Boffa Miskell

# Rangitoopuni

Landscape Management Plan - Structure
Prepared for Rangitoopuni Developments Limited Partnerships

1 May 2025

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## Document Quality Assurance

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| Reviewed by: | [redacted]<br>Partner / Landscape Architect<br>Boffa Miskell Limited | [redacted] |
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Although this is not a hearing before the Environment Court, I record that I have read and agree to comply with the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023. I confirm that this report is within my area of expertise, except where I state that I rely upon the evidence or reports of other expert witnesses lodged forming part of the project's application material. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed.

[redacted]

# CONTENTS



# Appendices

# 1.0 Introduction

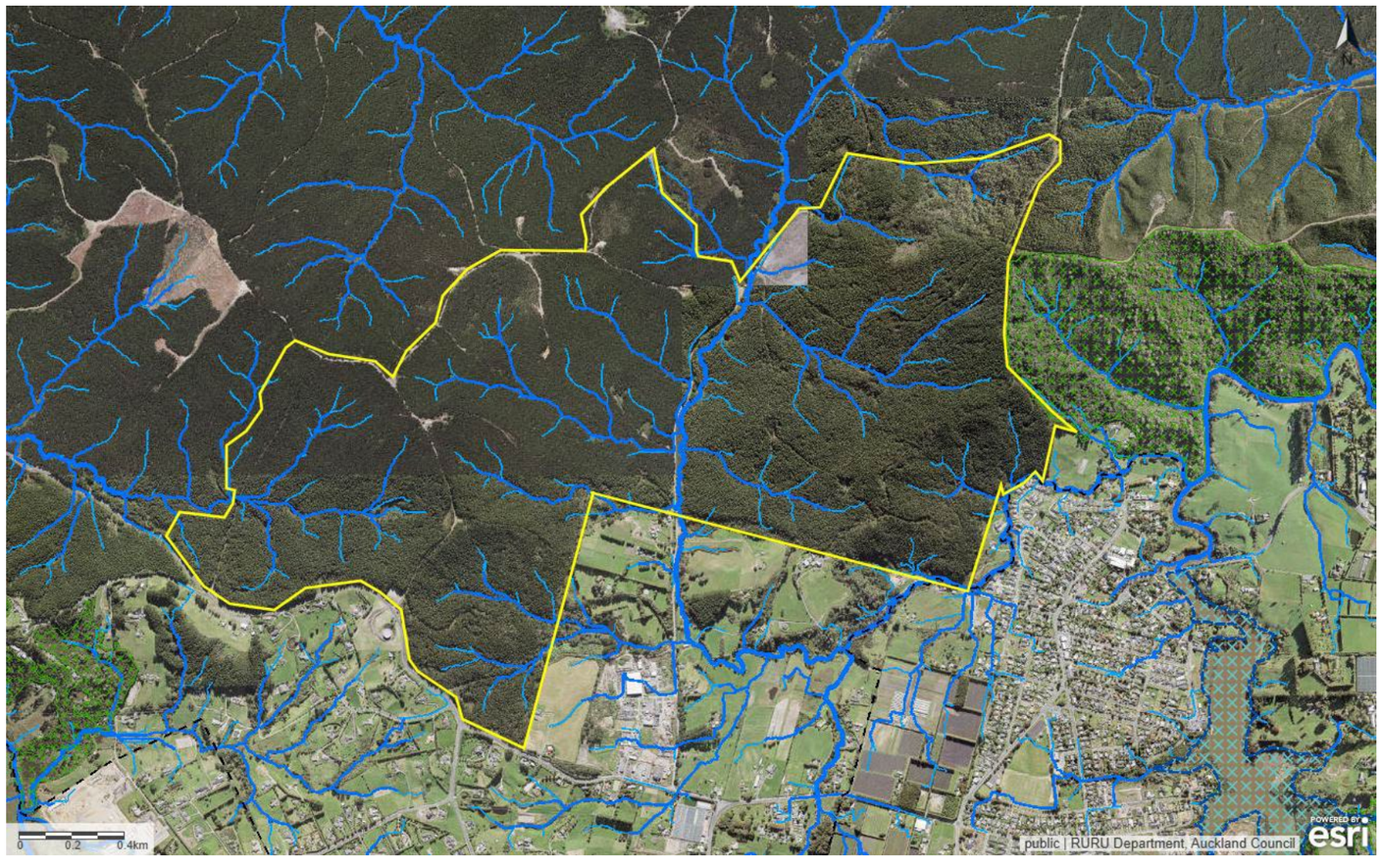
## 1.1 Purpose of the Plan

This Landscape Management Plan (LMP) outlines strategies for sustainable management of the revegetation and amenity planting associated with the Rangitoopuni project site (part of the former the Riverhead Forest, a production pine commercial forest), balancing ecological restoration and conservation, recreational use, cultural significance, and economic opportunities through residential development and sales.

## 1.2 Background

Riverhead Forest is a significant ecological and recreational asset located northwest of Auckland. Covering approximately 4,500 hectares, it features a mix of exotic pine plantations and regenerating native vegetation. Te Kawarau a Maki (TKaM) own some 3,275 hectares with extensive public use, including mountain biking, horse riding, running, walking, and hunting. The surrounding region has growing residential development, intensifying the need for careful landscape management.

Lots 1 and 2 of the Rangitoopuni site, covers approximately 377 hectares of the south eastern portion of the forest.




Lots 1 and 2 combined area and Riverhead location

Auckland Council Geomaps

# 2.0 Goals and Objectives

## 2.1 Goals

### 2.1.1 Preserve and enhance the ecological integrity of Rangitoopuni.

Through the removal of the exotic pine trees and the extensive revegetation of the development site, the ecological health of Rangitoopuni will be significantly enhanced. Te Kawarau a Maki, as kaitiaki of the forest, will in perpetuity, guide the management and maintenance of the plantings and nurture the forest, fauna and the community of Rangitoopuni.

### 2.1.2 Create a distinct and unique residential enclave, identifiable as a Te Kawarau a Maki project.

The Cultural Framework document has been prepared in conjunction with TKaM, to provide guidance as to how to develop the project such that the TKaM identity is apparent through the design implementation. Mahi toi, dual language signage, motif and patterns on common elements, storytelling of the TKaM narratives at significant locations (through wayfinding and information signage), intentional design of spaces for mara hupara, mara kai and wananga are proposed.

### 2.1.3 Promote sustainable recreational activities within the site and the wider forest.

Within Lot 1 and Lot 2, walking tracks will be established and maintained by the resident's association and TKaM. Links to the wider forest will be established or maintained. Access from Old North Road will be maintained for recreation users of the forest.

### 2.1.4 Support sustainable revegetation practices.

Using best practice and practical experience, the revegetation of Rangitoopuni, will draw upon the wider ecological and landscape community knowledge for planting in cut-over pine forest locations.

### 2.1.5 Foster community engagement and education.

The Rangitoopuni community and the wider Riverhead, Kumeu and Huapai communities, along with the residents of wider Auckland will be able to enjoy the development of Rangitoopuni and participate in learning more about TKaM, the "Wanderings of Ruarangi", ecological efforts to enhance the mana of Rangitoopuni and the aspirations of TKaM in the management of Rangitoopuni.

## 2.2 Objectives

### 2.2.1 Protect native flora and fauna.

The revegetation and amenity plantings will be managed through the resident's association along with TKaM's kaitiaki practices. Residents will have limited scope to work on the land beyond their building platforms. Pest plant and animal control programmes will be established site wide and there are controls on residents owning cats and dogs must be contained and controlled.

### 2.2.2 Manage invasive species.

Experienced landscape contractors and TKaM will provide the weed control within the revegetation. Residential landscapes will have to pass through the Design Review process and plant species that are likely to cause damage to the revegetation outcomes will be prohibited. The long-term management of residential gardens will sit with the resident's association. This is important for second and subsequent property owners who may not otherwise be aware of planting restrictions.

### 2.2.3 Ensure recreational activities align with environmental goals.

Walking routes will be provided within Lot 1 and Lot 2 development areas. Other recreational pursuits that exist in the forest, typically occur further north of the development sites however currently users do use the existing forestry road for access. This access will be maintained within the proposed road network with links into the wider forest area.

### 2.2.4 Provide clear guidelines for sustainable harvesting of taonga species in the very long-term i.e. kauri, totara.

In conjunction with TKaM, locations for specimen tree clusters, which in time may be suitable for cultural harvest, will be selected. These trees can be planted at any time and will be managed as part of the overall revegetation scheme. Locations will be selected that are close to access routes, will not cause significant damage to the future forest and provide for the safe felling and extraction of the timber. The management of the cultural harvest stock, the replacement planting, thinning, other arboricultural practices, will be managed by TKaM.

### 2.2.5 Integrated countryside living opportunities.

Rangitoopuni will not be the traditionally envisaged "countryside living" environment with paddocks and horses grazing. In the long term, it will be akin to living within the Waitakere hills, amongst the bush. The countryside living will provide large building platforms for the residents to use. Privacy will be important whilst developing a sense of community with a common goal in helping the forest and fauna rehabilitate at Rangitoopuni.

# 3.0 Ecological Management

## 3.1 Biodiversity Conservation (Post-Construction/Planting)

### 3.1.1 Conduct annual surveys of native species to monitor biodiversity.

A number of initiatives will be established to monitor vegetation growth and faunal studies. Static camera sites will be established to document vegetation growth over a number of seasons. Vegetation survey plots will be logged and measured annually as part of the canopy closure measurements.

Once the vegetation has been planted, annual surveys of birds and invertebrates can commence. There are several different bird survey tools and invertebrate survey techniques. The results are to be collated and retained to provide an accurate record of ecological change as the forest grows.

In-stream surveys shall also be conducted, as water quality improves and creates a better environment for aquatic animals.

### 3.1.2 Ensure buffer zones around waterways are protected and enhanced with appropriate native plantings.

A minimum 20 metre buffer of appropriate plantings are planned for all riparian zones and wetland areas. Riparian zones and wetland will receive full planting treatments with a wide range of species at tighter spacings to ensure canopy closure and shading is established quickly.

## 3.2 Pest and Weed Control

### 3.2.1 Implement a comprehensive pest control program targeting possums, rats, and mustelids.

**Weed Control**

**PHASE 1 (Initial weed control –prior to planting):**

**Note:** It is recommended that the full Lot 1 and Lot 2 development areas receive the first round of initial weed control in order to prevent the establishment and seeding of weed species into the freshly planted early-stage areas.

- Establish a 20 m buffer around any intact areas of existing native vegetation, within which larger pest trees should be drilled and injected (the dead standing tree will provide roost and perching spots for birds and invertebrate habitat), smaller trees- cut and stump swabbed, and seedlings hand pulled or carefully sprayed. Weed shrub species can be swabbed or carefully sprayed (avoiding drift). Where weed plants can be hand pulled (whole plant, leaving not roots), this should be the preferred method around existing native vegetation especially sedges. Gorse is already establishing throughout the cut-over forest area and its control is important.
- Blanket spray all other areas ensuring full coverage.
    - Where persistent weeds of those with tubers, corms or bulbs are present, remove the topsoil layer mechanically, ensuring all roots etc are removed (roadside bund – Old North Road boundary).
    - After the herbicide manufacturer’s recommended period, repeat the initial weed control exercise for those areas to be developed or planted first in the programme.

**PHASE 2 (Ongoing weed control post-planting – Defects Liability Period):**

- During the Defects Liability Period for the planting, the landscape contractor shall be responsible for the weed control within the planting areas. There is a maintenance schedule included within the Landscape Specification. Hand pull weeds in sedge plantings, selective herbicide use for significant weeds, hand pull wilding pines.

**PHASE 3 (Ongoing maintenance):**

- Following the initial two phases and the handover of the planting to the resident’s association and TKaM, ongoing weed control will occur throughout the site. The selected contractor, or other operatives shall submit a maintenance plan to be approved by the resident’s association and TKaM.
- Annual monitoring of plant growth rates and weed incursions shall be recorded to determine the success of the planting and weed control methods.

**Pest Control**

Pest control stages:

Given the location of the development sites at Rangitoopuni – abutting established production pine forest, pest animal incursions are a very likely occurance. Hunting of pigs is common within the existing forest. There are anecdotal reports of red deer also within the area. Possums, feral cats, rabbits, hares, hedgehogs and the mustelid animals are all present within the forest environment and adjacent rural properties. Pukeko may be an issue with new plantings so if recorded, staking of wetland and riparian plants will be required. Shooting of pukeko is permitted in season however the public perception of that control method once residents are on site, may not be palatable.

Local pest control groups within the surrounding communities are very active and have set up control lines along the forest boundary in places such as Green Road, Coatesville. The Pest Free Coatesville organisation caught 1440 pests in trap lines along the eastern boundary of the Riverhead Forest in 2022 alone.

**Rangitoopuni Pest Animal Control**

STAGE 1:

During the initial weed control (Phase 1: Initial weed control), set up and run perimeter trapping infrastructure and install bait stations both perimeter and interior at set locations and run initial toxic bait pulse (following the control methodology outlined below). A follow-up toxic baiting operation should be carried out at perimeter and interior bait station sites.

STAGE 2:

At the conclusion of intensive initial weed control programme (Phase 1), remove interior bait stations and further toxic bait operations will use the perimeter bait stations only to avoid any further access and potential disturbance to the planting exercise.

STAGE 3:

The ongoing pest control within the site will be with bait stations, trapping devices and domestic control devices such as automated kill traps (Good Nature A24 or similar). Pest control outside the development site, within the existing pine forest should be undertaken as a matter of urgency to help reduce the pest loads entering the site.

**Pest Control Methodology**

**Mustelid & Rat Trapping**

Mustelids and rats will be targeted with a combination of DOC200 double-set run-through tunnel traps and DOC250 taps set-up every 50 m along the inside edge of the perimeter roads (Browns Road and Barlow Road) with DOC250 traps installed at every third location and DOC200 double-set run-through tunnel traps installed at the balance of the sites. DOC200 traps will be baited with fresh rabbit, dried rabbit or a fresh hen's egg with a spoonful of peanut butter smeared on top and DOC250 traps will be baited with fresh rabbit or dried rabbit.

All traps will be checked and rebaited once per month between April and July (inclusive) and then once every week between August and March (inclusive). During trap checks, if traps have not been triggered then they will be set off, reset and then rebaited where bait has been removed or has degraded. The entrance to each trap must also be clear of debris and vegetation to ensure easy access by target pest mammals.

**Toxic Baiting**

Baits containing the first-generation toxin diphacinone will be used in rat specific bait stations set around the perimeter at the same sites as the DOC200 traps and within the interior of the site during Stage 1. Toxic baiting operations targeting rats will be undertaken twice a year; once in July and then again in October. This is primarily to ensure that rats numbers are rapidly reduced prior to and during the breeding season for native birds.

For rat control using rat specific bait stations and diphacinone toxic bait, rats must feed on the poison for at least five days and bait stations must not be allowed to become empty during this period to ensure rats ingest sufficient poison to kill them. Each toxic baiting operation should last 14 days (see Table below). All uneaten bait must be collected and removed from operational area at the end of the operation. This reduces both the chance of rats being exposed to poor quality or old bait and the time toxin is in the environment.

New technology long-life baits and smart traps are becoming commercially available. The pest control operative may substitute the nominated baits and traps for these products where appropriate and by approval from the Developer.

Baiting Schedule

| Day 1 | Day 3 | Day 7 | Day 14 |
|---|---|---|---|
| Each station loaded with 100 g of toxic bait | Each bait station checked, baits with 50% or less remaining replaced with fresh bait | As per Day 3 | All toxic bait removed from bait stations |

**Hare, rabbit, pig, cat & possum control**

| **Pest Animal Species – Identification List and Control Methods** | | |
|---|---|---|
| Name | Common Name | Control Method |
| *Lepus europaeus occidentalis* | Hare | Night shooting (before residents are on site),<br>Repellents: Eggs mixed with acrylic paint; mutton fat with kerosene or Thropel (Commercial relent sold as Thiram), Plantskydd. |
| *Oryctolagus cuniculus* | Rabbit | Night shooting (before residents are on site)<br>Pindone poisoning<br>Fumigation of burrows<br>Repellents: Eggs mixed with acrylic paint; mutton fat with kerosene or Thropel (Commercial relent sold as Thiram), Plantskydd. |
| *Sus scrofa* | Pig | Shooting (day), with or without dogs – needs to extend into the wider forest<br>Trapping<br>Poisoning |
| *Trichosurus vulpecula* | Possum | Night shooting (before residents are on site)<br>Trapping (Sentinal traps preferred) – throughout the forest.<br>Poisoning (DoubleTap or cholecalciferol) |
| *Felis catus* | Feral cat | Night shooting (before residents are on site) – needs to extend into the wider forest.<br>Trapping<br>Toxic baiting |

### 3.2.2 Monitor and eradicate invasive plant species, such as woolly nightshade, wild ginger and pampas grass.

The appointed resident's association contractors and TKaM will be responsible for the identification and control of invasive weed species. During the Defects Liability Period for the initial planting work, the landscape contractor for the planting, will be responsible for weed control generally.

### 3.2.3 Collaborate with Te Kawarau a Maki and local conservation groups for pest control efforts.

There exists a well-co-ordinated community pest control group in the Riverhead/Coatesville area. The resident's association and TKaM may wish to collaborate with that group to utilise any suppliers benefits they may have and to gain learnings from the group. Additionally, new pest control tools are being developed and Rangitoopuni would provide a good test ground for much of the new technology tools.

The Pest Plant and Animal Management Plan will provide guidance into the expected levels of controls required.

Annual reporting of control results is to be collected and held by the residents association and TKaM.

## 3.3 Revegetation Method

### 3.3.1 Site Preparation

The Lot 1 and Lot 2 sites are and will be cut-over pine forests. Forestry slash has not been cleared from the site and tree stumps have been left in-situ.

Areas of wetlands and riparian margins may contain some native species however with full exposure to light and wind, some species have begun to fail e.g. mamaku tree ferns.

With the increased sun exposure, weed species have begun proliferating the site.  Typically, these species include gorse, woolly nightshade, pampas and many minor weeds.

Several weed control spray rotations will be required to control the extant weeds and emerging weeds prior to planting.  Wildling pines will remain an issue for some given the longevity and spread of the seeds.

There is no need to reduce the forestry slash as it will provide wind protection for the young plants. Overtime this material will break down.

However, for ease of planting (not scrambling over slash), the slash can be windrowed into bunds that run perpendicular to the predominant wind direction. These windrow bunds will help break up the wind flow over the new plantings (shown below).  Stumps can remain in place (outside of the extents of engineering works) as they provide a good stabilising effect through the root systems and will break down in the soil over time.

The level and extent of windrowing can be determined by the planting contractors' requirements if needed.  Slash removal from wetlands and riparian areas may be required by the project Ecologists.

Windrows on site (by forestry operatives)

Avant

### 3.3.2 Plant Procurement

Plant seeds shall be generally sourced from the Rodney Ecological Area, more specifically from the local Riverhead area and surrounds, including the Waitakere Ranges. Where plants are unable to be sourced from the preferred ecological regions and specific areas, plants can be sourced from the Tamaki Ecological Region. Approval will be sought from TKaM for the use of these plants.

Extensive plant schedules have been prepared and reviewed by TKaM, Bioresearchers and Auckland Council staff. TKaM have sourced seed and propagated some species that will be made available for use within the planting. These plants include kauri, with seeds sourced for trees within the Waitakere hills that appear to be die-back resistant. Scion has been conducting tests on these trees and there are several thousand specimens establishing in a controlled nursey environment.

Selected harakeke with excellent muka qualities will also be made available for use in specific areas where harvest will be available.

Plants supplied shall be at the specified grades, true to type and not root bound. A Landscape Specification will be supplied for the planting contract.

### 3.3.3 Planting

The technical aspects of the planting shall be detailed in the Landscape Specification (Attached as Appendix 2).

Plant species have been selected from the W11 Kauri, Broadleaf forest type and the W3-B Kahikatea, Puriri forest type, from Te Haumanu Taiao document from Auckland Council.

Manuka and kanuka will be the dominant pioneer species used outside of the riparian and wetland areas. Manuka will appear in some riparian zones.

Pockets of fast-growing seed-bearing species such as, but not limited to, Pittosporum and Coprosma species will be planted in locations to assist in the spread of viable seeds around the site.

Conditions such as slope, aspect, hydrology have been considered for the selection of plants around the site. Within the plant schedules, a table exists identifying the preferred conditions for each species. At the time of planting, the landscape architects will work with the landscape contractor to ensure ‘the right plants go in the right place’. The plant schedules are appended to this document (Appendix 1). Note: planting numbers have not been included.

Riparian margins (the 20m buffer zone) and wetlands will be extensively planted with appropriate species for those sites. Enrichment planting, if required, will take place in the existing wetlands where there is already significant native vegetation in place.

Within private lots, outside the building platforms, a zone of low er level planting, consisting of groundcovers, grasses and shrubs, make up a buffer strip to the general revegetation areas. The purpose of this planting to ensure the building platforms have access to abundant light, local and within lot views and a sense of openness around the resident’s house. Whilst not traditional revegetation, this planting will still offer some landscape ecology services as habitat and food sources for invertebrate and birds. The planting, being graded in height towards the general revegetation plantings will provide a degree of buffering and some reduction of edge effects.

The same planting is proposed along roadsides to ensure sightlines are maintained and there isn’t vegetation spilling into the corridor.

The edges of the walkway/track system will also have the same planting treatment, for sightlines, light and safety. The width of that planting will be reduced to 2 metres from the track edge.

Lot 1 wetland example

Bioresearchers

Existing conditions Lot 1 showing riparian corridor and wetland

Avant

### 3.3.4 Maintenance of Plantings

During the Landscape Contract Defects Liability Period, the contractor will be responsible for the maintenance of the planting areas. This includes watering, when necessary (as detailed in the Landscape Specification), weed control and releasing of plants, replacement of diseased and dead plants, re-staking (amenity specimen trees) and reporting on findings. A maintenance schedule is included in the attached Landscape Specification.

Following the hand-over of the site following the Final Completion Certification, the maintenance of the landscape plantings shall be the responsibility of the resident's association in conjunction with TKaM.

Together, they will be responsible for weed control, pest plant and animal control, track maintenance, replacement and enrichment planting.

They will also be responsible for the ongoing vegetation surveys (photographic) and may contribute as citizen scientists into annual bird counts.

# 4.0 Landscape Elements

## 4.1 Track Network

### 4.1.1 Design

Te Kawerau a Maki have developed a Track Guidelines document, in conjunction with Auckland Council and ReNature. The guidelines were prepared for the management of access during the rahui placed during the period of the initial Kauri Dieback issue. The track guidelines now determine how tracks and structures are to be constructed and maintained in the rohe of TKaM.

Therefore, all pedestrian access tracks within Lot 1 and Lot 2 will be designed and constructed to meet these standards. Any variations to the standard designs will be designed in collaboration with TKaM and should engineering input and building consents be required, Auckland Council will be consulted.

The details from the Track Guidelines document are appended to this document (within Appendix 3: Landscape Elements).

Note: the tracks and structures are intended for pedestrian access only.

### 4.1.2 Track Network

The network of pedestrian tracks has been located within the site to provide a variety of walking routes through the development. Tracks links to the road network to create a series of loops of different lengths. Where possible, track slopes have been minimised by following contour lines and gently descending into the valleys. Routes have been selected so that users can experience several different environments, from bush clad hills, damper gullies with streams, wetlands and views down valleys.

Where tracks become overly steep, stairs will be constructed. In soft ground conditions, or sensitive locations, boardwalks or bridges will be used. Screw piles are the preferred ground fixing system provided ground conditions are appropriate.

### 4.1.3 Track Maintenance

As detailed in the Track Guidelines document, the maintenance of the tracks is just as important as getting the right design and initial construction. The resident's association and TKaM will have the responsibility to maintain the tracks following the handover of the works from the constructor.

The methods of maintenance and the frequency are detailed in the Tracks Guidelines document.

## 4.2 Other Landscape Elements

### 4.2.1 Lighting

TKaM have a 'Dark Sky' initiative in place. The development team have respected that initiative by using low level bollard lights, not to illuminate roadways, but to indicate corners, intersections and the ends of the roadways.

Targeted spotlighting to illuminate features such as mahi toi, entrances, signage etc will be shielded and set to a low angle of projection.

Uplights for specimen trees will be carefully used and targeted to project into the canopy not to highlight the edge foliage.

Exterior lighting on buildings is to be downward projecting and shielded to prevent light spill.

The use of warm light systems (yellow light) is proving to be better than LED cool light (white light) for not attracting bats, birds and invertebrates.

### 4.2.2 Furniture, Entrances, Shelters etc.

The design aesthetic developed for Rangitoopuni includes the use oversized, or large dimension timbers, industrial style fixings (weathering steel) and locally sourced rock (if suitable). The Rangitoopuni setting is an expansive landscape that residential scale elements will be 'lost'. By scaling up built elements, the structures will be more noticeable.

Mahi toi elements will be developed and provided by TKaM and placed where TKaM determine. The Cultural Design Framework document will provide some guidance in this respect.

Community open spaces will be developed with the intention of being a combination of active and passive recreation areas. Shelter structures, mara kai and mara hupara, wananga areas are to be provided where possible. TKaM will have a significant input into the design and development of these spaces.

# 5.0 Conclusion

This Landscape Management Plan provides a structured approach to managing the Rangitoopuni development area sustainably, respecting its ecological, recreational, and cultural values. Through collaboration with stakeholders, this plan aims to ensure Rangitoopuni remains a vibrant, richly diverse and cherished landscape for generations to come.

This Landscape Management Plan is a 'living document' in that it will be updated and supplemented as new information is developed and reporting becomes available.

# Appendix 1: Landscape Elements

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# APPENDIX ONE
# LANDSCAPE ELEMENTS

REV A

01 MAY 2025

TE KAWERAU IWI
SETTLEMENT TRUST

RANGITOOPUNI
RIVERHEAD

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| **REVIEWED BY:** | [redacted]<br>Landscape Architect<br><br>[redacted]<br>Urban Designer<br><br>[redacted]<br>Landscape Architect<br><br>[redacted]<br>Landscape Architect | [redacted] |
| **STATUS: FINAL** | Revision / version: A | Issue date: 01 May 2025 |

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Cover photograph: Description, © Photographer, 2025

Although this is not a hearing before the Environment Court, I record that I have read and agree to comply with the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023. I confirm that this report is within my area of expertise, except where I state that I rely upon the evidence or reports of other expert witnesses lodged forming part of the project's application material. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed. Peter Whiting


**CONNECTIONS TO OTHER DOCUMENTS**

This document is developed in connection with:


LOT ONE
Countryside Living


LOT TWO
Retirement Village


LOT 1 & LOT 2
Landscape Concept Masterplan


RANGITOOPUNI
Mahere Matua Ahurea | Cultural Masterplan


RANGITOOPUNI
Design Guidelines

## CONTENTS

# LANDSCAPE STATEMENT

## THE PROPOSAL:

The Rangitoopuni project is the catalyst project for the prosperous economic future of Te Kawerau aa Maki (TKaM) by the Rangitoopuni Development Limited Partnership.

Taking the former Riverhead production pine forest, with many recreational pursuits within its confines, the project will transform the landscape into a diverse and rich native bush environment, with house discreetly positioned within the plantings.

Walking trails will permeate the site, connecting neighbours and allowing access to the wider pine forest and recreation tracks.

The Senior Living Village is equally set on the rehabilitated landscape and is nestled into the hills and valleys, creating a stunning and private setting.

## EXISTING SITE:

The existing site is/has been clothed in production pine trees for the last 60 plus years. This has always been important whenua for Te Kawerau aa Maki with important events and stories captured in the names of the area. The mana of the site has been diminished with forestry activities, weed ingress and waterway sedimentation.

Access into the forest is largely uncontrolled for recreation activities such as mountain biking, horse riding, walking and running, motocross events and hunting.

## THE LANDSCAPE OUTCOME:

This development project will see, in the long term, a richly planted and diverse landscape, supporting birds and insects and the people who have chosen to live within this setting.  Public access for walking, biking and horse riding will not be constrained on the road network. The tracks within the development areas are pedestrian access only due to the topography.

Te Kawerau aa Maki will be Kaitiaki over the plantings and tracks, their knowledge of the land, plants and fauna will be passed onto the residents and visitors through mahi toi, wananga, maara huupara and maara kai. Once in the development, you will know you are on Te Kawerau aa Maki whenua.

## LANDSCAPE ELEMENTS:

Throughout Rangitoopuni, public furniture, signs and materials will help reinforce the story of the land.

Oversized timbers recall the forestry, the weathering steel further draws on the heavy industry required to service that activity.

The material selections will reference the local rock, soils and vegetation. Te Kawerau aa Maki have placenames referencing the red soils of one particular area.

Motifs have been gifted to the design team from TKaM, to use on furniture and signage elements to further enhance the TKaM connection to the site.

# WAYFINDING & SIGNAGE


**DEVELOPMENT SIGNAGE**


**TRAIL MARKERS**


**SITE & NATURAL FEATURE MARKERS**

# MATERIALITY

WEATHERED STEEL

WEATHERED & NATURAL TIMBER

RURAL ELEMENTS

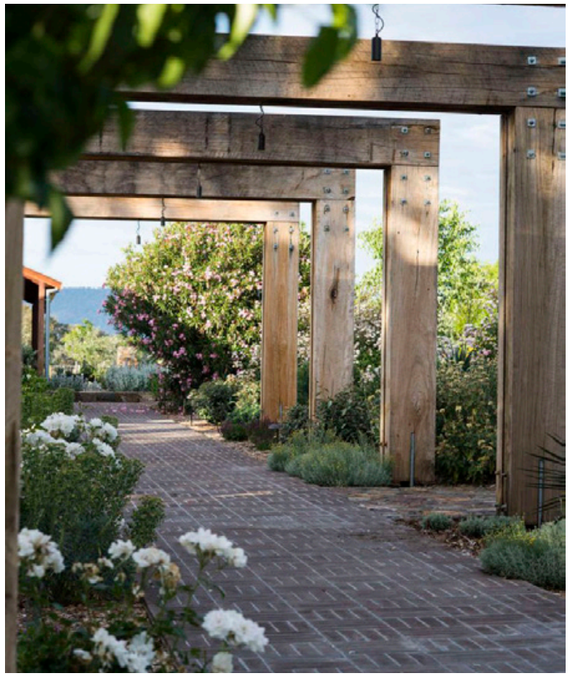
INDUSTRIAL FIXINGS

# LANDSCAPE FEATURES

## COMMUNAL SPACES

COOKING FACILITIES

HANGI PIT / SHADE STRUCTURE



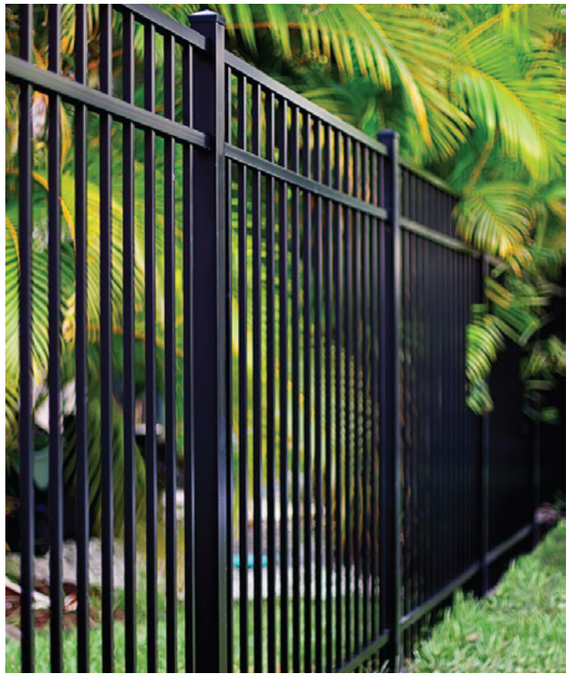
SHADE STRUCTURES

SEATING

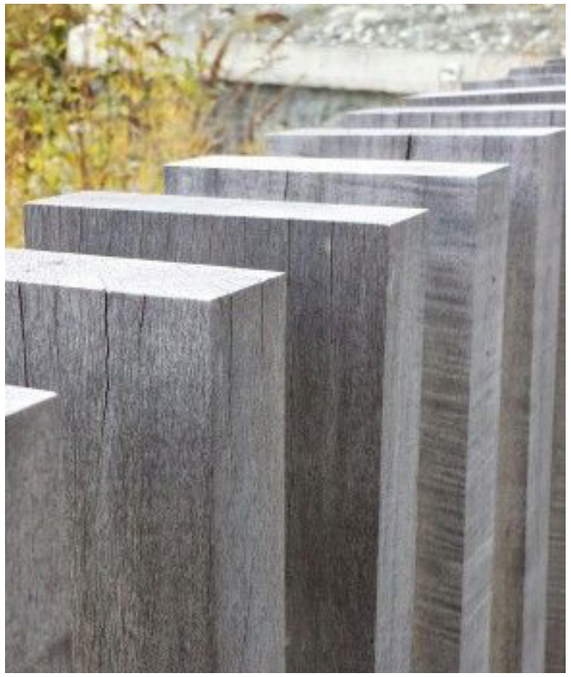
# LANDSCAPE FEATURES

## BOUNDARY TREATMENTS


FENCING - LOT MARKER POSTS



FENCING - PERMEABLE



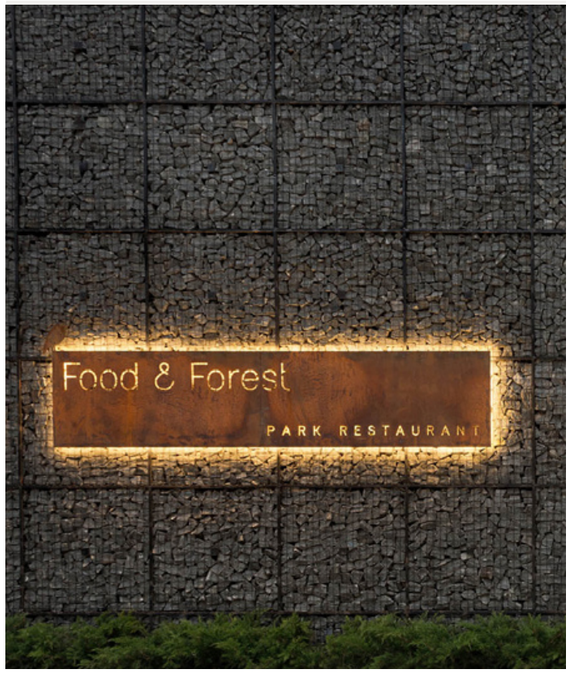
FENCING - VERTICAL SLEEPERS

FENCING - POST AND RAIL

# LANDSCAPE FEATURES

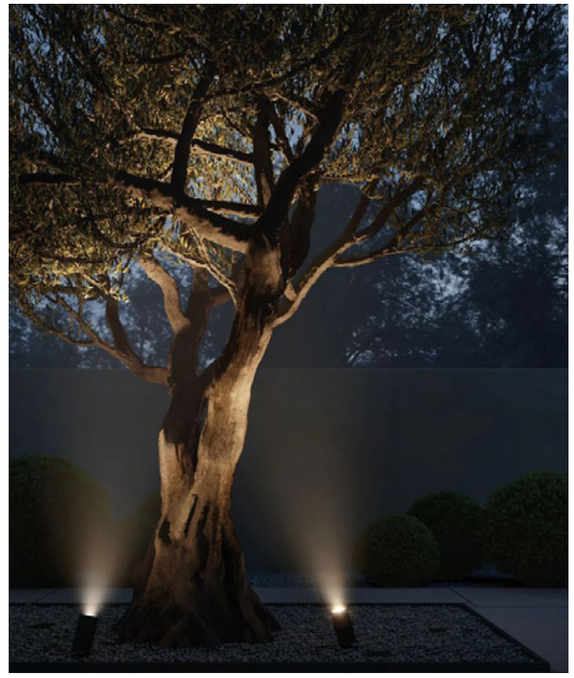
## LIGHTING

ROAD - LOW BOLLARD




SIGNAGE / WALLS - BACKLIT

SIGNAGE / WALLS - DOWN LIGHT



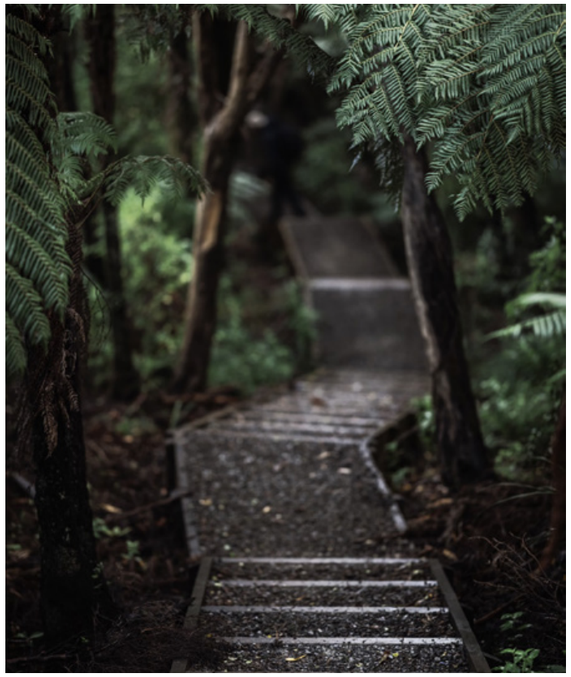
FEATURE VEGETATION - UP LIGHT

**NOTE:** Lighting will be in line with requirements from Te Kawerau ā Maki. Rangitoopuni is a dark sky project area

# TRACKS

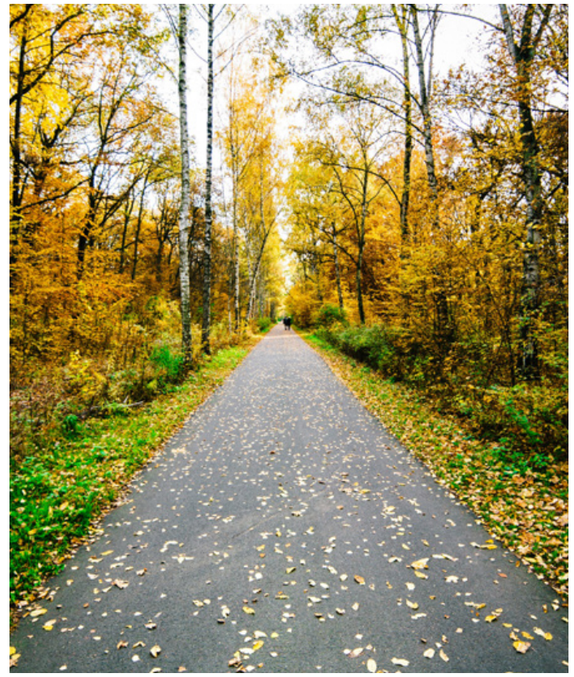
## PUBLICALLY ACCESSED

FORESTRY / MAINTENANCE ROADS



WALKING / MOUNTAIN BIKE TRACKS

BOARDWALKS



CONCRETE PATHS

# Appendix 2: Auckland Council Regional Parks Standards (Tracks)

Boffa Miskell

# APPENDIX TWO

## AUCKLAND COUNCIL REGIONAL PARKS STANDARD DETAILS ENGINEERING DRAWINGS

EXTRACTED FROM:
***'WAITĀKERE TRACK STANDARDS GUIDANCE DOCUMENT FOR TRACK CONSTRUCTION & MAINTENANCE IN THE WAITĀKERE RANGES'***
PUBLISHED 18/01/2024

TE KAWERAU IWI SETTLEMENT TRUST

RANGITOOPUNI RIVERHEAD

# AUCKLAND COUNCIL
# REGIONAL PARKS STANDARD DETAILS
# ENGINEERING DRAWINGS

| DRAWING | TITLE | REVISION | DATE |
|---|---|---|---|
| 22133 - 500 | STANDARD TRACK DETAILS | 3 | 17/01/2024 |
| 22133 - 501 | TYPICAL AGGREGATE TRACK GRADE DIPS | 3 | 17/01/2024 |
| 22133 - 502 | GEOCELL DETAILS | 3 | 17/01/2024 |
| 22133 - 503 | TYPICAL BOXED STEPS DETAIL | 3 | 17/01/2024 |
| 22133 - 504 | 1.2m WIDE COMPOSITE DECKING LOW BOARDWALK | 3 | 17/01/2024 |
| 22133 - 505 | 1.6m WIDE COMPOSITE DECKING LOW BOARDWALK | 3 | 17/01/2024 |
| 22133 - 506 | LOW COMPOSITE DECKING STAIRCASE DETAILS - SH 1 OF 2 | 3 | 17/01/2024 |
| 22133 - 507 | LOW COMPOSITE DECKING STAIRCASE DETAILS - SH 2 OF 2 | 3 | 17/01/2024 |
| 22133 - 508 | TYPICAL BOARDWALK FOOTING DETAILS - SH 1 OF 2 | 3 | 17/01/2024 |
| 22133 - 509 | TYPICAL BOARDWALK FOOTING DETAILS - SH 2 OF 2 | 3 | 17/01/2024 |
| 22133 - 510 | TYPICAL ROPE FENCE DETAIL - SH 1 OF 2 | 3 | 17/01/2024 |
| 22133 - 511 | TYPICAL ROPE FENCE DETAIL - SH 2 OF 2 | 3 | 17/01/2024 |
| 22133 - 600 | 1.2m WIDE TIMBER DECKING LOW BOARDWALK | 3 | 17/01/2024 |
| 22133 - 601 | 1.6m WIDE TIMBER DECKING LOW BOARDWALK | 3 | 17/01/2024 |
| 22133 - 602 | LOW TIMBER DECKING STAIRCASE DETAILS - SH 1 OF 2 | 3 | 17/01/2024 |
| 22133 - 603 | LOW TIMBER DECKING STAIRCASE DETAILS - SH 2 OF 2 | 3 | 17/01/2024 |

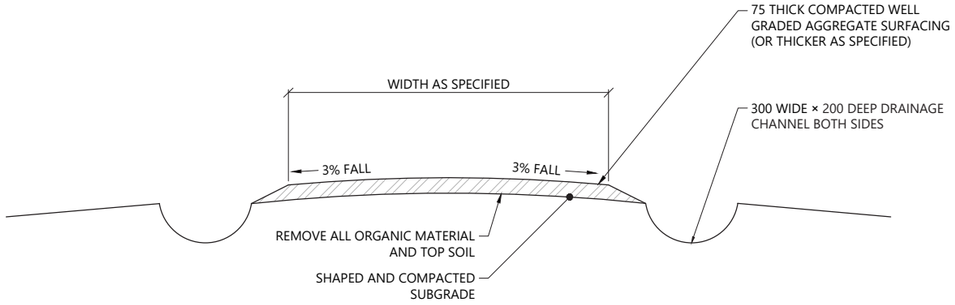
Auckland Council
Te Kaunihera o Tāmaki Makaurau

reNature



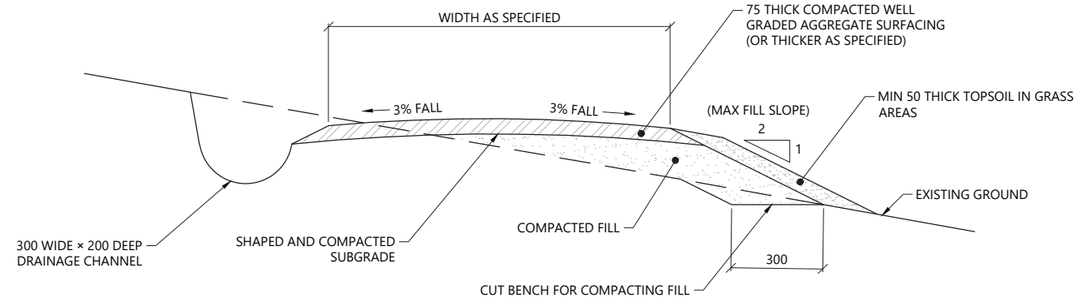
STATUS:
FOR INFORMATION
PROJECT NO:
22133

Plotted: Wednesday, 17 January 2024 9:07:40 am By: FERNANDA CONTRERAS
File Path: C:\ReNature Limited\P - Documents\2022\22133 AC Standard Kauri Details (Regional)\3 CAD\0 Drawings\AC West Standard Boardwalk R3.dwg



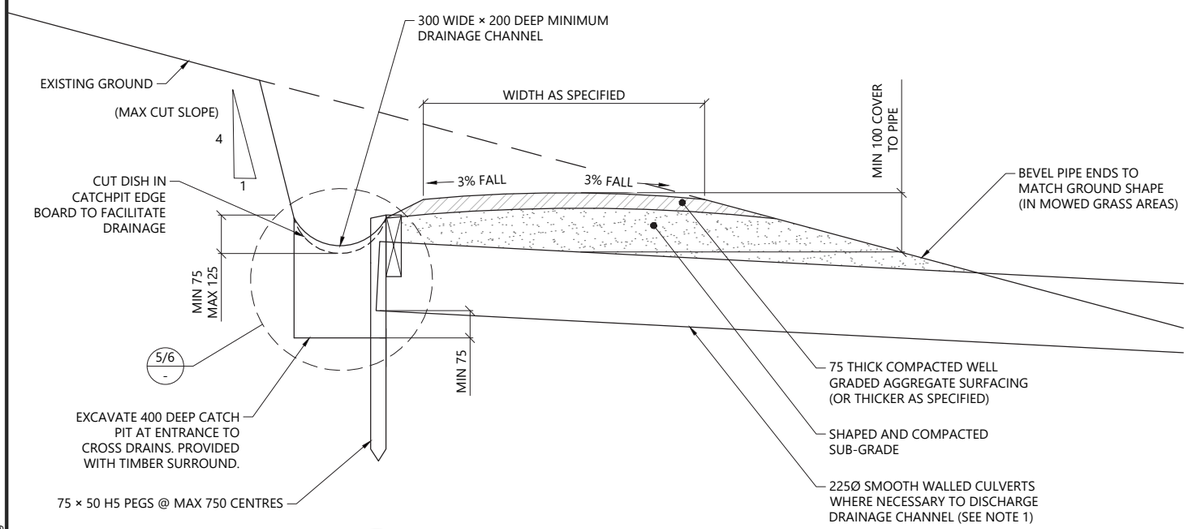

1 - TYPICAL CROWNED TRACK ON LEVEL GROUND FORMATION

SCALE 1:20 @ A3



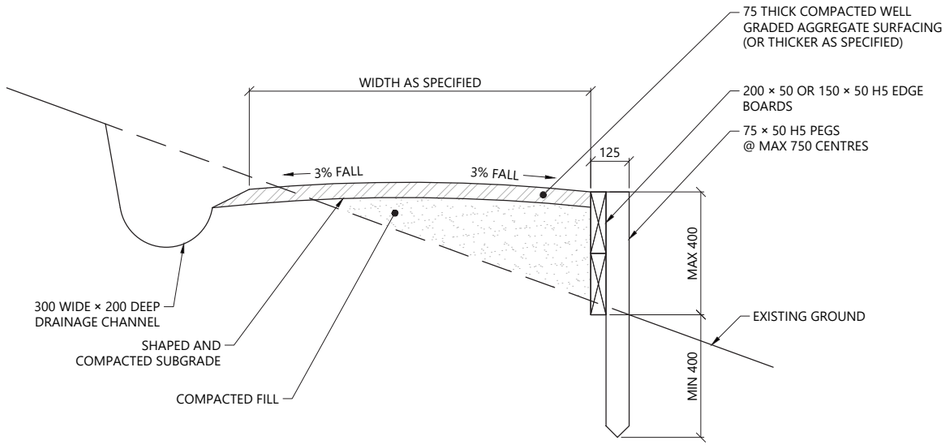

2 - TYPICAL CROWNED TRACK ON BENCHED FORMATION

SCALE 1:20 @ A3



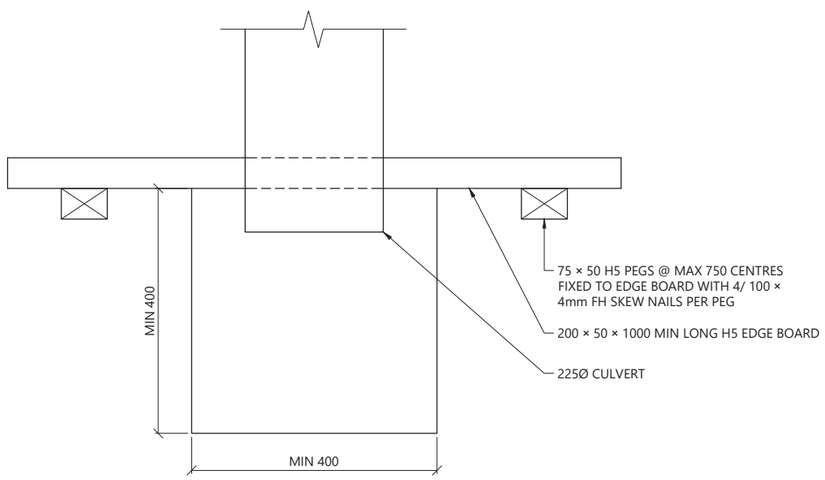

3 - CUT FORMATION (SHOWING CULVERT)

SCALE 1:20 @ A3



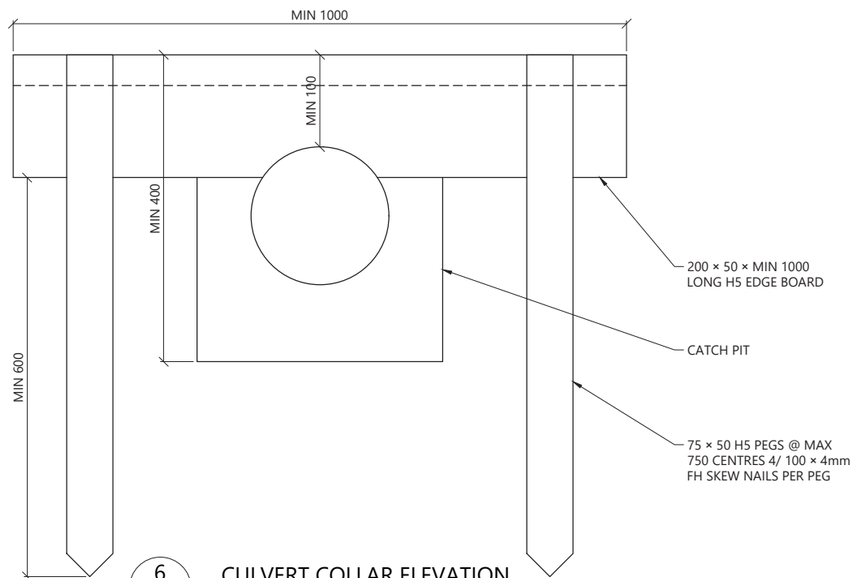

4 - RETAINED FORMATION (USE WHERE SPECIFIED)

SCALE 1:20 @ A3




5 - CULVERT COLLAR PLAN

SCALE 1:10 @ A3




6 - CULVERT COLLAR ELEVATION

SCALE 1:10 @ A3

NOTES:

1. DRAINAGE CHANNEL DISCHARGES TO BE LOCATED AT MAXIMUM 15m SPACING WHERE THE TRACK GRADE IS STEEPER THAN 1:10 AND MAXIMUM 20m SPACING WHERE THE GRADE IS FLATTER THAN 1:10.
2. MAXIMUM WALKING TRACK GRADE TO BE 1:6 UNLESS OTHERWISE STATED.

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER: reNature

PROJECT: REGIONAL PARKS STANDARD DETAILS

DRAWING: STANDARD TRACK DETAILS

CLIENT: Auckland Council, Te Kaunihera o Tāmaki Makaurau

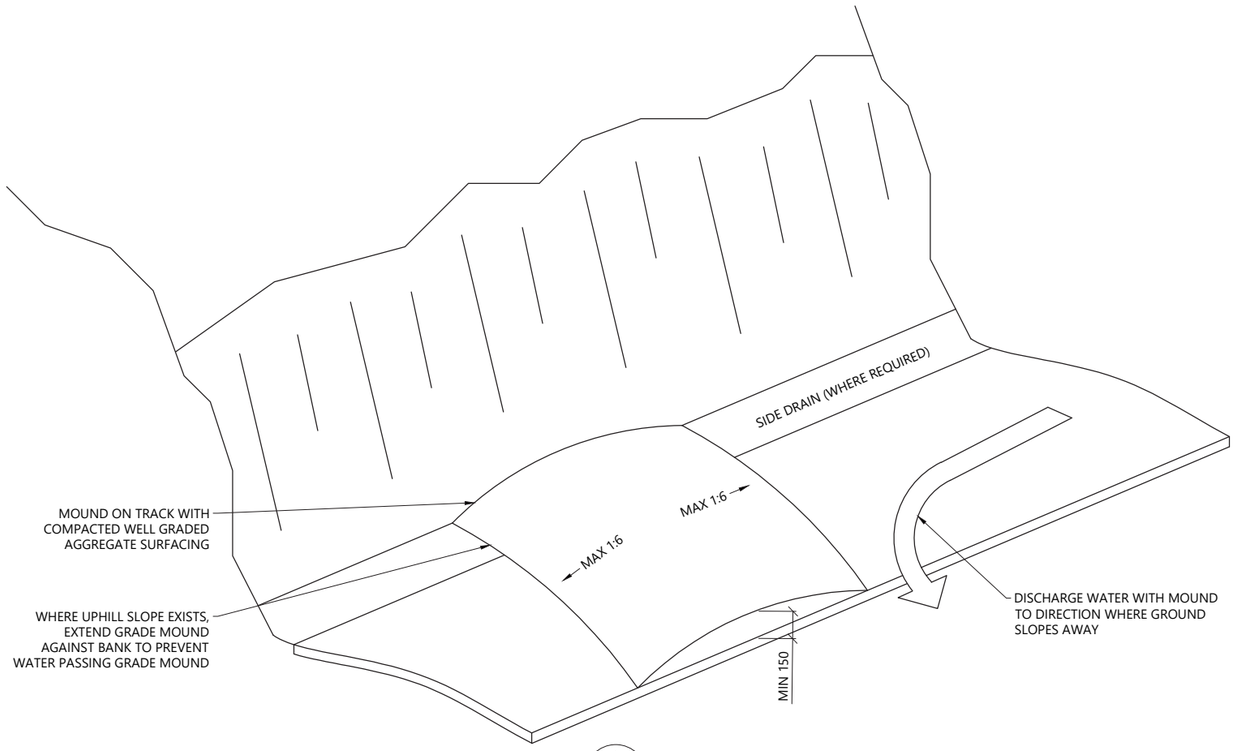
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

STATUS: FOR INFORMATION

SCALE: AS SHOWN

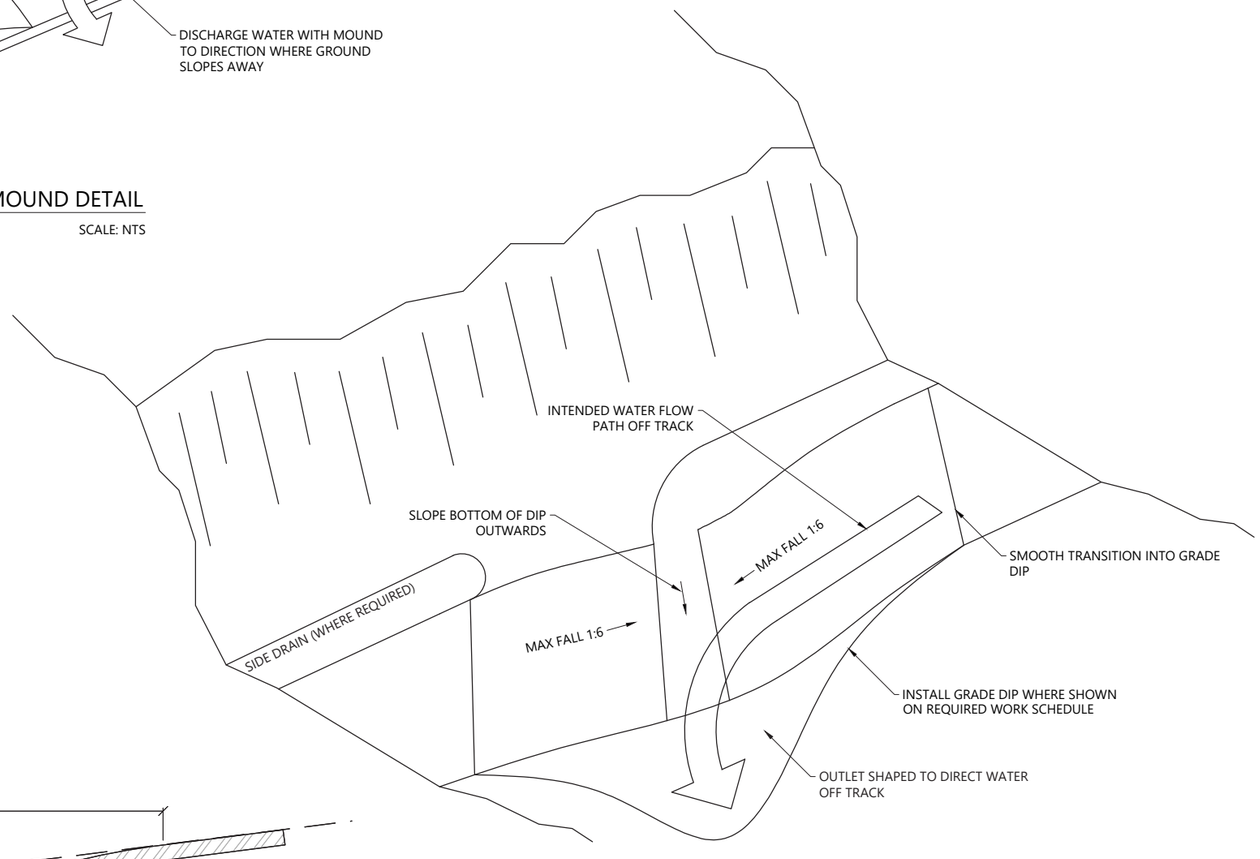
DRAWING NO: 22133 - 500

REVISION: 3



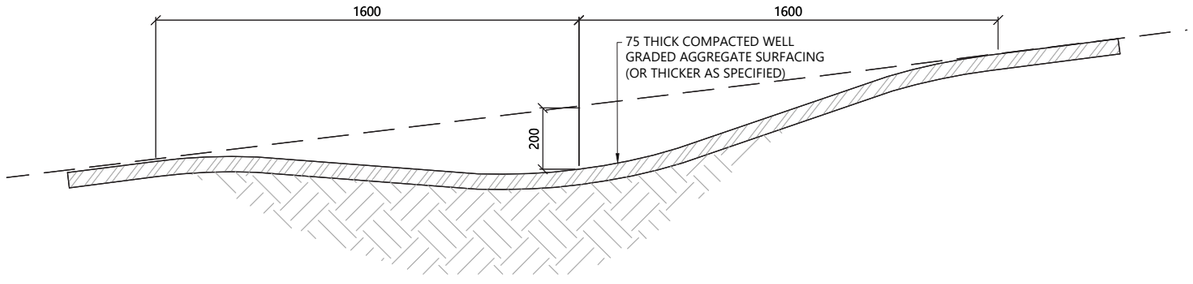

1 - FILLED GRADE MOUND DETAIL

SCALE: NTS




2 - GRADE DIP DETAIL

SCALE: NTS




3 - TYPICAL GRADE DIP SECTION

SCALE 1:20 @ A3

NOTES:

1. DRAINAGE CHANNEL DISCHARGES TO BE LOCATED AT MAXIMUM 15m SPACING WHERE THE TRACK GRADE IS STEEPER THAN 1:10 AND MAXIMUM 20m SPACING WHERE THE GRADE IS FLATTER THAN 1:10.
2. MAXIMUM WALKING TRACK GRADE TO BE 1:6 UNLESS OTHERWISE STATED.

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

PROJECT:
REGIONAL PARKS STANDARD DETAILS

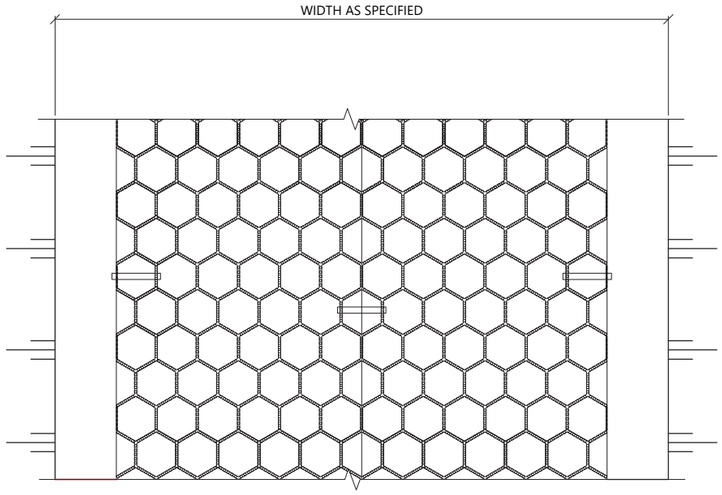
DRAWING:
TYPICAL AGGREGATE TRACK GRADE DIPS

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

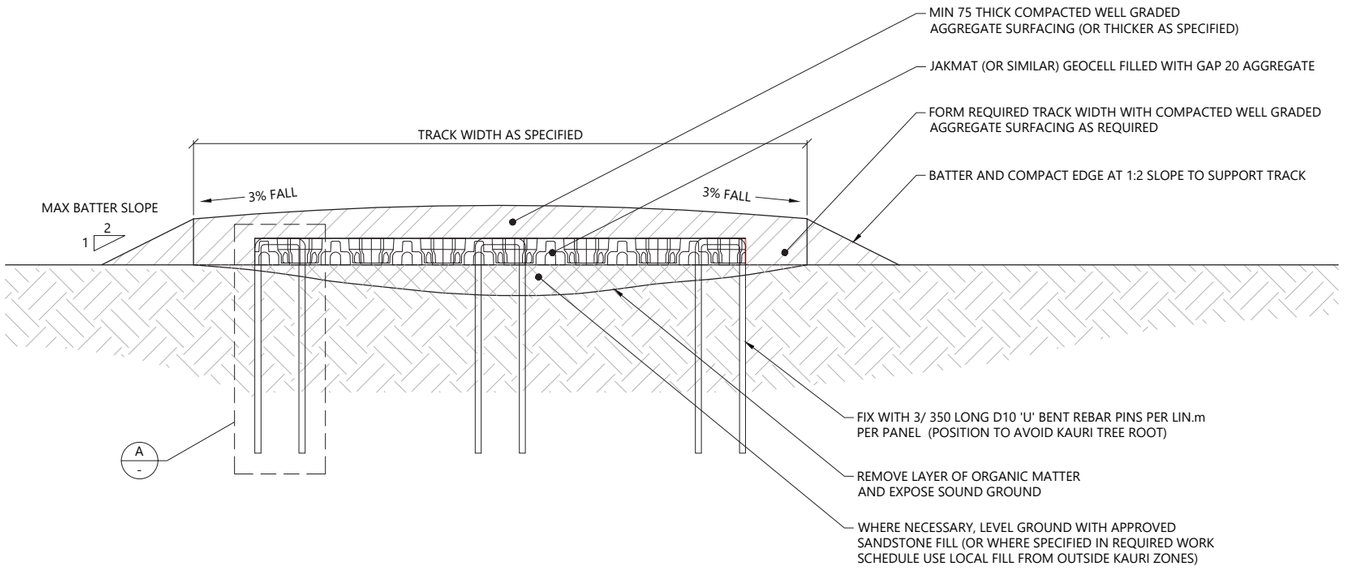
| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: | REVISION: |
| 22133 - 501 | 3 |

Plotted: Wednesday, 17 January 2024 9:07:48 am By: FERNANDA CONTRERAS
File Path: C:\ReNature Limited\P - Documents\2022\22133 AC Standard Kauri Details (Regional)\3 CAD\0 Drawings\AC West Standard Boardwalk R3.dwg



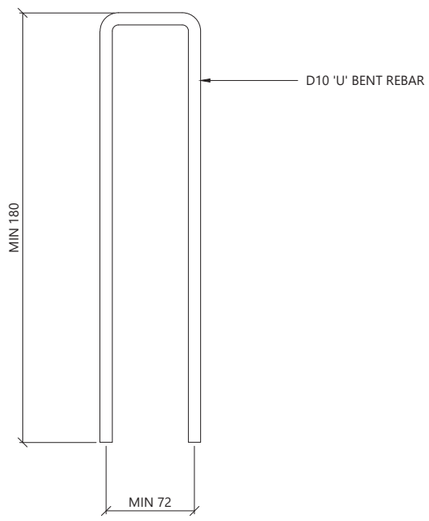

1 – GEOCELL PLAN

SCALE: 1:10 @ A3




2 – GEOCELL SECTION

SCALE: 1:10 @ A3




A – REBAR DETAIL

SCALE: 1:5 @ A3

NOTES:

1. GEOCELL ARE POSITIONED & PINNED TO THE GROUND USING FIXING PINS.
2. JAKMAT PALLET DIMENSIONS: 1.2 × 1.2 × 0.92m JAKMAT PANEL SIZE: 585 × 400 × 43

| TABLE 1 | |
|---|---|
| WIDTH | PANEL |
| 800 | 2 |
| 1000 | 2 + 100 AGGREGATE EACH SIDE |
| 1200 | 3 |
| 1500 | 3 + 150 AGGREGATE EACH SIDE |
| 1800 | 4 + 100 AGGREGATE EACH SIDE |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

PROJECT:
REGIONAL PARKS STANDARD DETAILS

DRAWING:
GEOCELL DETAILS

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

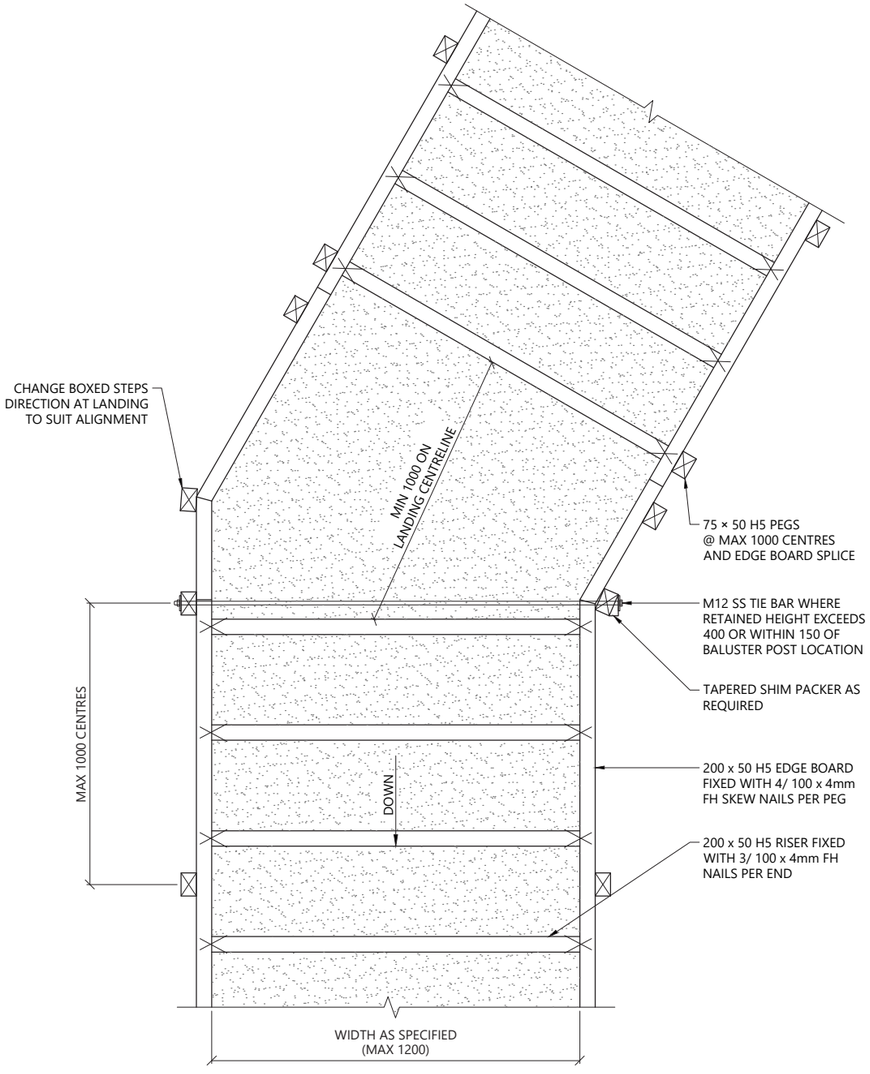
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

STATUS: FOR INFORMATION

SCALE: AS SHOWN

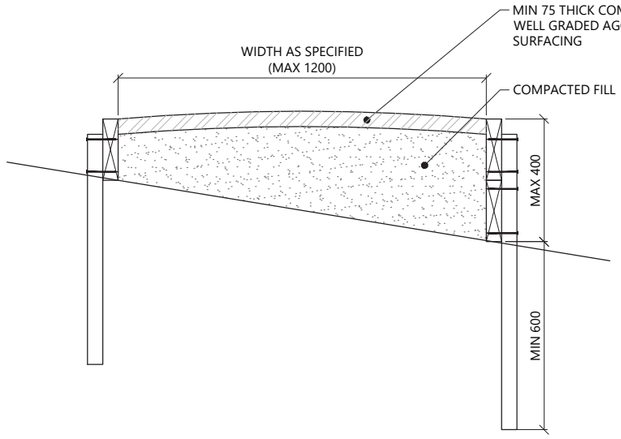
DRAWING NO: 22133 - 502

REVISION: 3



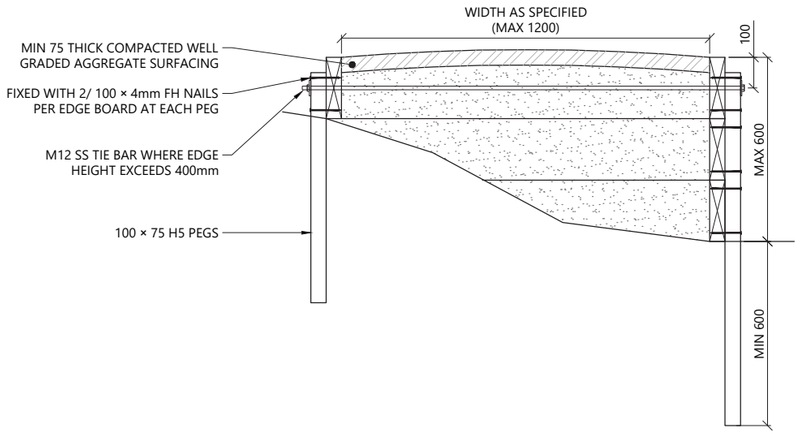

1 – PART PLAN ON BOXED STEPS AND LANDING

SCALE: 1:20 @ A3



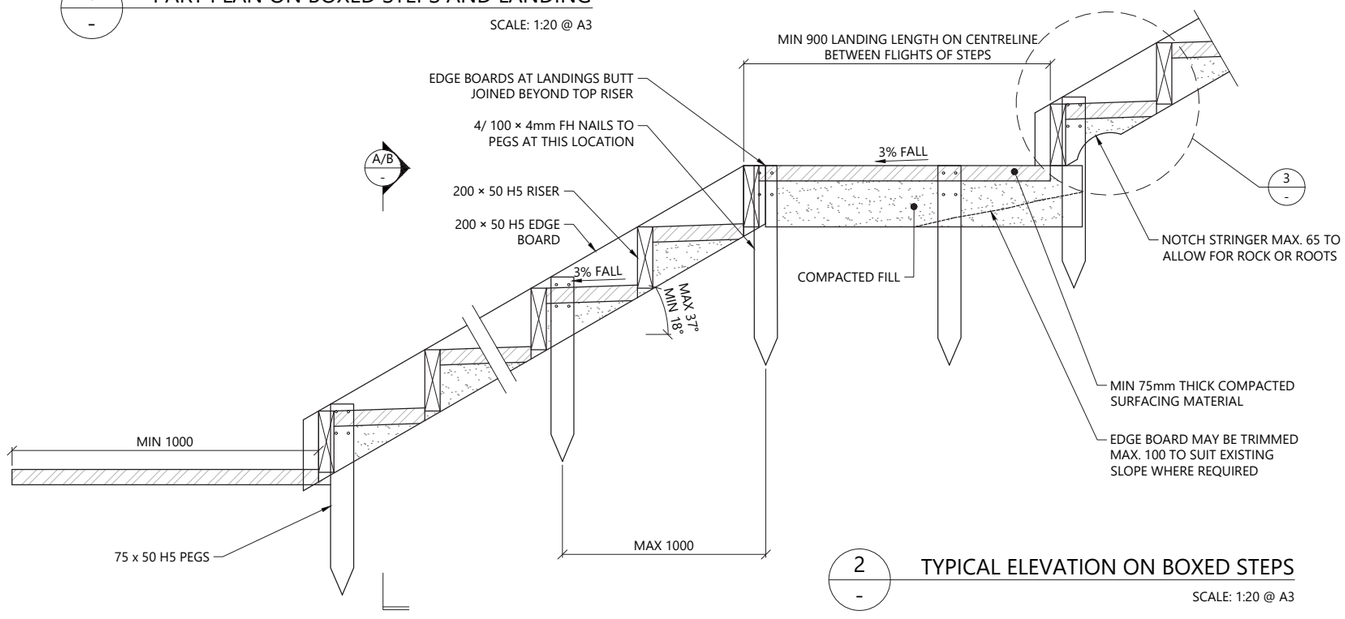

A – TYPICAL SECTION ON BOXED STEPS

SCALE: 1:20 @ A3



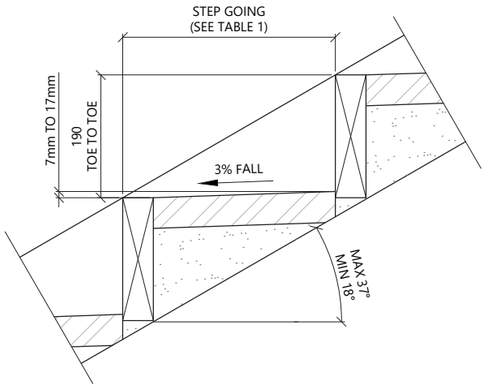

B – BOXED STEP SECTION WITH 600mm HIGH EDGE

SCALE: 1:20 @ A3




2 – TYPICAL ELEVATION ON BOXED STEPS

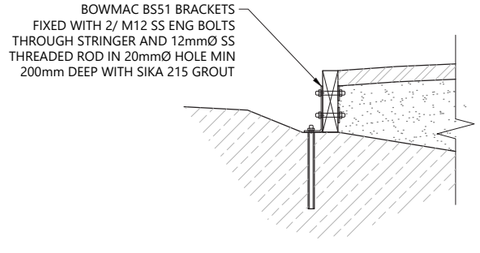
SCALE: 1:20 @ A3




3 – STEP DETAIL

SCALE: 1:10 @ A3

| TABLE 1 - STEP GEOMETRY | | |
|---|---|---|
| ANGLE | RISE | GOING |
| 18° / 33% | 190 | 575 |
| 20° / 36% | 190 | 530 |
| 22° / 40% | 190 | 475 |
| 24° / 45% | 190 | 420 |
| 27° / 50% | 190 | 380 |
| 30° / 58% | 190 | 330 |
| 31° / 60% | 190 | 315 |
| 34° / 66.6% | 190 | 285 |
| 36° / 73% | 190 | 260 |
| 37° / 76% | 190 | 250 |




4 – STRINGER FIXING TO ROCK

SCALE: 1:20 @ A3

NOTES:

1. DRAINAGE CONTROL TO BE PROVIDED AT EACH LANDING WITH 225mmØ SMOOTH WALLED CULVERTS.
2. PROVIDE LANDING EVERY 12 STEPS 190mm AND 180mm RISE (16 STEPS AT 150mm RISE). LANDING SHALL CONSIST OF AT LEAST 1000mm LONG LEVEL STEP.
3. STEPS SHALL HAVE UNIFORM LENGTH AND RISER HEIGHT WITHIN EACH FLIGHT BETWEEN LANDINGS.
4. TIMBER GRADE:
   - ALL TO BE N01 FRAMING OR BETTER.
5. TIMER TREATMENT:
   - SAWN TIMBER IN CONTACT WITH GROUND TO BE H5.
   - TREATMENT SHALL COMPLY WITH THE CURRENT REQUIREMENTS OF THE TIMBER PRESERVATION COUNCIL. ALL TIMBER SHALL BE BRANDED WITH THE APPROPRIATE WOODMARK. IT IS PREFERRED THAT TIMBER BE TREATED AT LEAST 2 MONTHS PRIOR TO USE.
6. NAILS:
   - GENERAL STRUCTURAL USE 100 x 4mm FH.
   - ALL NAILS SHALL BE HOT DIPPED GALVANISED.

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

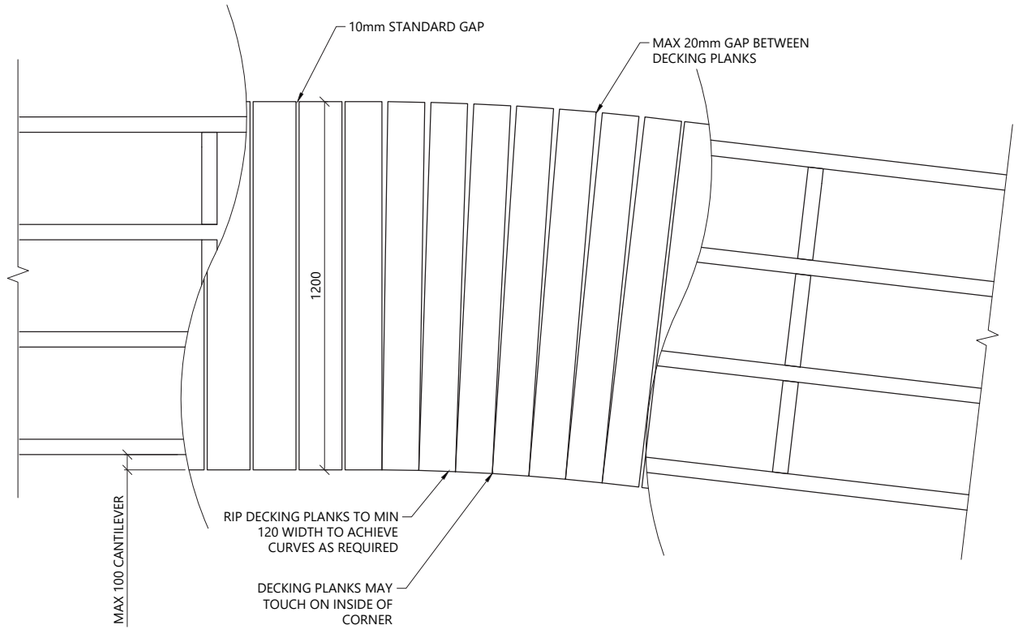
PROJECT:
REGIONAL PARKS STANDARD DETAILS

DRAWING:
TYPICAL BOXED STEPS DETAIL

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

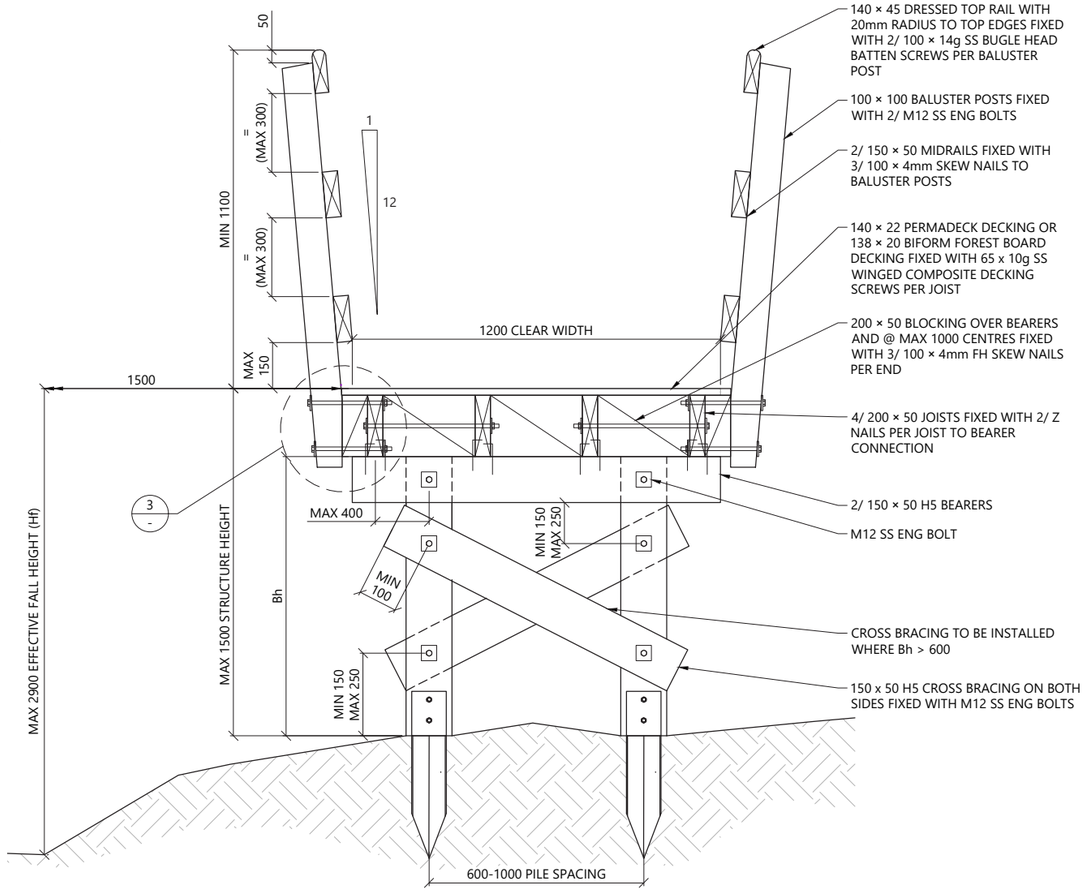
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: | REVISION: |
| 22133 - 503 | 3 |



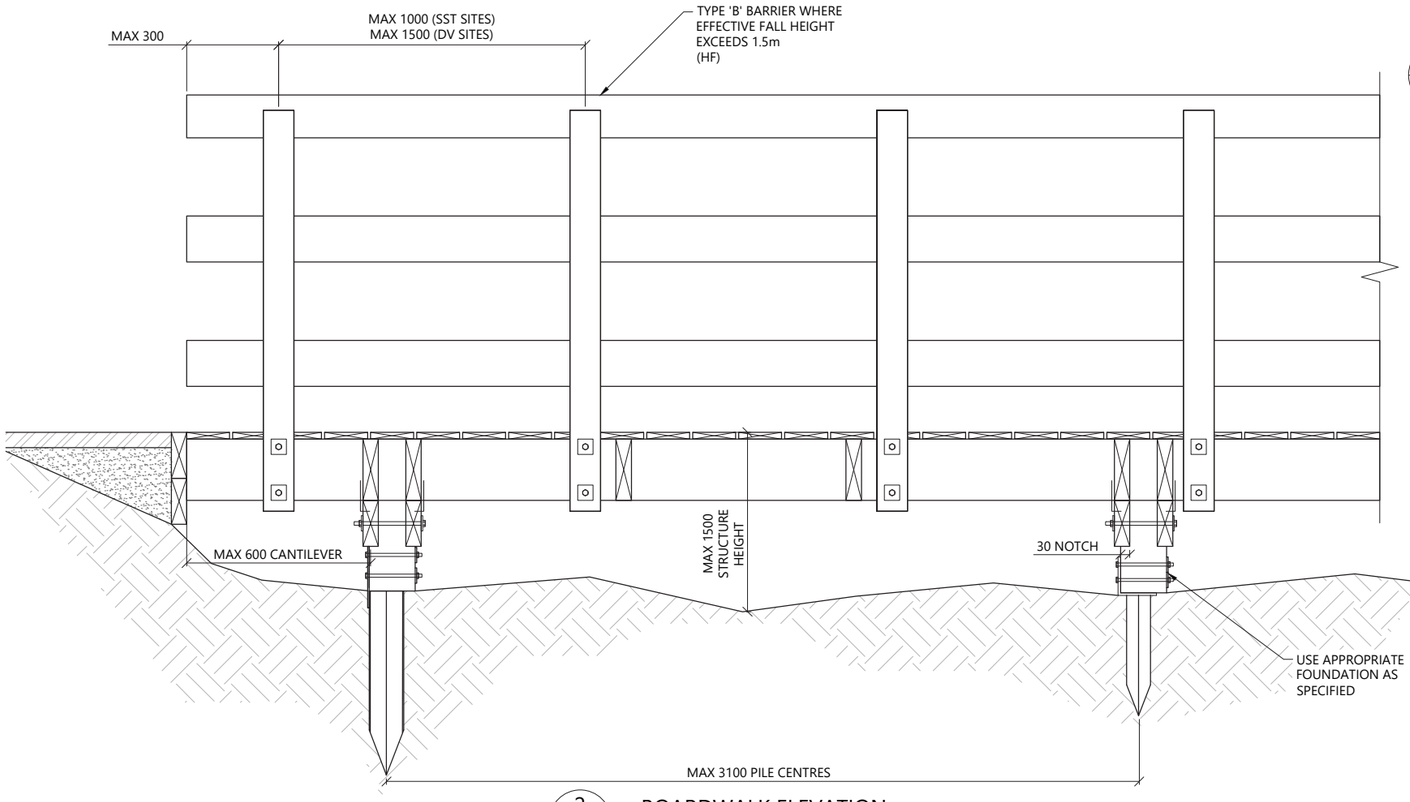

1 / - BOARDWALK PLAN

SCALE: 1:20 @ A3



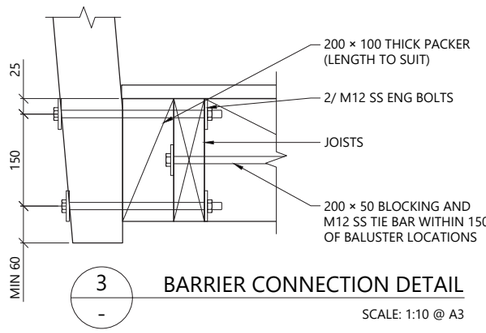

A / - BOARDWALK SECTION

SCALE: 1:20 @ A3



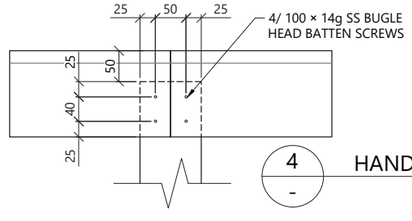

2 / - BOARDWALK ELEVATION

SCALE: 1:20 @ A3



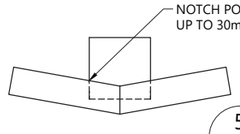

3 / - BARRIER CONNECTION DETAIL

SCALE: 1:10 @ A3




4 / - HANDRAIL SPLICE ELEVATION

SCALE: 1:10 @ A3




5 / - HANDRAIL SPLICE PLAN

SCALE: 1:10 @ A3

NOTES:

1. BARRIER REQUIRED WHERE EFFECTIVE FALL HEIGHT > 1500mm

| THIS STRUCTURE IS DESIGNED ACCORDANCE WITH SNZ HB8630:2004 | |
|---|---|
| STRUCTURE TYPE | ACCESS |
| SITE USER GROUP | SST |
| BASIC DESIGN LOAD | 3.6 kPa |
| CONCENTRATED LOAD | 1.8 kN |
| BARRIER TYPE | TYPE B (BOTH SIDES) |
| BASIC BARRIER DESIGN LOAD | 0.75 kN/m |
| FALL SURFACE CATEGORY | FAVOURABLE |
| EFFECTIVE FALL HEIGHT ($H_f$) | < 3.0 |
| DESIGN LATERAL LOADING | 10% OF DESIGN LIVE LOAD |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER: reNature

PROJECT: REGIONAL PARKS STANDARD DETAILS

DRAWING: 1200 WIDE COMPOSITE DECKING LOW BOARDWALK

CLIENT: Auckland Council, Te Kaunihera o Tāmaki Makaurau

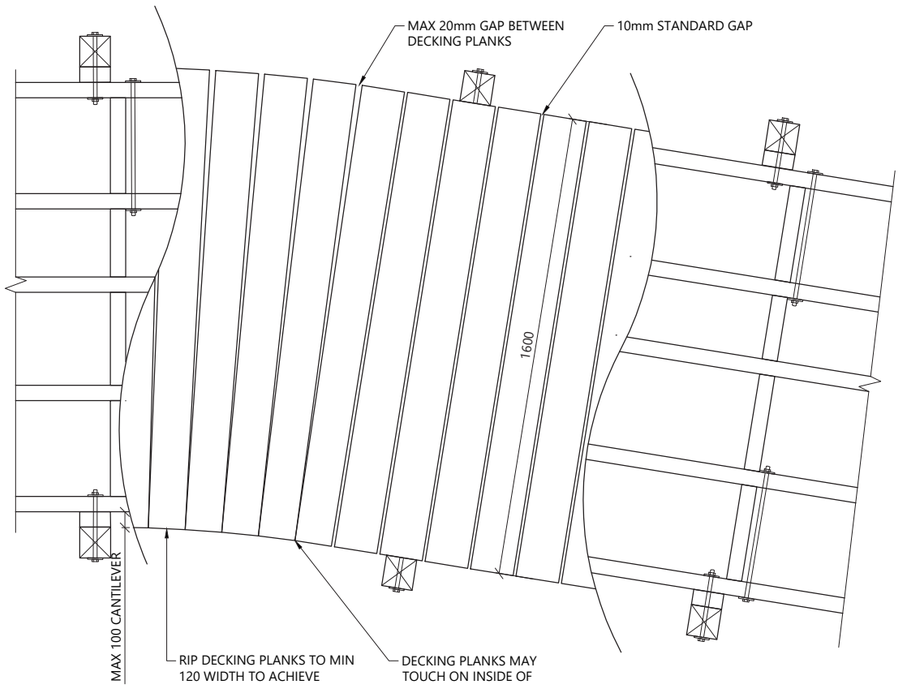
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

STATUS: FOR INFORMATION

SCALE: AS SHOWN

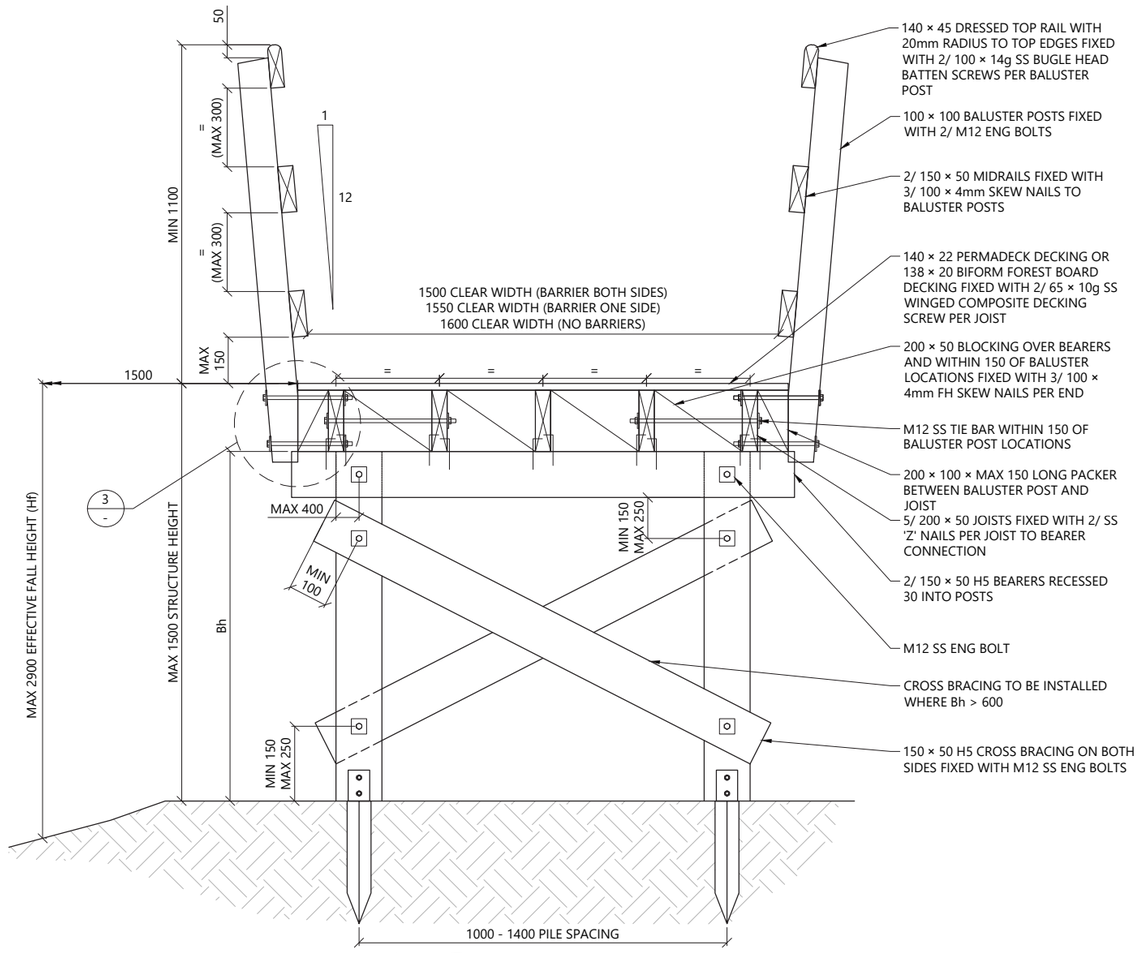
DRAWING NO: 22133 - 504

REVISION: 3



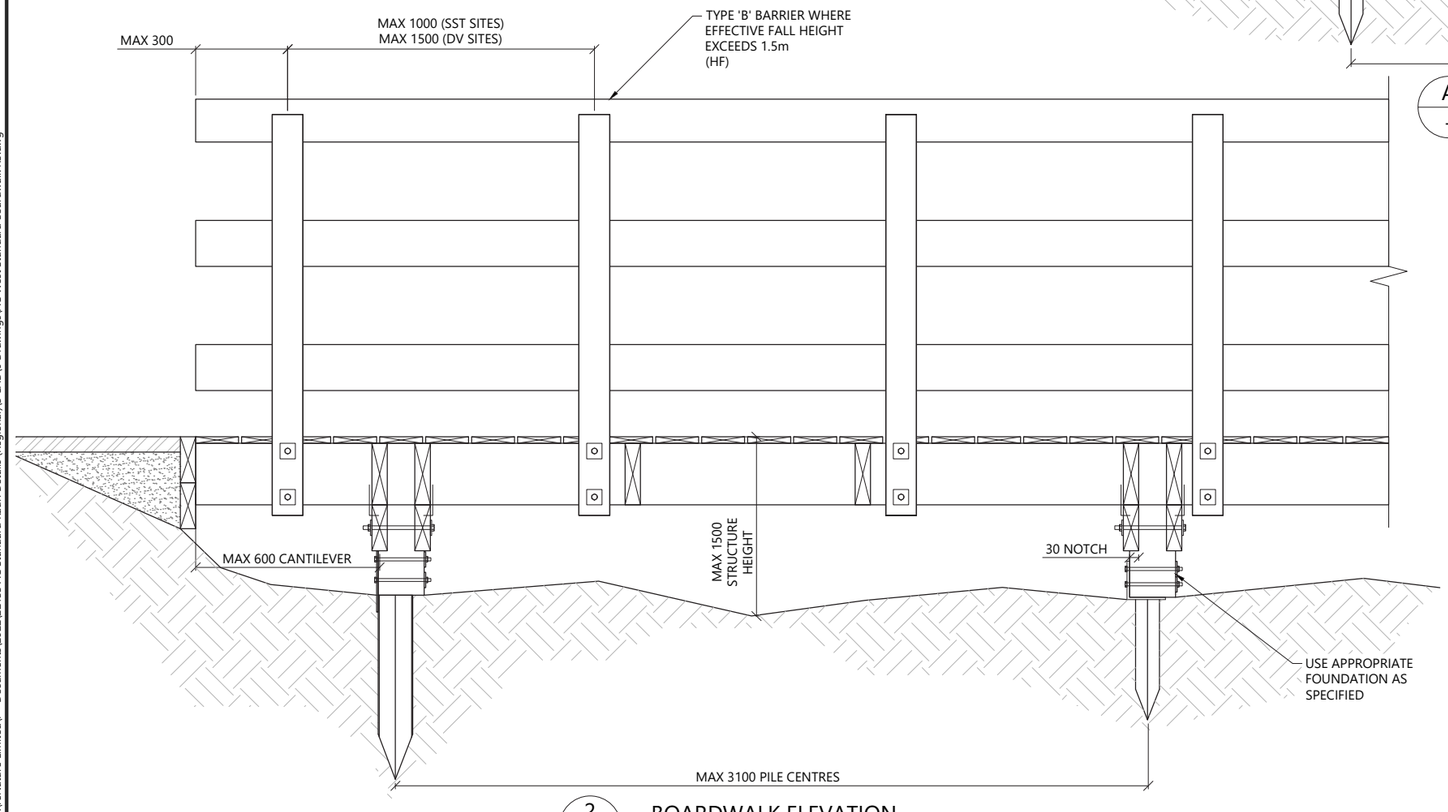

1 / - BOARDWALK PLAN

SCALE: 1:20 @ A3



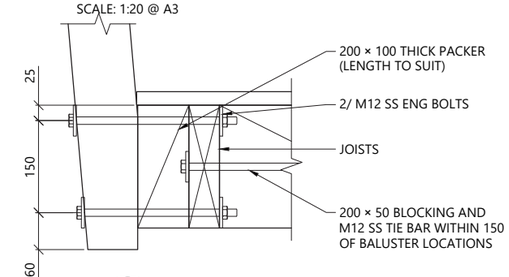

A / - BOARDWALK SECTION

SCALE: 1:20 @ A3



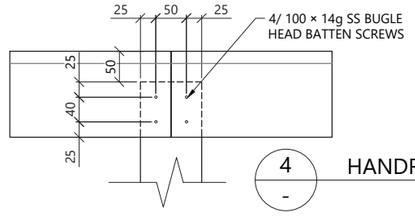

2 / - BOARDWALK ELEVATION

SCALE: 1:20 @ A3



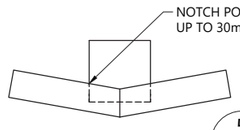

3 / - BARRIER CONNECTION DETAIL

SCALE: 1:10 @ A3




4 / - HANDRAIL SPLICE ELEVATION

SCALE: 1:10 @ A3




5 / - HANDRAIL SPLICE PLAN

SCALE: 1:10 @ A3

NOTES:

1. BARRIER REQUIRED WHERE EFFECTIVE FALL HEIGHT > 1500mm

| THIS STRUCTURE IS DESIGNED ACCORDANCE WITH SNZ HB8630:2004 | |
|---|---|
| STRUCTURE TYPE | ACCESS |
| SITE USER GROUP | SST |
| BASIC DESIGN LOAD | 3.6 kPa |
| CONCENTRATED LOAD | 1.8 kN |
| BARRIER TYPE | TYPE B (BOTH SIDES) |
| BASIC BARRIER DESIGN LOAD | 0.75 kN/m |
| FALL SURFACE CATEGORY | FAVOURABLE |
| EFFECTIVE FALL HEIGHT ($H_f$) | < 3.0 |
| DESIGN LATERAL LOADING | 10% OF DESIGN LIVE LOAD |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

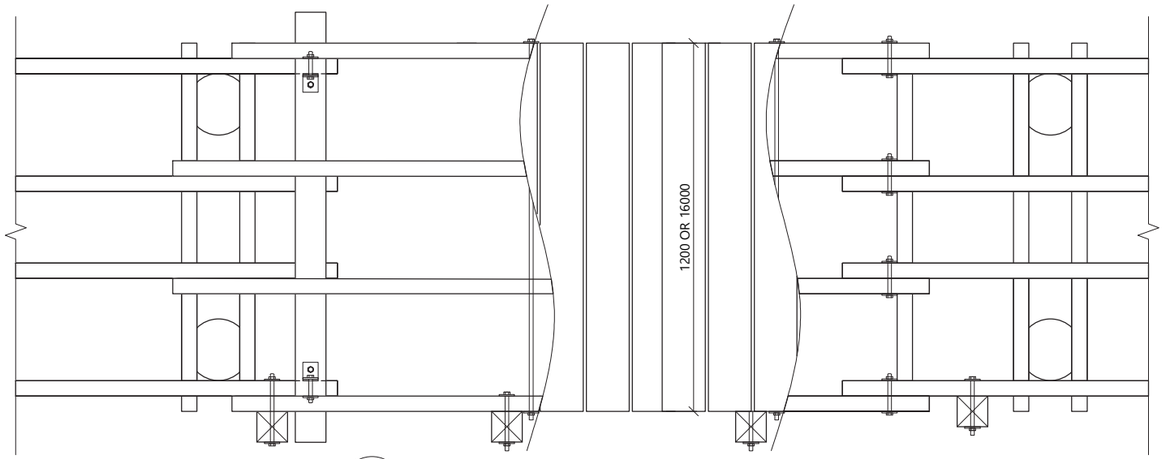
PROJECT:
REGIONAL PARKS STANDARD DETAILS

DRAWING:
1600 WIDE COMPOSITE DECKING LOW BOARDWALK

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

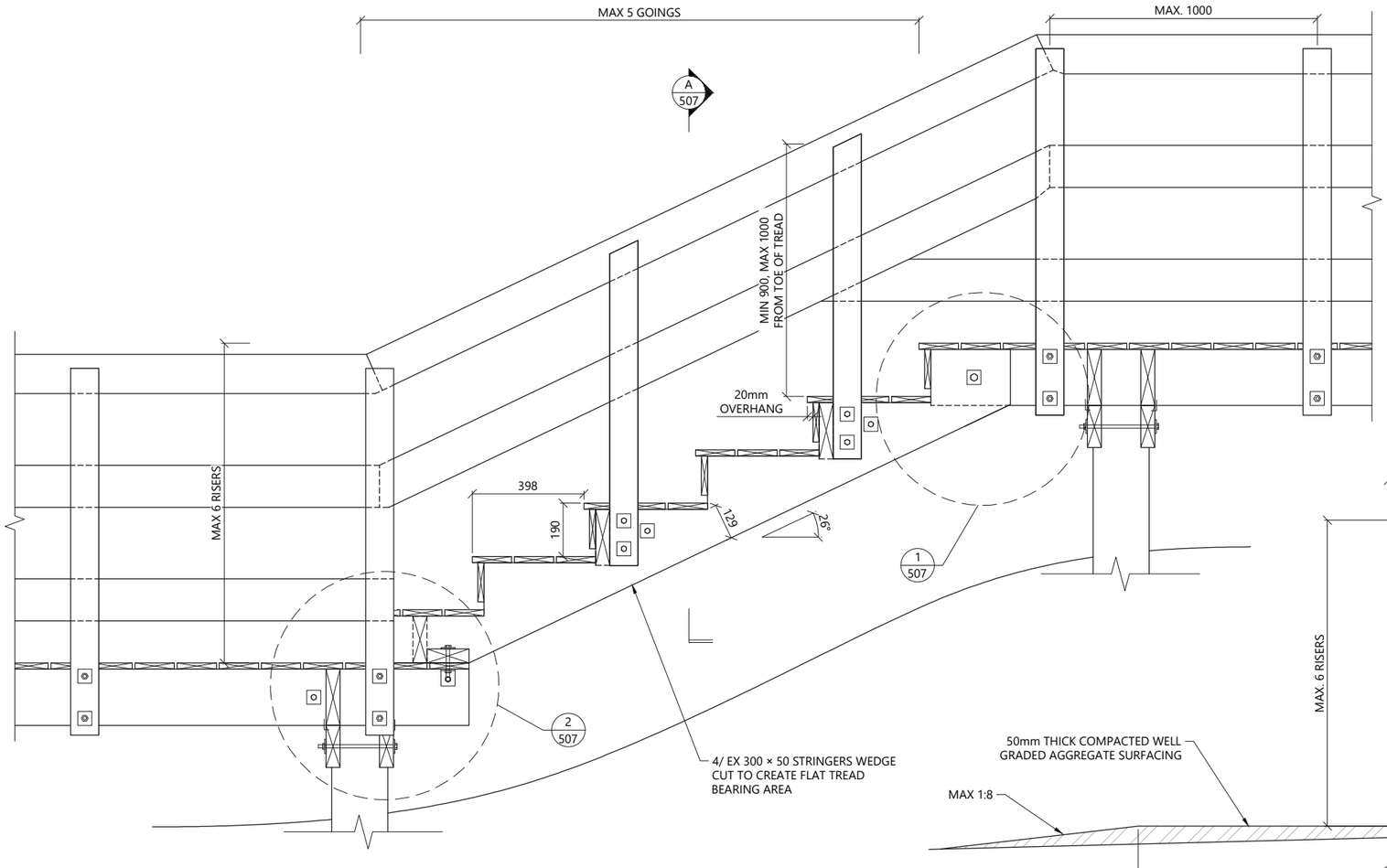
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: | REVISION: |
| 22133 - 505 | 3 |



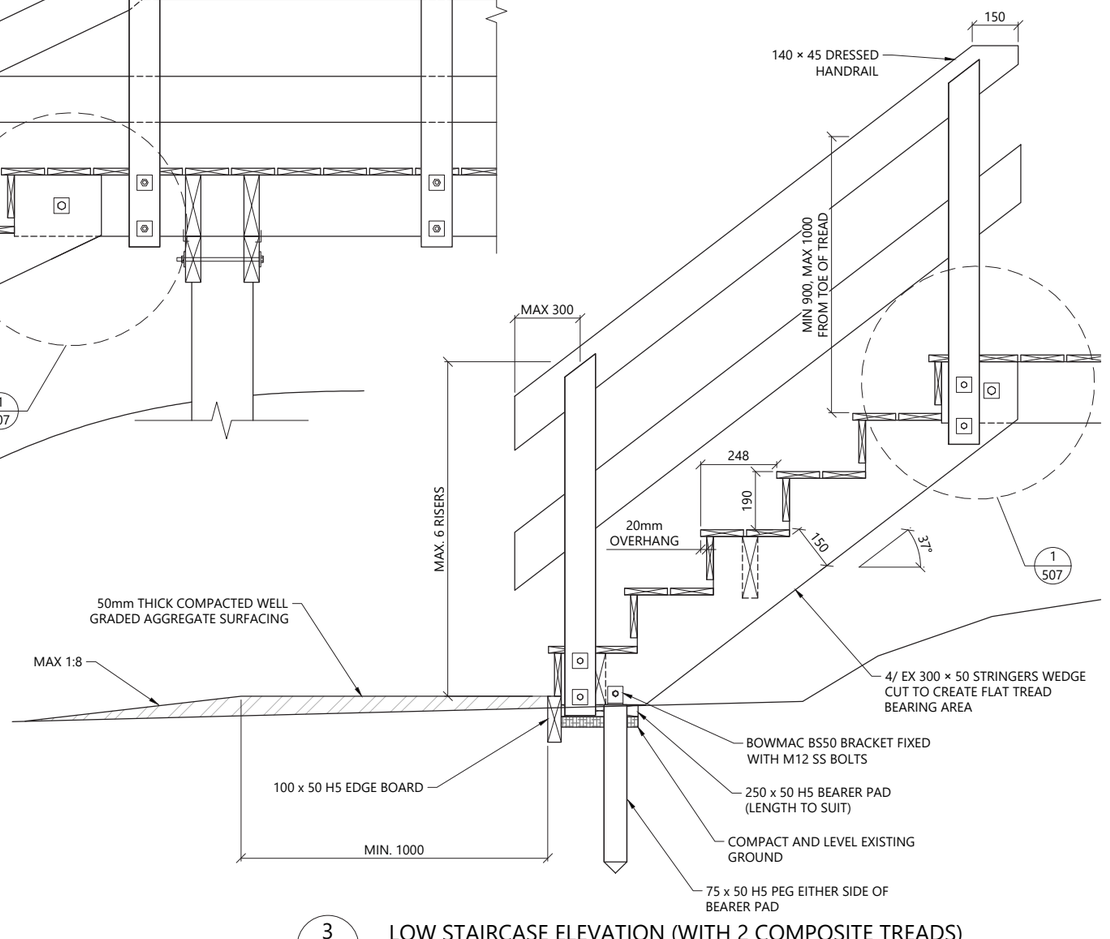

1 / - LOW STAIRCASE PLAN

SCALE: 1:20 @ A3




2 / - LOW STAIRCASE ELEVATION (WITH 3 COMPOSITE TREADS)

SCALE: 1:20 @ A3




3 / - LOW STAIRCASE ELEVATION (WITH 2 COMPOSITE TREADS)

SCALE: 1:20 @ A3

NOTES:

1. 25.5° STAIRCASE PREFERRED. 37.5° STAIRCASE TO BE USED ONLY WHEN REQUIRED BY LOCAL TOPOGRAPHY.
2. ADDITIONAL JOIST REQUIRED WHERE 1600 STAIRCASE IS CONSTRUCTED. NUMBER OF JOISTS TO MATCH WITH BOARDWALK.
3. TYPE 'B' BARRIER REQUIRED WHERE EFFECTIVE FALL HEIGHT IS GREATER THAN 1.5m.

| THIS STRUCTURE IS DESIGNED ACCORDANCE WITH SNZ HB8630:2004 | |
|---|---|
| STRUCTURE TYPE | ACCESS |
| SITE USER GROUP | SST |
| BASIC DESIGN LOAD | 3.6 kPa |
| CONCENTRATED LOAD | 1.8 kN |
| BARRIER TYPE | TYPE B (BOTH SIDES) |
| BASIC BARRIER DESIGN LOAD | 0.75 kN/m |
| FALL SURFACE CATEGORY | FAVOURABLE |
| EFFECTIVE FALL HEIGHT ($H_f$) | < 3.0 |
| DESIGN LATERAL LOADING | 10% OF DESIGN LIVE LOAD |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

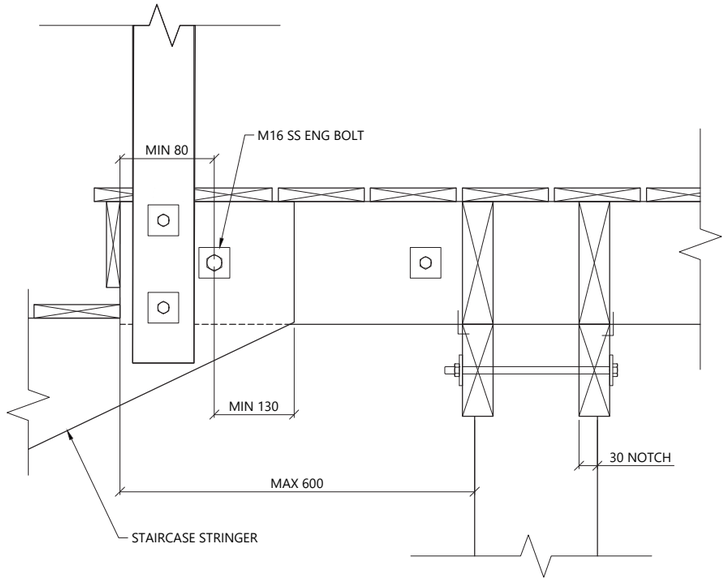
PROJECT:
REGIONAL PARKS
STANDARD DETAILS

DRAWING:
LOW COMPOSITE DECKING
STAIRCASE DETAIL
SHEET 1 OF 2

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

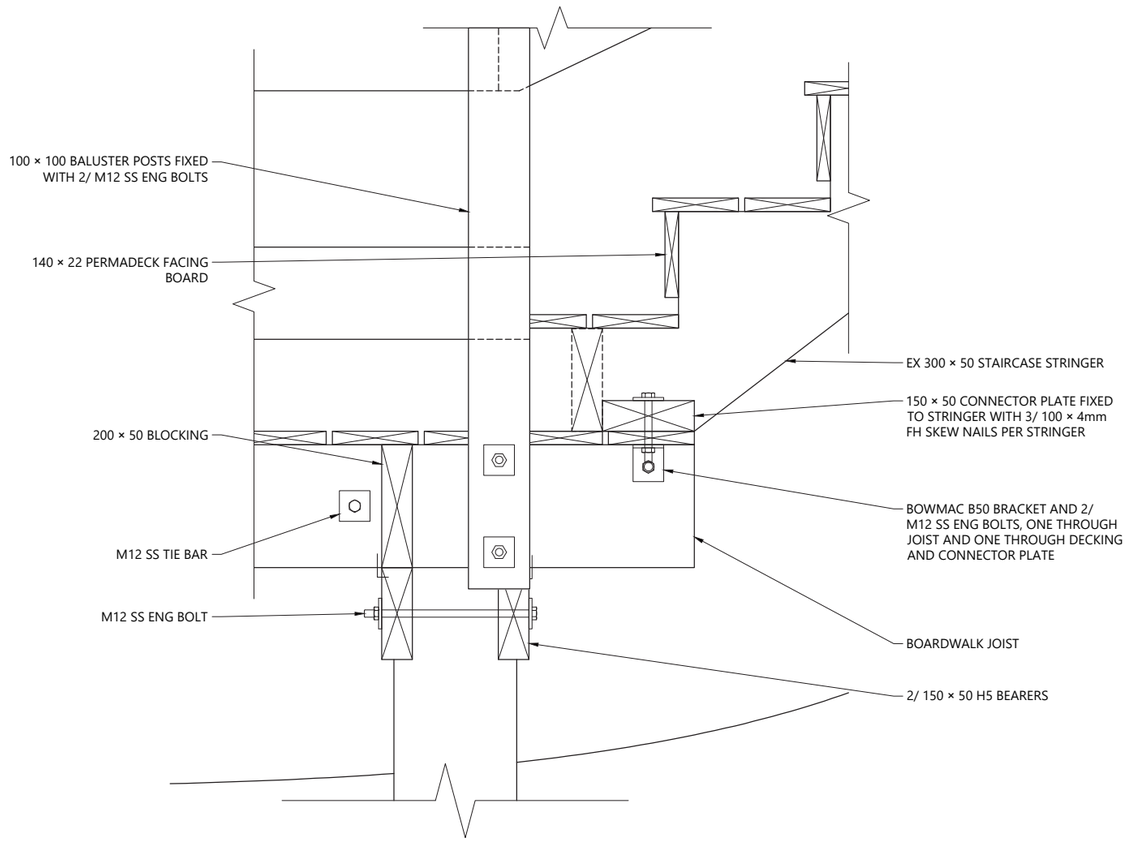
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: | REVISION: |
| 22133 - 506 | 3 |



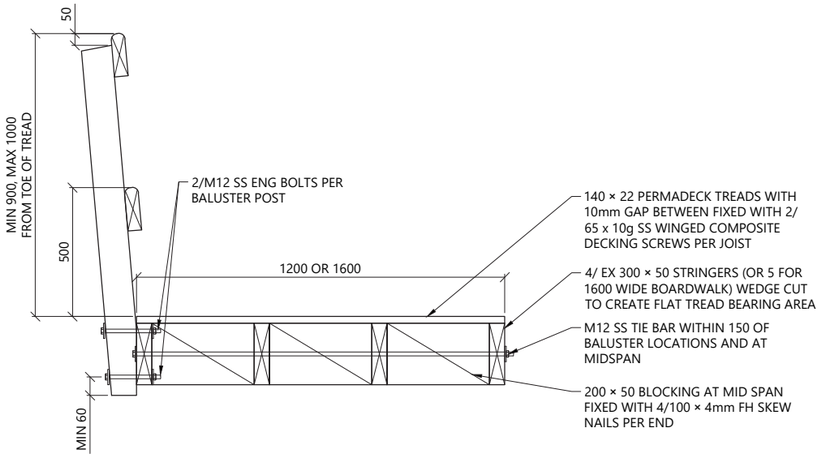

1/506 STRINGER TOP CONNECTION DETAIL

SCALE: 1:10 @ A3



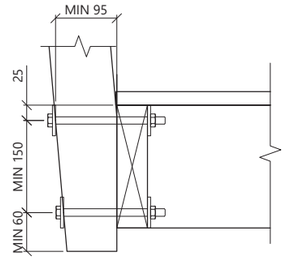

2/506 STRINGER BOTTOM CONNECTION DETAIL

SCALE: 1:10 @ A3



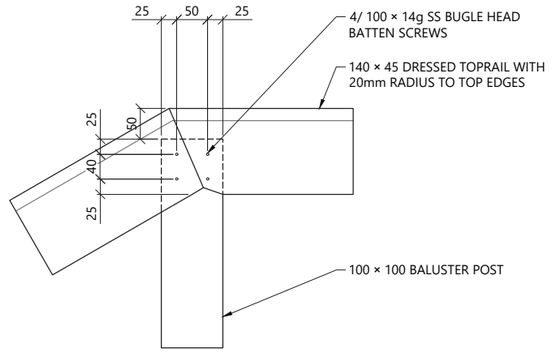

A/506 STAIRCASE SECTION

SCALE: 1:20 @ A3




3/- BARRIER POST CONNECTION DETAIL

SCALE: 1:10 @ A3




4/- HANDRAIL SPLICE ELEVATION

SCALE: 1:10 @ A3

NOTES:

| THIS STRUCTURE IS DESIGNED ACCORDANCE WITH SNZ HB8630:2004 | |
|---|---|
| STRUCTURE TYPE | ACCESS |
| SITE USER GROUP | SST |
| BASIC DESIGN LOAD | 3.6 kPa |
| CONCENTRATED LOAD | 1.8 kN |
| BARRIER TYPE | TYPE B (BOTH SIDES) |
| BASIC BARRIER DESIGN LOAD | 0.75 kN/m |
| FALL SURFACE CATEGORY | FAVOURABLE |
| EFFECTIVE FALL HEIGHT ($H_f$) | < 3.0 |
| DESIGN LATERAL LOADING | 10% OF DESIGN LIVE LOAD |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

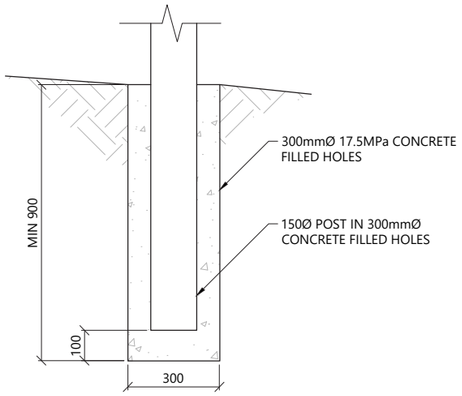
PROJECT:
REGIONAL PARKS STANDARD DETAILS

DRAWING:
LOW COMPOSITE DECKING STAIRCASE DETAIL SHEET 2 OF 2

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

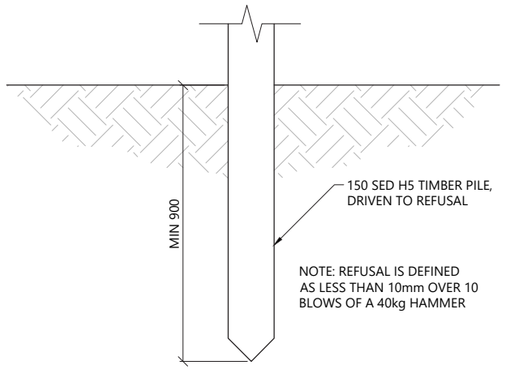
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: 22133 - 507 | REVISION: 3 |



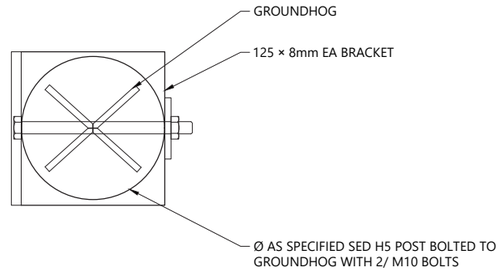

1 – TYPICAL POST FOOTING

SCALE: 1:20 @ A3



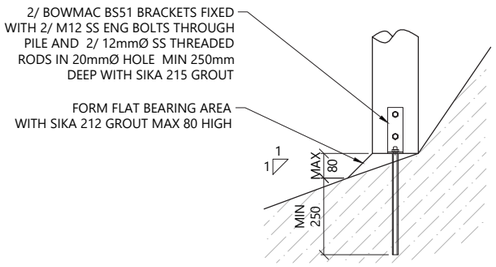

2 – DRIVEN TIMBER PILE

SCALE: 1:20 @ A3



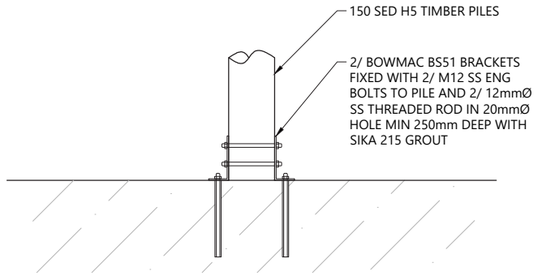

NOTES:

1. ALL STEEL WORK TO BE HOT DIPPED GALVANISED U.O.N.
2. ALL WELDS TO BE 4mm GP FILLET WELDS
3. USE GROUNDHOG DRIVING PLATE TO ENSURE HOT DIP GALVANISING SURFACE IS NOT DAMAGED DURING INSTALLATION
4. TYPE '1' (SMALL) GROUNDHOG FOR USE ONLY IN LOCATIONS WHERE:
   - BEARER HEIGHT IS LESS THAN 600mm
   - CROSS FALL LESS THAN 30%
   - BOARDWALK IS OUTSIDE OF FLOODPLAIN
   - OUTSIDE AREAS OF GROUND INSTABILITY
   - 'GOOD' GROUND AS DEFINED BY NZS3604
   - TO BE APPROVED BY ENGINEER



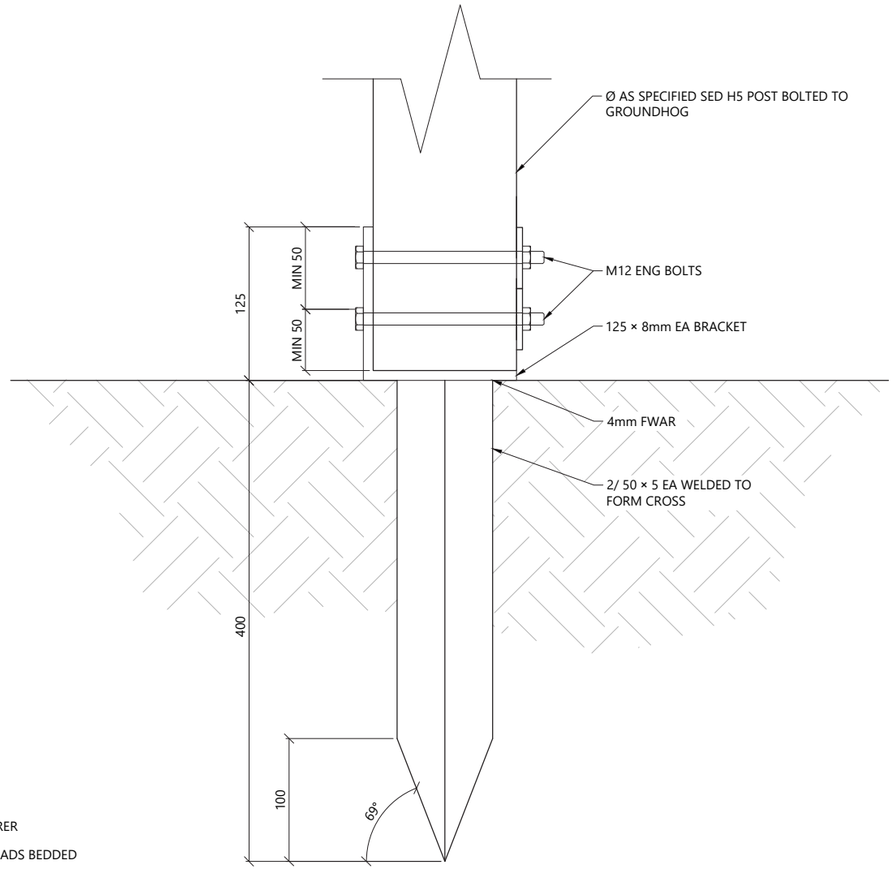

3 – ROCK FIXING FOUNDATION DETAIL

SCALE: 1:20 @ A3



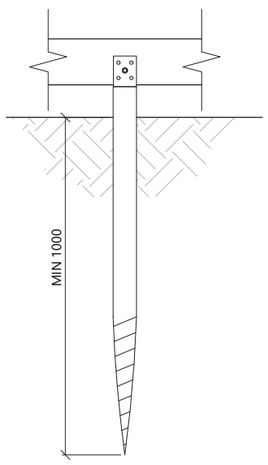

A – ROCK FIXING FOUNDATION ELEVATION

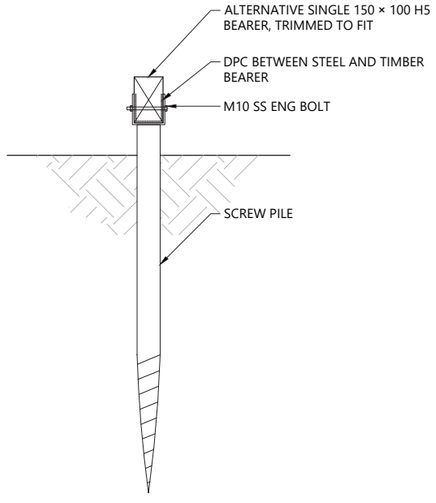
SCALE: 1:20 @ A3




6 – TYPE '1' TYPICAL GROUNDHOG FOOTING

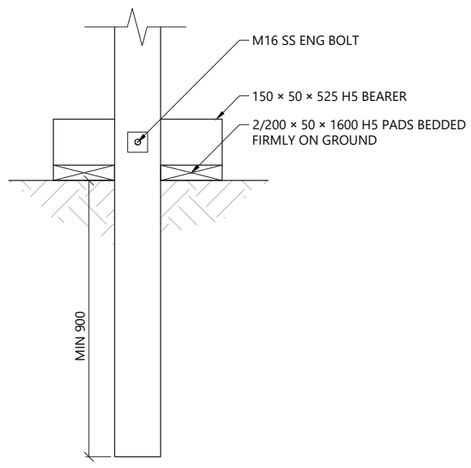
SCALE: 1:5 @ A3




4 – TYPICAL SCREW PILE FOOTING

SCALE: 1:20 @ A3




5 – TYPICAL PAD FOOTING (MARINE ESTURY OR SWAMPY GROUND)

SCALE: 1:20 @ A3

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

PROJECT:
REGIONAL PARKS STANDARD DETAILS

DRAWING:
TYPICAL BOARDWALK FOOTING DETAILS SHEET 1 OF 2

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

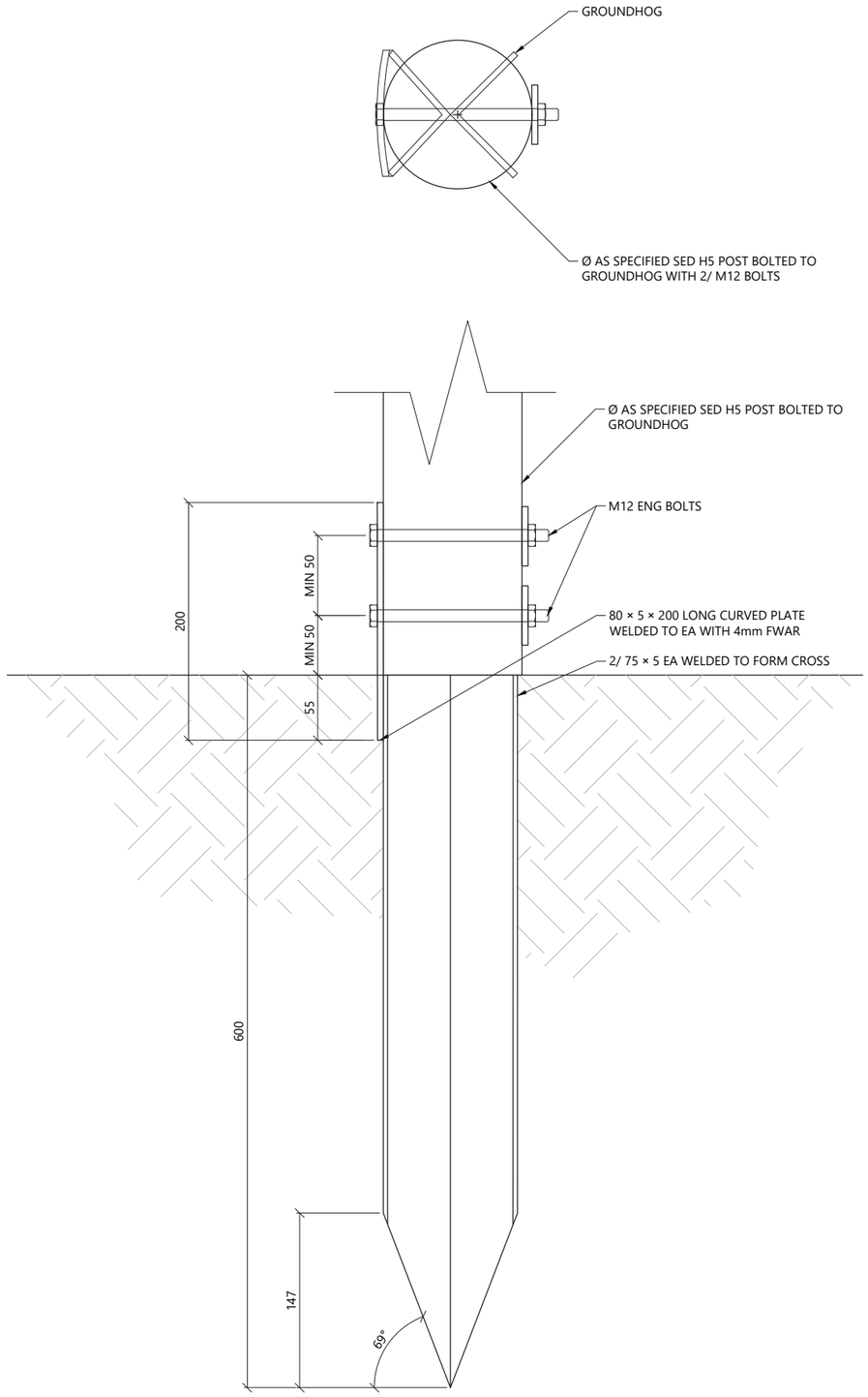
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

STATUS: FOR INFORMATION

SCALE: AS SHOWN

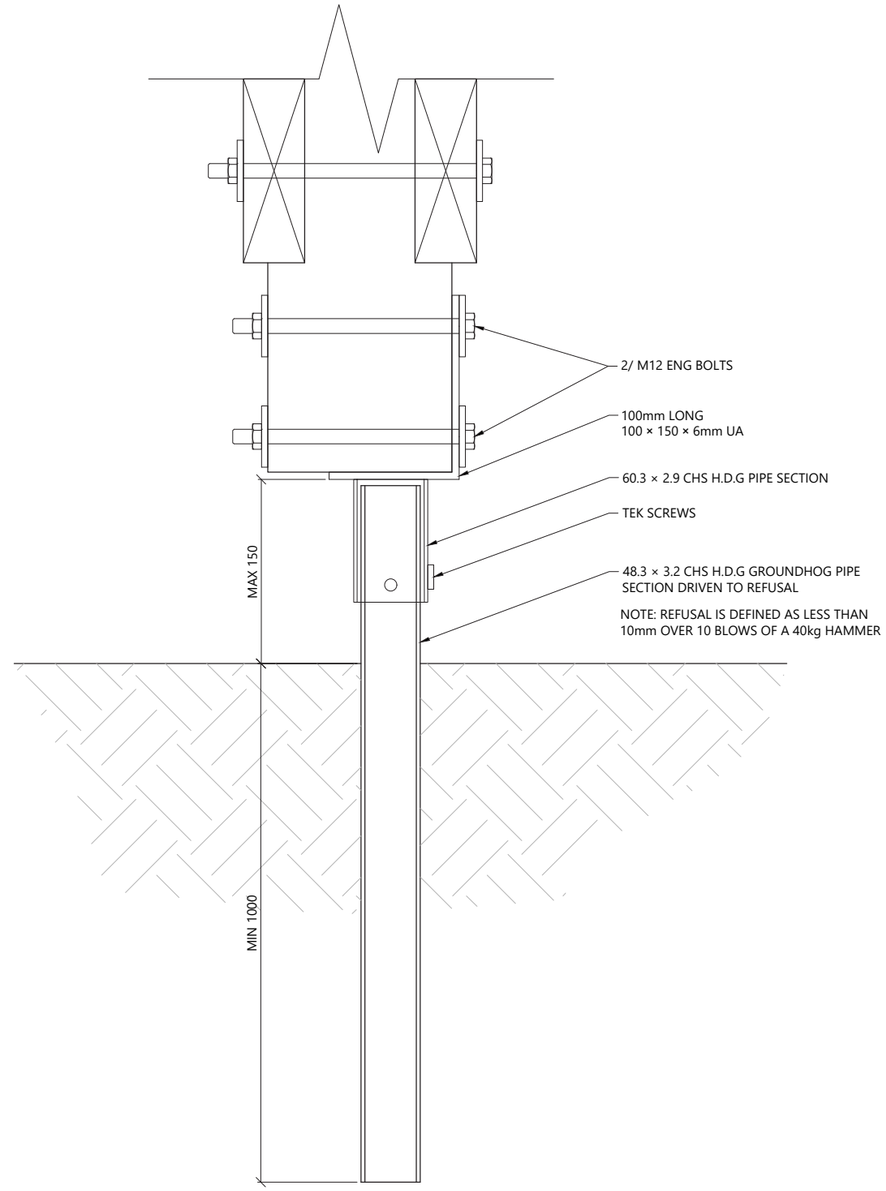
DRAWING NO: 22133 - 508

REVISION: 3




7 – TYPE '2' TYPICAL GROUNDHOG FOOTING

SCALE: 1:5 @ A3




8 – TYPE '3' TYPICAL GROUNDHOG FOOTING

SCALE: 1:5 @ A3

NOTES:

1. ALL STEEL WORK TO BE HOT DIPPED GALVANISED U.O.N.
2. ALL WELDS TO BE 4mm GP FILLET WELDS
3. USE GROUNDHOG DRIVING PLATE TO ENSURE HOT DIP GALVANIZING SURFACE IS NOT DAMAGED DURING INSTALLATION
4. TYPE '2' (LARGE) GROUNDHOG FOR USE ONLY IN LOCATIONS WHERE:
   - BEARER HEIGHT IS GREATER THAN 600mm
   - CROSS FALL LESS THAN 30%
   - BOARDWALK WITHIN FLOODPLAIN
   - OUTSIDE AREAS OF GROUND INSTABILITY
   - 'GOOD' GROUND AS DEFINED BY NZS3604
   - TO BE APPROVED BY ENGINEER
5. TYPE '3' (PIPE) GROUNDHOG FOR USE ONLY IN LOCATIONS WHERE:
   - BEARER HEIGHT IS LESS THAN 800mm
   - CROSS FALL LESS THAN 30%
   - OUTSIDE AREAS OF GROUND INSTABILITY
   - 'GOOD' GROUND AS DEFINED BY NZS3604
   - BOARDWALK IS OUTSIDE OF FLOODPLAIN
   - TO BE APPROVED BY ENGINEER

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

PROJECT:
REGIONAL PARKS STANDARD DETAILS

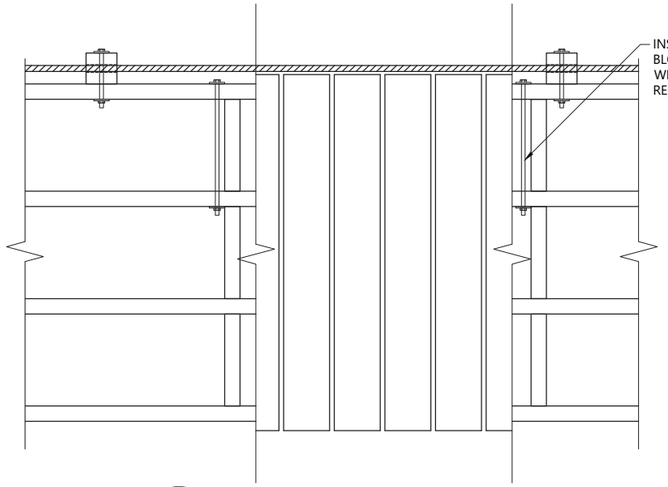
DRAWING:
TYPICAL BOARDWALK FOOTING DETAILS SHEET 2 OF 2

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

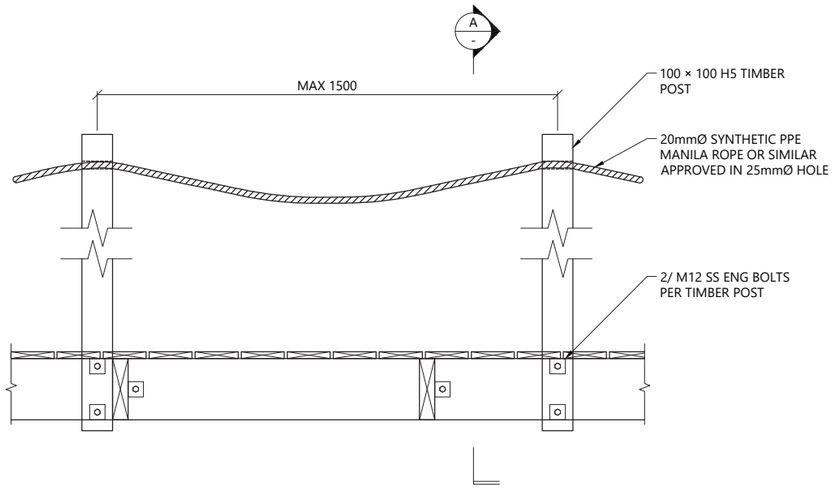
| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |

| DRAWING NO: | REVISION: |
|---|---|
| 22133 - 509 | 3 |



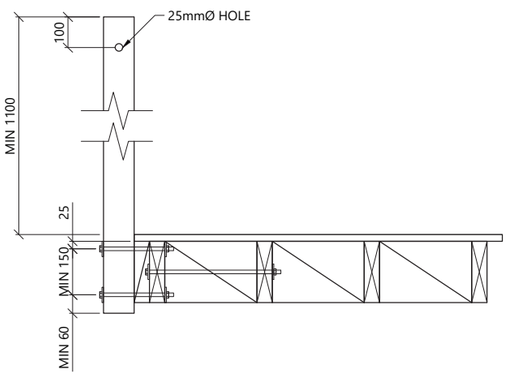

1 - ROPE FENCE ON BOARDWALK PLAN

SCALE: 1:20 @ A3



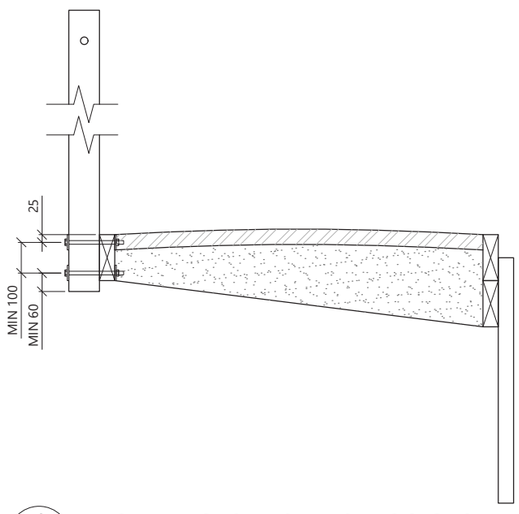

2 - ROPE FENCE ON BOARDWALK ELEVATION

SCALE: 1:20 @ A3



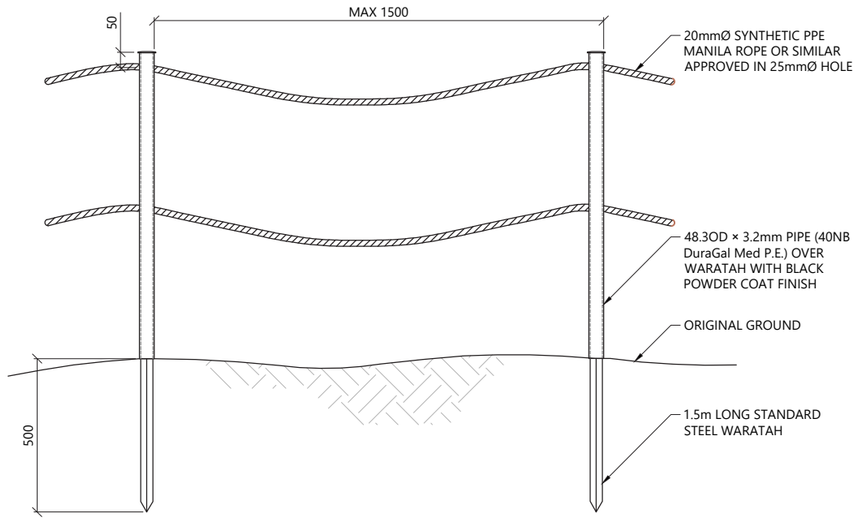

A - ROPE FENCE ON BOARDWALK SECTION

SCALE: 1:20 @ A3



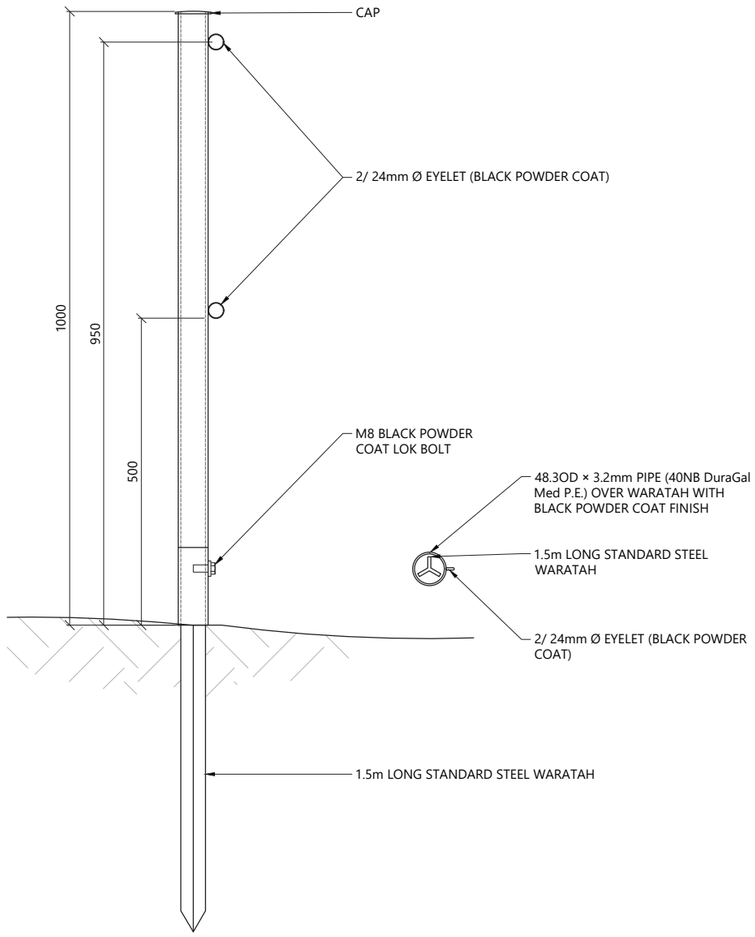

4 - ROPE FENCE ON BOXED STEPS SECTION

SCALE: 1:20 @ A3




3 - ROPE FENCE IN GROUND ELEVATION

SCALE: 1:20 @ A3




5 - ROPE FENCE POST DETAIL

SCALE: 1:10 @ A3

NOTES:

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

PROJECT:
REGIONAL PARKS STANDARD DETAILS

DRAWING:
TYPICAL ROPE FENCE DETAILS
SHEET 1 OF 2

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

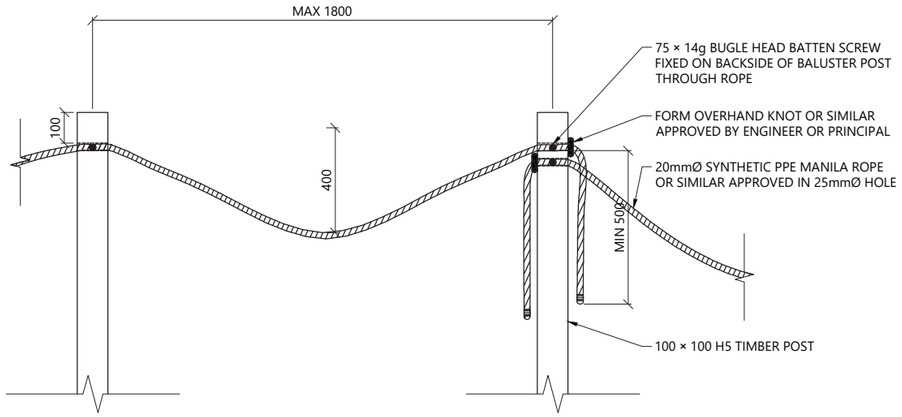
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

STATUS: FOR INFORMATION

SCALE: AS SHOWN

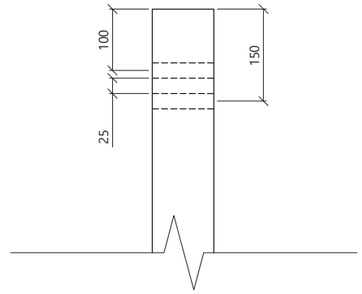
DRAWING NO: 22133 - 510

REVISION: 3




1 - KAURI PROTECTION ROPE FENCE

SCALE: 1:20 @ A3




2 - ROPE TO BALUSTER CONNECTION DETAIL

SCALE: 1:10 @ A3

NOTES:

1. ROPE ENDS ARE TO BE WHIPPED WITH A WEST COUNTRY WHIP TO PREVENT FRAYING. MIN LENGTH OF WHIPPING IS 30mm.
2. AVERAGE LENGTH OF ROPE SEGMENT IS TO BE INSTALLED AT 15M LENGTHS (10 BALUSTER POSTS). ENSURE TO START AND STOP ROPE SEGMENT AT SPECIFIC LOCATIONS SUCH AS CHANGE IN HEIGHT WHERE NO DIG TRACK JOINS BOXED STEPS.
3. LEAVE MIN 200mm TAIL AT START AND FINISH OF ROPE SEGMENTS TO ALLOW FOR FUTURE MAINTENANCE ADJUSTMENTS

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
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| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

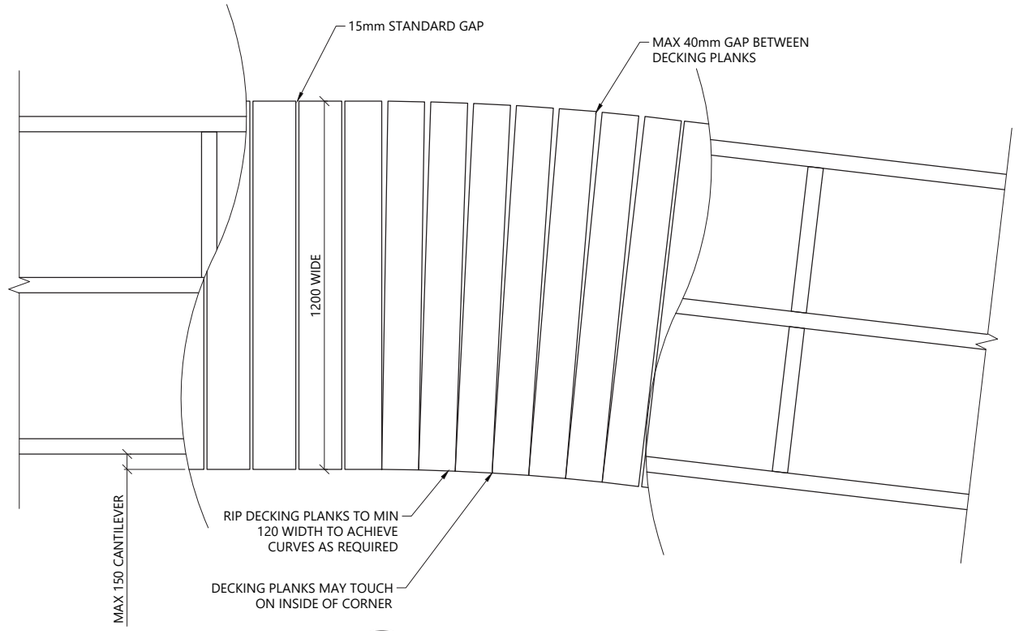
PROJECT:
REGIONAL PARKS
STANDARD DETAILS

DRAWING:
TYPICAL ROPE FENCE
DETAILS
SHEET 2 OF 2

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

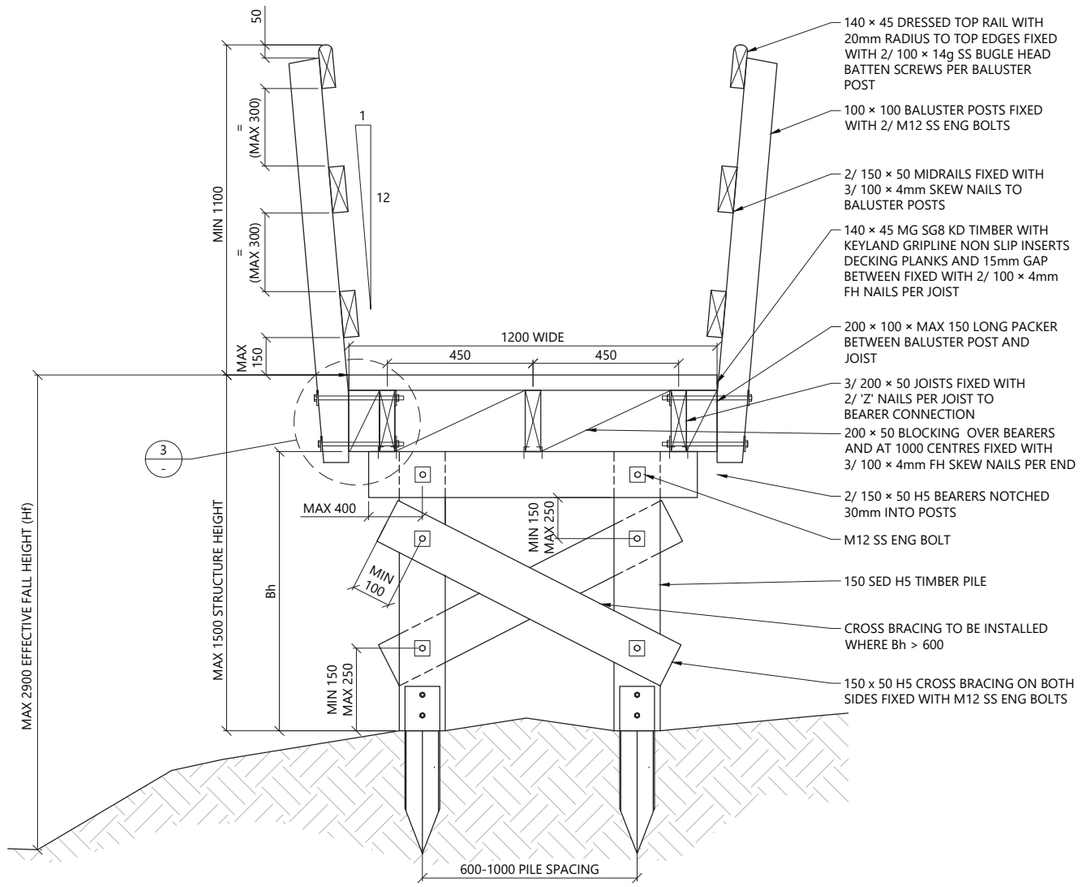
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: 22133 - 511 | REVISION: 3 |



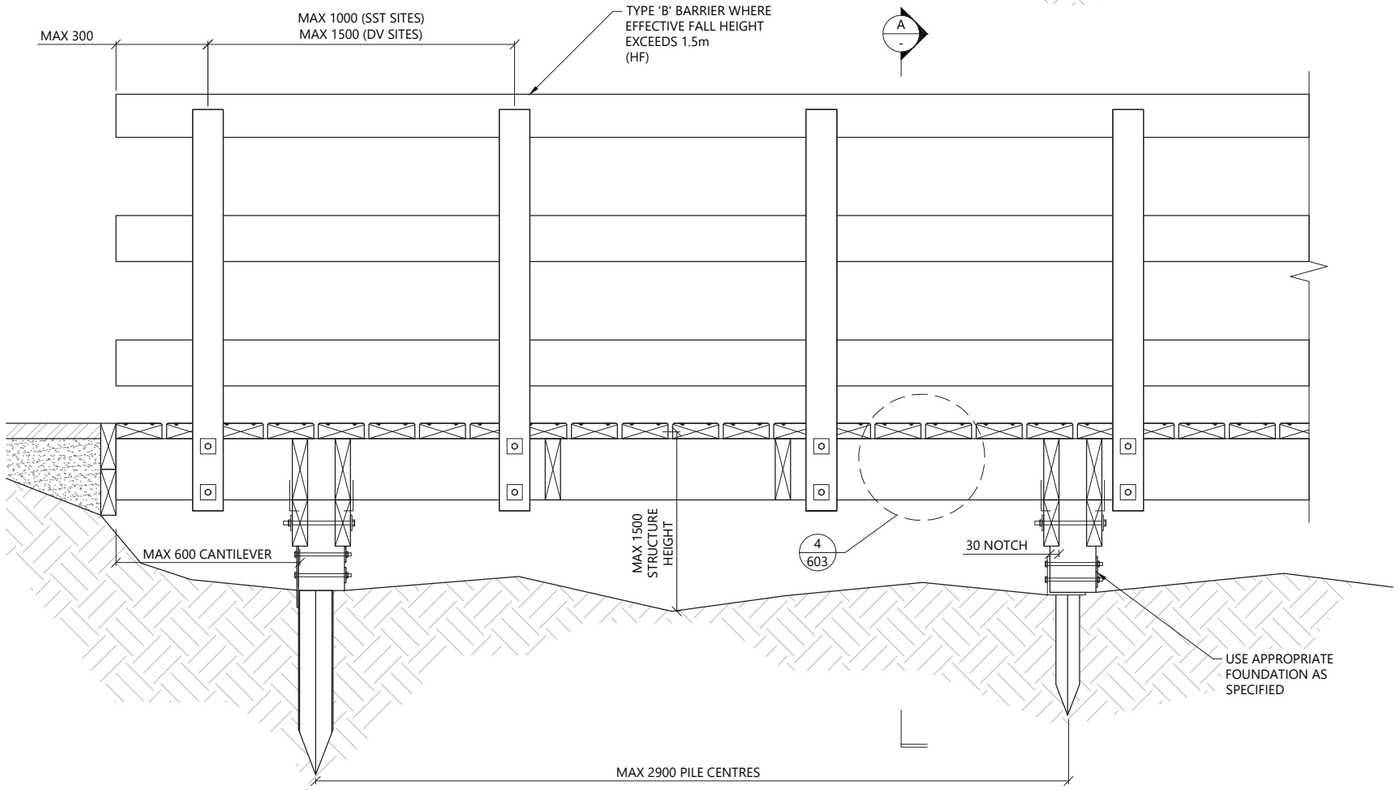

1 / - LOW BOARDWALK PLAN

SCALE 1:20 @ A3



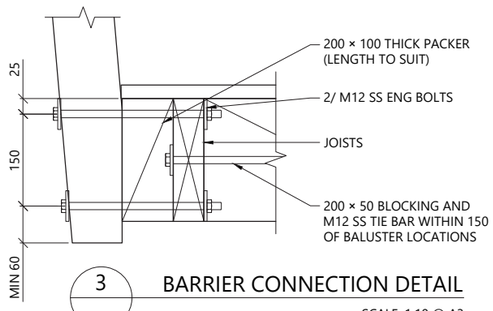

A / - LOW BOARDWALK SECTION

SCALE 1:20 @ A3



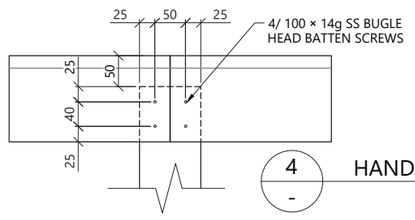

2 / - LOW BOARDWALK ELEVATION

SCALE 1:20 @ A3



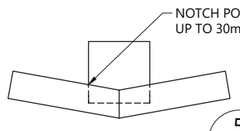

3 / - BARRIER CONNECTION DETAIL

SCALE: 1:10 @ A3




4 / - HANDRAIL SPLICE ELEVATION

SCALE: 1:10 @ A3




5 / - HANDRAIL SPLICE PLAN

SCALE: 1:10 @ A3

NOTES:

1. A BARRIER MAY BE REQUIRED WHERE EFFECTIVE FALL HEIGHT > 1500mm.

| THIS STRUCTURE IS DESIGNED ACCORDANCE WITH SNZ HB8630:2004 | |
|---|---|
| STRUCTURE TYPE | ACCESS |
| SITE USER GROUP | SST |
| BASIC DESIGN LOAD | 3.2 kPa |
| CONCENTRATED LOAD | 1.8 kN |
| BARRIER TYPE | TYPE 'B' |
| BASIC BARRIER DESIGN LOAD | 0.75 kN/m |
| FALL SURFACE CATEGORY | FAVOURABLE |
| EFFECTIVE FALL HEIGHT ($H_f$) | < 1.5m |
| DESIGN LATERAL LOADING | 10% OF DESIGN LIVE LOAD |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER: reNature

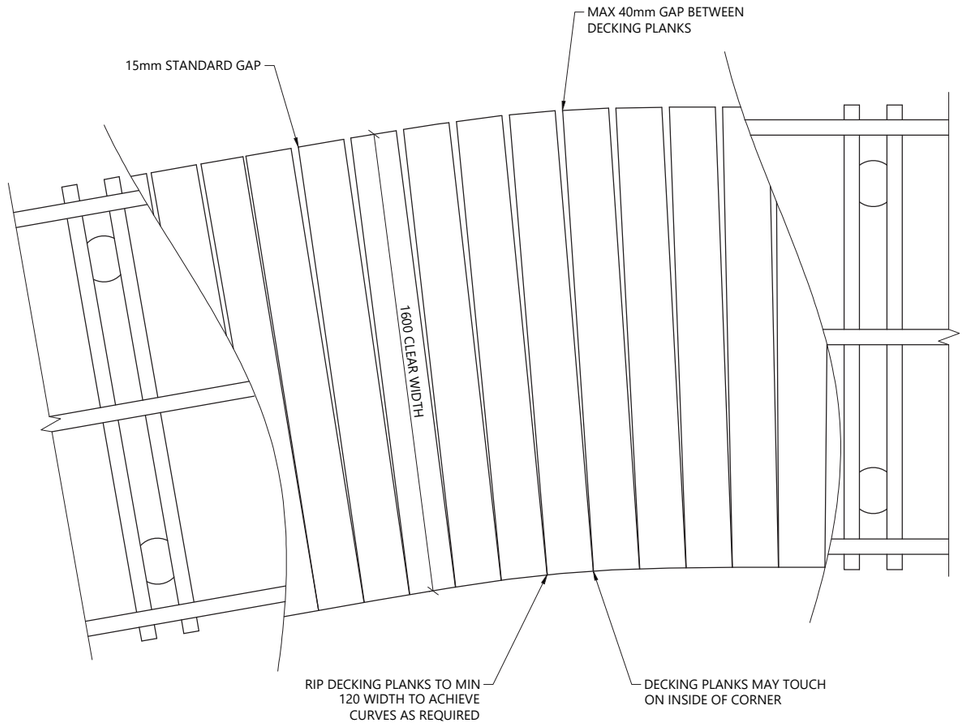
PROJECT: REGIONAL PARKS STANDARD DETAILS

DRAWING: 1200 WIDE TIMBER DECKING LOW BOARDWALK DETAILS

CLIENT: Auckland Council, Te Kaunihera o Tāmaki Makaurau

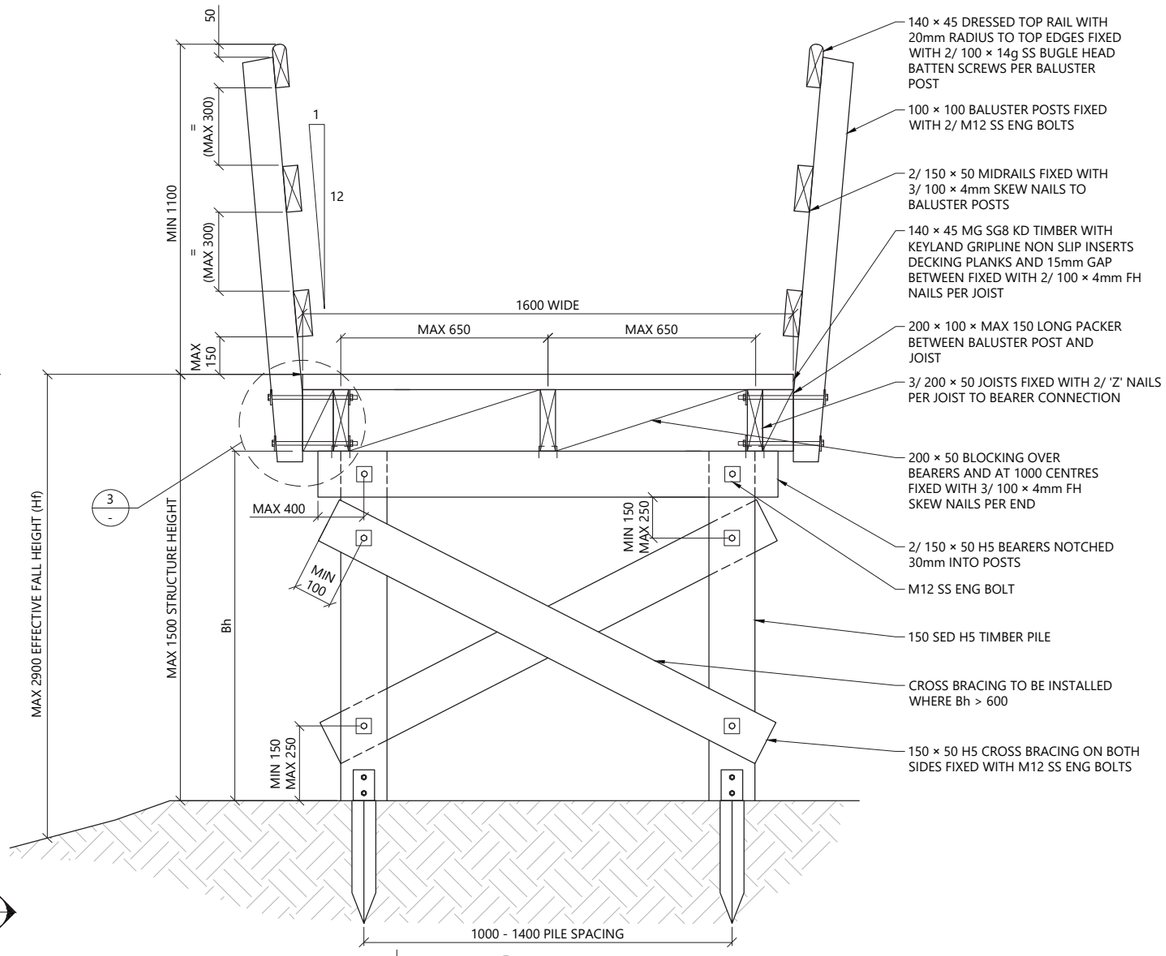
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: | REVISION: |
| 22133 - 600 | 3 |



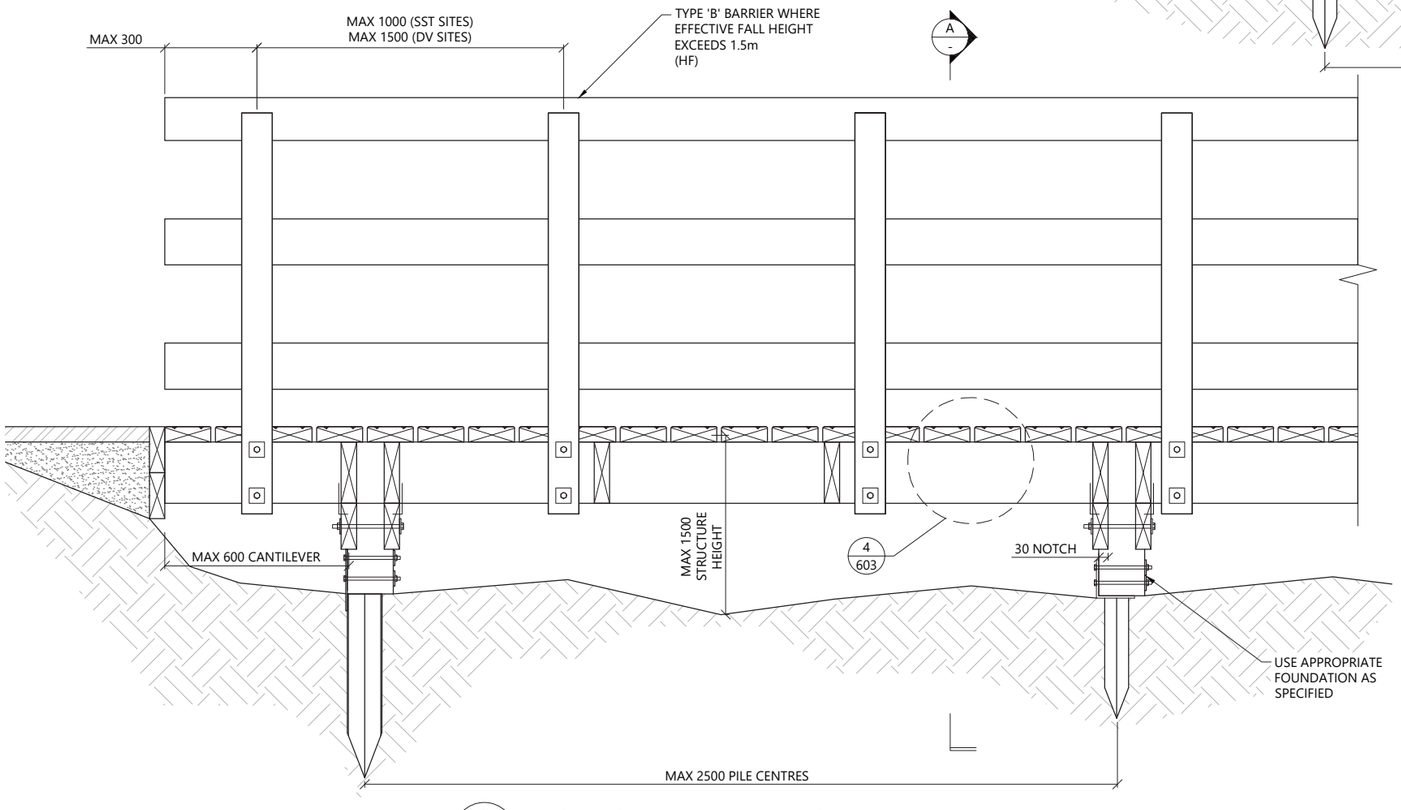

1 / - LOW BOARDWALK PLAN

SCALE 1:20 @ A3



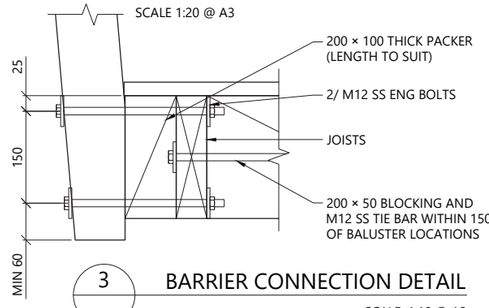

A / - LOW BOARDWALK SECTION

SCALE 1:20 @ A3



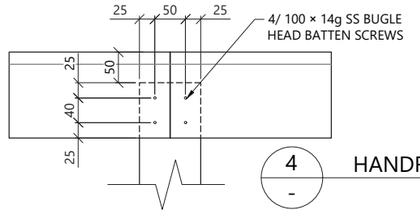

2 / - LOW BOARDWALK ELEVATION

SCALE 1:20 @ A3



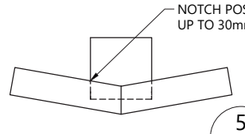

3 / - BARRIER CONNECTION DETAIL

SCALE: 1:10 @ A3




4 / - HANDRAIL SPLICE ELEVATION

SCALE: 1:10 @ A3




5 / - HANDRAIL SPLICE PLAN

SCALE: 1:10 @ A3

NOTES:

1. A BARRIER MAY BE REQUIRED WHERE EFFECTIVE FALL HEIGHT > 1500mm.

| THIS STRUCTURE IS DESIGNED ACCORDANCE WITH SNZ HB8630:2004 | |
|---|---|
| STRUCTURE TYPE | ACCESS |
| SITE USER GROUP | SST |
| BASIC DESIGN LOAD | 3.2 kPa |
| CONCENTRATED LOAD | 1.8 kN |
| BARRIER TYPE | TYPE 'B' |
| BASIC BARRIER DESIGN LOAD | 0.75 kN/m |
| FALL SURFACE CATEGORY | FAVOURABLE |
| EFFECTIVE FALL HEIGHT ($H_f$) | < 1.5m |
| DESIGN LATERAL LOADING | 10% OF DESIGN LIVE LOAD |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

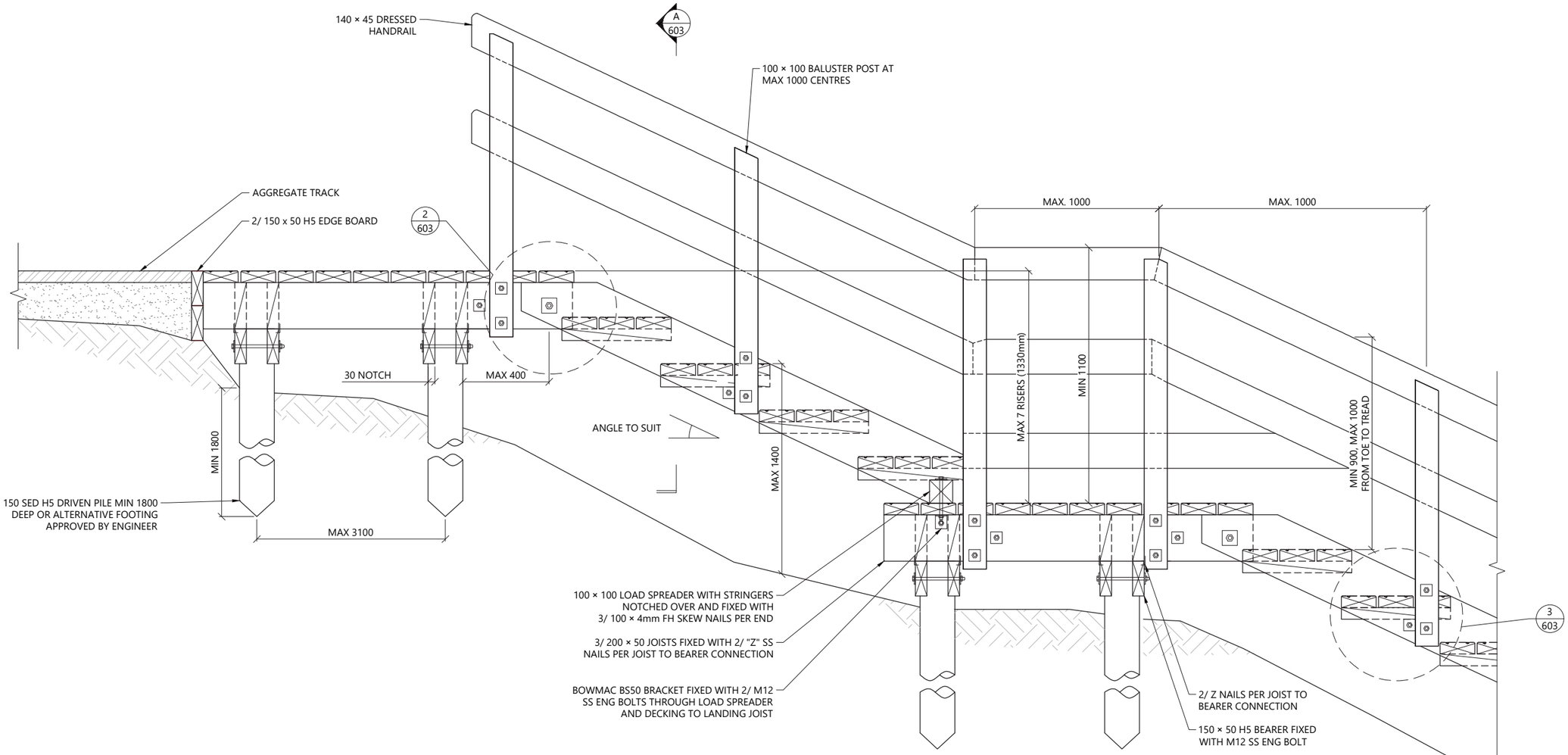
PROJECT:
REGIONAL PARKS STANDARD DETAILS

DRAWING:
1600 WIDE TIMBER DECKING LOW BOARDWALK DETAILS

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

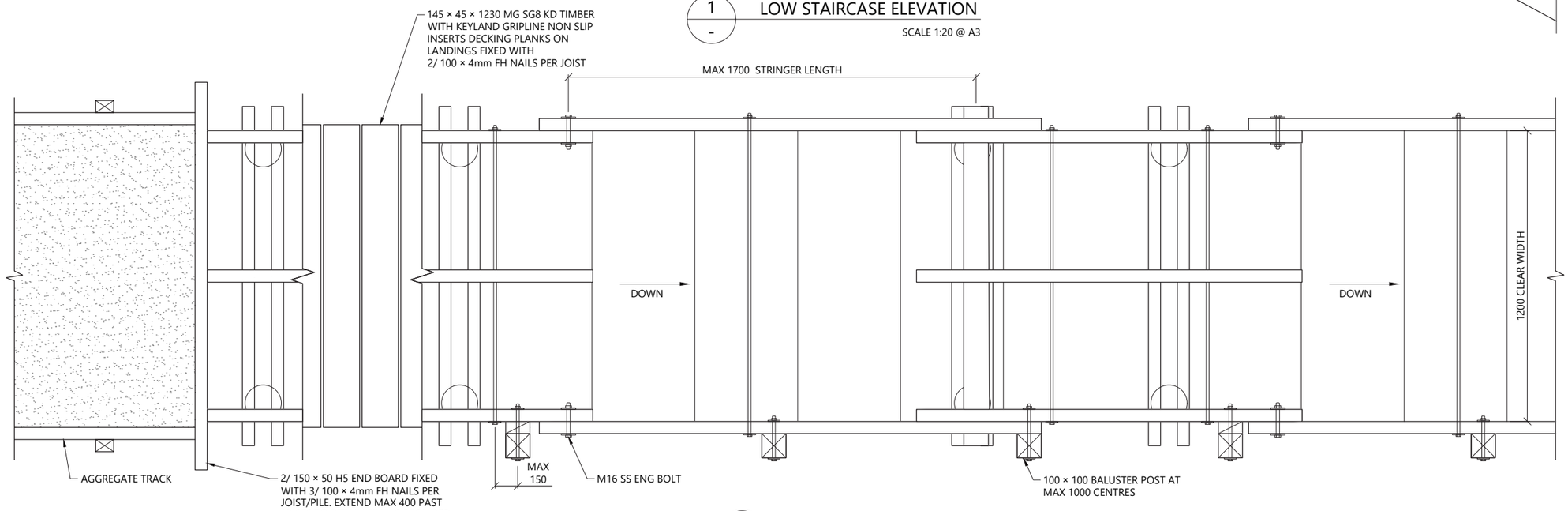
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: | REVISION: |
| 22133 - 601 | 3 |




1 - LOW STAIRCASE ELEVATION

SCALE 1:20 @ A3




2 - LOW STAIRCASE PLAN

SCALE 1:20 @ A3

NOTES:

| THIS STRUCTURE IS DESIGNED ACCORDANCE WITH SNZ HB8630:2004 | |
|---|---|
| STRUCTURE TYPE | ACCESS |
| SITE USER GROUP | SST |
| BASIC DESIGN LOAD | 3.2 kPa |
| CONCENTRATED LOAD | 1.8 kN |
| BARRIER TYPE | TYPE 'B' |
| BASIC BARRIER DESIGN LOAD | 0.75 kN/m |
| FALL SURFACE CATEGORY | FAVOURABLE |
| EFFECTIVE FALL HEIGHT ($H_f$) | < 1.5m |
| DESIGN LATERAL LOADING | 10% OF DESIGN LIVE LOAD |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

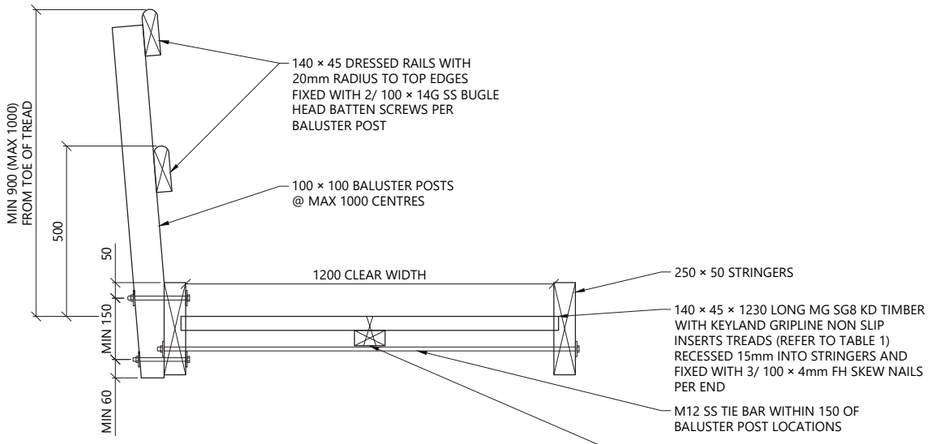
PROJECT:
REGIONAL PARKS STANDARD DETAILS

DRAWING:
TIMBER DECKING LOW STAIRCASE DETAILS - SHEET 1 OF 2

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

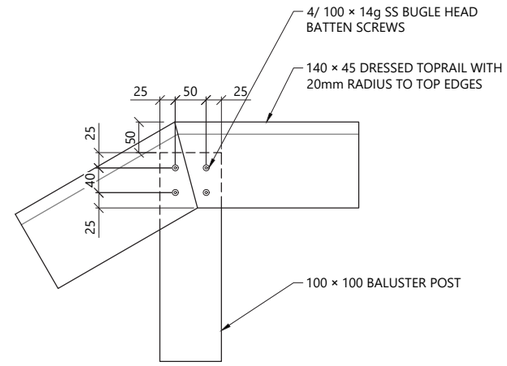
| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: | REVISION: |
| 22133 - 602 | 3 |



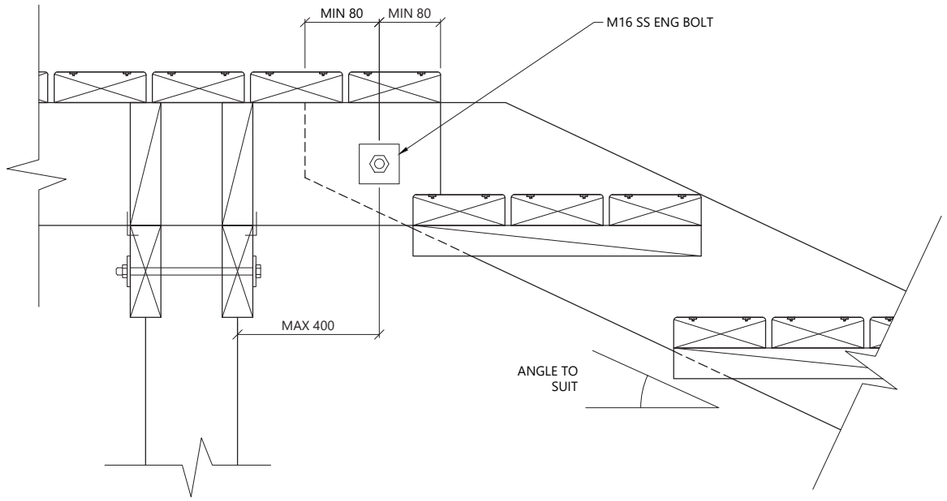

A / 602 LOW STAIRCASE SECTION

SCALE 1:20 @ A3



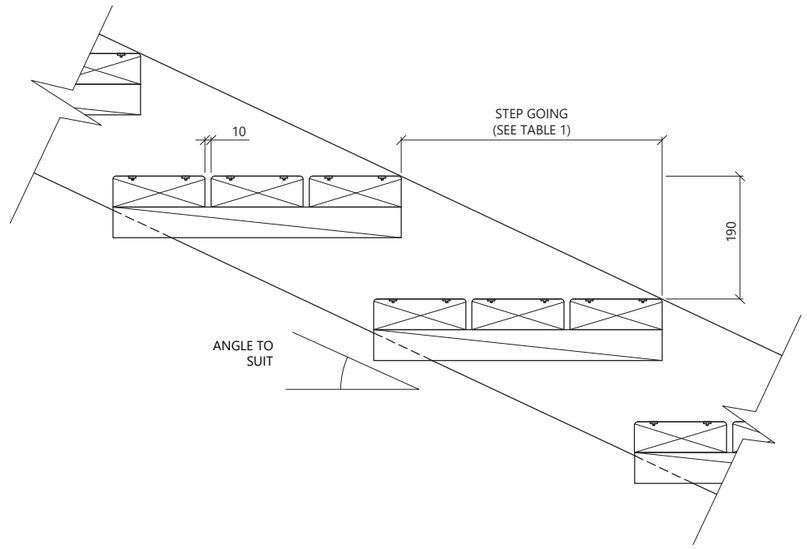

1 / - TOP RAIL SPLICE DETAIL

SCALE 1:10 @ A3



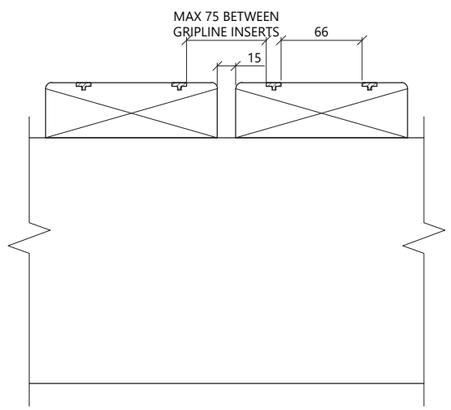

2 / 602 STRINGER TO JOIST CONNECTION DETAIL

SCALE 1:10 @ A3




3 / 602 STEP DETAIL

SCALE 1:10 @ A3




4 / 600 KEYLAND GRIPLINE DECKING DETAIL

SCALE 1:5 @ A3

NOTES:

| TABLE 1 - STEP GEOMETRY | | | |
|---|---|---|---|
| ANGLE | RISE | GOING | TREADS |
| 24° / 45% | 190 | 425 | 3/ 145 × 45 |
| 27° / 50% | 190 | 380 | 3/ 145 × 45 |
| 33° / 65% | 190 | 290 | 2/ 145 × 45 |

| REV | DESCRIPTION | BY | CHD | DATE |
|---|---|---|---|---|
| 3 | FOR INFORMATION | FC | AM | 17/01/2024 |
| 2 | FOR INFORMATION | FC | CG | 17/04/2023 |
| 1 | FOR INFORMATION | FC | AM | 22/11/2022 |
| 0 | FOR INFORMATION | CG | AM | 16/06/2022 |

DESIGNER:

reNature

PROJECT:
REGIONAL PARKS
STANDARD DETAILS

DRAWING:
TIMBER DECKING LOW
STAIRCASE DETAILS - SHEET
2 OF 2

CLIENT:
Auckland Council
Te Kaunihera o Tāmaki Makaurau

| DESIGNED BY: | DRAWN BY: | APPROVED: |
|---|---|---|
| A.MACKENZIE | C.GLITZ | A.MACKENZIE |

| STATUS: | SCALE: |
|---|---|
| FOR INFORMATION | AS SHOWN |
| DRAWING NO: | REVISION: |
| 22133 - 603 | 3 |

# Appendix 3: Landscape Specification

# Rangitoopuni

Landscape Specification

Prepared for Rangitoopuni Developments Limited Partnership

31 March 2025

# RANGITOOPUNI

## Landscape Specification

**The work specified in this section covers the general obligations the Constructor shall meet in executing the Landscape Works under this Contract.**

*SP5000.1* **APPLICABILITY**

**.1 Precedence**

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

**.2 General Definitions**

The following are definitions of general terminology contained within this document:

- 'the Project' refers to the Rangitoopuni development project.
- 'the Developer' refers to any person (or team) within the Project Development Team (Rangitoopuni)
- 'the Designer' for the purpose of this specification shall:
  - be a NZILA Registered Landscape Architect or a qualified landscape architect acting under the direction of a NZILA Registered Landscape Architect.
  - Shall act as a technical advisor to the Constructor.
- 'the Constructor' refers to the person (or team) within the Project, appointed by the Developer, responsible for the planning, executions and delivery of the required physical works.
- Where subcontractors are necessary for the execution of physical works they may be referred to as 'the Constructor', 'the Applicator', 'the Supplier' or 'the Installer' as applicable. For the purposes of this specification 'the Installer' and 'the Supplier' refers to the landscape subcontractor(s) responsible for (where required); site preparation, weed and pest control, eco-sourced seed collection, plant propagation and supply, planting, mulching and maintenance of all planting in accordance with the defects liability and maintenance periods specified.

*SP5000.2* **STANDARD SPECIFICATION**

This specification shall be read in conjunction with the following standards, which are deemed to form part of this specification. In the event of this specification being at variance with any provisions of these standards, the requirements of this specification take precedence over the provision of the standard. Reference to any standard shall include any amendments thereto and any standard in substitution thereof.

The following substitutions shall be made to referenced standards where present:

i. "the Engineer" shall be read as "the Designer"
ii. "the Contractor" shall be read as "the Constructor"

All materials and workmanship shall comply with these standards unless expressly noted otherwise.

*Site Preparation and Pest Control*

- Code of Practice for Safety and Health in Tree Work, Part 1 – Arboriculture
- Relevant Auckland Council standards
- Hazardous Substances and New Organisms Act 1996

- NZS 8409:2004 Management of Agrichemicals
- Biosecurity Act 1993
- Wild Animal Control Act 1977
- Health and Safety at Work Act 2015
- Rangitoopuni Ecological Management Plan.
- Rangitoopuni Landscape Management Plan

*Plant Propagation work*

- NZS 4454 Standard for Composts, Soil Conditioners and Mulches
- The aims and objectives of 'Eco-sourcing Code of Practice and Ethics'

*Planting*

- NZS 4454 Standard for Composts, Soil Conditioners and Mulches
- *SP5002* – Landscape – Site Preparation
- Rangitoopuni Ecological Management Plan
- Rangitoopuni Landscape Management Plan

Grassing

- *SP5002* – Landscape – Site Preparation

Maintenance

- SP5008 – Landscape – Defects Liability Period and Maintenance

## *SP5000.3* GENERAL

### .1 Scope

To achieve the consistency and high quality in the delivery of landscape treatments for the Rangitoopuni development project, the following standard specification sets out the minimum standards for the landscape works. This baseline landscape specification sets the required performance standards, quality and workmanship for the landscape treatments which are appropriate for this high quality development.

Associated with this standard specification shall be landscape plans and plant schedules specific to Project that include design and quantitative information. Both this specification and the site specific plans and schedules will form part of the construction contract and pricing package.

The landscape works shall be for, but not limited to, the supply of all labour, plant and materials for the construction and completion of the works, including the preparation of the site, in accordance with the Project Drawings, Plant Schedules and Management Plans.

Constructors, Applicators and Installers should ensure that they are familiar with relevant conditions of any Resource Consent, or legal/landowner agreements prior to undertaking any works on site. The details of this specification do not in any way absolve the need to comply with these conditions. Where this specification is in conflict with the consent conditions, the conditions would take precedence over the specification.

### .2 Use of this Specification

The Developer seeks high quality landscape outcomes. In order to achieve this, consideration of all aspects of the works is required. This includes; site preparation, weed and pest control, topsoil quality, plant material, standard of planting and associated materials, timing of planting and maintenance.

This specification should be read in conjunction with the Rangitoopuni Management Plans. All of the following specification documents shall be read as a whole:

*SP5000 – Landscape – General*

*SP5001 – Landscape – Quality Control*

*SP5002 – Landscape – Site Preparation*

*SP5003 – Landscape – Plant and Animal Pest Control*

*SP5004 – Landscape – Plant Propagation*

*SP005 – Landscape – Topsoil Supply*

*SP5006 – Landscape – Planting*

*SP5007 – Landscape – Grassed Surfaces*

*SP5008 – Landscape – Defects Liability and Maintenance*

## *SP5000.4* PERFORMANCE CRITERIA

The aim of the following performance criteria is to achieve the quality landscape outcomes sought by the Developer. The following criteria apply to all of the Project landscape treatments:

- *The works specified in this document and detailed on the Project plans shall be carried out to the best industry standards,*
- *The works shall be carried out in good faith, with open communication and transparency so as to avoid conflict where ever possible.*
- *'Best for Project' decisions shall be encouraged at all times.*
- *Where a landscape treatment to be carried out is outside the scope of the specification, the Contractor is to seek advice from the Project team as to the appropriate outcome to be achieved.*

## *SP5000.5* MATERIALS

### .1 General

All materials supplied shall be new (unless noted otherwise) and to the best of their respective kinds, suitable for the purpose for which they have been intended and complying in all respect with this specification.

**.2 Inspection**

The Designer shall, prior to installation, inspect all Materials for signs of damage, which may have occurred during transport to the site or during storage or handling on site.

**.3 Alternatives and Substitutes**

The nomination of a particular manufacturer or brand name for Materials shall be taken to indicate the type and quality required. It does not imply that the nominated Material is readily available, or is the only one acceptable.

Where alternative products, materials, procedures or designs are proposed, whether these are provided for in the specification or not, written approval shall be obtained before any such changes are incorporated. Details of any alternatives shall be submitted to the Designer for approval sufficiently in advance of them being required to be incorporated within, or used upon, the Contract Works, and prior to placing orders and /or purchasing.

*SP5000.6* **WORKMANSHIP**

All materials and construction shall be to a high standard, and workmanship shall meet best trade practice.

*SP5000.7* **SETTING OUT**

The Constructor shall set out the works from the information shown on the Drawings. The site shall be provided with survey control points to be used for set out.

Should any conflict and/or discrepancy exist, the Constructor shall request instruction from the Designer prior to proceeding.

All existing survey marks on Site shall be protected. Any disturbance, displacement or destruction of existing survey marks shall be reinstated.

*SP5000.8* **PRACTICAL COMPLETION**

Certificate of Practical Completion shall not be issued until the landscape works are fully completed as set out in the Specification. Should the Contract allow, staged Practical Completion may be allowed, if agreed with the Developer prior to the Contract being enacted.

END

# SP5002 – LANDSCAPE – SITE PREPARATION

The work specified in this section covers (where required) the clearing and disposal of existing vegetation, (except vegetation identified to be retained), site preparation spraying, pruning and minor landscape earthworks (not bulk earthworks), topsoil/soil mix re-spreading, stockpiling and storage of bulk materials (mulch, made up topsoil, imported topsoil). For the removal and disposal of existing hardstand surfaces and inorganic debris, refer to specification sections by others.

## *SP5002.1* APPLICABILITY

### .1 Precedence

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

### .2 General Definitions

The following are definitions of general terminology contained within this document:

- 'the Project Team' refers to any person (or team) within the Project (Rangitoopuni)
- 'the Designer' for the purpose of this specification shall:
  - be a NZILA Registered Landscape Architect or a qualified landscape architect acting under the direction of a NZILA Registered Landscape Architect.
  - Act as a technical advisor to the Constructor.
- 'the Constructor' refers to the person (or team) within the Project responsible for the planning, executions and delivery of the required physical works.
- Where subcontractors are necessary for the execution of physical works they may be referred to as 'the Constructor', 'the Applicator', 'the Supplier' or 'the Installer' as applicable. For the purposes of this specification 'the Installer' and the 'the Supplier' refers to the landscape subcontractor(s) responsible for (where required), site preparation, weed and pest control, eco-sourced seed collection, plant propagation and supply, planting, mulching and maintenance of all planting in accordance with the defects liability and maintenance periods specified.

## *SP5002.2* GENERAL

### .1 Scope

To achieve the consistency and high quality in the delivery of landscape treatments for the Rangitoopuni development project, the following standard specification sets out the minimum standards for the landscape works. This baseline landscape specification sets the required performance standards, quality and workmanship for the landscape treatments which are appropriate for this high quality development.

Associated with this standard specification shall be landscape plans and plant schedules specific to Project that include design and quantitative information. Both this specification and the site specific plans and schedules will form part of the construction contract and pricing package.

The landscape works shall be for, but not limited to, the supply of all labour, plant and materials for the construction and completion of the works, including the preparation of the site, in accordance with the Project Drawings, Plant Schedules and Management Plans.

Constructors, Applicators and Installers should ensure that they are familiar with relevant conditions of any Resource Consent, or legal/landowner agreements prior to undertaking any works on site. The details of this specification do not in any way absolve the need to comply with these conditions. Where this specification is in conflict with the consent conditions, the conditions would take precedence over the specification.

**.2 Use of this Specification**

The Developer seeks high quality landscape outcomes. In order to achieve this, consideration of all aspects of the works is required. This includes; site preparation, weed and pest control, topsoil quality, plant material, standard of planting and associated materials, timing of planting and maintenance.

This specification should be read in conjunction with the Rangitoopuni Management Plans. All of the following specification documents shall be read as a whole:

*SP5000 – Landscape – General*

*SP5001 – Landscape – Quality Control*

*SP5002 – Landscape – Site Preparation*

*SP5003 – Landscape – Plant and Animal Pest Control*

*SP5004 – Landscape – Plant Propagation*

*SP005 – Landscape – Topsoil Supply*

*SP5006 – Landscape – Planting*

*SP5007 – Landscape – Grassed Surfaces*

*SP5008– Landscape – Defects Liability and Maintenance*

*SP5002.3* **PERFORMANCE CRITERIA**

The aim of the following performance criteria is to achieve the quality landscape outcomes sought by the Developer. The following criteria apply to all of the Project landscape treatments:

- *The works specified in this document and detailed on the Project plans shall be carried out to the best industry standards,*
- *The works shall be carried out in good faith, with open communication and transparency so as to avoid conflict where ever possible.*
- *'Best for Project' decisions shall be encouraged at all times.*
- *Where a landscape treatment to be carried out is outside the scope of the specification, the Contractor is to seek advice from the Project team as to the appropriate outcome to be achieved.*

*SP5002.3* **MATERIALS**

**.1 Topsoil**

Topsoil is defined as the top layer of soil characterised by the presence of organic matter and meeting the standards as set out in SP5005 – Landscaping – Topsoil Supply. Where topsoil is referred to throughout, it may be material as defined above and recovered from site, **or** a manufactured slip material/compost/forest duff mix.

**.2 On site topsoil and re-use of suitable material**

The Constructor shall inspect the site together with the Designer to assess the condition of the existing topsoil and define testing locations.

The Constructor shall provide for soil testing for each batch/area of topsoil as appropriate, and submit a report from the soil testing laboratory including topsoil analysis of physical and chemical properties. This shall be interpreted by a soil scientist and recommendations made to achieve a planting medium suited to the plant species proposed. Any remedial measures would generally seek to address compacted soils, poor or low fertility and levels of any contamination.

In the event that the Client or their agent fails to accept the advice of the soil tests, and plants subsequently die due to the topsoil conditions the Constructor shall be responsible for the remediation of the soil and replacement of those plants.

Topsoil material recovered from on-site shall form the basis of manufactured soil mix for planting. The slip material requires the incorporation of suitable organic material to provide additional friability and fertility. A forest duff (forest floor material) , if present on the Project Site, may also be added to provide essential mycorrhizal fungi and a potential seed source.

**.3 Stockpile and storage**

The stockpiling and storage of bulk materials (slip material, organic matter and manufactured topsoil) shall be in accordance with any Consent Conditions and Auckland Council Standards. Stockpiles of topsoil (imported or manufactured) shall be no greater than 2.00m in height, drained and vegetated (clover grass or legumes) if standing for longer than 90 days.

**.4 Topsoil care**

Topsoil compaction should be avoided, measure include:

- The use of the lighted possible vehicles and machinery when spreading topsoil and/or trafficking planting areas which have been topsoiled.
- Ensure all machinery is fit for purpose.
- Avoid trafficking completed topsoil areas and limit passes.

**.5 Imported fill**

Imported fill/topsoil material shall be clean and free of stones, rubble, organic material, contaminants, stumps, branches and construction materials. The Constructor shall co-ordinate with the Designer prior to importing material to site for placement.

**.6 Unsuitable materials**

The Constructor shall ensure that all planting is undertaken on suitable material which will sustain the proposed plant species. Unsuitable materials would include:

- Soil that is too weak, impoverished, too compact or lacking in essential structure and/or nutrients to provide support for new planting
- Soil containing rubbish or contaminated material
- Soil containing excessive amounts of pest plant material.

The Constructor may supply a methodology to remediate unsuitable materials, including how the volume of pest plants will be reduced or managed. This shall be approved by the Designer prior to commencement.

Should dormant seed or plant pest seed be present or identified onsite, the Constructor shall supply a methodology to control any infestation. This shall be approved by the Designer prior to commencement.

Failure to identify unsuitable material or plant pest emergence would not alleviate the Constructor of their responsibilities to control these issues or any infestation.

*SP5002.4* **PREPARATION**

**.1 Erosion and Sediment Control**

For all areas of earthworks, the Constructor shall ensure that erosion and sediment control measures are installed in accordance with the consent conditions and Auckland Council requirements.

**.2 Vegetation Clearing**

Vegetation clearance is generally required for the following reasons:

- Clearance to enable construction works to be undertaken
- Clearance for safety, visibility/views and removal of hazards
- Clearance of exotic vegetation and/or pest plants in association with native revegetation planting.
- Clearance of exotic vegetation and/or pest plants to reduce long term maintenance costs and the spread of pest plants.

For all clearance works associated with plant pest removal, refer to SP5003 – Landscape – Plant and Animal Pest Control; where the use of herbicides in site preparation spraying is covered.

**Please note:** The Constructor shall ensure that personnel are familiar with relevant conditions of any Resource Consent, or Designation, or legal/land owner agreement prior to undertaking any clearing works on site.

(a) Vegetation Clearance Works

The area of any clearing work shown on the relevant drawings shall be cleared of all exotic trees, shrubs or grass. Should any native vegetation shall be cleared as indicated following an on site review by the Designer to determine if viable seeds or plants may be recovered for use on the project.

**Please note**: Should any endangered, rare or noted plant or fauna be required to be removed from any clearance site (i.e. lizards), the Constructor must not undertake such clearance works until the capture/relocation works have been complete and an instruction to proceed has been issued from the Project Team.

(b) Vegetation Disposal

Unless otherwise specified, the Constructor is responsible for the disposal of all cleared materials in a safe and legal manner.

All material to be retained on site (e.g. approved vegetation to be mulched for re-use) shall be stockpiled in suitable locations where topsoil manufacture can occur. Material that is mulched in-situ shall be spread to achieve an even spread of mulched material over the ground surface. Deep clumps of mulched material are to be avoided.

Areas that mulched where there are weeds present will need to be carefully controlled to avoid weed contamination to areas where the mulch is to be used. Care needs to be exercised where there is pest plant material that would re-sprout and take root in the mulched area. These plants (e.g. crack willow/*Salix fragilis, Tradescantia fluminensis*) shall not be mulched and shall be disposed of separately where the risk of spread/re-sprouting is minimised.

Any material not suitable for in-situ mulching shall be removed from the site and disposed of in an appropriate and legal dump site, including payment of any associated fees as required. The Constructor is to identify a suitable disposal area prior to commencing the vegetation clearance works.

**.3 Vegetation to be retained**

The Constructor shall take all necessary measures to protect existing vegetation to be retained from damage.

Vegetation to be retained shall be marked on site by the Constructor, and then inspected and approved by the Designer (or Project Arborist), prior to fencing off.

**.4 Habitat features**

Where identified as part of the landscape works, the Constructor shall take all necessary measures to retain any existing logs, boulders, gravel or woody debris as habitat features within the landscape works (e.g. riparian zones, lizard habitat, bat habitat and bird habitat – *where appropriate*).

Material identified on the drawings to be retained, recovered and reused within the project area, shall be protected or set aside and retained for use. All habitat features shall be positioned as required and installed to avoid dislodgement.

*SP5002.5* **WORKMANSHIP**

**.1 General**

All plant and equipment shall only be operated by licensed, competent operators. The Developer (or nominated Project Team personnel) reserves the right to review competencies at any time without notice.

Only certified applicators shall be responsible for the application of herbicides.

**.2 Clearing – General**

The working area shall be cleared of all vegetation and structures except those specifically required to remain as noted on the Drawings. Refer to specification sections referring to vegetation clearance.

Any works near a watercourse shall be undertaken in accordance with the relevant Auckland Council standards.

The extent of clearing shall include all areas affected by cutting and filling together with sufficient additional areas on which to stockpile topsoil materials.

Unless elements are noted for retention on the Drawings; clearing shall include the complete removal of all trees and vegetation (not including the roots due to soil erosion issues on this site), inorganic debris, pipes, fences, any retaining walls, hardstand areas, boulders and other material as identified.

Where machine clearing is not possible, vegetation shall be removed by hand clearing methods and removed from site. Roots from cleared vegetation shall not be removed during cultivation work due to potential soil erosion issues.

Particular care shall be taken around the root zone of trees to be retained. (Note: the root zone extends to at least the drip line of the remaining tree).

The clearing of hardstand surfaces shall include saw cutting where necessary, breaking and excavation of basecourse materials and disposal off site.

Cleared materials shown on the Drawings for re-use or to be stockpiled for the Project's re-use, shall be stored on site in a location to avoid relocation and damage.

**.3 Tree Clearing**

All cleared material shall be mulched, buried or removed from site and may not be burnt on site. If the Constructor elects to chip the cleared material on site, then the Constructor shall ensure that its operations do not affect neighbouring properties.

**.4 Pruning**

Where trees and other vegetation are being retained but require pruning, the work shall be undertaken by skilled operators under the supervision of the Project Arborist. Pruning shall remove all damaged twigs and branches.

Operations are to be carried out using sharp clean implements to give a clean sloping cut with one flat face. Ragged edges of bark or wood are to be trimmed in accordance with current horticultural trade practice.

All prunings shall be chipped on site if possible. Retain mulched material on site at agreed locations. Place stockpiles in sufficient number to make to and from planting sites or topsoil manufacture site economic and feasible.

**.5 Site Preparation Spraying**

Refer to *SP5003* – Landscape – Plant and Animal Control

**.6 Topsoil Stripping**

**Note:** See *SP5005* – Landscape – Topsoil Supply for topsoil testing and quality prior to acceptance.

Any topsoil stripping shall not start until the clearing operation has been inspected and passed, and all control measures are installed.

All topsoil including turfs, humus and organic materials shall be stripped to the satisfaction of the Designer from areas as shown on the Drawings and/or affected by cutting or filling and stockpiled clear of the areas affected by other works.

Stripped topsoil shall be stockpiled separately and neatly outside of the stripped areas for later re-spreading or re-use. The stockpiles shall be trimmed to a free draining slope to reduce ingress of rainwater. Location and size of stockpiles in flood hazard areas shall meet consent conditions and be approved by the Designer (Civil Engineer).

### .7 Soil Disposal

Unless otherwise specified, the Constructor is responsible for the disposal off site of all cleared materials in a safe and legal manner, including payment of any associated fees as required.

### .8 Earthworks and Topsoil

Topsoil shall not be placed and spread if the earth-worked sub-surfaces are not to the required standard. All sub-surface works, including drainage, shall be completed by the Constructor prior to topsoil spreading. Refer to site preparation and topsoil inspections.

Earth worked areas ready for the Constructor to commence landscape work shall be such that earth-worked surfaces:

- Have sufficient drainage and fall to shed water in a controlled manner and prevent ponding and riling (erosion)
- Are free of contaminants, stumps, branches and construction debris
- Have been placed and compacted in layers no greater than 100mm thick and compacted by track rolling (if appropriate) to prevent undue settlement.

### .9 Unsuitable Materials

Should sub-surfaces include unsuitable materials and are not to the required standard, topsoiling shall not procced until directed by the Designer.

### .10 Soil Mix

Site won topsoil material based manufactured soil mixes comprising topsoil material/compost/ forest duff (if applicable) shall be thoroughly mixed in situ or as approved by the Designer. (Refer to Specification *SP5005* – Landscape - Topsoil Supply).

### .11 Topsoil/Soil Mix Placement

Refer to Specification SP5005 – Landscape – Topsoil Supply. Where required in areas where topsoil has been removed (i.e. earthworks areas), topsoil shall be spread from stockpiles to a compacted depth as shown on the Drawings or as follows:

- Grassed areas 150mm
- Amenity planting areas 300mm or greater where engineering requirements allow for increased depths.
- Specimen Tree pits 1000mm

Topsoil shall not be placed and spread if the earth-worked sub-surfaces do not have sufficient fall to shed water in a controlled manner to prevent ponding.

Topsoil shall not be placed until the sub-surfaces are at the required standard. Unduly compacted areas (such as in traffic routes) shall be loosened prior to final levelling in readiness for topsoiling.

Topsoil shall not be placed and spread when the ground or topsoil are excessively wet or in a condition which would be detrimental to the work.

Final grading of the topsoil shall be carried out to ensure a true specified level and slope and to avoid dishing or other depressions where water may collect, unless areas to collect water are specified i.e. for direct transfer plantings.

The placed topsoil profile shall allow for subsidence so that after the settlement the levels shall be at the final specified levels.

The Designer shall inspect final topsoil/soil mix depths to ensure they meet specification, after placement and prior to planting.

**.12 Imported Topsoil**

The Constructor shall co-ordinate with the Designer early in the project regarding both the volumes of topsoil required and the specifications for imported topsoil. Imported topsoil shall be carefully managed to avoid any contamination, seeds or undesirable material being brought to site.

**.13 Final Grading**

The Constructor shall ensure that –

- All earthworks have been shaped to integrate the works with the surrounding landform (except for stand alone earthworks such as bunds)
- All areas to be planted (or grassed) shall have been contoured when the topsoil is reasonably dry and workable to smooth flowing contours with falls for adequate drainage and, removing all minor hollow and ridges.

**.14 Inspections**

The Constructor shall notify the Designer for inspection of the works following:

- Set out for vegetation clearance
- On completion of the clearance
- Formation of any stormwater devices i.e. detention basins, swales, bunds etc
- During site preparation of sub-surfaces being at the required standard
- Completion of the cultivation prior to the placement of stockpiled topsoil, soil mix, or imported topsoil

*SP5002.6* **COMPLETION**

The Site Preparation will be deemed complete when all areas are in a clean and tidy condition ready for planting.

**END**

# *SP5003* – LANDSCAPE – PEST PLANT AND ANIMAL CONTROL

**The work specified in this section covers the control of plant pests and animal pests within the project area where plant and animal populations threaten the success of the landscape and ecological treatments.**

## *SP5003.1* APPLICABILITY

### .1 Scope

To achieve the consistency and high quality in the delivery of landscape treatments for the Rangitoopuni development project, the following standard specification sets out the minimum standards for the landscape works. This baseline landscape specification sets the required performance standards, quality and workmanship for the landscape treatments which are appropriate for this high quality development.

Associated with this standard specification shall be landscape plans and plant schedules specific to Project that include design and quantitative information. Both this specification and the site specific plans and schedules will form part of the construction contract and pricing package.

The landscape works shall be for, but not limited to, the supply of all labour, plant and materials for the construction and completion of the works, including the preparation of the site, in accordance with the Project Drawings, Plant Schedules and Management Plans.

Constructors, Applicators and Installers should ensure that they are familiar with relevant conditions of any Resource Consent, or legal/landowner agreements prior to undertaking any works on site. The details of this specification do not in any way absolve the need to comply with these conditions. Where this specification is in conflict with the consent conditions, the conditions would take precedence over the specification.

### .2 Use of this Specification

The Developer seeks high quality landscape outcomes. In order to achieve this, consideration of all aspects of the works is required. This includes; site preparation, weed and pest control, topsoil quality, plant material, standard of planting and associated materials, timing of planting and maintenance.

This specification should be read in conjunction with the Rangitoopuni Management Plans. All of the following specification documents shall be read as a whole:

*SP5000 – Landscape – General*

*SP5001 – Landscape – Quality Control*

*SP5002 – Landscape – Site Preparation*

*SP5003 – Landscape – Plant and Animal Pest Control*

*SP5004 – Landscape – Plant Propagation*

*SP005 – Landscape – Topsoil Supply*

*SP5006 – Landscape – Planting*

*SP5007 – Landscape – Grassed Surfaces*

*SP5008 – Landscape – Defect's Liability and Maintenance*

## *SP5003.2* PERFORMANCE CRITERIA

The aim of the following performance criteria is to achieve the quality landscape outcomes sought by the Developer. The following criteria apply to all of the Project landscape treatments:

- *The works specified in this document and detailed on the Project plans shall be carried out to the best industry standards,*

- *The works shall be carried out in good faith, with open communication and transparency so as to avoid conflict where ever possible.*
- *'Best for Project' decisions shall be encouraged at all times.*
- *Where a landscape treatment to be carried out is outside the scope of the specification, the Contractor is to seek advice from the Project team as to the appropriate outcome to be achieved.*

### .1 Precedence

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

### .2 General Definitions

The following are definitions of general terminology contained within this document:

- 'the Project Team' refers to any person (or team) within the Project (Rangitoopuni)
- 'the Designer' for the purpose of this specification shall:
  - be a NZILA Registered Landscape Architect or a qualified landscape architect acting under the direction of a NZILA Registered Landscape Architect.
  - Act as a technical advisor to the Constructor.
- 'the Constructor' refers to the person (or team) within the Project responsible for the planning, executions and delivery of the required physical works.
- Where subcontractors are necessary for the execution of physical works they may be referred to as 'the Constructor', 'the Applicator', 'the Supplier' or 'the Installer' as applicable. For the purposes of this specification 'the Installer' and the 'the Supplier' refers to the landscape subcontractor(s) responsible for (where required), site preparation, weed and pest control, eco-sourced seed collection, plant propagation and supply, planting, mulching and maintenance of all planting in accordance with the defects liability and maintenance periods specified.

*SP5003.3* **REQUIREMENTS**

The control of plant and animal pests has been identified as a priority for the Project for the following reasons:

- Addressing pest impacts early aids the establishment and success of the landscape treatments
- Achieves social and environmental objectives
- Meets biosecurity and land management requirements in line with the Auckland Council objectives.
- Meets whole of life objectives to ensure the Project and the future Management Entity do not inherit landscape assets which require costly pest management and the replacement of planting due to pest problems.

**Plant pest control** shall address vegetation management and plant pests within the Project boundaries. Priority for control should be given to pest species outlined in any consent conditions and the local authority requirements. It shall also address the non-introduction of plant pests from outside the project area especially where the receiving environment will become relatively pest plant free.

Agrichemical management and application shall adhere to a low toxicity policy. This policy is to aim to minimise risk to users and the environment, by using herbicide with the lowest toxicity that is effective for the weed being targeted. Extra caution is required when using agrichemicals adjacent to waterways. Only appropriate herbicides approved for use over the water shall be used.
Material Safety Data Sheets (MSDS) shall be provided to Rangitoopuni Estate Ltd or its nominated representative prior to the application of any herbicide.

**Animal pest control** shall be undertaken if levels of animal pests pose a risk to the landscape treatment, especially new planting areas, and/or if control measures are required in accordance with any consent conditions. Generally, animal pest control is undertaken within the Project boundaries to ensure planting can establish. Operations are strictly controlled and shall be undertaken in accordance with legal requirements by suitable experienced, qualified, licensed (if applicable) personnel.

Overall across the project, there is a requirement for vegetation management and for plant pests to be controlled. Before any work commences, an assessment of pests shall be undertaken. Prior to earthworks and planting, the Constructor shall scope pest levels and establish control methods. Plant pests shall be controlled across the project area during the contract works and during the Defects Liability and Maintenance Period. The goal shall be plant pest control Project wide.

*SP5003.4* **MANAGEMENT AREAS**

The area to control shall be the site defined as:

The entire project area as shown in the Project plans.

The extent of the control areas is to be confirmed with the Developer prior to any plant pest and animal pest control works are undertaken. Due to the multiple land owner areas adjoining the Project site, the work, all legal and land owner agreements must be in place and understood by the Supplier.

Generally materials required for pest control shall align with the site specific control methodology. All materials shall be targeted to the species, project context (including sensitive areas) and be certified and used in accordance with best practice and the manufacturers specifications.

*SP5003.5* **PREPARATION**

**.1** An assessment of plant and animal pests shall be undertaken prior to any works commencing. This assessment shall outline the baseline pest populations to be controlled throughout the contract works and include a list of pest species (including animal pests if required) and plant pests.

*Note: The baseline assessment would be used to evaluate progress and levels of control during the works and at completion.*

Methodology and Programme

A detailed methodology and programme report shall be prepared by the Constructor for approval by the Designer prior to site preparation and planting. The methodology and programme shall address pests identified in the pest assessment. Including the following:

i. A plan or map detailing the extent of the site preparation/clearance areas to be managed, and the location of any sensitive areas;
ii. Types of chemicals (herbicide, fungicide, baits) that will be used and the times of the year that any control operations are likely to occur.
iii. Strategies used to avoid contamination of sensitive areas. This could include specific application techniques, no-spray buffer zones, a list of people who need to be informed of spraying operations.
iv. The identity of the person likely to be undertaking the work and confirmation of their current qualifications/certification.
v. Particular weather conditions which may increase the potential drift hazard.
vi. Indication of agrichemicals to be used that may present a specific hazard;
vii. A critical path timeline capable of showing progress through the contract period up to the end of the defects liability and maintenance period.
viii. This methodology and programme shall be prepared using critical path techniques and shall be capable of showing actual progress through the project.

**.2 Experience of Staff**

a. Plant Pest Control

All plant pest control works shall be in accordance with accepted horticultural practices, and shall be carried out by suitable qualified and experienced personnel in relation to the use of herbicides. Growsafe certification or similar shall be required.

b. Animal Pest Control

All animal pest control works shall be undertaken by staff suitable qualified and experienced in handling (including holding a controlled substance licence CSL) and the application of pesticides and traps, and familiarity with the Hazardous Substances and New Organisms Act 1996, the Biosecurity Act 1993 and the Wild Animal Control Act 1977.

The Installer shall take all prescribed steps contained in the Health and Safety at Works Act 2015 and the Resource Management Act 1991 (RMA) to ensure no act or omission is in breach of any duty or obligation of the Client under the said legislation.

c. Insects

Wasp nests and bees may be an issue in places; eradication and control measures shall be undertaken by staff suitably qualified and experienced in the handling and application of pesticides and traps.

**.3 Preparation for Plant Pest Control**

a. Pest plant removal

Plant pest control shall be undertaken during site preparation and prior to planting.

b. Disposal

Unless otherwise specified, the Constructor is responsible for the disposal off site of all pest plant materials is a safe and legal manner in accordance with local authority guidance.

**.4 Preparation for Animal Pest Control**

Where animal pests are a risk to or have damaged the planting, the Constructor shall be responsible for notifying the Designer managing this issue. Lack of notification by the Constructor may result in the Project being responsible for damage caused by pests.

The Designer may advise the Constructor on steps to control the pests to reduce damage: this may include some or all of the following measures:

- Install wire staples around the root balls of the plants (e.g. to prevent damage caused by pukeko),
- Capture and relocate birds (permit required)
- Apply Pindone pellets to control rabbits and possums (or similar approved pest control measures)
- Trapping
- Bait laying
- Shooting

a. Consents

The Constructor is responsible to apply for obtaining any approval from the Medical Officer of Health of the District Health Board, to legally execute the pest control works. The consents shall (but not be limited to) the following consent requirements;

- Application for Medical Officer of Health Permission
- Medical Officer of Health Permission to use Controlled Pesticides
- Department of Conservation (DoC) Consent
- Local Authority

b. Notifications, Hoardings and Signs

The Constructor shall supply, install, manage and maintain all Health and Safety Warning signs as required, for the duration of the Contract Works and in accordance with the Application for Medical Officer of Health Permission to lay Controlled Pesticides.

All necessary warning notices and other signage shall be erected for the duration of the pest control and the pesticide caution period, in accordance with the consent(s).

The Constructor shall inform neighbouring landowners of the proposed pest control programme at least 24 hours prior to pesticide applications and again on completion of the programme. Notification shall be in the form of a letter delivered to the property occupier, providing the following details:

- Pests to be controlled
- Poisons to be used (and/or other control measures)
- Drop locations
- Application dates
- Name of Constructor’s representative with a 24 hour contact phone number.

*SP5003.6* **WORKMANSHIP**

**.1 Site Preparation Spraying**

Multiple applications of herbicide may be required in order to achieve weed control. In addition, a variety of weed control measures may have to be implemented in order to achieve adequate control of a wide range of weeds species if they are present on any site. Spot spray and blanket spray methods may be applicable.

The Constructor shall provide details of the proposed herbicide and spraying method to the Designer prior to spraying, for example:

- Herbicide(s) to be used
- Method of application
- Proposed dates of application (and rain day alternatives)
- Targeted species
- Possible effects to non-target species
- Notification areas.

**.2 Spraying Operations**

The Constructor shall remove and control plant pests regularly throughout the contract and maintenance period. With all planted areas kept plant pest free to the extent that perennial weed species are eradicated and annual weed species are well controlled so not to compete with any planting or pose a long term risk to plant establishment.

To attain a weed-free ground prior to planting, the existing weed growth will require cutting, mulching, and possibly removal prior to herbicide application. Any vegetation exceeding 500mm in height shall be cleared or mown prior to application of herbicide. Generally, this shall mean that all areas to be sprayed other than well-grazed paddock shall be cleared or mown. Herbicide shall be applied to cleared/mown areas following sufficient re-growth of the weeds as approved by Rangitoopuni Estate Ltd. or its nominated representative.

The details of the proposed cutting, mulching and herbicide spraying methods shall be provided by the Constructor for approval by Rangitoopuni Estate or its nominated representative prior to works commencing. Particular care shall be taken to ensure that adjacent areas of existing native vegetation are not compromised by any form of weed control.

All vegetated areas to be planted shall be sprayed with 2 to 3 applications (as required) of approved herbicide two weeks apart and two weeks prior to final clearing for planting.

Grass in areas that are to be planted shall be eradicated by applications of a suitable translocated herbicide.

Spraying of herbicides shall not take place in windy conditions (refer to GrowSafe manual). The Constructor shall be responsible for reinstating any damage caused by herbicide spray drift.

All spraying equipment is to be carefully calibrated to prevent under or over dosing.

No herbicide containers, empty or full, are to be left unattended on site at any time.

Where herbicide with a residual effect has been applied, the Constructor shall ensure that no planting proceeds until the exclusion timeframe specified by the manufacturer has passed.

Additional pest plant control may be required in spring when the ground warms and sees in the soil may germinate.

Saplings/ re-growth of all woody trees and shrubs to be removed shall be cut and the cut stumps immediately treated with an appropriate herbicide on an ongoing basis.

To avoid spray drift and damage to vegetation to be retained, pest plants and weeds shall be spot sprayed using a protective spray nozzle/cone.

Where a translocated herbicide is used around plants in leaf which are to be retained, an adequate guard must be used, or a suitable hood applicator used for spot spray treatment.

Care shall be taken to avoid disturbances of root systems and excessive compaction of existing vegetation or planting areas.

Where monocotyledon plants are affected by grass intrusion, a grass specific herbicide (Haloxyfop or similar approved) shall be used. This may be in conjunction with line trimming and/or hand weeding.

**.3 Animal Pest Control Operations**

(a) Control Operations

The control operations for Animal Pests shall be subject to the requirements of the project as outlined within the Constructor's methodology.

(b) Carcass Removal

The Constructor shall collect carcasses, especially during all professional hunting operations, and throughout the Contract period, and dispose of carcasses at licensed landfills.

(c) Animal Pest Monitoring and Inspections

Where portions of the Contract Works are subject to the approvals by the Designer, the Constructor shall ensure that they have been completed to the required standards.

The Constructor shall notify the Designer of the works completed, for example, following the set up and monitor of bait stations and predator control traps in accordance with the methodology.

(d) Health and Safety

The Constructor shall include in the site specific Health and Safety Plan, details demonstrating compliance with the requirements with the Hazardous Substances and New Organisms Act 1996, the Biosecurity Act 1993, Wild Animal Control Act 1977 and all other relevant legislation.

The Constructor shall provide all necessary Health and Safety equipment, warning signage requirements. The Constructor shall hold all licences and approvals required to undertake the full scope of the works.

The Constructor shall be responsible for controlling the manner and methods of its operations and shall be directly responsible for the health and safety of its employees while on site. The Constructor must comply with the requirements of the site Health and Safety Plan(s) and the Hazardous Substances and New Organisms Act 1996, and the Biosecurity Act 1993, and the Wild Animal Control Act 1977.

(e) Ecology Considerations

Where native fauna (e.g. lizards) are required to be captured from the area prior to control works, no works shall be undertaken until an instruction to proceed has been issued by the Designer.

*SP5003.7* **COMPLETION**

All plant pest control and/or animal pest control works shall be monitored to ensure control methods have achieved the outcomes sought, against the original baseline infestations.

The Constructor shall remove all rubbish, signage, materials and spoil from the site on completion of the works, leaving the site in a clean and tidy condition.

**.1 Plant Pest Control Monitoring & Acceptance**

The Designer shall inspect the area prior to practical completion to confirm the pest control requirements have been met. This inspection shall be attended by the Constructor to confirm acceptance of the liability relating to the survival of plants through the defects liability and maintenance period.

Any areas requiring further pest control under the contract or that are not satisfactorily controlled as determined by the Designer shall be addressed by the Constructor.

(a) Monitoring and inspections

The Contract Works may be inspected from time to time by accredited representatives from the relevant authorities in relation to consent conditions. Should such representatives ask for information in connection with the pest control component of the Contract Works or its progress, the Constructor shall give them freely and willingly, any details within its knowledge.

(b) Assurances

Prior to Practical Completion of the site preparation portion and 6 monthly following planting, the Constructor shall confirm in writing that the plant pest control has been undertaken and meets the Specifications.

**.2 Animal Control Monitoring & Acceptance**

The Constructor shall provide the Designer with all necessary material to assess the pest animal control works. This shall include but be not limited to: Day sheets (site visit date, time, area covered and health and safety matters), evidence of control operations such as bait take data, trapping data, carcass disposal data, GPS logs etc.

(a) Assurances

Prior to Practical Completion of all or a portion of the Contract, the Constructor shall confirm in writing that the pest animal control works have been undertaken and meets the Specification.

*SP5003.8* **PRACTICAL CMPLETION AND MAINTENANCE PERIOD**

The Contract Works shall be deemed to be Practically Complete when all required plant pest and animal pest control works are complete as specified in the Contract and this has been confirmed in writing.

**END**

# *SP5004* – LANDSCAPE – PLANT PROPAGATION

**The work specified in this section covers the collection of seeds and the propagules, propagation, growing on and hardening of plants.**

## *SP5004.1* APPLICABILTY

### .1 Precedence

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

### .2 General Definitions

The following are definitions of general terminology contained within this document:

- 'the Project Team' refers to any person (or team) within the Project (Rangitoopuni)
- 'the Designer' for the purpose of this specification shall:
  - be a NZILA Registered Landscape Architect or a qualified landscape architect acting under the direction of a NZILA Registered Landscape Architect.
  - Act as a technical advisor to the Constructor.
- 'the Constructor' refers to the person (or team) within the Project responsible for the planning, executions and delivery of the required physical works.
- Where subcontractors are necessary for the execution of physical works they may be referred to as 'the Constructor', 'the Applicator', 'the Supplier' or 'the Installer' as applicable. For the purposes of this specification 'the Installer' and the 'the Supplier' refers to the landscape subcontractor(s) responsible for (where required), site preparation, weed and pest control, eco-sourced seed collection, plant propagation and supply, planting, hydroseeding, mulching and maintenance of all planting in accordance with the defects liability and maintenance periods specified.

## *SP5004.2* GENERAL

### .1 Scope

To achieve the consistency and high quality in the delivery of landscape treatments for the Rangitoopuni development project, the following standard specification sets out the minimum standards for the landscape works. This baseline landscape specification sets the required performance standards, quality and workmanship for the landscape treatments which are appropriate for this high quality development.

Associated with this standard specification shall be landscape plans and plant schedules specific to Project that include design and quantitative information. Both this specification and the site specific plans and schedules will form part of the construction contract and pricing package.

The landscape works shall be for, but not limited to, the supply of all labour, plant and materials for the construction and completion of the works, including the preparation of the site, in accordance with the Project Drawings, Plant Schedules and Management Plans.

Constructors, Applicators and Installers should ensure that they are familiar with relevant conditions of any Resource Consent, or legal/landowner agreements prior to undertaking any works on site. The details of this specification do not in any way absolve the need to comply with these conditions. Where this specification is in conflict with the consent conditions, the conditions would take precedence over the specification.

**.2 Use of this Specification**

The Developer seeks high quality landscape outcomes. In order to achieve this, consideration of all aspects of the works is required. This includes; site preparation, weed and pest control, topsoil quality, plant material, standard of planting and associated materials, timing of planting and maintenance.

This specification should be read in conjunction with the Rangitoopuni Management Plans. All of the following specification documents shall be read as a whole:

*SP5000 – Landscape – General*

*SP5001 – Landscape – Quality Control*

*SP5002 – Landscape – Site Preparation*

*SP5003 – Landscape – Plant and Animal Pest Control*

*SP5004 – Landscape – Plant Propagation*

*SP005 – Landscape – Topsoil Supply*

*SP5006 – Landscape – Planting*

*SP5007 – Landscape – Grassed Surfaces*

*SP5008 – Landscape – Defects Liability and Maintenance*

## *SP5003.2* PERFORMANCE CRITERIA

The aim of the following performance criteria is to achieve the quality landscape outcomes sought by the Developer. The following criteria apply to all of the Project landscape treatments:

- *The works specified in this document and detailed on the Project plans shall be carried out to the best industry standards,*
- *The works shall be carried out in good faith, with open communication and transparency so as to avoid conflict where ever possible.*
- *'Best for Project' decisions shall be encouraged at all times.*
- *Where a landscape treatment to be carried out is outside the scope of the specification, the Contractor is to seek advice from the Project team as to the appropriate outcome to be achieved.*

**.1 Precedence**

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

## *SP5004.3* REQUIREMENTS

The Developer requires that all planting shall include quality plant stock, true to form and shape with healthy signs of growth.

The Developer requires that at least five (5) different plant species be included in all planting areas, with the aim of supporting resilience within plantings and for biodiversity reasons Emphasis shall be given to local species that are recovering as well as creating environments that will encourage natural colonisation.

Some small amenity area plantings may deviate from the 5 plant requirement for safety reason or for a specific locational or cultural reason i.e. Filter strip and Rain Garden planting or feature planting areas such as around an entrance feature.

*SP5004.4* **MATERIALS**

**.1 Plant Materials**

Plant materials shall mean plants of all descriptions required for the project in accordance with the plans and as specified.

The roots shall have a high percentage of fibrous roots that are just touching the edge of their containers. Plants with roots that are wound round their containers in circular fashion shall be rejected.

All plant material shall be free from pests, diseases and physiological disorders.

All plant material may be grown on in poly bags of the specified PB size or pots of the specified pint or litre grade.

Open ground plant stock (e.g. amenity species) shall be sturdy, have well-formed root systems and supplied in a dormant state ready for planting.

All plant material shall be of the minimum size and grade specified in the plant schedule at the time of delivery.

Plant heights shall be to the minimum sizes for a given PB size or litre grade where described in the drawings and plant schedule.

Legible labels shall be attached to batches of plants delivered to site as a separate unit, or to each box, bundle or bale containing plants. The labels shall give the approved botanical name, and other information required to identify the plant or plants.

**.2 Potting Medium – Biosecurity requirements**

The Supplier shall ensure plants are propagated in a proprietary brand of potting medium which complies with New Zealand's biosecurity requirements. If necessary, alternative potting medium shall be submitted to the Designer for approval.

**.3 Genetic Origin**

As required by the consent conditions, all plants shall be sourced from the Tamaki Ecological Region, in particularly from the Riverhead, Huapai, Waitakere Ranges (to be approved by Te Kawerau a Maki) as far as practicable. They shall be propagated from seed collected from naturally occurring populations of plants growing in that area. Where plant species are unable to be sourced from the Tamaki Ecological Region, the plants seeds shall be collected from the Auckland Ecological Region (collection area identified). The Eco-sourcing methodology and locations of seed utilised shall be confirmed by the supplier to the Designer, in a signed statement.

In summary, the supplier of eco-sourced seed shall adhere to the following:

- Arrange permits and approvals for the collection of seed from naturally occurring plant populations in the Inner Gulf Islands Ecological Region (i.e. AC, DoC, Iwi, private landowners etc);
- Collect seed at an optimum time to ensure seed viability and quality;
- Accurately record data on the details, location, and date of collection.
- Label, clean and store the seed collected under appropriate conditions to maintain seed germination viability.
- Conduct germination trials of batches of seed collected to help assess seed viability,
- Maintain a complete record of information on the collected seed in a suitable format that enables the identification and tracking of plants from collection, through to subsequent propagation and installation.

**.4 Biosecurity**

A number of unwanted organisms may pose a threat to the ecology of the areas within the wider Project area and eco-system health (e.g. Myrtle Rust, Kauri Dieback).

The Supplier shall meet any obligations under the Biosecurity Act 1993 to prevent the spread of such unwanted organisms.

(a) Rainbow Skinks

The Department of Conservation (DoC) are working to prevent rainbow skinks from spreading and occupying habitat of New Zealand's skinks.

Where plant stock is supplied from a nursery in an area that has rainbow skink:

- Potting mix: check the pots for any small white eggs:- all equipment, goods or other freight that is to be shifted to the planting site is to be checked for rainbow skinks.
- Any plants to be found harbouring rainbow skinks or evidence of their presence (e.g. eggs) shall be rejected by the Designer.

(b) Myrtle Rust

The Ministry for Primary Industries (MPI) is monitoring the spread of this potentially devastating fungal disease. If found, vegetation movement enforcement areas will be put in place and the infected vegetation will require eradication. Myrtle Rust has the potential to adversely affect large areas of New Zealand indigenous vegetation.

Should Myrtle Rust be identified, do not touch the affected plants but contact MPI immediately (0800 80 99 66).

**.5 Fertilisers**

Fertiliser for container grown plants shall be of the types and at the rates that are normal industry practice for the species, for the stage of growth and the method employed.

**.6 Substitution**

There shall be no substitution of plant species without the written approval of the Designer.

*SP5004.5* **PREPARATION**

**.1 Seed/Cuttings Collection**

The Supplier shall ensure sufficient seed or plant stock is collected to propagate the required plant numbers, with due allowance for losses resulting from poor germination or other propagation failures.

Seed or plant stock shall be collected from healthy, vigorous, young plants with good form that are growing in a similar environment to the planting site.

The Supplier shall provide a Method Statement detailing the proposed method of collection of seed or cuttings, including gaining any licences and approvals. The Designer shall review and approve the methodology prior to collection of this source material.

On completion of an annual collection of plant source material, the Supplier shall provide a certificate confirming the method by which the source material is collected and its location are in accordance with the approved methodology.

*SP5004.6* **WORKMANSHIP**

All workmanship shall be in accordance with the best horticultural practice. All work hall be carried out by staff experienced in plant propagation and supervised by a qualified horticulturalist.

**.1 Method of Propagation**

Those plants which are normally which are normally propagated by seed shall be grown by seed in preference over cuttings or asexual propagation. Tissue Culture propagation methods shall not be accepted.

The method of production (i.e. seed/cutting) shall be stated in the Method Statement to be approved by the Designer.

The plant material may be grown in either poly bags or pots. These details shall be provided in the Method Statement to be approved by the Designer.

**.2 Conditions**

Prior to delivery all plant material shall be well hardened off and acclimatised to the site conditions for the proposed planting areas.

**.3 Inspection**

All plant material shall be inspected by the Designer prior to delivery to ensure that it meets Specification. Should any plant material be grown on a sub-contractual basis then the Supplier shall arrange an appropriate itinerary of inspection at the request of the Designer. This inspection shall be attended by the Supplier for them to confirm the acceptance.

The Designer shall undertake a final inspection of plant materials on arrival of the materials on site.

At Final Inspection, the Supplier shall have supplied all plant material in accordance with the Specification and Plant Schedule for the phase(s) of work being undertaken.

**.4 Operations**

All horticultural operations, including regular potting up, control of pests and diseases, watering, shade, frost and wind protection shall be undertaken in a method that ensures healthy, vigorous stock that is hardy to the environmental conditions expected on site.

All growing on operations shall be programmed to include an appropriate 'hardening off' period prior to dispatch to site. (Note: Hardening off refers to when plants grown in a nursery environment have been subjected to a sustained period to the range of environmental conditions similar to those that will be reasonably expected to be experienced in the area they are to be planted. Once installed, hardened off plants should generally be able to withstand the prevailing environmental conditions).

**.5 Spares**

The Supplier shall make allowance at all times throughout the Contract Period, for a quantity of each plant species in excess of that scheduled. This is to allow for plant losses. Such plant losses shall be covered at the Suppliers expense.

On completion of the propagation contract, the Supplier shall offer to sell any additional plants to the maintenance contractors at the tendered rates for those plants. If the maintenance contractors choose not to purchase the plants, the Supplier may sell or dispose of the additional plants at their discretion.

**.6 Inspections of the propagated plants**

The Supplier shall notify the Designer for inspections of the plants following:

- Prior to shipment of plant material
- Upon delivery of the plant material.

The Designer may at their discretion, inspect the plants during any phase of the eco-sourcing of parent material or seeds, propagation or growing on.

**.7 Reporting**

The Supplier shall keep records on the progress of plant propagations and provide copies of these to the Designer at the end of each three month period (dependant on the scale of plant propagation). These records shall include:

- Inventory of seeds and plants that have been eco-sourced including parent plant details of location (e.g. GPS locations), height, grade and condition.
- Plant material propagated, timing of sowing, potted up date and size at reporting time.
- Delivery process
- Holding areas on site, including description of area, available water supply and security.
- Progress for each species in relation to programme for delivery to site
- Any other matters which affect the propagation, growing on, supply and storage of the plant material.

**.8 Pruning – General**

Immediately prior to delivery, plants shall be checked to ensure that there is a balanced root to foliage ratio. If necessary, the foliage shall be reduced by skilled staff to conform to the best horticultural practice and appropriate to the type of plant.

Operations are to be carried out using clean and sharp implements to give a clean sloping cut with one flat face. Ragged edges of bark or wood are to be trimmed with a sharp knife.

**.9 Timing**

The plants shall be ready for delivery in the planting season required. The dates for the plants to be ready shall be confirmed by the Designer. The core planting season shall generally be between 1st May and 1st September, but may be extended by two weeks either side of the core period where seasonal conditions allow.

**.10 Delivery**

The method of transportation is at the discretion of, and is the responsibility of the Supplier.

Plants shall be carefully loaded by hand, unless special container arrangements for mechanical handling have been provided and approved by the Designer.

No plant material shall be subjected to adverse conditions in transit to the work site. Adverse conditions may include:

- Drying out (even in still, apparently moist air)
- Prolonged heating under humid conditions
- Freezing
- Water logging
- Physical breakage

Amongst other factors, plant viability can be reduced by crushing, dropping etc. even if no visible physical breakage results. Plants must therefore be handled gently and with care at all times.

All plant material shall be adequately protected from damage during transit.

All plants shall be loaded, stacked and unloaded in such a way that breakage or crushing by the weight of plants above is avoided during loading, transit and unloading. All plant material being transported shall be completely and firmly covered in such a way that there is the minimum draught from the direction of travel. Provision shall also be made to ensure that the load remains cool and moist at all times.

Where transport is by others, not under the control of the Supplier or the Constructor, the sender must ensure that the packaging is adequate to protect the plants whilst in the third party's charge.

All plant material being transported shall be clearly addressed, manageable units, securely packaged to withstand mechanical damage. The packaging must also include sufficient moisture retentive material around the roots to ensure that they remain cool and moist until they are delivered to the purchaser.

The Supplier shall provide documentation showing the species, grades and quantities of all plant material being transported.

(a) Plant Delivery Planning

It is essential that –

- The planting specifications are prepared in detail to suit the requirements of the project phases and delivery locations.
- The planting is planned, as far as possible in advance of the planting season (core season begins 1st May and ends 1st September, however depending on seasonal conditions planting may occur during a two week 'shoulder' at both ends of the core planting season may be possible), and plants are propagated and available in the sizes specified.
- Site preparation has occurred and the soil conditions are suitable in advance of planting.
- Plant supply needs to be co-ordinated with the plant supplier so that planting can occur upon delivery, during the planting season.
- Adequate facilities are available for the receipt and storage of plants, including a conveniently situated and suitable water supply.
- Suitably qualified and experienced Installer shall care for the plants and undertake planting and maintenance. Quality control checks shall be undertaken as per the Specification.

(b) Temporary Storage

Generally plants shall be stood upright upon delivery to site. If on site storage is required, the following shall apply:

Plants shall be stood upright on well-drained, weed free ground. All plants shall be adequately watered prior to and shall be protected from potential wind damage and sun scorching. Tall plants will require support to prevent them blowing over. Species susceptible to frost damage shall be given temporary protection.

*SP5004.7* **COMPLETION**

**.1 Acceptance**

The Designer shall inspect the plants on site to confirm they meet the requirements of the Specification, Planting Plans and Schedules. This inspection shall be attended by the Constructor to confirm acceptance of the liability relating to the planting and ongoing survival of the plant materials.

At the inspection, the Supplier shall have supplied all plant materials to site in accordance with the Specification and Plant Schedules. All plant material to be undamaged by transportation, be healthy, weed free, free of pests and diseases and true to name and size as per the Schedule.

Any plants that are dead, dying, not true to name or size as specified, or not in satisfactory growth as determined by the Designer shall be removed and replaced by the Supplier at their own expense.

**.2 Assurances**

Prior to Practical Completion of all or a portion of the Contract, the Supplier shall provide assurances that the plants delivered to the site meet the Contract Specifications and confirm in writing the authenticity of eco-sourced plant stock.

**.3 Completion**

Completion shall be deemed to be acceptance on site of the plants in the correct numbers, species and quantities as specified in the Contract.

END

# *SP5005* – LANDSCAPE – TOPSOIL SUPPLY

**The work specified in this section covers the topsoil and operations relating to topsoil for this site. Quality/characteristic testing of existing site topsoil, topsoil from outside the site, manufactured topsoil, stripping, storage and the quality required of topsoil, preparation for topsoil and topsoil placement. This section only applies to those areas where the existing topsoil has been stripped for civil earthworks.**

## *SP5005.1* APPLICABILITY

### .1 Precedence

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

### .2 General Definitions

The following are definitions of general terminology contained within this document:

- 'the Project Team' refers to any person (or team) within the Project (Rangitoopuni)
- 'the Designer' for the purpose of this specification shall:
  - be a NZILA Registered Landscape Architect or a qualified landscape architect acting under the direction of a NZILA Registered Landscape Architect.
  - Act as a technical advisor to the Constructor.
- 'the Constructor' refers to the person (or team) within the Project responsible for the planning, executions and delivery of the required physical works.
- Where subcontractors are necessary for the execution of physical works they may be referred to as 'the Constructor', 'the Applicator', 'the Supplier' or 'the Installer' as applicable. For the purposes of this specification 'the Installer' and the 'the Supplier' refers to the landscape subcontractor(s) responsible for (where required), site preparation, weed and pest control, eco-sourced seed collection, plant propagation and supply, planting, hydroseeding, mulching and maintenance of all planting in accordance with the defects liability and maintenance periods specified.

## *SP5005.2* GENERAL

### .1 Scope

To achieve the consistency and high quality in the delivery of landscape treatments for the Rangitoopuni development project, the following standard specification sets out the minimum standards for the landscape works. This baseline landscape specification sets the required performance standards, quality and workmanship for the landscape treatments which are appropriate for this high quality development.

Associated with this standard specification shall be landscape plans and plant schedules specific to Project that include design and quantitative information. Both this specification and the site specific plans and schedules will form part of the construction contract and pricing package.

The landscape works shall be for, but not limited to, the supply of all labour, plant and materials for the construction and completion of the works, including the preparation of the site, in accordance with the Project Drawings, Plant Schedules and Management Plans.

Constructors, Applicators and Installers should ensure that they are familiar with relevant conditions of any Resource Consent, or legal/landowner agreements prior to undertaking any works on site. The details of this specification do not in any way absolve the need to comply with these conditions. Where this specification is in conflict with the consent conditions, the conditions would take precedence over the specification.

**.2 Use of this Specification**

The Developer seeks high quality landscape outcomes. In order to achieve this, consideration of all aspects of the works is required. This includes; site preparation, weed and pest control, topsoil quality, plant material, standard of planting and associated materials, timing of planting and maintenance.

This specification should be read in conjunction with the Rangitoopuni Management Plans. All of the following specification documents shall be read as a whole:

*SP5000 – Landscape – General*

*SP5001 – Landscape – Quality Control*

*SP5002 – Landscape – Site Preparation*

*SP5003 – Landscape – Plant and Animal Pest Control*

*SP5004 – Landscape – Plant Propagation*

*SP005 – Landscape – Topsoil Supply*

*SP5006 – Landscape – Planting*

*SP5007 – Landscape – Grassed Surfaces*

*SP5008 – Landscape – Defects Liability and Maintenance*

## *SP5005.3* REQUIREMENTS

It is required by the Developer that topsoil shall support plant growth within the Project landscape treatments.

**Please Note:** This section shall only be applicable to those areas where the existing topsoil has been stripped to undertake civil earthworks. Areas that are undisturbed by construction activity shall not be subject to this specification section, i.e. planting will take place within the existing soil structure on the site.

## *SP5005.4* MATERIALS

Topsoil is defined as 'the top layer of soil characterised by the presence of organic matter'. In order to be retained for use on site, topsoil shall meet certain specific characteristics.

Imported topsoil shall be carefully managed to avoid any contamination, weed seeds or undesirable material being brought to site.

**.1 Topsoil Analysis**

Topsoil, whether existing material from within the project site, imported soil from external sites or site manufactured topsoil shall be tested.

The Constructor shall provide a report from the soil testing laboratory and topsoil analysis of physical and chemical properties as below.

Samples for analysis shall be representative of the batches of topsoil being offered and 10 equal samples shall be taken and well mixed. From this mixture, approximately 100gms of topsoil shall be placed in a plastic bag[1], labelled with the name and details of origin and sent to a laboratory for testing and analysis with a request for the following information:

i. Soil reaction (soil pH)
ii. Basic soil profile based saturation and volume weight and nutrient levels (potassium, calcium, magnesium and sodium)
iii. Organic soil profile (total nitrogen, organic matter, available nitrogen, C:N ratio and anaerobically mineralised nitrogen)
iv. Sulphur
v. Sulphate sulphur
vi. Recommendations for correction of nutrient deficiencies.

Note: in some situations, testing for toxic or hazardous substances may be required.

Laboratory testing shall be accompanied by recommendations from a soil scientist for measures to remedy soils to sustain planting.

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[1] Sample bags are available on request from testing laboratories.

**.2 Existing site topsoil, imported topsoil and on site manufactured topsoil**

The characteristics of the existing site topsoil (where present) to be retained, imported topsoil and on site manufactured topsoil shall be tested at a New Zealand laboratory to ascertain that is of sufficient quality.

Provided for information:

Laboratories can provide information for sample collection and carrying

New Zealand Laboratory Services Ltd

www.nzlabs.co.nz

0800 NZLABS (800 695 227)

OR

Hill Laboratories

www.hill-labs.co.nz

07 858 2000

Following receipt of soil tests, the results are to be interpreted by a soli analyst where adjustment is required.

The Constructor shall confirm in writing:

The topsoil has been tested and found to be satisfactory for use on site.

OR

The topsoil once tested was found to be deficient and what the recommendations of the soil analyst are to remediate the soil to meet specification

OR

The soil is not recommended for use on site.

Table C5005.1 – Topsoil Characteristics

| | | |
|---|---|---|
| **Texture** | Sand (0.005 – 2.0mm) | Maximum 75%<br>Minimum 20% |
| | Silt (0.002 – 0.05mm) | Maximum 20%<br>Minimum 5% |
| | Clay (<0.002mm) | Maximum 30%<br>Minimum 5% |
| **Stone Content** | Stones (2.00mm – 50mm) | Stone content to not be more than 15% by dry weight; of this the faction 2.00m – 5.00mm must not exceed 10% by dry weight |
| **Organic Matter** | | Organic matter is not to be less than 4% by weight |
| **Soil Reactions** | | pH to be between 5.5 and 7.8 |
| **Nitrogen** | | Nitrogen (N) shall be within optimum levels for grass/pasture growth |
| **Phosphorus** | | Extractable phosphorus shall be within optimum levels for grass/pasture growth |
| **Potassium** | | Extractable potassium (K) shall be within optimum levels for grass/pasture growth |
| **Magnesium** | | Extractable magnesium (Mg) shall be within the optimum levels for grass/pasture growth |
| **Calcium** | | Calcium (Ca) shall be within the optimum levels for grass/pasture growth |
| **Sodium** | | Sodium (Na) shall be within the optimum levels for grass/pasture growth |
| **Sulphur** | | Sulphur (S) shall be within the optimum levels for grass/pasture growth |
| **Contamination** | | Soil shall be free of perennial weeds, toxic chemicals and any foreign matter (e.g. construction debris) |
| **Structure** | | Topsoil shall have a clearly defined crumb structure and not be waterlogged or over compacted. |
| | | |

a. Source and Samples

The Constructor shall advise the Designer of the supply source and the existing use of the topsoil. If requested, the Constructor shall take the Designer to view the topsoil at source.

The Constructor shall obtain a sample load of not less than five cubic metres (or similar approved) for inspection by the Designer. The accepted sample is to be retained on site for comparison with subsequent loads. Prior to inspection by the Designer the sample must have been analysed in accordance with the requirements of the topsoil analysis clause.

Manufactured soil mixes comprising site won material/composted mulch/rotted sawdust/forest duff (if available) material will be accepted if the material meets the topsoil quality requirements. The incorporation of composted mulch and forest duff material is important as it will provide the organic matter which in turn provides microbial activity, 'activates' the soil and acts as an inoculum for some plant species.

The final composition and the blends of the manufactured soil mix shall be determined according to the type of stripped material, its attributes confirmed by testing, and input from a soil scientist who analysed the testing results.

b. Blending of Material for Manufactured Soils

The Constructor shall supply a methodology statement outlining how the soil mix components will be blended together. The methodology statement shall be approved by the Designer and shall form the basis for soil blending and installation on site. If the soil mix components are installed in layers and then cultivated together, the layers shall be no more than 300mm.

**.3 Topsoil Strip**

The site topsoil which is to be retained for later use shall be stripped and stockpiled. The following method shall be used:

I. During suitable dry weather conditions, the existing vegetation shall be cleared in preparation for stripping
II. Clear the site of foreign materials
III. In locations where there are areas of pest plants are present these should be first stripped and set aside for disposal
IV. During suitable dry weather conditions (i.e. when the topsoil is friable and not plastic) strip topsoil down to its full natural depth, taking care to avoid contamination with subsoil or foreign materials.

**.4 Topsoil Storage**

The Constructor shall determine the topsoil storage requirements at an early stage in the project. Suitable accessible, dry/free draining and secure storage areas shall be provided.

a. Storage Period
Topsoil for use on this site shall be stored for as short a period as practicable. Existing topsoil shall not be stored for more than 18 months unless remedial measures approved by the Designer are adopted (e.g. topsoil stockpiles may be grassed, which will also act as a dust suppression measure).

b. Stockpile
Topsoil stockpiles shall be graded to shallow falls over a large an area as practical to prevent the formation of ponding, to a maximum height of 2.0 metres to prevent deterioration of the soil structure.

c. Weed Control
The Constructor shall carry out weed control to the topsoil storage mounds using a suitable translocated herbicide spray. Herbicide sprays to be carried out three times at least 2 weeks apart. Spraying shall be carried out in early April or preferably starting in August through September to allow for full treatment prior to the season for placement. Refer to SP*5003* – Landscape– Plant and Animal Pest Control.

**.5 Preparation of Formation**

a. Sub Soil Preparation

Prior to any cultivation or grading, the subsoil shall be completely cleared or treated for any weed growth using an approved herbicide in accordance with the manufacturer's specifications. Where necessary through compaction by machinery, subsoils should be ripped to a depth of 300mm to prevent a slip plane developing between the placed topsoil and the native ground.

b. Formation Level

The site shall be brought to formation level using a suitable subsoil material. All soil handling should be carried out when the soil is sufficiently dry and not plastic. The formation level shall be completely free of all rubbish, prior to any topsoiling taking place. The Constructor shall liaise with the Designer on formation levels to ascertain which areas can be reinstated to the soil depths specified or otherwise reinstated. Formation levels shall align with the landscape treatments including setting out of planted areas and tree pits prior to the commencement of topsoiling.

The Installer shall provide short stakes to mark the exact positions of tree and climber pits for acceptance by the Designer prior to excavation and retain in the same position after topsoiling.

Topsoil depths in planted areas are to be as follows:

- In grassed areas 150mm minimum
- In planted amenity areas 300mm minimum
- In raised planting areas 300mm where possible.

Tree pits are to be:

- For 40 litre grade trees 500 x 500 x 1000m depth
- For larger grade trees 1000 x 1000 x 1000 depth

**.6 Workmanship**

a. Topsoil Spreading

Topsoil shall be spread and lightly consolidated using layers (usually 100 mm depth), but not compacted.

I. Weather

The Constructor shall spread the topsoil during appropriate dry weather free of frost.

II. Depths

The areas of different topsoil depths and finished levels are to be as shown on the drawings.

III. Ground Modelling

There shall be an even grade with no depressions that will result in water ponding or hollows.

IV. Gradients

Finished gradients are to be smooth, flowing and free of minor hollow and high spots and marry in neatly with existing levels and adjoining topography, paving, kerbing, edgings and manhole covers where applicable.

V. Contamination

Any areas of topsoiling that are contaminated with subsoil, rubbish, construction debris and other deleterious material shall be removed by the Constructor in the course of carrying out the earthworks.

The Constructor shall ensure all topsoiling is free from stones greater than 50mm.

VI. Compaction

Topsoiling areas shall be in a lightly consolidated and uncontaminated state prior to setting out of all planting areas.

END

# *SP5006* – LANDSCAPE – PLANTING

**The work specified in this section of the works shall include the preparation for planting, setting out plants, planting, staking (of trees, if required), fertilising and mulching of all plant material. Planting shall include all areas of planting associated with the project's landscape treatments.**

## *SP5006.1* APPLICABILITY

### .1 Precedence

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

### .2 General Definitions

The following are definitions of general terminology contained within this document:

- 'the Project Team' refers to any person (or team) within the Project (Rangitoopuni)
- 'the Designer' for the purpose of this specification shall:
  - be a NZILA Registered Landscape Architect or a qualified landscape architect acting under the direction of a NZILA Registered Landscape Architect.
  - Act as a technical advisor to the Constructor.
- 'the Constructor' refers to the person (or team) within the Project responsible for the planning, executions and delivery of the required physical works.
- Where subcontractors are necessary for the execution of physical works they may be referred to as 'the Constructor', 'the Applicator', 'the Supplier' or 'the Installer' as applicable. For the purposes of this specification 'the Installer' and the 'the Supplier' refers to the landscape subcontractor(s) responsible for (where required), site preparation, weed and pest control, eco-sourced seed collection, plant propagation and supply, planting, hydroseeding, mulching and maintenance of all planting in accordance with the defects liability and maintenance periods specified.

## *SP5005.2* GENERAL

### .1 Scope

To achieve the consistency and high quality in the delivery of landscape treatments for the Rangitoopuni development project, the following standard specification sets out the minimum standards for the landscape works. This baseline landscape specification sets the required performance standards, quality and workmanship for the landscape treatments which are appropriate for this high quality development.

Associated with this standard specification shall be landscape plans and plant schedules specific to Project that include design and quantitative information. Both this specification and the site specific plans and schedules will form part of the construction contract and pricing package.

The landscape works shall be for, but not limited to, the supply of all labour, plant and materials for the construction and completion of the works, including the preparation of the site, in accordance with the Project Drawings, Plant Schedules and Management Plans.

Constructors, Applicators and Installers should ensure that they are familiar with relevant conditions of any Resource Consent, or legal/landowner agreements prior to undertaking any works on site. The details of this specification do not in any way absolve the need to comply with these conditions. Where this specification is in conflict with the consent conditions, the conditions would take precedence over the specification.

### .2 Use of this Specification

The Developer seeks high quality landscape outcomes. In order to achieve this, consideration of all aspects of the works is required. This includes; site preparation, weed and pest control, topsoil quality, plant material, standard of planting and associated materials, timing of planting and maintenance.

This specification should be read in conjunction with the Rangitoopuni  Management Plans.  All of the following specification documents shall be read as a whole:

*SP5000 – Landscape – General*

*SP5001 – Landscape – Quality Control*

*SP5002 – Landscape – Site Preparation*

*SP5003 – Landscape – Plant and Animal Pest Control*

*SP5004 – Landscape – Plant Propagation*

*SP005 – Landscape – Topsoil Supply*

*SP5006 – Landscape – Planting*

*SP5007 – Landscape – Grassed Surfaces*

*SP5008 – Landscape – Defects Liability and Maintenance*

*SP5006.3* **REQUIREMENTS**

It is required by the Developer that all planting and associated plant ancillaries (such as climber supports, mulch, biodegradable weed mat and pins, tree stakes and ties), where required, shall meet the requirements of this Specification.

It is required by Developer that all planting shall be 100% completed by Practical Completion.

*SP5006.4* **MATERIALS**

**.1 Plant Materials – General**

Plant materials shall be:

- True to name and type with well-developed roots and well-shaped stem and foliage head.  They shall be hardened off to cope with the climatic conditions of the site, and free from weeds, pests and disease.
- The roots shall have a high percentage of fibrous roots that are just touching the edge of their containers.  Plants that have roots that are wound around their containers in a circular fashion shall be rejected.
- Plants shall be free from disfiguring knots, bark abrasions, wind or freezing injury or other disfigurements and shall bear evidence of proper pruning.

Where several specimens of the same species are to be selected, evenness of shape and size is required within the size range specified.

All plant material shall be available for inspection by the Designer, prior to planting.

All trees shall be inspected by the Designer prior to delivery.

Legible labels shall be attached to each batch of plants delivered to site as a separate unit, or to each box, bundle or bale containing plants.  The labels shall give the approved botanical name and quantity and other information required to identify the plant or plants.

In exceptional shortages, plant substitutions may be considered by the Designer.  No substitution shall be made without the written approval of the Designer.  Approved substitutions shall be of a similar height and habit to those specified.

Plant sizes are specified by litre bag size (litre grade).  Specimen trees may be supplied by grade, girth or height or a combination of these.  Where the Supplier proposes to supply plants in PB (pint bag sizes): the conversion factor shall be 1 pint equalling 0.568 litres.  The exact sizes must be shown, so the Constructor is aware of the exact conversion.

**.2 Supply and Possession of Plants**

The Installer shall inspect all plants on arrival to site to ensure the required quality is provided and that the plants have not been damaged in transit. The Installer shall confirm acceptance of the plants. On acceptance, the Installer shall thereafter be responsible for the condition of the plants and shall replace dead or unhealthy plants at their own cost.

**.3 Container Grown Shrubs**

Container grown shrubs shall be to the container size (litre grade) specified in the Schedule and on the Drawings.

Container grown shrubs shall be strong, well-rooted sturdy plants without stakes or canes. Shrubs shall have two or three main stems and a good bushy form. They must have been grown in their containers for at least 6 months over a summer period prior to planting out and the container shall be full of roots but not root bound.

**.4 Trees – Advanced Nursery Stock**

Advanced nursery stock PB40 (22 litre grade) and larger to be planted in tree pits and staked as specimen plants.

Advanced stock shall be to the bag size, girth or height or a combination of these specified on the Drawings and Schedules.

Trees shall have a sturdy straight and vertical stems with a well-balanced canopy of branches. Only specimens which have a well-defined, single central leader which is reasonably straight and upright, unless a single straight leader is uncharacteristic of that species.

**.5 Stakes and Ties**

All stakes shall be driven sufficiently deep enough to secure the plant. In total, 2 stakes per tree shall be used depending upon the tree size or situation.

Stakes shall be straight, pointed H4 treated *Pinus radiata* stakes 50 x 50 x 1500mm long (or similar approved). The final desired height for the stakes shall be set to ensure ties secure the plant.

Ties shall be 50mm wide, flexible ties attached to the stakes with approved galvanised fastenings (hessian webbing or similar approved proprietary products). Ties and fixings to the stakes shall be sufficiently durable to provide support to the plants for a minimum of 3 years.

**.6 Support Structures**

Any climbing plants require support structures. Where a climbing plant species are in association with engineering structures, the engineering structures are to be considered on a case by case basis as to their suitability to act as a support structure for the climbing plant species.

**.7 Mulch**

(a) Organic Mulch (Pine Chippings)

Organic mulch (pine chippings) shall be applied to planting areas only where indicated on the Drawings and Schedules. The use of mulch in this Project is for the purpose of weed suppression and moisture retention. It is not intended as a supplement for the soil conditions.

Where required, mulch may be applied (either blown onto the site or mechanically applied) prior to planting, to a depth of 100mm. Planting shall be completed through the mulch layer, which shall be scraped back then carefully placed back, once the plant has been installed, as specified below:

- To retain soil moisture levels and limit possible weed seed germination, mulch shall be applied immediately or as soon as practicable after topsoil placement.
- Alternatively, mulch may be placed after planting with the approval of the Designer.
- All trees shall be mulched to a 100mm depth at least with not less than 75mm depth remaining after settling.
- Individual specimen trees located within grassed areas shall include a circular 1.0m diameter mulched area surrounding the base of each tree.
- The perimeter of any mulched area adjacent to grassed areas or ground level structures, shall be shaped to allow the full depth of mulch to be at the same level as the grass or structure.

- Mulch is to be kept clear from the base of tree trunks or underneath shrubs and not piled against the stems of plants.
- Mulch that may contain pest plant material that is likely to re-sprout and take root shall be rejected to avoid pest plants being transferred to the planting area. Any weeds that emerge from the mulch must be controlled as soon as possible to prevent further spread.
- Mulch type and grade may vary according to the requirements of the particular location. The type of mulch, grade and any particular treatment to prevent washout/movement shall be as described on the Drawings and Schedules.

(b) Organic Mulch (Mulched weeds)
(c)
The existing weedy vegetation of predominantly gorse and woolly nightshade will be mechanically mulched in-situ where there are large stands of vegetation to be removed. The mulched material will be left on site (in-situ). The mulched material must not be allowed to accumulate in deep piles (approximately 300mm or more deep) due to the risk of combustion as the material breaks down. The mulched material will act as a weed suppressant and will retain moisture. Planting will occur into the mulched material as noted in the above listed requirements.

*SP5006.5* **WATER**

**.1 Water Generally**

All plants shall be thoroughly watered a few hours prior to planting to help with successful establishment.

The Constructor shall be responsible for providing suitable water for watering plants in the event of unseasonal dry conditions that could compromise plant survival and establishment.

Notwithstanding any prevailing restrictions by the local authority on the use of water for watering any plants, the Constructor shall be deemed totally responsible for making any special arrangements which may be necessary to ensure an adequate supply of water for watering trees and shrubs for successful establishment.

In the interests of good horticultural practice, watering shall be sufficient to give 300mm minimum soil penetration and not just surface dampening.

In the event of unseasonal dry conditions, the Installer shall bring to site sufficient water carts, hoses and sprinklers to provide an adequate water supply to the plant material.

**Drought Conditions:**

In the event of drought conditions, the Installer shall notify the Constructor. If water supply is likely to be restricted, the Constructor shall organise water from other approved sources. The Installer shall be responsible for watering all plants as required to ensure their survival.

**.2 Watering Tubes**

If watering tubes are required, they shall be 65mm diameter perforated HDPE pipe (Novaflo or approved equivalent) installed across the base of the tree pit and up the side to extend 100mm above the finished ground level (i.e. above the mulch).

**.3 Fertilisers**

All plants shall be planted with a controlled, slow release fertiliser such as ‘Nutricote’ or ‘Osmocote Plus’ or ‘Grotabs’ of composition 12:8:6 (N:P:K).

Fertiliser shall be applied to the backfill of each tree, shrub and groundcover in accordance with the following application rates. In all cases, the fertiliser shall be mixed with the soil in the prepared hole prior to placement of the root ball. Care shall be taken to avoid the roots having direct contact with the fertiliser.

“Crystal Rain” or similar water retention crystals shall be incorporated into each planting hole at the rate recommended by the Manufacturer.

**Table SP5006.1 – Fertiliser Application Rates**

| Plant Size | Application Rate per Plant (gms) or tab |
|---|---|
| 0.5 litre (approx. PB1) | 12g or 1 x tab |
| 1.0 litre (approx. PB2) | 12g or 1 x tab |
| 1.5 litre (approx. PB3) | 12g or 1 x tab |
| 10 litre (approx. PB18) | 50g or 2 x tab |
| 22 litre (approx. PB40) | 50g or 2 x tab |

Note: Fertiliser to be applied as per the Manufacturer's recommendation but shall not be less than the rates detailed in Table SP5006.1

**.4 Delivery and Transport**

The Installer shall arrange for the plants, once brought to site, to be placed in a secure, temporary storage area on site. Plants delivered shall be limited to that able to be planted over the following 3 days.

All plants stored on site shall be watered daily

Plant roots shall be protected at all times from sun or drying winds. Plants that cannot be planted immediately on delivery shall be kept in the shade, well-protected, with soil kept well-watered.

If roots or shoots suffer slight damage they shall be carefully pruned and treated with an approved fungicide sealant. If major damage occurs the plants shall be replaced at the Installers expense.

Pots and other protective materials shall not be removed until immediately prior to planting, and shall be disposed of off site after planting. Roots shall not be left uncovered at any time.

*SP5006.6* **PREPARATION**

Refer to SP5002 – Landscape – Site Preparation

**.1 Cultivation of natural ground prior to planting (Amenity Planting areas)**

Generally, cultivation will not be required across the site due to the nature of the planting being undertaken. Where civils earthworks have taken place and soils have been adversely compacted, those areas shall be cultivated to a depth of 300mm.

Minor grading shall be carried out to ensure an even surface that will not hold water, particularly at junctions with edges, kerbs, manholes, paths etc. Refer to SP5005 – Landscaping – Topsoil Supply.

Within the root zones of trees to be retained, cultivation shall be undertaken with hand held tools (spades etc).

**.2 Tree Pit Excavation**

All plants 22 litre (approx. PB40), shall be planted in to pits 1.0m deep with a diameter of at least 500mm greater than that of the root system when fully spread and a depth of 200mm greater than the depth of the root system.

The bottom of each pit shall be loosened to a depth of 200mm to ensure root penetration and free drainage. The sides of the pits dug by rotary augers shall be roughened to remove any surface glazing of the soil.

The base of the tree pits shall be provided with 200mm depth of proprietary compost and sides backfilled with site won topsoil or soil mix, which is then mixed into the soil in the base of the pit.

Material excavated from tree pits that is unable to be distributed within adjoining areas without affecting adjacent planting or mulch shall be stockpiled for later removal from the site.

**.3 Acceptance of soil conditions**

All subsoil shall be reviewed prior to topsoiling and planting. Prior to planting, the Installer shall also consider whether the existing soil is deficient or waterlogged. The Constructor shall conduct soil testing for sectors or groups of sectors and for batches of manufactured topsoil to ascertain the soil condition and whether any remedial measures will be required. Together with the Designer, soil tests will be reviewed along with the accompanying recommendations from a soil scientist for soil remediation and any remedial measures to be undertaken.

In the event that the Constructor fails to accept the advice of the Designer regarding soil problems and remediation, and the plants subsequently die due to topsoil conditions or associated effects (e.g. waterlogging), the Constructor shall be responsible for the replacements of those plants and the remediation of the topsoil.

**.4 Setting Out**

Prior to planting, all plant positions shall be pegged/laid out, in accordance with the planting plan. Set out shall recognise the growth and spread of all planting and associated setbacks in relation to protected areas, structures, utilities/services and maintenance and operation access.

Prior to laying out plants for revegetation areas, the Installer and the Designer shall discuss the plant placement requirements on site, to confirm plant placements based on aspect, soil moisture and plant mix.

Specimen tree positions shall be pegged out prior to planting and the final positions approved by the Designer prior to tree pits being excavated.

In areas of massed planting, plants shall be spaced evenly so that when established they will completely fill the areas. Planting shall be in general accordance with the Drawings and Schedules.

The Installer shall arrange for the Designer to inspect the setting out. The Designer may require minor refinement to the design with adjustments to lines, levels and grouping of trees/shrubs locally as the planting proceeds requiring the Installer's co-operation and agreement.

The Installer shall not commence planting until the setting out has been inspected and approved by the Designer. If work is carried out without the prior approval, realignment and re-siting may be required.

## *SP5006.7* WORKMANSHIP

**.1 Planting Generally**

All planting shall be performed by experienced worker in accordance with the recognised best horticultural practice and under the supervision of the Installer's skilled foreperson.

All plants not requiring tree pits shall be planted into holes so that the soil after settlement shall match the original soil mark on the stem of the plant. The bottom of each planting hole shall be loosened to ensure root penetration and free drainage. The sides of the hole shall be roughened to remove any glazing of the soil.

Fertiliser shall be applied to the base of the hole in accordance with Table SP5006.1 Fertiliser Application Rates.

Container grown plants shall have the container removed immediately prior to planting. Care shall be taken to ensure the root ball is not disturbed during container removal or planting.

Plants shall be set in their final positions with the main stem vertical and at such a depth that the soil, when firmed down is at the same height as the nursey earth marks on the stem or the container soil level. Loose roots shall be spread out in a natural fashion; the soil being carefully placed under and amongst them to fill all voids and firmed in.

Specimen trees and advanced stock shall be orientated when planted, so that the weathered face of the trunk faces north.

Any major roots that become accidentally broken off or frayed shall be cleanly cut off from the plant. Damaged roots over 25mm diameter on advanced nursery stock and specimen trees shall be cut back to sound growth and treated with fungicidal sealant.

The Designer shall regularly check the planting, mulch placement, stakes and ties, progressively as planting is completed.

**.2 Timing of Operations**

Work shall only be undertaken when the weather is suitable, and when the ground is moist and workable. All planting operations shall be suspended during periods of severe frosts, waterlogging, drought or persistent drying winds.

**.3 Pruning – General**

After planting, all plants with damaged branches unless rejected, shall be carefully pruned back to healthy wood.

Operations are to be carried out using sharp clean implements to give a clean sloping cut with one flat face. Ragged edges of bark or wood are to be trimmed with a sharp knife.

All pruning waste shall be removed from the site.

At the end of the maintenance period, all plant material shall be checked for any dead wood, broken or damaged branches which shall be pruned and removed from the plant.

**.4 Rain Garden Planting**

(a) General

The extent of any stormwater filter strip or rain garden, shall be shown on the Drawings.

(b) Timing of Operations

Timing of planting associated with stormwater devices should also align with the device coming on line. All strength testing of stormwater devices shall be carried out prior to planting to avoid any damage to the plants.

(c) Fertilisers

No fertiliser is to be used in filter strip or rain garden plantings that will to some degree be growing in water.

(d) Weed Mat

Only biodegradable weed mat shall be used.

If Pukeko are present, the aquatic plants and grasses shall be pinned with “U” shaped wire pins 300mm long (or similar approved).

**.5 Water – General**

The Constructors shall be responsible for the provision of water supply for watering (or water carts if necessary) at the time of planting.

Attention must be paid to watering during and after planting to ensure successful establishment. Notwithstanding any prevailing restrictions by the local authority on the use of water for watering any plants, the Installer shall be deemed totally responsible for making any special arrangements which may be necessary to ensure regular and adequate watering of trees and shrubs to ensure successful establishment.

(a) Prior to Planting

All plants shall be thoroughly watered a few hours prior to planting.

(b) After Planting

The Installer shall be responsible for watering all plants as required to ensure their survival.

(c) Drought Conditions

Lack of availability of water shall not release the Installer from his obligation to replace all dead or dying plants at the end of the first season of growth after planting. The price submitted shall allow for adequate watering and /or plant replacement.

If during a drought some planting has not been carried out, planting may be delayed by agreement with the Designer.

**.6 Staking**

Stakes shall be driven 600mm into the ground clear of the plant root ball.

Two stakes shall be installed for each 22 Litre (PB40) grade tree and one stake for 10 Litre (PB18) grade plants.

Prior to planting, position each stake close to and on either side of the tree, with the alignment at right angles to the prevailing wind, outside the rootball, and drive vertically into the bottom of the pit until the top of the stake is 600mm above ground level. Consolidate material around the stake during backfilling. The trees shall be held firmly, although not rigidly, by staking to prevent a pocket forming around the stem and newly formed fibrous roots being broken by mechanical pulling as the tree rocks in the wind.

One plant tie shall be positioned proportional to the height of the tree (i.e. generally this will be approximately one third from the base of the tree).

**.7 Planting Bed Edge**

All planting beds located adjacent to a grassed area (where a mowing strip or proprietary garden restraint edge has not been specified) shall have a 100mm deep 'V cut" (or similar approved) edging formed around the perimeter of the beds to act as a mulch containment and to provide a neat border with the adjacent grassed area.

**.8 Mulch Placement**

Refer to Materials clause SP5006.4.7 above

**.9 Quality Control**

See SP5001 – Landscape – Quality Control.

During the Contract Period, the Installer shall control weeds, which affect the establishment and growth of the plants already installed under the contract. Prior to release of the Certificate of Practical Completion, the Installer shall remove all weeds within the landscape treatment areas. The removal shall be deemed to include the killing of the weeds with an approved herbicide or the removal of the entire root system.

The Installer shall also control weeds throughout the Defects Liability and Maintenance Period as set out in SP5009 – Landscape – Defects Liability and Maintenance.

All weed material shall be removed from the planting areas and disposed of offsite at an approved facility.

Any seed heads on weeds that are well formed and could potentially germinate shall be removed from site and disposed of in a safe secure manner to an approved facility.

**.10 Defects**

During implementation of planting works under the Contract, all defects shall be repaired/replaced at the Installer's expense (SP5009 – Landscape – Defect Liability and Maintenance

Defects for which the Installer is liable prior to issue of Practical Completion include the following:

- Defective plants shall be deemed to be those plants, which in the opinion of the Designer are dead or dying,
- Vandalised or broken plants or stakes,

- Mulch not to the specified depth at Practical Completion.
- Plants that have declined due to lack of water.

*SP5006.8* **COMPLETION**

**.1 Condition on Acceptance**

The Installer shall ensure that any non-conformance with these specifications will be remedied prior to application for issue of the Certificate of Practical Completion. Within any planting project there may be a natural attrition of plants which have been planted. Under this Contract up to a level of 5% is acceptable as provided for in SP5006.8.2 below.

The Designer shall inspect planting on completion for each area of planting.

**.2 Loss, Damage or Theft of Plants**

Greater than 5% loss or damage of plants as part of any 'massed planting area' during the Defects Liability period, shall be made good by the Installer at their own expense.

Less than 5% of plants lost shall be deemed to be an acceptable loss, provided the lost plants are evenly spread over the whole of the planting area and are not noticeable as a bare patch. In the event that loss occurs over a confined area, the Installer shall replace such plants at its cost. The Designer shall have the sole discretion to determine if the plants are evenly spread or in a confined area.

Any plants stolen or vandalised after Practical Completion shall be recorded in writing to the Developer who may agree to replace the plants at agreed rates.

Any plants stolen or vandalised after Practical Completion and identified during regular maintenance inspections shall be recorded in writing to the Developer who may agree to replace the plants at an agreed rate.

**END**

# *SP5007* – LANDSCAPE – GRASSED SURFACES

**The work specified in this section covers the preparation of grass seeding of stripped, cleared or earthworks areas. The Constructor is to co-ordinate all grassing operations, which may also be covered under erosion and sediment control within the main Contract.**

## *SP5007.1* APPLICABILITY

### .1 Precedence

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

### .2 General Definitions

The following are definitions of general terminology contained within this document:

- 'the Project Team' refers to any person (or team) within the Project (Rangitoopuni)
- 'the Designer' for the purpose of this specification shall:
  - be a NZILA Registered Landscape Architect or a qualified landscape architect acting under the direction of a NZILA Registered Landscape Architect.
  - Act as a technical advisor to the Constructor.
- 'the Constructor' refers to the person (or team) within the Project responsible for the planning, executions and delivery of the required physical works.
- Where subcontractors are necessary for the execution of physical works they may be referred to as 'the Constructor', 'the Applicator', 'the Supplier' or 'the Installer' as applicable. For the purposes of this specification 'the Installer' and the 'the Supplier' refers to the landscape subcontractor(s) responsible for (where required), site preparation, weed and pest control, eco-sourced seed collection, plant propagation and supply, planting, hydroseeding, mulching and maintenance of all planting in accordance with the defects liability and maintenance periods specified.

## *SP5005.2* GENERAL

### .1 Scope

To achieve the consistency and high quality in the delivery of landscape treatments for the Rangitoopuni development project, the following standard specification sets out the minimum standards for the landscape works. This baseline landscape specification sets the required performance standards, quality and workmanship for the landscape treatments which are appropriate for this high quality development.

Associated with this standard specification shall be landscape plans and plant schedules specific to Project that include design and quantitative information. Both this specification and the site specific plans and schedules will form part of the construction contract and pricing package.

The landscape works shall be for, but not limited to, the supply of all labour, plant and materials for the construction and completion of the works, including the preparation of the site, in accordance with the Project Drawings, Plant Schedules and Management Plans.

Constructors, Applicators and Installers should ensure that they are familiar with relevant conditions of any Resource Consent, or legal/landowner agreements prior to undertaking any works on site. The details of this specification do not in any way absolve the need to comply with these conditions. Where this specification is in conflict with the consent conditions, the conditions would take precedence over the specification.

On this Project, grassing of this type is typically limited to the buildable areas contained within private residential Lots and within the Lot 2 Senior Living Village.

**.2 Use of this Specification**

The Developer seeks high quality landscape outcomes. In order to achieve this, consideration of all aspects of the works is required. This includes; site preparation, weed and pest control, topsoil quality, plant material, standard of planting and associated materials, timing of planting and maintenance.

This specification should be read in conjunction with the Rangitoopuni Management Plans. All of the following specification documents shall be read as a whole:

*SP5000 – Landscape – General*

*SP5001 – Landscape – Quality Control*

*SP5002 – Landscape – Site Preparation*

*SP5003 – Landscape – Plant and Animal Pest Control*

*SP5004 – Landscape – Plant Propagation*

*SP005 – Landscape – Topsoil Supply*

*SP5006 – Landscape – Planting*

*SP5007 – Landscape – Grassed Surfaces*

*SP5008 – Landscape – Defects Liability and Maintenance*

*SP5007.3* **REQUIREMENTS**

It is a requirement of the Developer that grass coverage shall achieve 95% coverage of the area by the time of completion with no single area of exposed soil greater than 100mm diameter in any one location.

The Constructor shall determine the areas to be either sown or hydroseeded where permanent grass is required.

Generally grassed areas are maintained by tractor mower are sought by the Developer, therefore consideration shall be given to the maintainability of the areas to be grassed.

SP5007.4 **MATERIALS**

**.1 Grass Seed Mix**

Grass seed shall be as specified on the planting plans. Seed mixes and application rates for permanent grass shall be applied as follows:

**Table SP*5007.1* – Seed Mix and Application Rates**

| Low Grow Grass Mix | Application Rate |
|---|---|
| Turf ryegrass (*Lolium perenne*) 50%<br>Browntop (*Agrostis tenuis*) 25%<br>Huia white clover (*Trifolium repens*) 25% | 30 gms/$m^2$ |

All grass seed shall be certified seed of the most recent crop available. All seed label analysis data shall comply with trade standards. Germination tests must have occurred within the past six months. The germination capacity of each constituent of the mixture should not be less than 80%, and the purity of the mixture not less than 90%.

All seed shall be free of noxious weeds. Other crop seeds shall not exceed 1% and the weed seed shall not exceed 0.05%.

**.2 Fertiliser**

Fertiliser shall be agricultural grade fertiliser containing the following proportions:

- Sulphate of Potash 1 part
- Sulphate of Ammonia 2 parts
- Super Phosphate 2 parts

Fertiliser shall be applied at the rate of 30gms/$m^2$ in autumn prior to seeding.

Note: Where the ground has a high pH level and is acid; Dolomite lime may be required to be applied.

*SP5507.5* **PREPARATION**

**.1 Weed Control**

All areas to be grassed shall be sprayed with an approved herbicide (such as Glyphosate or similar approved) according to the manufacturer's instructions, and at least 14 days prior to cultivation.

Weed spraying shall be in accordance with Clause 7.2 Spraying Operations in SP*5002* – Landscape – Site Preparation.

**.2 Cultivation**

Areas to be grassed shall be cultivated with a harrow to provide a suitable tilth for seed distribution and grass growth. Weeds, root material, stones, rubble and any other debris exposed during cultivation shall be removed and disposed off-site. Minor grading may be required after each cultivation to ensure that no ponding of surface water occurs. Minor grading shall also be carried out to ensure an even surface particularly at junctions with edgings, kerbs, manhole covers/concrete aprons and paths if present.

Cultivation shall be carried out by mechanical means except within the root zones of any existing tree to be retained.

Within the root zone of trees to be retained, cultivation shall be undertaken with hand tools if required (subject to the tree species). Following cultivation, the areas shall be spread with 100mm compacted depth of topsoil as specified.

*SP5007.6* **WORKMANSHIP**

**.1 Topsoil**

Topsoil shall be in accordance with SP5005 – Landscape – Topsoil Supply.

**.2 Grassing**

On completion of the topsoil cultivation, the total area of topsoiled areas affected by the works shall be sown in 2 directions with the specified seed mix and fertiliser to the specified application rates.

The sown surface shall then be lightly brushed with soil to cover seeds, and reduce potential dust and scour.

Where practicable the Installer shall ensure the seed is kept moist until the grass is established.

**.3 Protective Fencing**

The Installer shall install 'Pigs Tails' fence standards and rope warning tape fencing (or similar approved stakes) around the perimeter of the sown area to prevent damage to the newly prepared surface from unauthorised access.

**.4 Weed Control**

During the grassed surface establishment period, the Installer shall control weeds, which affect the establishment of the grassed surface and in the areas to be maintained by the Installer.

Weeds are defined as any grass or broadleaf plant not included in the seed mix applied as part of the grassed surface sowing and establishment.

Weeds shall be sprayed with spot spray or selective herbicide approved for use by the local authority and applied to the manufacturer's specifications preferably between 3 – 6 months from the time of establishment.

Bare patches following weed control, shall be over-sown by the Installer to re-establish the specified grass surface species. A fine layer of topsoil or straw mulch will be applied over these areas to promote germination and protect young plants.

Prior to the release of the Certificate of Practical Completion, the Installer shall remove all weeds within grassed areas and re-sow as necessary.

**.5 Establishment**

The Installer is responsible to ensure that grass seed germinates and grass grows to produce a grassed surface that is acceptable to the Designer.

Any areas of grass not meeting the approval of the Designer shall be weed sprayed, or over-sown, or have fertiliser applied, or any combination of these or other measures applied at the Installer's expense to produce grassed surfaces acceptable to the Designer (See SP5001 – Landscape – Quality Control for acceptance criteria).

Where grass is shown on the drawings and/or schedule to be mown the Installer shall mow it when it has reached 100-200mm tall. Cutting height shall be no less than 65mm on the initial cut to be undertaken in dry conditions with sharp mower blades.

The Installer shall mow grass for a second time at which time the Designer shall inspect the grass and may approve the grassed surface.

If necessary, the Installer shall dress the grassed surface with no more than 15mm depth at a time of screened topsoil, to eliminate minor hollows.

**.6 Mowing**

The Installer is responsible to ensure that grass is mown to the level of service as specified by the Developer, or other approved height.

**.7 Tolerances**

Grassed surfaces shall be deemed in an acceptable condition when:

- Have fully established vigorous growth
- No ponding of surface water occurs
- Grass covers 95% of the grassed area
- No single area of exposed soil greater than 100mm diameter in any one location
- Broadleaf weeds less than 10% of cover visible by eye through 360 degrees from any location
- Mowing has been undertaken in accordance with this Specification
- Kikuyu grass is not present (Kikuyu may be specified in areas of hard wearing or other specialised environment).

The Installer shall notify the Designer for inspection of the works following:

- Cultivation and preparation work prior to seeding
- Completion of re-spreading of topsoil prior to final levelling and seeding
- Inspection once grass established prior to the first mowing.
- Completion inspection following second mowing.

*SP5007.7* **COMPLETION**

The grassed areas shall not be considered complete until the grass meets the acceptance tolerances detailed above.

On completion of the work, the Installer shall ensure all surfaces affected by the works are reinstated to the pre-construction condition (i.e. topsoil to swept off paths/hard stand areas) unless otherwise specified.

**END**

# *SP5008* – LANDSCAPE – DEFECTS LIABILITY AND MAINTENANCE

**The work covered in this section covers the correction of defects relating to the landscape treatment works installed by the Constructor, together with maintenance of the site during the Defects Liability and Maintenance Period.**

## *SP5008.1* APPLICABILITY

### .1 Precedence

This specification shall be read in conjunction with relevant design and construction information contained in each work package. Any additional or specific technical information included within a work package shall take precedence over the provisions in this specification. In the event of the requirements of the Drawings being at variance with the provisions of this specification then the requirements of the Drawings shall take precedence.

### .2 General Definitions

The following are definitions of general terminology contained within this document:

- 'the Project Team' refers to any person (or team) within the Project (Rangitoopuni)
- 'the Designer' for the purpose of this specification shall:
  - be a NZILA Registered Landscape Architect or a qualified landscape architect acting under the direction of a NZILA Registered Landscape Architect.
  - Act as a technical advisor to the Constructor.
- 'the Constructor' refers to the person (or team) within the Project responsible for the planning, executions and delivery of the required physical works.
- Where subcontractors are necessary for the execution of physical works they may be referred to as 'the Constructor', 'the Applicator', 'the Supplier' or 'the Installer' as applicable. For the purposes of this specification 'the Installer' and the 'the Supplier' refers to the landscape subcontractor(s) responsible for (where required), site preparation, weed and pest control, eco-sourced seed collection, plant propagation and supply, planting, hydroseeding, mulching and maintenance of all planting in accordance with the defects liability and maintenance periods specified.

## *SP5008.2* GENERAL

### .1 Scope

To achieve the consistency and high quality in the delivery of landscape treatments for the Rangitoopuni development project, the following standard specification sets out the minimum standards for the landscape works. This baseline landscape specification sets the required performance standards, quality and workmanship for the landscape treatments which are appropriate for this high quality development.

Associated with this standard specification shall be landscape plans and plant schedules specific to Project that include design and quantitative information. Both this specification and the site specific plans and schedules will form part of the construction contract and pricing package.

The landscape works shall be for, but not limited to, the supply of all labour, plant and materials for the construction and completion of the works, including the preparation of the site, in accordance with the Project Drawings, Plant Schedules and Management Plans.

Constructors, Applicators and Installers should ensure that they are familiar with relevant conditions of any Resource Consent, or legal/landowner agreements prior to undertaking any works on site. The details of this specification do not in any way absolve the need to comply with these conditions. Where this specification is in conflict with the consent conditions, the conditions would take precedence over the specification.

### .2 Use of this Specification

The Developer seeks high quality landscape outcomes. In order to achieve this, consideration of all aspects of the works is required. This includes; site preparation, weed and pest control, topsoil quality, plant material, standard of planting and associated materials, timing of planting and maintenance.

This specification should be read in conjunction with the Rangitoopuni Management Plans. All of the following specification documents shall be read as a whole:

*SP5000 – Landscape – General*

*SP5001 – Landscape – Quality Control*

*SP5002 – Landscape – Site Preparation*

*SP5003 – Landscape – Plant and Animal Pest Control*

*SP5004 – Landscape – Plant Propagation*

*SP005 – Landscape – Topsoil Supply*

*SP5006 – Landscape – Planting*

*SP5007 – Landscape – Grassed Surfaces*

*SP5008 – Landscape – Defects Liability and Maintenance*

## *SP5008.3* REQUIREMENTS

The Defects Liability and Maintenance Period shall be as follows:

- **Five** (5) years for all landscape works associated with the Project as identified in the Drawings,

The following definitions shall apply:

- **Practical Completion**: means where planting is complete for all intents and purposes and the site can be used.
- **Defects Liability Period**: Means the period immediately following Practical Completion in which any defects in the planting works is remedied for the duration of Defects Liability Period timeframe.
- **Final Completion** (Completion of the Contract): means when the site is handed over from the Constructor to the Developer (or Residents Association or similar entity) to maintain the works thereafter.
- **Maintenance Period**: means maintaining the landscape works over the duration of the Defects Liability and Maintenance Period. Within the Defects Liability and Maintenance Period the role of the Designer is as a Technical Advisor and Reviewer, to provide quality control checks and ensure the works are undertaken in accordance with this Specification.

## *SP5008.4* DEFECTS LIABILITY AND PERFORMANCE CRITERIA

At Practical Completion, the Installer shall advise the Designer to make an inspection. After the inspection, the Designer shall issue a list of any areas or items that require remediation.

The Installer shall remedy all defects relating to the landscape treatment works, throughout the Defects Liability and Maintenance Period, at the first available opportunity. All planting defects shall be addressed within the planting season (1st May to 1st September with a two week shoulder period at both or either ends of the planting period depending on environmental conditions). The aim of the defects liability is to achieve quality establishment of the projects landscape components.

To ensure that is the case, the Developer has set the following performance criteria:

- All ground preparation, topsoil and mulch shall support plant growth within the landscape treatments.
- All planting shall include quality plant stock, true to form and shape with healthy signs of growth.
- At least five (5) different plant species shall be included in mass planting areas, with the aim of supporting resilience within the plantings.
- For biodiversity reasons, planting shall include where possible, ‘At Risk’ plant species if appropriate.
- All associated plant ancillaries (such as climber supports, matting, tree stakes and ties) shall meet this Specification.
- Planting shall achieve an 90% canopy coverage of the ground at the time of Final Completion whereby a sustainable plant community has been established and where plants have grown to create a canopy that shades the ground and suppresses weed growth. The exception to the 90% coverage rule will apply to areas where the Designer has determined that the underlying geology and environmental conditions mean that achieving an 90% coverage target is not feasible in the timeframes. The Constructor will undertake their best endeavours to establish a healthy plant community in these areas.

- Plant coverage in wetland and riparian areas is an exception given the nature of these environments and consequently some weed species may be present; this is acceptable provided they do not compromise the growth of the plants. Manual release of plants from weeds may be required in some wetland and riparian areas. The acceptable percentage of canopy coverage is 70% in the riparian areas.
- For any specimen trees, successful planting shall be defined as 100% plant survival, with 100% of the tees in full leaf at the time of Final Completion (seasonally dependant). Trees are to have a habit of growth that is normal to that species and are to be sound, healthy and vigorous with a normal well-developed branch system at the time of Final Completion.
- Grass covers and hydro-seeded grass coverage shall achieve 95% coverage of the area by contract completion with no single area of exposed soil greater than 100mm diameter in any location.
- The effects of pest plants and pest animals shall be managed to ensure the establishment of all plantings and amenity outcomes. Limiting the distribution of pest plants and costly retrospective maintenance across the network is also sought. Consistent control of pest plants is required throughout the Contract period.
- All defects shall have been progressively rectified during the defects period and prior to the issue of the Defects Liability Certificate at the end of the period.
- At the Contract completion, the Designer nominated in the tender shall complete a producer statement. The statement shall confirm that the Contract Works have been undertaken in accordance with the Drawings and Specification. The Developer may accept the producer statement as evidence the landscape treatment works comply with the landscape design and the requirements included in the Landscape Specification for the Project.

Defects relating to landscape works for this project include reinstatement of the soil profile where ground conditions following earthworks have adversely affected plant establishment, replacement of dead and dying plants, re-spreading mulch, checking and correcting all plant ancillaries for example, ties loosened to allow for plant growth, stakes inspected and re-fixed or replaced as required (or removed). The Installer's responsibility relating to defects liability of landscape treatments includes the control of pests and diseases in order to maintain the plants to a sufficient degree to ensure the plantings establish and grow.

**.1 Maintenance**

In addition to the remedy of defects, the Installer shall undertake maintenance of the area or of the landscape works regularly throughout the Defects Liability and Maintenance Periods. The minimum degree required and frequency is detailed in this Specification.

The objective of the maintenance is to maintain plant pest free areas and to encourage the healthy establishment of landscape treatments to a point where the Developer can be assured there are no inherent defects in the planting stock.

In all cases, landscape maintenance access shall be established, unless otherwise specified in the Contract

**.2 Areas of Landscape Maintenance**

The area to be maintained shall be the site as defined by the Contract and showing on the planting plans. It comprises of general revegetation areas, riparian and wetland areas and open grassed areas.

The full extent of the Installer's works area, cover landscape maintenance of all planted and grassed areas within the Project area unless otherwise specified.

In all cases landscape maintenance shall be established and maintained for the duration of the Defects Liability and Maintenance Period unless otherwise specified.

*SP5008.5* **FREQUENCY**

**.1 Defects**

Defects of the landscape treatments shall be remedied within a reasonable time of being notified by the Designer of the defect and shall be completed no longer than one month after notification (unless an environmental factor or construction activity affects access and the delay is agreed to by the Designer).

Replanting where required shall be carried out annually during the planting season (1st May to 1st September – with a two week shoulder period at either end if environmental conditions allow). Any defect shall be remedied prior to release of the Defects Liability Certificate.

Wetland/Riparian edge planting, because of the location, environment and circumstances may be able to be extended beyond the specified planting season but this too will depend on the prevailing seasonal conditions.

Watering, pest and disease control associated with defects liability of landscape treatments shall be at a frequency proposed by the Installer and agreed with the Designer. The Installer shall submit a proposed maintenance regime, based on the schedule included as a guide in this Specification, to the Designer for approval.

If in the opinion of the Designer, the frequency of maintenance visits is inadequate, the Installer shall amend the maintenance regime to the satisfaction of the Designer. The approval of the maintenance regime, by the Designer, shall not relive the Installer of its liabilities with respect to defects, in the event that the landscape treatment is found defective.

### .2 Maintenance

Maintenance shall be undertaken in accordance with the following schedule: the final maintenance work in each task shall be completed immediately prior to the release of the Defects Liability Certificate.

**Table SP5008.1: Landscape Treatments Maintenance Schedule**

| | GROWING SEASON | | | | | | | | | | | | AT COMPLETION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SPRING | | | SUMMER | | | AUTUMN | | | WINTER | | | |
| | September | October | November | December | January | February | March | April | May | June | July | August | |
| TREES, SHRUBS and GROUNDCOVERS | | | | | | | | | | | | | |
| Staking | Monthly – as required | | | | | | | | | | | | |
| Trimming/Foliage Reduction | Monthly – as required | | | | | | | | | | | | |
| Fertiliser | | | | | | | | | | | | | |
| Weed Control | Monthly (year 1) then Three Monthly | | | | | | | | | | | | |
| Watering | | As required during dry periods | | | | | | | | | | | |
| Replacement | Annually | | | | | | | | | | | | |
| Wetland Planting | | | | | | | | | | | | | |
| Weed Control | Three monthly | | | | | | | | | | | | |
| Replacement | Annually | | | | | | | | | | | | |
| GRASS | | | | | | | | | | | | | |
| Mowing (to suit Developer's requirements) | | | | | | | | | | | | | |
| Fertiliser | | | | | | | | | | | | | |
| Weed Control (within grass area) | | | | | | | | | | | | | |
| Over Sowing | | | | | | | | | | | | | |
| LITTER REMOVAL | | | | | | | | | | | | | |
| Removal | Monthly | | | | | | | | | | | | |
| MULCH (if required) | | | | | | | | | | | | | |
| Top up | | | | | | | | | | | | | |

**.3 Responsive Maintenance**

In addition to the routine maintenance of landscape treatments programmed in Table SP5008.1: Landscape Treatments Maintenance Schedule, responsive monitoring and repairs are required as necessary. These should be carried out as follows:

- Following a storm event
- Following prolonged dry or wet periods
- If damage from animal pests occurs
- Should any vandalism to any landscape works be reported

The Installer shall visit the site and report back to the Designer for confirmation of any actions to address issues arising from the events noted above.

**.4 Notification of Defects Liability/Maintenance Visits**

The Installer shall supply to the Designer, a maintenance schedule which details the location and dates of work to be undertaken. In addition, the Installer shall notify the Designer immediately prior to those visits being made, the Designer shall attend to make any necessary inspections.

**.5 Access**

The Installer shall ensure that all applicable approvals and access permits are obtained prior to undertaking any maintenance visits. Failure to do so will result in the Installer being unable to access areas of landscape works.

*SP5009.6* **LANDSCAPE – DEFECTS**

The Installer shall check for the following defects in accordance with the maintenance schedules above (or as notified by the Designer) and remedy as necessary at the Installer's expense.

**.1 Topsoil**

Any settlement or slipping shall be made good by the Constructor. All surfaces shall be reinstated to the originally specified condition. Topsoil/soil mix used to re-levelling shall be uncontaminated, dry and meet the requirements for imported topsoil as specified in SP5005 – Landscape – Topsoil Supply.

**.2 Removal of Temporary Works**

Prior to issue of the Defects Liabilities Certificate, the Constructor shall remove all temporary fencing or other works provided to protect the works during the Defects Liability Period or during the establishment of the grassing/planting. Areas affected by the removal of temporary works shall be made good.

*SP5008.8* **LANDSCAPE TREATMENT (PLANTING, GRASSING) – DEFECTS**

**.1 Planting Defects**

Any material or plant that is found to be defective (e.g. does not show leaf or make adequate growth) during the Defects Liability Period from any cause other than vandalism, shall be replaced at the Installer's expense. If there is a significant plant mortality within a given area or of a certain species, the Installer shall review the defect with the Designer, this may result in replacements of a different species.

Planting shall be done to a standard that is fit for purpose. If poor growth of plants is attributed to the ground preparation or any associated horticultural operation that is within the control of the Installer, then the Installer shall be liable for plant replacement and the associated costs.

Broken or damaged stakes and ties shall be replaced as soon as practicable. Damage to the plants resulting from delays in replacing plant supports shall be made good at the Installer's expense. Refer to the clause relating to vandalism at the end of this Specification.

The Installer is responsible to ensure that plants installed, survive and grow. Water is essential to achieve this. As part of the Installer's work relating to defects liability, the Installer shall water the plants as frequently as necessary to achieve this obligation (refer to clause 2.1 above relating to *Frequency: Defects*).

The Installer shall inspect the landscape works no less than monthly to confirm the health of the plants, existence of pests, diseases or vandalism. The Installer shall control pests, diseases or repair vandalism as directed by the Designer.

**.2 Wetland and Riparian Zone Planting Defects**

Given the nature of planting in wetlands and in riparian zones, it is expected that there will be some weeds present. Manual release of plants is likely to be required in these areas because the use of herbicides in water zones is restricted. Consequently, it is acceptable that some weed species may be present providing these do not inhibit or compromise the growth of the wetland species planted.

**.3 Grassed Area Defects**

Grassed areas shall be deemed to be defective where they do meet the requirements of SP5007 – Landscape– Grassed Surfaces.

Grassed areas not meeting this Specification shall be returned to the seedbed condition and replanted with the appropriate seed mixture until satisfactory grass is established, or take remedial action as agreed with the Designer.

**.4 Replacement Plants**

Plants used to replace defective plants, shall be reviewed to ensure that the species are suitable. Replacement planting shall be of a similar size to those originally specified, supplied and approved, unless otherwise agreed between the Installer and the Designer. The Installer shall be responsible for any preparatory and other work necessary to enable planting to be properly carried out including the removal and disposal of dead or defective plants and materials.

Dead or unhealthy plants shall be replaced, within the immediately following planting season of the Installer being aware of this condition of the plants. Any plant which is found to be defective (e.g. does not show leaf or make adequate growth – at the discretion of the Designer being aware of the geological and environmental conditions within the Project works area) from any cause other than vandalism, shall be replaced by the Installer at their expense.

The Installer shall be responsible to ensure replacement plants survive and grow in accordance with these Contract Specifications.

Replacement of plants, which are damaged through vandalism, may be replaced as a Variation at the discretion of the Designer with the approval of the Developer.

## *SP5008.9* LANDSCAPE TREATMENT (PLANTING, GRASSING) – MAINTENANCE

**.1 General Maintenance**

General maintenance shall include watering, weed removal, plant trimming, cultivation, animal pest and disease control, checking tree stakes and ties, pruning and other accepted horticultural operations to ensure normal and healthy plant establishment and growth and generally keeping the area neat and tidy.

**.2 Watering**

The Installer shall water all plants over periods of dry weather as part of the Installer's obligations relating the Defects Liability. In addition to the defects liability requirement to ensure the plants survive and grow, the Installer shall undertake additional watering as necessary.

Water shall be applied until the top 200mm of topsoil around each plant is saturated.

Watering should be undertaken during the hot part of the day. Watering nozzles shall be fine rose or sprinkler heads to prevent damage to growth areas of the plants.

**.3 Weed Control**

The Installer shall remove and control weeds regularly through the period of maintenance. Removal of weeds at the end of the Defects Liability Period only, is not acceptable.

All cultivated planted areas shall be kept weed free to the extent that perennial weed species are eradicated and annual weed species are well controlled. Care shall be taken to avoid disturbances to the shrub roots and excessive compaction of the planting bed surface. The Installer shall remove all arisings, litter and other debris and dispose of off the site at the end of each day.

Weeds shall be removed to the best horticultural practice and in accordance with any consent conditions. Spraying of weeds with an approved herbicide will be required. Focused weed control shall be required in spring when the ground warms and seeds in the soil germinate. Herbicide application shall be spot- sprayed using protective spray nozzles/cone. Chemicals shall be selected to target weed species and avoid damaging any landscape assets through spray drift or run-off.

**.4 Fertiliser**

Slow release fertiliser is applied to the bedding soil of plants at the time of plant installation.

Further applications of approved NPK (nitrogen, phosphorus and potassium) balanced, slow release fertiliser shall be applied in accordance with the Maintenance Schedule. Application rates shall be as recommended by the fertiliser manufacturer with regard to the plant size.

Fertiliser should be watered in after application.

Fertiliser shall be applied to grassed areas in accordance with the maintenance programme above. Fertiliser shall be Osmocote, or similar approved, applied at the rate of 20gm/$m^2$ or at a rate recommended by the manufacturer.

**.5 General Pests**

The Installer shall monitor the works for animal, insect and plant problems (e.g. disease); on identifying a problem, the Installer shall apply appropriate remedy through accepted horticultural practices including isolating the area, chemical control or biological control methods.

The Installer is responsible to take all suitable precautions for the safe handling and application of certified herbicides, fungicides and insecticides and shall use these strictly in accordance with the manufacturer's specifications. In all cases, sprays shall be applied according best trade practice. The public shall be advised by signage that spraying is occurring and shall be directed away from the spray areas.

Damage to neighbouring properties caused by the Installer's spraying, shall be made good at the Installer's expense.

**.6 Mulch**

The Installer shall supply and install additional mulch (the same as the material as originally placed) to ensure all mulch areas have a depth of not less than 100mm with not less than 75mm depth remaining after settling.

**.7 Specimen Trees**

(a) Horticultural Operations

Planted trees are to be encouraged to grow to maturity as naturally as possible to achieve their natural characteristic form, through sound management practices including weeding, trimming, checking of stakes and ties, pruning and other accepted horticultural operations. Pruning may also be required as a safety measure to remove overhanging branches that may cause an obstruction.

(b) Staking

Young specimen trees are staked and tied when they are planted in order to protect the growth and development of these trees through to semi-maturity. Staking shall be repaired or replaced as required.

Ties must be checked regularly every two to three months, to ensure that ties are not broken and more importantly, that they have not become too tight around the trunk as the tree grows. Ties should be maintained firm but not tight so as to cause damage. Ties should be adjusted accordingly over the initial three (3) growing seasons for planted trees, after which tome the majority of stakes can be removed.

(c) Pruning

Given that the aim of most of the planting along the project length is to approximate native plant assemblages, little if any remedial tree pruning will be required in planting areas. However, some pruning may be required to those specimen trees planted in grassed areas. For those areas of planting, the Installer shall undertake pruning of the trees over a period of time as may be required. Broken or dangerously overhanging branches shall be removed.

Overhanging branches shall be pruned back to a minimum clearance of 2.3m above the ground. Dead and broken branches must be removed as they pose a safety hazard to the site as well as encouraging wood rotting organisms. Care must be taken when removing branched to prevent damage to nearby vegetation as well as the tree being pruned. All pruning shall be undertaken in accordance with a health and safety plan.

Prune back to a sound and healthy branch with a clean cut, in accordance with good arboricultural practice. Final cuts shall be made as close as possible to the branch collar without damaging the collar. Final cuts and wound treatments are to be carried out in accordance with the principles and practice of good arboriculture.

All pruning waste will be removed and disposed of offsite.

### .8 Shrubs and Ground Cover

(a) Operations

The Installer shall maintain plantings to establish good plantings, and achieve a high level of lush vegetation. Maintenance shall include weed control, trimming, watering and fertilising. Ground cover plants should grow to fully cover the ground and thus reduce weed growth and maintenance.

Plantings in Amenity areas shall be maintained to a neat and tidy appearance in the same condition as when the works were completed at Practical Completion.

(b) Trimming

The Installer shall undertake trimming of shrubs as required to maintain the following aspects:

- Removal of dead or weak growth
- Cutting back to encourage vigorous growth
- Thinning out mass planting areas to allow stronger plants to dominate
- Cut back groundcover plants that are growing outside the planted area and across adjacent surfaces such as grass, paths or gravel.

Generally, pruning operations to maturing shrubs will be unnecessary for some time although some topping may be required to some species that rapidly develop a large canopy mass that may lead to instability or toppling (i.e. ngaio).

### .9 Climbers

Climbing shrubs shall be trained to grow over a climbing frame or wires (not required for some species i.e. *Meuhlenbeckia* sp). The Installer shall adjust vegetation and tie to wires to encourage an even spread over the structure where necessary.

### .10 Wetland Planting

Wetland plants require weed removal and replacement of dead and damaged plants. Certain herbicides cannot be used in wetlands due to their impacts on aquatic environments. The Installer shall seek specialist advice on the use of herbicides within wetland planting areas.

**.11 Grassed Areas**

Newly sown areas and grassed areas are to be protected against traffic until the grass is well established.

All grassed areas shall be protected and maintained to produce an even sward of grass at a uniform height and healthy colour; mowing and spraying to maintain a good quality turf.

**.12 Grass Cutting**

Grass cutting shall only be undertaken in dry conditions using suitable equipment (generally a tractor mower) with sharp blades. The first cut shall be after the grass has reached 100mm - 200mm tall. Cutting height shall be no less than 65mm on the initial cut to be undertaken in dry conditions with sharp mower blades.

The Installer is responsible to ensure that grass is mown to the Developer's requirements or other approved height.

Before each cut, all litter, stones and other debris must be removed so that a tidy appearance is maintained at all times.

Edges to paths or around trees or structures shall be neatly trimmed each time the grass is mowed.

The Installer shall exercise all due care in the use of mowing and trimming machines to minimise flying debris hazards. Mowers shall be fitted with stone guards designed for the mower. Safety guards shall be supplied for all equipment. Due to the steep nature of some building areas, line trimming of grass may be the only method available.

All necessary signage and barriers shall be in place prior to commencing mowing operations.

**.13 Plant and Animal Pest Control**

Refer to Specification SP5003 – Landscape – Plant and Animal Pest Control. Undesirable weeds shall be sprayed with approved herbicide strictly in accordance with the manufacturer's specifications and with all necessary safety precautions.

Undesirable weeds shall be sprayed with glyphosate or similar approved target chemical mixed and applied in strict accordance with the manufacturer's specifications. Selective weed sprays may be used in appropriate circumstances.

Fungal infection and insect attack shall be controlled with appropriate chemical sprays as approved by the Designer, applied strictly in accordance with the manufacturer's specification.

The Installer shall observe target species for Myrtle Rust signs at all times. If found, vegetation movement enforcement areas will be put in place and the infected vegetation will require eradication. Myrtle Rust has the potential to adversely affect large areas of New Zealand indigenous vegetation.

Should Myrtle Rust be identified, do not touch the affected plants but contact MPI immediately (0800 80 99 66).

**.14 Grassed Surface**

If necessary, the grassed area shall be top dressed with clean screened soil to eliminate minor hollows. Applications shall be less than 15mm at any one time, preferably applied in spring or autumn.

All grassed areas shall be protected and maintained by mowing and spraying to maintain a good quality turf with a neat appearance to the Designer's satisfaction until the end of the Defects Liability and Maintenance Period.

Final establishment shall be accepted at the discretion of the Designer, with regard to the acceptance criteria. If establishment is unsatisfactory, the Installer shall return the area to the seed bed condition and replant with appropriate seed mixture until satisfactory grass is established, or take remedial actions as agreed by the Designer.

**.15 Protection of Trees and Structures**

Care shall be taken to avoid damage to existing and newly planted trees during cutting or trimming operations. Generally areas around trees shall be trimmed by small appliances (e.g. line trimmer). Maintain a minimum of 1.00m of mulch area around trees in grassed areas to avoid ring barking.

The Installer shall take due care to located and protect all structures from damage from mowers and make good any damage. Boundary pegs are included in structures to be protected.

**.16 Vandalism**

The Installer shall notify the Designer of areas, which have in its opinion, been vandalised (including any graffiti). The Designer may issue a request for the vandalism to be reinstated as a Variation.

Any plants vandalised after Practical Completion shall be notified in writing to the Designer.

Those plants which fail and are not notified to the Designer shall be assumed to have died as a result of planting operations and shall be replaced at the Installer's expense.

The cost of plants or other landscape works deemed to have failed due to theft, wilful damage or vandalism shall be the Owner's responsibility.

Where planting is suffering damage as a result of wear and tear, the Installer shall advise the Designer, who may issue a request to provide temporary barriers or substitute damaged species with a more resilient planting solution as a variation.

(a) Fly Tipping

Fly tipping shall refer to items such as soil, aggregate, builder's rubble, motor vehicle bodies, beds, mattresses, fridges and televisions or any larger item requiring removal by machine. Any fly tipping shall be reported to the Constructor immediately.

Removal shall be advised by the Constructor.

*SP5008.10* **COMPLETION OF MAINTENANCE**

On completion of the Defects Liability and Maintenance Period and prior to the issue of the Defects Liability Certificate, The Installer shall undertake the following:

- Repair all defects to the satisfaction of the Designer and undertake all maintenance as required in accordance with the maintenance schedule.
- Provide written summary of all maintenance visits, machinery used, staff employed and weather during defects liability/maintenance visits.

The Contract Works may be inspected from time to time by accredited representatives of the Developer and /or Auckland Council in relation to any consent conditions. Should such representatives ask for information in connection with the pest control component of the Contract Works or its progress, the Installer shall give it to them freely and willingly, any details held within its knowledge.

*SP5008.11* **COMPLETION OF CONTRACT**

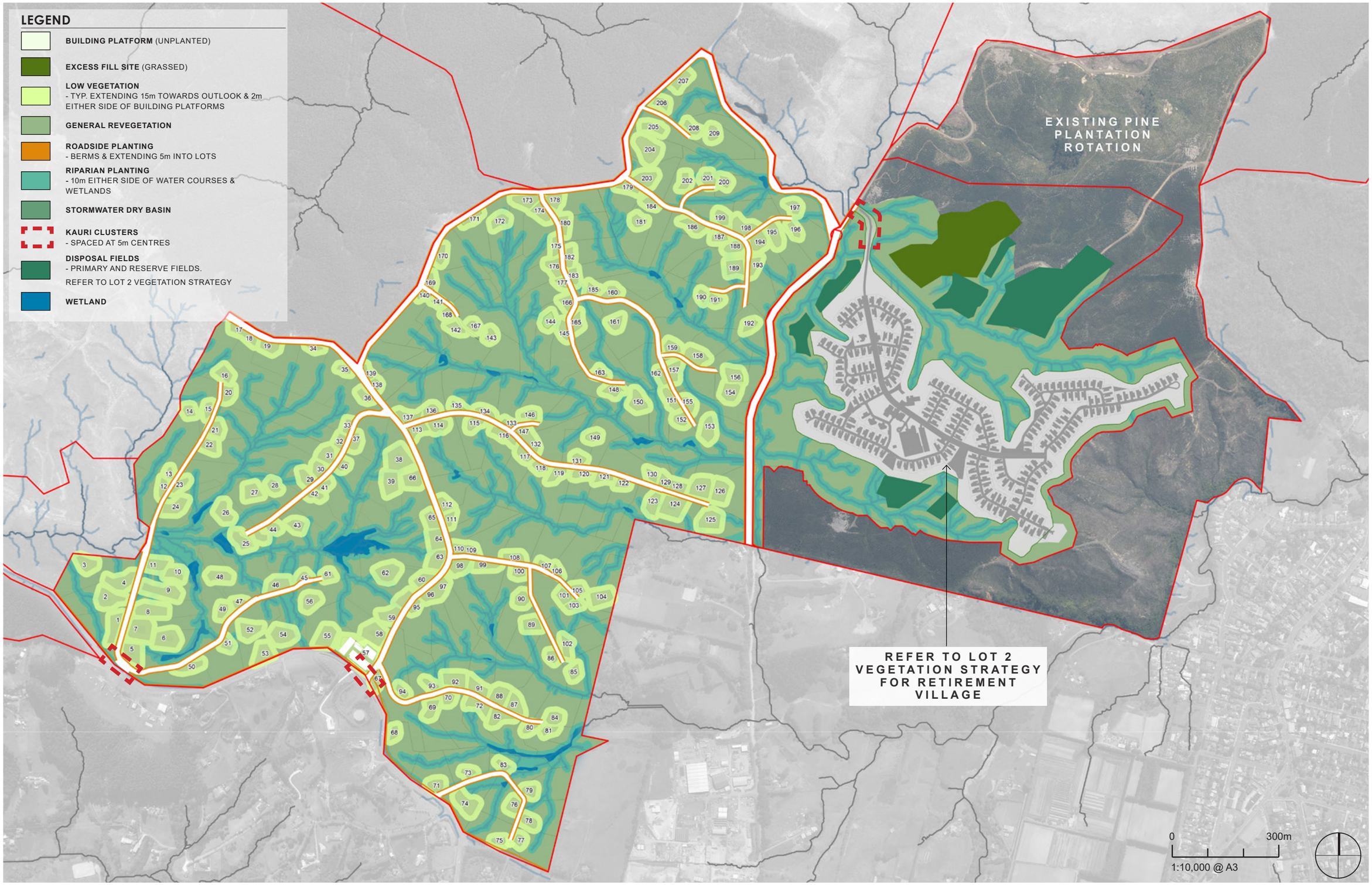
On completion of the Contract and prior to the issue of the Final Completion Certificate, the Constructor shall undertake/supply the following:

i. Provide a copy of the maintenance and defects reporting.
ii. Provide a copy of the designer review sign-off and quality control reporting (prepared by the Designer).
iii. As built drawings (mark ups of the Contract Plans) to show any variations undertaken during the Contract works.

**END**

# Appendix 4: Landscape Planting Schedules

# VEGETATION STRATEGY



# REVEGETATION - PRECEDENT IMAGERY


### 1 RIPARIAN PLANTING

RIPARIAN PLANTING TYPICALLY FEATURES A MIX OF NATIVE GRASSES, SHRUBS, AND TREES ALONG STREAM BANKS. THIS VEGETATION CREATES A LUSH, GREEN BUFFER ZONE EXTENDING 10M EITHER SIDE OF WATER COURSES AND WETLANDS.

IT STABILISES SOIL, FILTERS POLLUTANTS, PROVIDES WILDLIFE HABITAT, REGULATES WATER TEMPERATURE, AND MITIGATES FLOODS.

### 2 SUB-CANOPY

A SUB-CANOPY LAYER FEATURING MĀNUKA AND KĀNUKA CONSISTS OF DENSE, BUSHY SHRUBS WITH SMALL, NARROW LEAVES. MĀNUKA TYPICALLY HAS WHITE OR PINK FLOWERS, WHILE KĀNUKA HAS SMALLER WHITE FLOWERS. TOGETHER, THEY CREATE A ROBUST UNDERSTORY BENEATH THE CANOPY.

BOTH MĀNUKA AND KĀNUKA ARE HARDY, FAST-GROWING SPECIES THAT PREPARE THE SOIL FOR THE ESTABLISHMENT OF OTHER NATIVE PLANTS.

### 3 CANOPY

A CANOPY LAYER FEATURING KAURI, KAHIKATEA, TŌTARA, NĪKAU, AND PŪRIRI CREATES A DIVERSE AND VISUALLY STRIKING FOREST.

THE MIXED CANOPY HELPS REGULATE TEMPERATURE AND HUMIDITY, CREATING A STABLE ENVIRONMENT FOR UNDERSTORY PLANTS.

THE DIVERSE ROOT SYSTEMS STABILISE SOIL, PREVENT EROSION, AND ENHANCE NUTRIENT CYCLING.

THE VARIETY OF SPECIES ENSURES A RESILIENT FOREST STRUCTURE, CAPABLE OF WITHSTANDING ENVIRONMENTAL CHANGES.

# PLANTING TABLE

## GENERAL REVEGETATION

| | EXAMPLE/SAMPLE | | BOTANICAL NAME | COMMON NAME | SIZE (L) | SPACING (M) | % | FORM | HEIGHT AT PLANTING | HEIGHT AT MATURITY | VALLEY FLOOR | LOWER SLOPE | MID SLOPE | UPPER SLOPE | RIDGELINE | ASPECT NORTH/ SOUTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAONGA SPECIES |  |  | *Agathis australis* | Kauri | 1 | 5.0 | 3 | Pyramidal | 0.5m | 30m | ● | | ● | ● | ● | N |
| | | | *Dacrycarpus dacrydioides* | Kahikatea | 1 | 5.0 | 3 | Columnar | 0.5m | 50m | ● | ● | ● | | | S |
| |  |  | *Podocarpus totara* | Tōtara | 1 | 5.0 | 3 | Pyramidal | 0.5m | 15m | | | ● | ● | ● | N |
| | | | *Vitex lucens* | Pūriri | 1 | 5.0 | 3 | Round | 0.5m | 15m | ● | ● | ● | ● | ● | N |
| |  |  | *Rhopalostylis sapida* | Nīkau | 1 | 5.0 | 3 | Palm | 0.5m | 10m | | ● | ● | ● | | S |
| | | | *Dacrydium cupressinum* | Rimu | 1 | 5.0 | 3 | Weeping | 0.5m | 25m | | ● | ● | ● | ● | S |
| CANOPY SPECIES |  |  | *Cordyline australis* | Tī Kouka | 1 | 1.5 | 3 | Fountain | 0.5m | 10m | ● | ● | ● | | | N |
| | | | *Beilschmiedia tarairi* | Taraire | 1 | 5.0 | 3 | Round | 0.5m | 20m | | ● | ● | | | N |
| |  |  | *Didymocheton spectabilis* | Kohekohe | 1 | 5.0 | 3 | Round | 0.5m | 10m | | ● | ● | | | S |
| | | | *Laurelia novae-zelandiae* | Pukatea | 1 | 5.0 | 3 | Pyramidal | 0.5m | 25m | ● | ● | ● | | | S |
| |  |  | *Prumnopitys taxifolia* | Matai | 1 | 5.0 | 3 | Pyramidal | 0.5m | 20m | ● | ● | ● | | | S |
| | | | *Pseudopanax crassifolius* | Horoeka | 1 | 5.0 | 3 | Columnar | 0.5m | 12m | | ● | ● | ● | ● | S |
| SUB-CANOPY SPECIES |  |  | Kunzea robusta | Kānuka | 1 | 1.5 | 35 | Tall shrub/ tree | 0.5m | 10m | ● | ● | ● | ● | ● | N / S |
| | | | *Leptospermum scoparium* | Mānuka | 1 | 1.5 | 35 | Tall shrub/ tree | 0.5m | 5.0m | ● | ● | ● | | | N / S |

*Species based on 'Te Haumanu Taiao : Restoring the Natural Environment in Tāmaki Makaurau' - 4.2.8 WF11: Kauri, podocarp, broadleaved forest and 4.4.3 VS3: Mānuka, kānuka scrub*

*NOTE*

*Heights are approximate and subject to supply and environmental influences*

# PLANTING TABLE

## GENERAL REVEGETATION - ENTRANCES & GATHERING SPACES

| | EXAMPLE/SAMPLE | | BOTANICAL NAME | COMMON NAME | SIZE (L) | SPACING (M) | % | FORM | HEIGHT AT PLANTING | HEIGHT AT MATURITY | OLD NORTH ROAD ENTRANCE | BROWNS ROAD ENTRANCE | COMMUNITY FACILITIESS | RETAIL HUB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAONGA SPECIES |  |  | *Agathis australis* | Kauri | 45 - 160 | 5.0 | 3 | Pyramidal | 2.5 - 5.0m | 30m | ● | ● | ● | |
| | | | *Dacrycarpus dacrydioides* | Kahikatea | 160 | 5.0 | 3 | Columnar | 3.0 - 4.0m | 50m | | ● | | |
| |  |  | *Podocarpus totara* | Tōtara | 160 | 5.0 | 3 | Pyramidal | 3.0 - 4.0m | 15m | | | ● | ● |
| | | | *Vitex lucens* | Pūriri | 160 | 5.0 | 3 | Round | 2.5 - 3.0m | 15m | | | ● | ● |
| |  |  | *Rhopalostylis sapida* | Nīkau | 160 | 5.0 | 3 | Palm | 1.7 - 2.5m | 10m | ● | ● | ● | ● |
| | | | *Dacrydium cupressinum* | Rimu | 160 | 5.0 | 3 | Weeping | 2.5 - 3.0m | 25m | ● | ● | ● | |
| CANOPY SPECIES |  |  | *Cordyline australis* | Tī Kouka | 160 | 1.5 | 3 | Fountain | 1.5 - 2.0m | 10m | | | ● | ● |
| | | | *Beilschmiedia tarairi* | Taraire | 160 | 5.0 | 3 | Round | 3.0m | 20m | | | ● | ● |
| |  |  | *Didymocheton spectabilis* | Kohekohe | 160 | 5.0 | 3 | Round | 3.0m | 10m | | | ● | |
| | | | *Laurelia novae-zelandiae* | Pukatea | 160 | 5.0 | 3 | Pyramidal | 2.5m | 25m | | | | ● |
| |  |  | *Prumnopitys taxifolia* | Matai | 160 | 5.0 | 3 | Pyramidal | 1.75m | 20m | | | ● | |
| | | | *Pseudopanax crassifolius* | Horoeka | 160 | 5.0 | 3 | Columnar | 3.0m | 12m | ● | ● | ● | ● |
| SUB-CANOPY SPECIES |  |  | Kunzea robusta | Kānuka | 160 | 1.5 | 35 | Tall shrub/ tree | 0.5m | 10m | ● | ● | ● | ● |
| | | | *Leptospermum scoparium* | Mānuka | 160 | 1.5 | 35 | Tall shrub/ tree | 0.5m | 5.0m | ● | ● | ● | ● |

*Species based on 'Te Haumanu Taiao : Restoring the Natural Environment in Tāmaki Makaurau' - 4.2.8 WF11: Kauri, podocarp, broadleaved forest and 4.4.3 VS3: Mānuka, kānuka scrub*

*NOTE*

*Heights are approximate and subject to supply and environmental influences*

# PLANTING TABLE

## ROADSIDE PLANTING - TREES

ROAD CORRIDOR & ~5m BUFFER ALONG LOT EDGES TO ROADS

Provides screening and vegetative character to roads

| EXAMPLE/SAMPLE | | BOTANICAL NAME | COMMON NAME | SIZE (L) | SPACING (M) | FORM | HEIGHT AT PLANTING | HEIGHT AT MATURITY |
|---|---|---|---|---|---|---|---|---|
|  |  | *Agathis australis* | Kauri | 45 | As shown | Pyramidal | 3m | 30m |
| | | *Cordyline australis* | Tī Kouka | 45 | As shown | Fountain | 1.2m | 10m |
|  |  | *Dacrycarpus dacrydioides* | Kahikatea | 45 | As shown | Columnar | 2.8m | 50m |
| | | *Dacrydium cupressinum* | Rimu | 45 | As shown | Weeping | 2m | 25m |
|  |  | *Knightia excelsa* | Rewarewa | 45 | As shown | Columnar | 1.5m | 20m |
| | | *Metrosideros excelsa* | Pōhutukawa | 45 | As shown | Spreading | 1.75m | 10m |
|  |  | *Podocarpus totara* | Tōtara | 45 | As shown | Pyramidal | 1.8m | 15m |
| | | *Rhopalostylis sapida* | Nīkau | 45 | As shown | Palm | 1.5m | 10m |
|  |  | *Sophora microphylla* | Kōwhai | 45 | As shown | Weeping | 2m | 8m |
| | | *Vitex lucens* | Pūriri | 45 | As shown | Round | 1.75m | 15m |

*NOTE*

*Heights are approximate and subject to supply and environmental influences*

# PLANTING TABLE

## ROADSIDE PLANTING - SHRUBS

ROAD CORRIDOR & ~5m BUFFER ALONG LOT EDGES TO ROADS

Providing a vegetated buffer between the road corridor and private property

| EXAMPLE/SAMPLE | | BOTANICAL NAME | COMMON NAME | SIZE (L) | SPACING (M) | % | FORM | HEIGHT AT PLANTING | HEIGHT AT MATURITY |
|---|---|---|---|---|---|---|---|---|---|
|  |  | *Adiantum cunninghamii* | Common maidenhair | 1 | 0.5 | 6 | Fern | 0.2m | 0.3m |
| | | *Apodasmia similis* | Oioi | 1 | 1 | 8 | Rush | 0.5m | 1m |
|  |  | *Asplenium bulbiferum* | Pikopiko | 1 | 1 | 3 | Fern | 0.5m | 0.8m |
| | | *Astelia chathamica* | Kakaha | 1 | 1 | 6 | Herb | 0.25m | 1.5m |
|  |  | *Astelia grandis* | swamp astelia | 1 | 1 | 6 | Herb | 0.25m | 1.5m |
| | | *Austroderia fulvida* | Toetoe | 1 | 2 | 3 | Grass | 0.5m | 2m |
|  |  | *Austroderia splendens* | Toetoe | 1 | 2 | 3 | Grass | 0.5m | 2m |
| | | *Carex germinata* | Rautahi | 1 | 1 | 8 | Sedge | 0.25m | 1m |
|  |  | *Carex secta* | Purei | 1 | 1 | 6 | Sedge | 0.25m | 1.5m |
| | | *Chionochloa flavicans* | Haumata | 1 | 1 | 6 | Grass | 0.25m | 1m |
|  |  | *Dianella nigra* | Turutu | 1 | 1 | 6 | Herb | 0.25m | 0.5m |
| | | *Fuchsia procumbens* | Creeping fuchsia | 1 | 2 | 6 | Liana | 0.1m | 0.2m |
|  |  | *Hebe stricta* | Koromiko | 1 | 1.5 | 6 | Shrub | 0.25m | 2m |
| | | *Lobelia angulata* | Panakenake | 1 | 0.5 | 6 | Liana | 0.1m | 0.2m |
|  |  | *Lomaria discolor* | Petipeti | 1 | 0.5 | 6 | Fern | 0.25m | 1m |
| | | *Parablechnum novae-zelandiae* | Kiokio | 1 | 0.5 | 6 | Fern | 0.25m | 1.5m |
|  |  | *Phormium tenax* | Harakeke | 1 | 1.5 | 6 | Herb | 0.5m | 3m |
| | | *Piper excelsa* | Kawakawa | 1 | 3 | 3 | Tall shrub/tree | 0.5m | 6m |

*NOTE*

*Heights are approximate and subject to supply and environmental influences*

# PLANTING TABLE

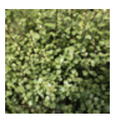
## RIPARIAN & STORMWATER DRY BASIN PLANTING

10m BUFFER TO WATERCOURSE & WETLAND EDGES

Essential for maintaining healthy, resilient riparian ecosystems

STREAM EDGE, FLOOD AND DRY SLOPE

DRY SLOPE ONLY

| EXAMPLE/SAMPLE | | BOTANICAL NAME | COMMON NAME | SIZE (L) | SPACING (M) | % | FORM | HEIGHT AT PLANTING | HEIGHT AT MATURITY |
|---|---|---|---|---|---|---|---|---|---|
|  |  | *Austroderia fulvida* | Toetoe | 1 | 1.5 | 8 | Grass | 0.25m | 1.5m |
| | | *Blechnum novae-zelandiae* | Kiokio | 1 | 1 | 8 | Fern | 0.25m | 1.0m |
|  |  | *Carex dissita* | Forest sedge | 1 | 1 | 8 | Sedge | 0.25m | 0.5m |
| | | *Carex lessoniana* | Rautahi | 1 | 1 | 8 | Sedge | 0.25m | 1.0m |
|  |  | *Carex virgata* | Pūkio | 1 | 1 | 12 | Sedge | 0.25m | 1.0m |
| | | *Carpodetus serratus* | Putaputawētā | 1 | 1.5 | 3 | Tall shrub | 0.25m | 6.0m |
|  |  | *Cordyline australis* | Tī kōuka | 1 | 1.5 | 3 | Tall shrub/ tree | 0.5m | 8.0m+ |
| | | *Veronica stricta var. stricta* | Koromiko | 1 | 1.5 | 7 | Shrub | 0.5m | 2.0m |
|  |  | *Cyperus ustulatus* | Giant umbrella sedge | 1 | 1 | 8 | Sedge | 0.5m | 1.5m |
| | | *Leptospermum scoparium* | Mānuka | 1 | 1.5 | 11 | Tall shrub/ tree | 0.5m | 5.0m |
|  |  | *Melicytus ramiflorus* | Māhoe | 1 | 1.5 | 3 | Tall shrub/ tree | 0.5m | 6.0m |
| | | *Phormium tenax* | Harakeke | 1 | 1.5 | 3 | Herb | 0.5m | 3.0m |
|  |  | *Hedycarya arborea* | Porokaiwhiri | 1 | 1.5 | 3 | Tall shrub/ tree | 0.5m | 8.0m |
| | | *Hoheria populnea* | Houhere | 1 | 1.5 | 3 | Tall shrub/ tree | 0.5m | 8.0m |
|  |  | *Kunzea robusta* | Kānuka | 1 | 1.5 | 3 | Tall shrub/ tree | 0.5m | 10m |
| | | *Myrsine australis* | Māpou | 1 | 1.5 | 3 | Tall shrub/ tree | 0.5m | 6.0m |
|  |  | *Pittosporum tenuifolium* | Kōhūhū | 1 | 1.5 | 3 | Tall shrub/ tree | 0.5m | 6.0m |
| | | *Schefflera digitata* | Patē | 1 | 1.5 | 3 | Tall shrub/ tree | 0.5m | 8.0m |

*Species based on 'Te Haumanu Taiao : Restoring the natural environment in Tāmaki Makaurau' - Table 9.2: Revegetation Schedule for Riparian Zones in Tāmaki Makaurau / Auckland*

*NOTE*

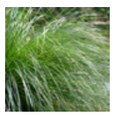
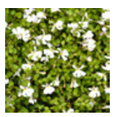
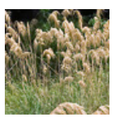
*Heights are approximate and subject to supply and environmental influences*

# PLANTING TABLE

## LOW VEGETATION / WASTE WATER DISPOSAL FIELD

LOW AMENITY PLANTING ADJACENT TO BUILDING PLATFORMS

Maintains outlook and solar access to the living environment

| EXAMPLE/SAMPLE | | BOTANICAL NAME | COMMON NAME | SIZE (L) | SPACING (M) | % | FORM | HEIGHT AT PLANTING | HEIGHT AT MATURITY |
|---|---|---|---|---|---|---|---|---|---|
|  |  | *Adiantum cunninghamii* | Common maidenhair | 1 | 0.5 | | Fern | 0.2m | 0.3m |
| | | *Apodasmia similis* | Oioi | 1 | 1 | | Rush | 0.5m | 1m |
|  |  | *Asplenium bulbiferum* | Pikopiko | 1 | 1 | | Fern | 0.5m | 0.8m |
| | | *Astelia chathamica* | Kakaha | 1 | 1 | | Herb | 0.25m | 1.5m |
|  |  | *Carex germinata* | Rautahi | 1 | 1 | | Sedge | 0.25m | 1m |
| | | *Carex lessoniana* | Rautahi | 1 | 1 | | Sedge | 0.25m | 1m |
|  |  | *Carex secta* | Purei | 1 | 1 | | Sedge | 0.25m | 1.5m |
| | | *Carex virgata* | Purei | 1 | 1 | | Sedge | 0.25m | 1.5m |
|  |  | *Chionochloa flavicans* | Haumata | 1 | 1 | | Grass | 0.25m | 1m |
| | | *Coprosma kirkii* | Taupata | 1 | 1.5 | | Shrub | 0.25m | 0.5m |
|  |  | *Dianella nigra* | Turutu | 1 | 1 | | Herb | 0.25m | 0.5m |
| | | *Fuchsia procumbens* | Creeping fuchsia | 1 | 2 | | Liana | 0.1m | 0.2m |
|  |  | *Hebe stricta* | Koromiko | 1 | 1.5 | | Shrub | 0.25m | 2m |
| | | *Libertia grandiflora* | Mikoikoi | 1 | 0.5 | | Herb | 0.25m | 1m |
|  |  | *Lobelia angulata* | Panakenake | 1 | 0.5 | | Liana | 0.1m | 0.2m |
| | | *Lomaria discolor* | Petipeti | 1 | 0.5 | | Fern | 0.25m | 1m |
|  |  | Kiokio | Parablechnum novae-zelandiae | 1 | 0.5 | | Fern | 0.25m | 1.5m |
| | | Austroderia fulvida | Toetoe | 1 | 2 | | Grass | 0.5m | 2m |

*NOTE*

*Heights are approximate and subject to supply and environmental influences*

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Boffa Miskell is a leading New Zealand environmental consultancy with nine offices throughout Aotearoa. We work with a wide range of local, international private and public sector clients in the areas of planning, urban design, landscape architecture, landscape planning, ecology, biosecurity, Te Hīhiri (cultural advisory), engagement, transport advisory, climate change, graphics, and mapping. Over the past five decades we have built a reputation for creativity, professionalism, innovation, and excellence by understanding each project's interconnections with the wider environmental, social, cultural, and economic context.