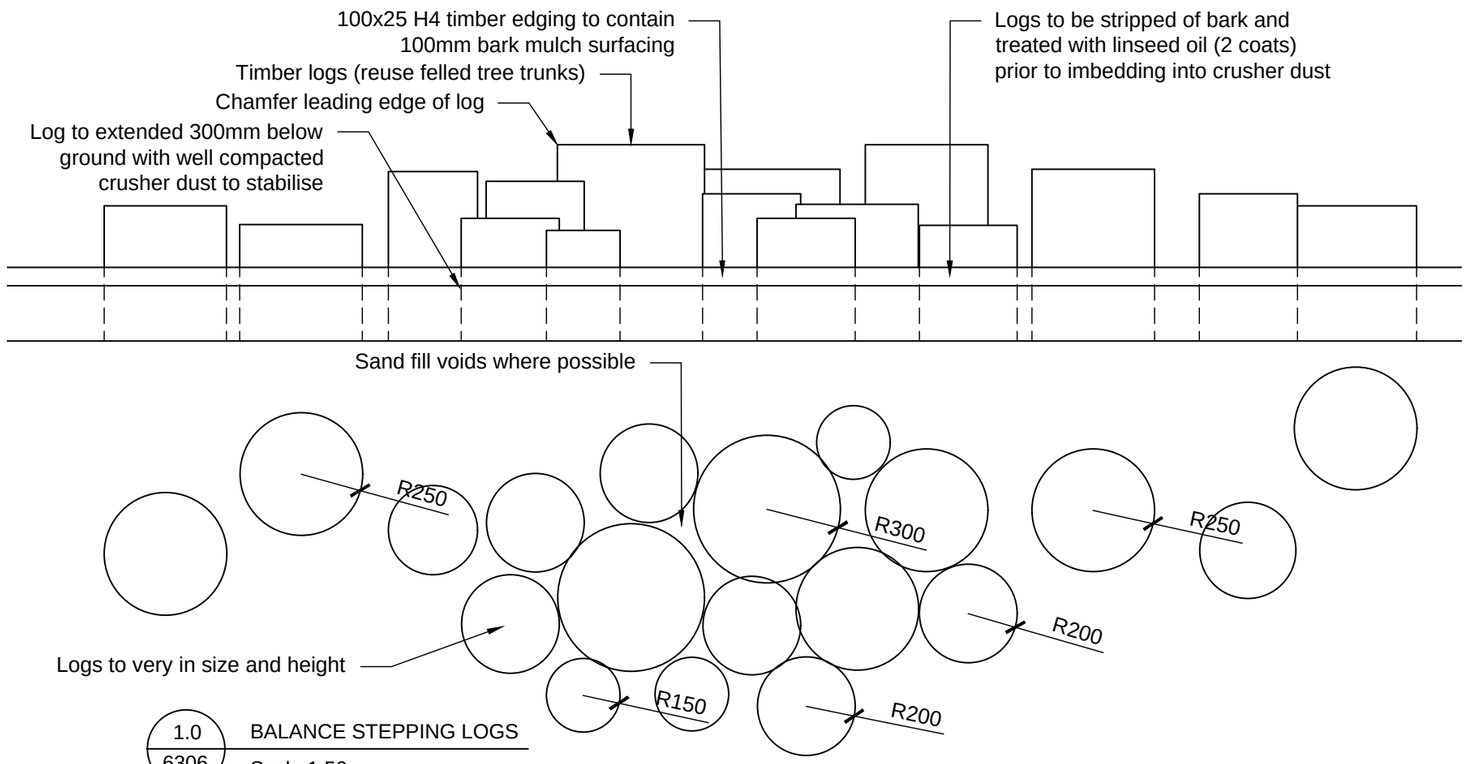
Adrian Morton Landscape Architects Ltd
Landscape Architecture :: Urban Design :: Environmental Planning

Hamilton City Council
Te kaunihera o Kirikiriroa

PROJECT: WHATUKOORURU DRIVE STRATEGIC TRANSPORT PROJECT

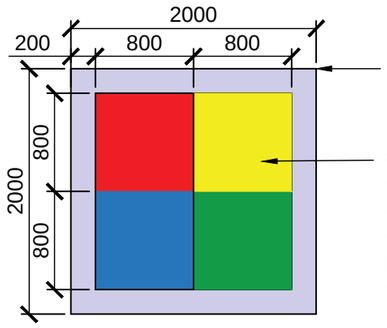
DRAWING: LANDSCAPE DETAILS CONSTRUCTION DETAILS

STATUS: TENDER
DATE: 11/04/2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6305
REVISION: 0



1.0 / 6306 BALANCE STEPPING LOGS

Scale 1:50

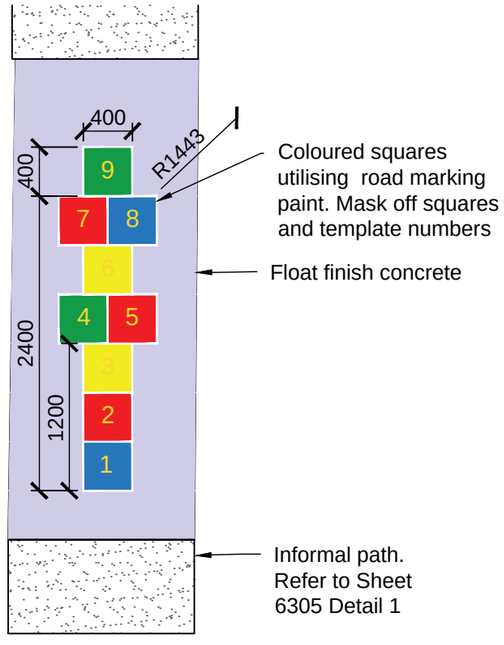


2.0 / 6306 FOUR SQUARE BALL PLAY

Scale 1:50

PAINT SPECS

- Paint system to be applied in accordance with paint manufacturer's/supplier's recommendations
- Supplier: Protective Paints Ltd
- Paint Type: C/R (Chlorinated Rubber) Roadmarking
- Colour Types: BAHAMA BLUE (8817DG)
-- SKY BLUE (881750)
-- ORANGE (881320)
- Surface to prepared and cleaned to accept paint system (brush and water blast)
- Sequence of work to be developed in conjunction with Traffic Management Requirements
- Ensure all unused materials, paints etc are removed from site and disposed of in correct manner



3.0 / 6306 PLAY HOPSCOTCH SAFETY SURFACE

Scale 1:50

	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
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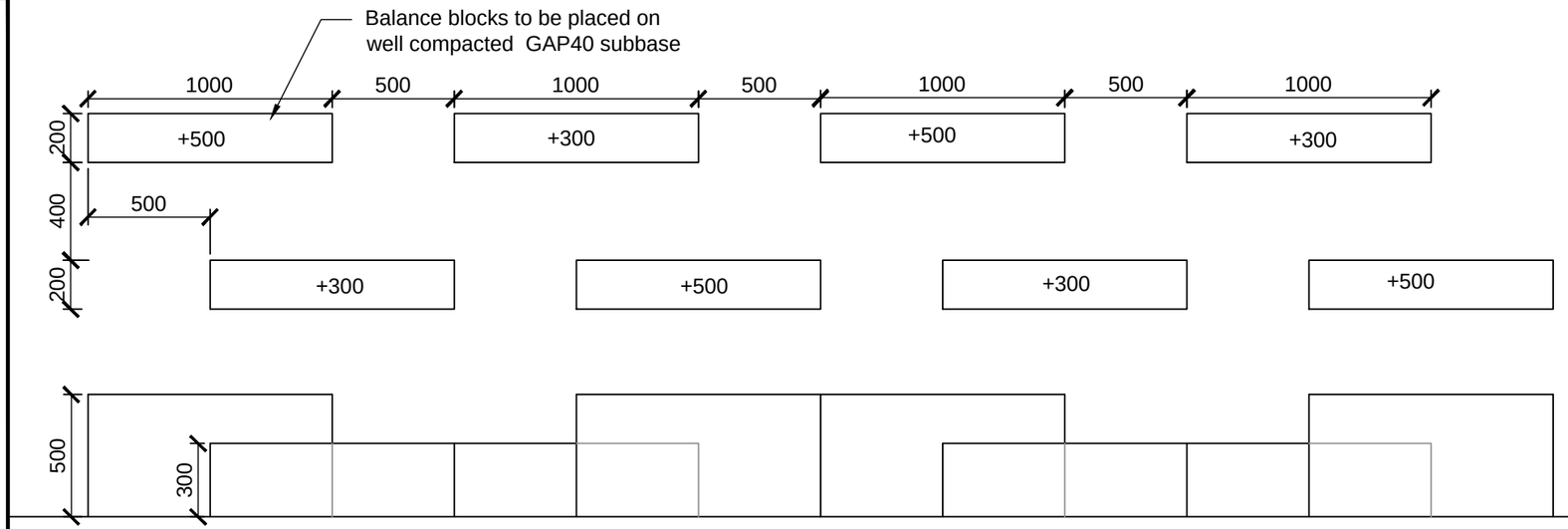
PROJECT: WHATUKOORURU DRIVE STRATEGIC TRANSPORT PROJECT

DRAWING: LANDSCAPE DETAILS PLAY EQUIPMENT

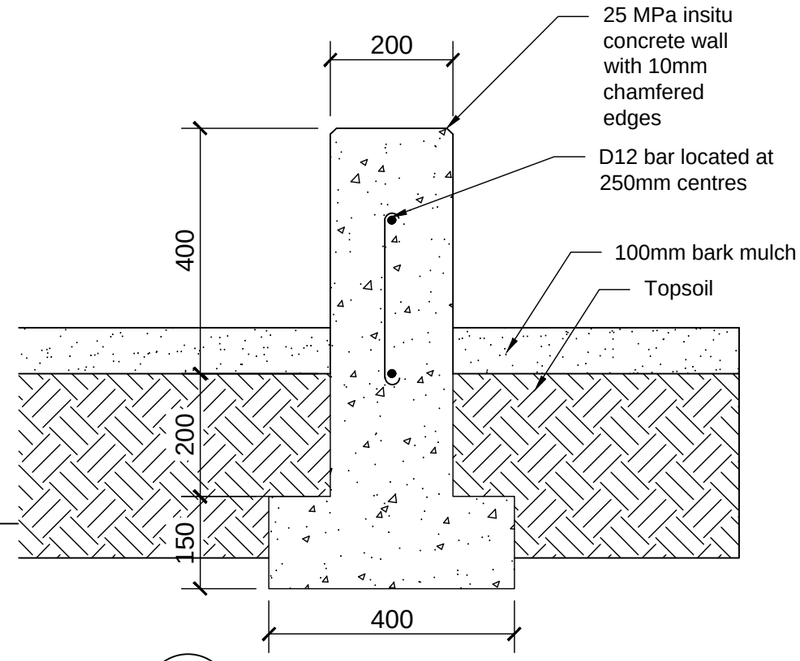
STATUS: TENDER

DATE: 11/04/2022 | SCALE (ORIGINAL SIZE A3): AS SHOWN

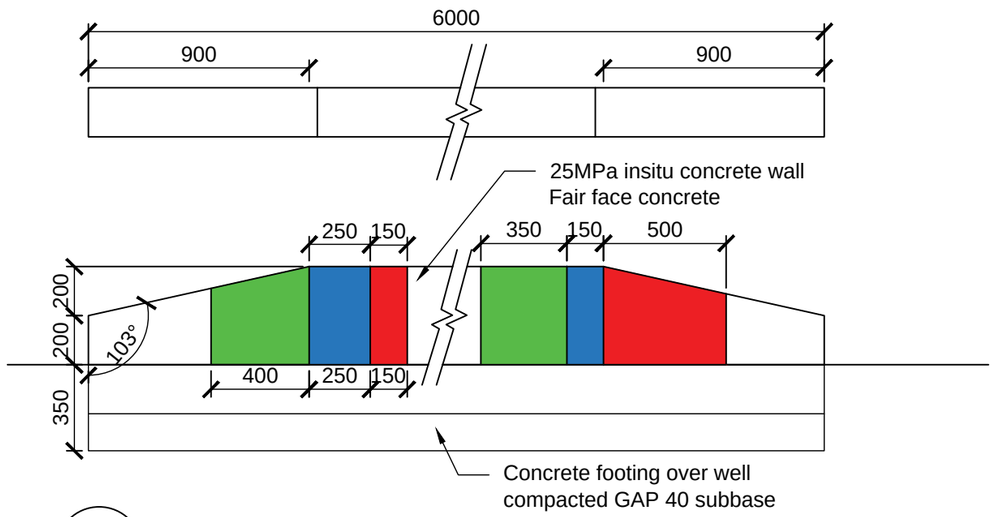
DRAWING NUMBER: 145900-001A-6306 | REVISION: 0



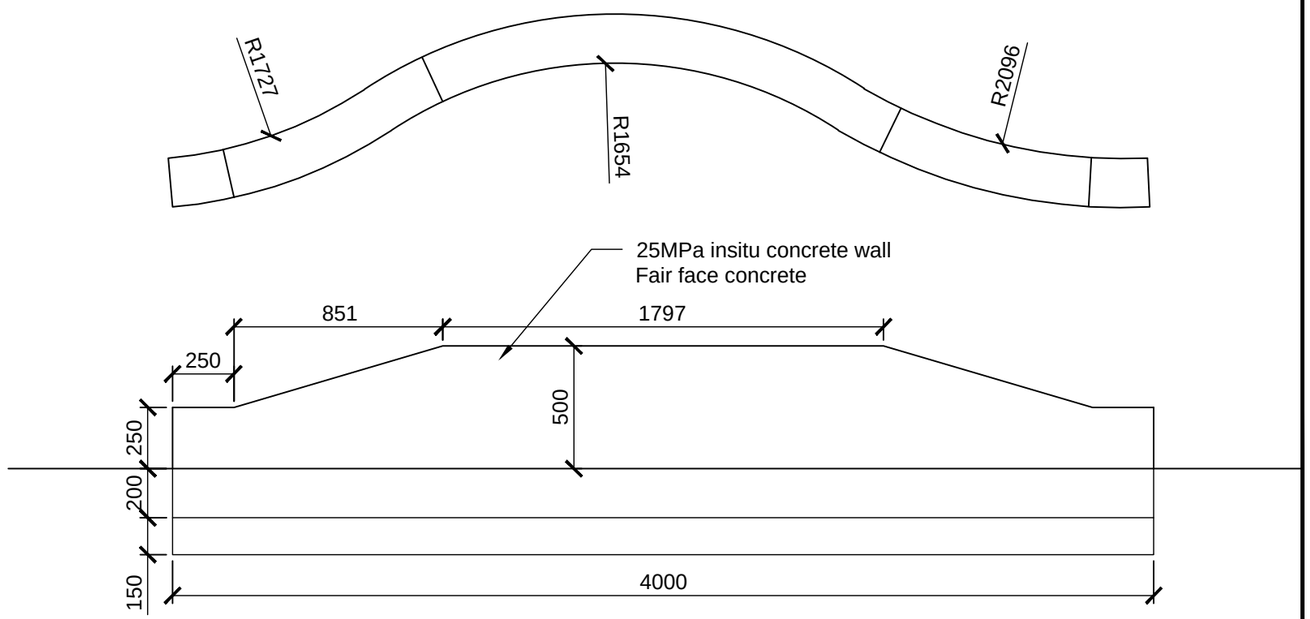
1.0 / 6207 STEPPING BLOCKS
Scale 1:25



1.1 / 6207 TYPICAL CONCRETE WALL DETAIL
Scale 1:10 - typical section



2.0 / 6307 CONCRETE BALANCE BEAM
Scale 1:25



3.0 / 6307 CONCRETE BALANCE BEAM
Scale 1:25

0	11/04/2022	Issued for tender	AM	AM	JG
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mx model version:

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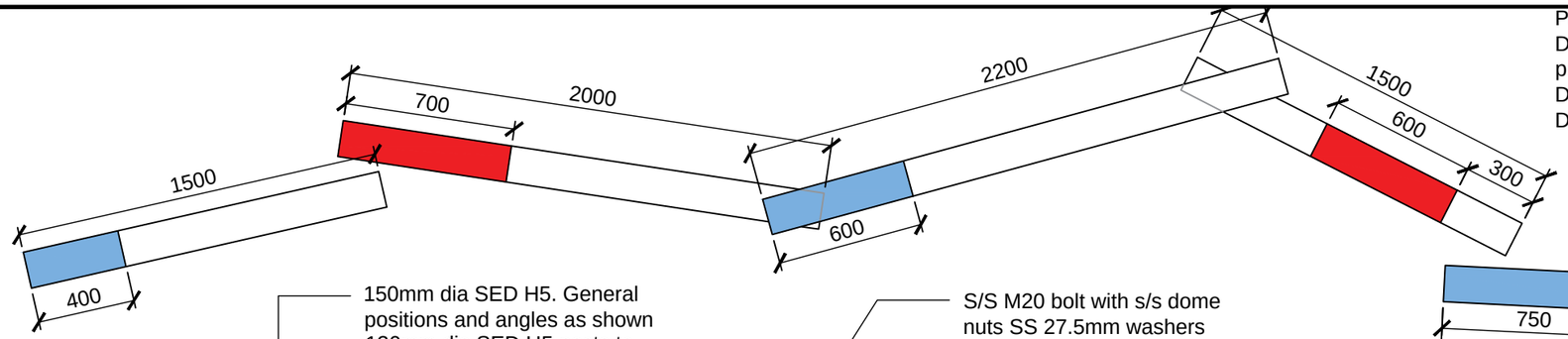
PROJECT: WHATUKOORURU DRIVE STRATEGIC TRANSPORT PROJECT

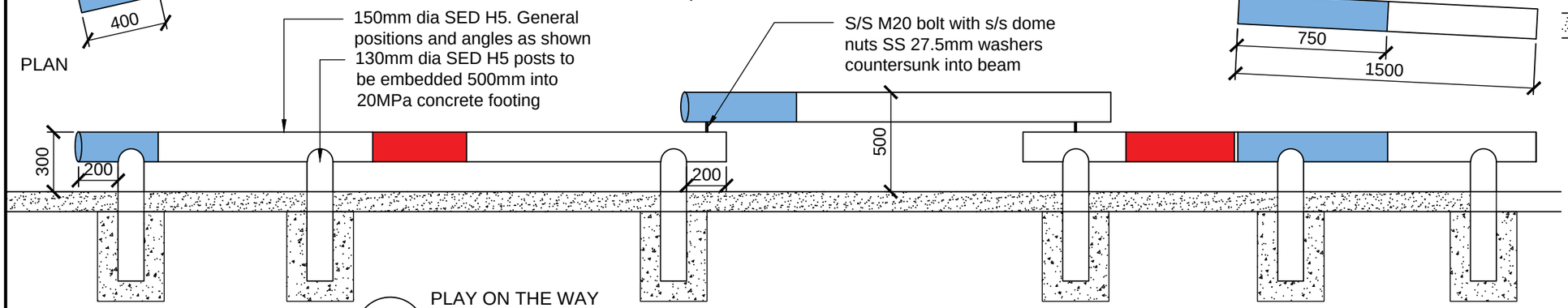
DRAWING: LANDSCAPE DETAILS PLAY ON THE WAY FEATURES

STATUS: TENDER
DATE: 11/04/2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6307
REVISION: 0

Version 3.0 - September 2017



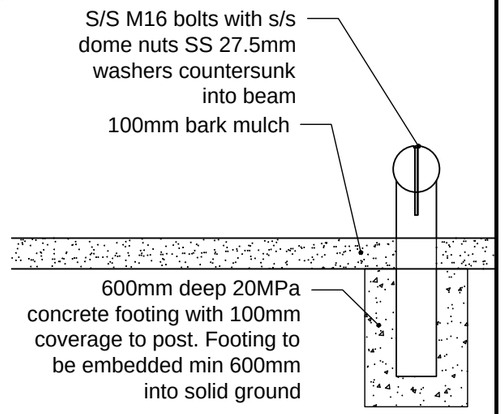
PLAN



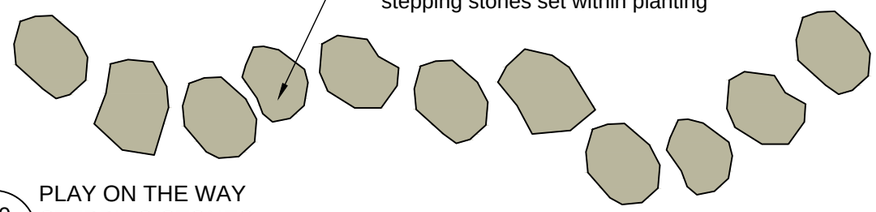
ELEVATION

1.0 / 6308 PLAY ON THE WAY TIMBER BALANCE BEAM
Scale 1:25

Paint:
Dulux Weathershield X10 self priming paint. Colours
Dulux 'Tawa' (red)
Dulux 'Lake Karapiro' (blue)



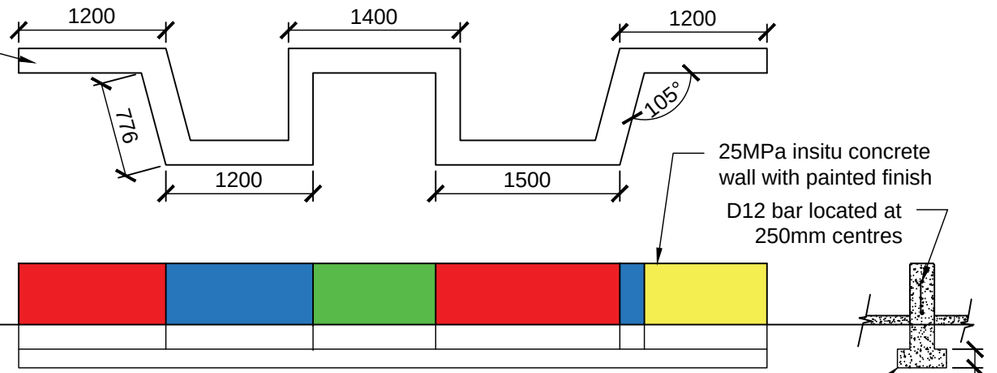
1.1 / 6308 PLAY ON THE WAY TIMBER BALANCE BEAM
Scale 1:20 - typical section



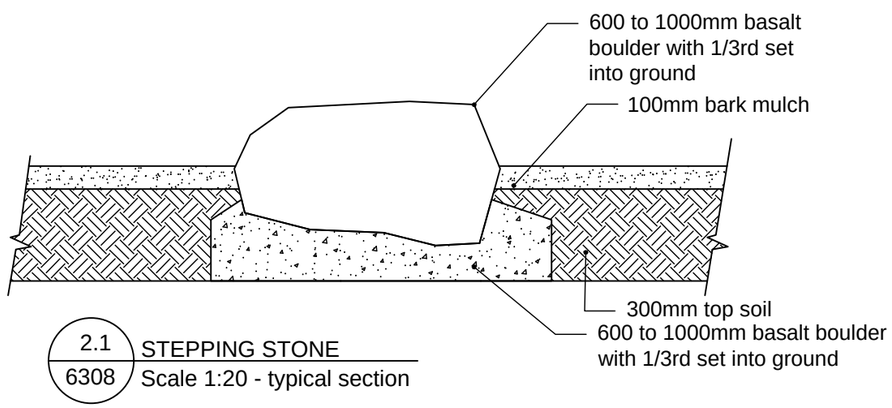
2.0 / 6308 PLAY ON THE WAY STEPPING STONES
Scale 1:50

On site shuttered wall over well compacted subbase. Leading edges to have 10mm chamfer with fair-faced concrete finish

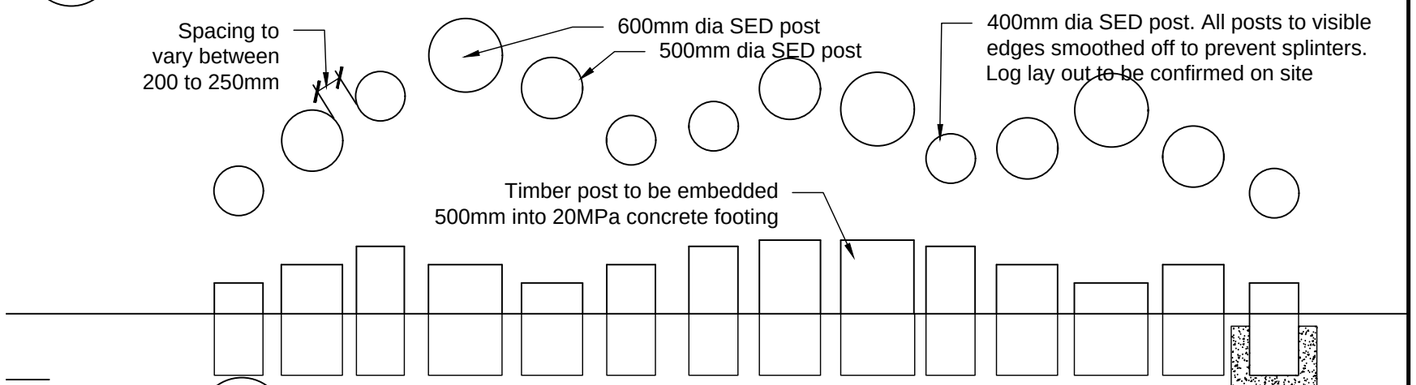
Paint:
Dulux Weathershield X10 self priming paint). Colours
Dulux 'Tawa' (red)
Dulux 'Lake Karapiro' (blue)
Dulux 'Wai O Taki Bay' (green)
Dulux 'Rotorua' (yellow)



3.0 / 6308 PLAY ON THE WAY CONCRETE WALL
Scale 1:50



2.1 / 6308 STEPPING STONE
Scale 1:20 - typical section



4.0 / 6308 PLAY ON THE WAY TIMBER STEPPING LOGS
Scale 1:50

	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
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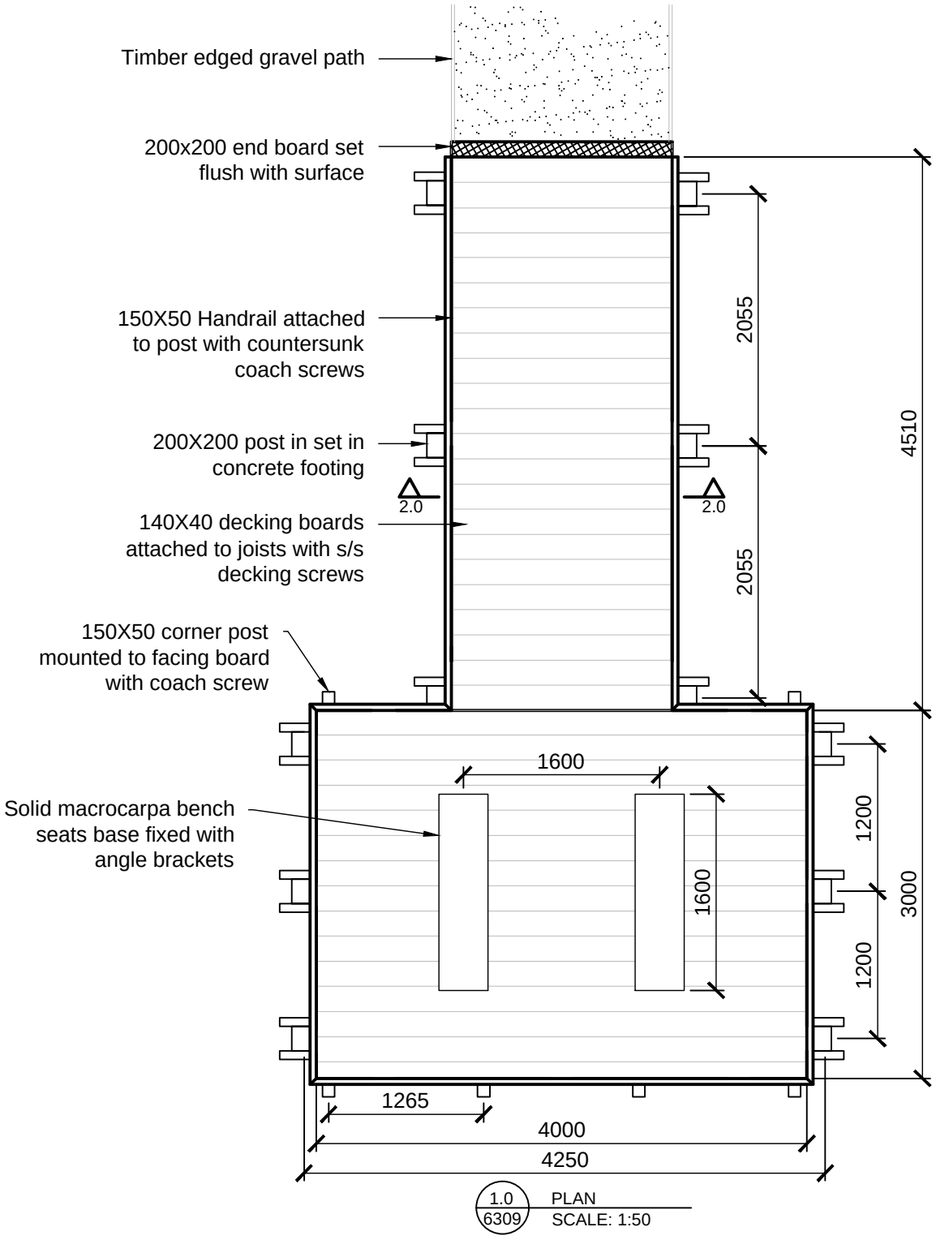
Te kaunihera o Kirikiriroa

PROJECT
WHATUKOORURU DRIVE
STRATEGIC TRANSPORT
PROJECT

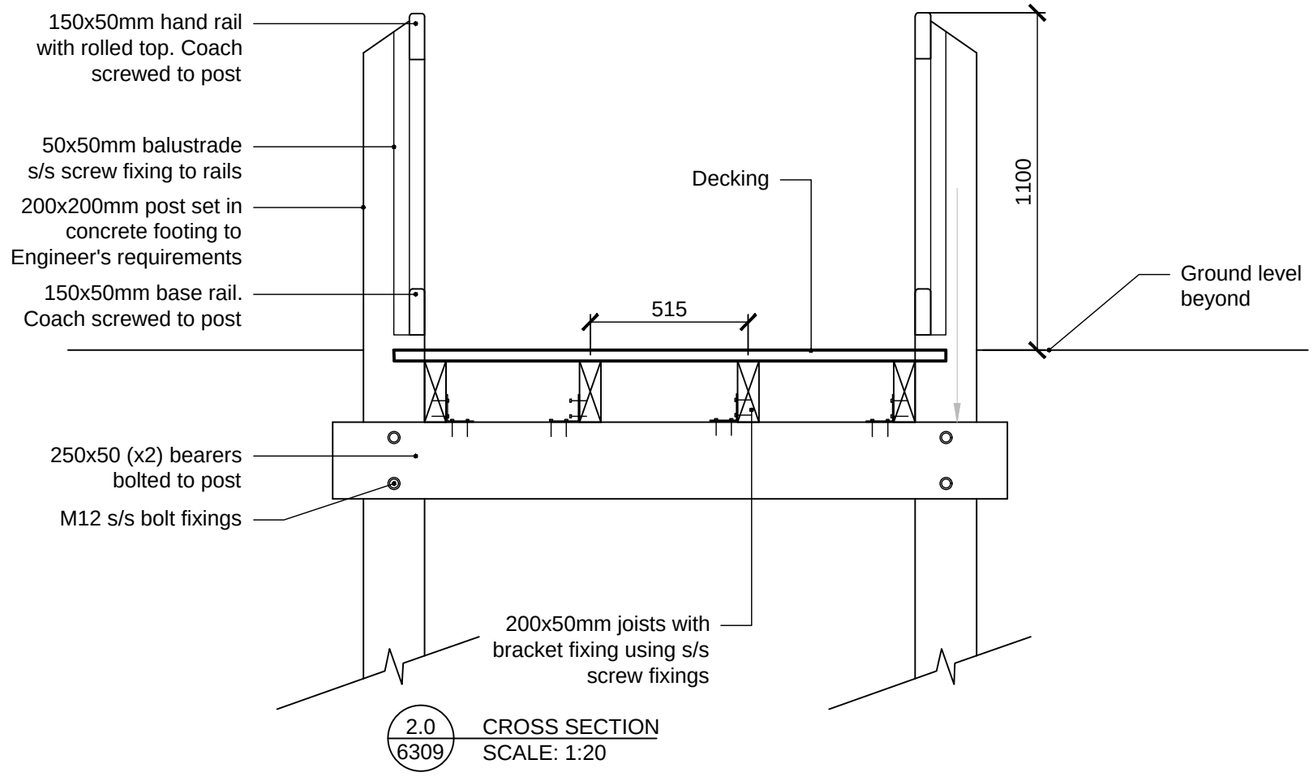
DRAWING
LANDSCAPE DETAILS
PLAY ON THE WAY FEATURES

STATUS: TENDER
DATE: 11/04/2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6308
REVISION: 0

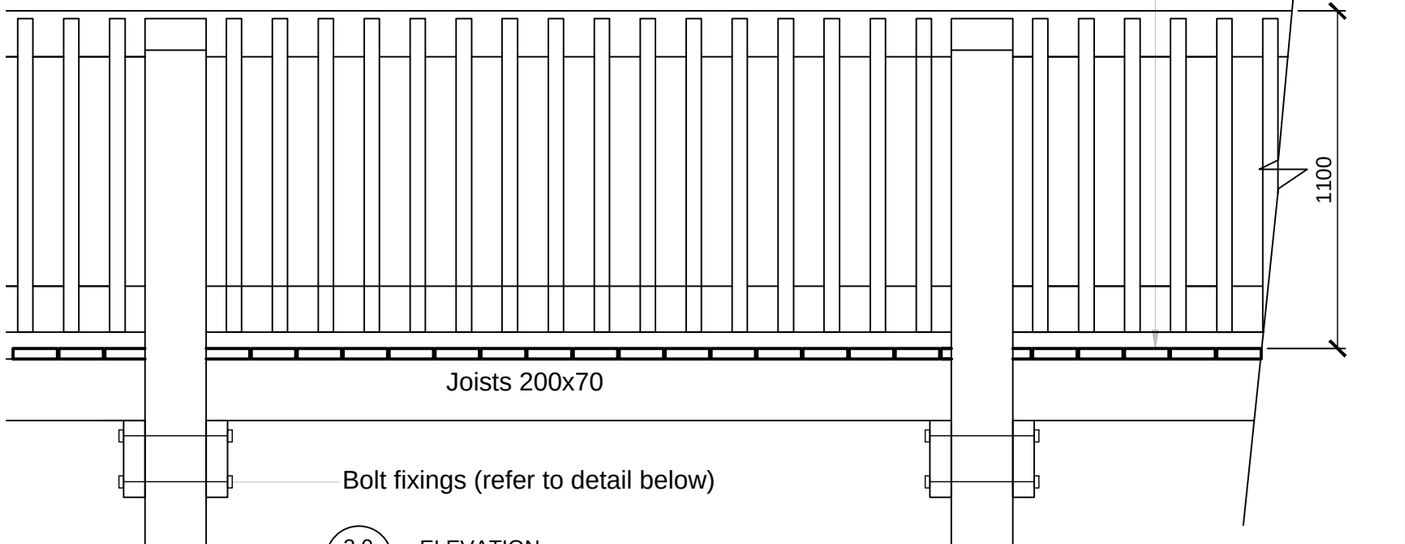
Version 3.0 - September 2017



1.0 / 6309 PLAN
SCALE: 1:50



2.0 / 6309 CROSS SECTION
SCALE: 1:20



3.0 / 6309 ELEVATION
SCALE: 1:20

	DESIGNED	CHECKED
	AM	JG
	DRAWN	APPROVED
	AM	JG

mx model version:

NO	DATE	ISSUE/REVISION DETAIL	BY	CHK	APPR
0	11/04/2022	Issued for tender	AM	AM	JG

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PROJECT
WHATUKOORURU DRIVE
STRATEGIC TRANSPORT
PROJECT

DRAWING
LANDSCAPE DETAILS
VIEWING DECK

STATUS: TENDER
DATE: 11/04/2022
SCALE (ORIGINAL SIZE A3): AS SHOWN
DRAWING NUMBER: 146000-002A-6309
REVISION: 0