Landscape Management Plan (LMP)

NZ TRANSPORT AGENCY
WAKA KOTAHI

1 MacKays to Peka Peka Expressway

Landscape Management Plan (LMP) Revision History

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Document Acceptance

Action	Name	Signed	Date
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Approved by	Alan Orange Alliance Project Manager		12 July 2013
On behalf of	M2PP Alliance		

Certification

Action	Name	Signed	Date
Regulatory Manager Approval	Andrew Guerin		26 August 2013
on behalf of	Kāpiti Coast District Council		

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Quick Reference Guide to Conditions

Condition Number	Condition Requirement	Comments	Key Final LMP Reference
DC.53C	Outcomes of the LMP;		Sections 2.0, 3.0 & Attachment 2
	Guidelines and Standards;		Section 10.0
	Definitions of terms.		Section 8.0 & Attachment 2
DC.54	Certification of the LMP;		Section 4.1 & Attachment 2
	Purpose of the LMP;		Section 2.0
	Consultation requirements for the LMP;		Sections 6.0 & 13.0 & Attachment 2
	Information requirements within the LMP;		Section 8.0 & Attachment 2
	Key points for Council inclusion.		Section 8.0 & Attachment 2
DC.55	Implementation requirements;		Section 8.0 & Attachment 2
	Consistency between the EMP and LMP.	Project Landscape Architect and Project Ecologist to work closely when developing the respective Management Plans and Site Specific Management Plans	Throughout, especially Sections 4.0, 5.0, 8.0 & Attachment 2
DC.55A	Independent review requirement for the LMP.		Section 4.10
DC.56	Submission of draft LMP to GWRC.		Attachment 2
DC.57	Certification of Site Specific Landscape Management Plans (SSLMPs);		Section 5.0
	Purpose of SSLMPs;		Section 4.2 & 5.0

	Consistency of SSLMPs with other plans and reports;	Project Landscape Architect and Project Ecologist to work closely when developing the respective Management Plans and Site Specific Management Plans	Sections 4.0 & 8.0
	Consultation requirements for preparation of the SSLMPs;		Sections 6.0 & 13.0
	Information requirements within the SSLMPs.		Section 8.0 & Attachment 2
DC.57A	Consultation requirements on draft SSLMPs for Landscape Focus Areas.		Sections 5.7, 6.0 & Attachment 2
DC.58	Preparation and submission timeframe of Planting Management Plans for specific terrestrial planting locations.	Submission timeframe identified in the staging plan within the CEMP	Sections 4.5 – 4.7 & 4.9

Acronyms and Abbreviations Used

Acronym/Abbreviation	Definition
BoI	Board of Inquiry
CWB	Combined Cycleway/Walkway/Bridleway
EMP	Ecology Management Plan
GWRC	Greater Wellington Regional Council
HLMP	Hard Landscape Management Plan
KCDC	Kāpiti Coast District Council
LMP	Landscape Management Plan
PMP	Planting Management Plan
SSEMP	Site Specific Ecological Management Plan
SSLMP	Site Specific Landscape Management Plan
SSMP	Site Specific Management Plan
SSUDP	Site Specific Urban Design Plan
ULDF	Urban and Landscape Design Framework

1.0 Introduction

1.1 This Landscape Management Plan (LMP) forms part of a comprehensive suite of environmental controls within the Construction Environmental Management Plan (CEMP) for the construction phase of the MacKays to Peka Peka Expressway Project (the Project). This LMP addresses all aspects of the Project's landscape amenity management and monitoring initiatives during the construction of the Expressway.

1.2 A draft LMP was prepared and submitted as part of the Assessment of Environmental Effects (AEE). This current LMP incorporates material from the original LMP but it also contains a considerable amount of new information and details as a result of matters raised in the Board of Inquiry (BoI) process and addressed in the consent conditions.

1.3 The NZTA is the requiring authority and the consent holder for the Project.

2.0 Purpose and Scope

2.1 The conditions that form part of the BoI decision outlines the purpose of the management plans, the process to be followed and what they are to address. The LMP is one of 12 specialised management plans which sit under as 'sub-plans' to the main Construction Environmental Management Plan (CEMP).

2.2 The decision sets out a series of conditions at the front end that apply to the preparation of all management plans (DC.7 to DC.10C) and then subsequently covers each management plan under a series of sub-headings.

2.3 Condition DC.7(d) states that:

"The Management Plans shall be prepared in general accordance with the draft Management Plans lodged in support of the Notice of Requirement (NOR), except as modified during the hearing with the Board's approval, and by these conditions".

2.4 Condition DC.7(e) states that:

"Management plans that are not site specific management plans provide the ***overarching principles, methodologies and procedures*** *for managing the effects of construction of the Expressway to achieve the environmental outcomes and performance standards required by these conditions"* (emphasis added).

2.5 This is expanded a little further in DC.54 (b), which states that:

"The purpose of the LMP is to outline the methods to be implemented during the construction phase and for a defined period thereafter to avoid, remedy and

mitigate adverse effects of the permanent work on landscape and visual amenity and to manage all planting and restorative work associated with the Project in order to achieve the outcomes and standards under Condition DC.53C. The LMP shall document the permanent mitigation measures, as well as the necessary monitoring and management required to successfully implement those measures during the construction phase and the transition to the Operational phase of the Project"

2.6 Apart from two exceptions[1], all of the management plans are to be submitted to the Manager, KCDC for certification (DC.7(b)). In addition to the preparation of management plans covering a range of activities Site Specific Management Plans (SSMPs) are also to be prepared and these too are required to be submitted for certification.

2.7 Condition DC.7B states that:

"Where a management plan is required to be prepared in consultation with any third party, the management plan shall demonstrate how the views of that party (or parties) have been incorporated, and, where they have not, the reasons why."

2.8 In the consent conditions under the sub-heading, 'Landscape and Vegetation Management', conditions DC.53C through to DC.58 set out in detail specifically what both the LMP and each of the Site Specific Landscape Management Plans (SSLMPs) must cover; conditions DC.53C through DC.56 deal specifically with LMPs.

2.9 DC.54 (b) states that:

"The purpose of the LMP is to outline the methods and measures to be implemented during the construction phase and for a defined period thereafter to avoid, remedy and mitigate adverse effects on the permanent work on landscape and visual amenity and to manage all planting and restorative work associated with the Project in order to achieve the outcomes and standards required under Condition DC.53C. The LMP shall document the permanent mitigation measures, as well as the necessary monitoring and management required to successfully implement those measures during the construction phase and the transition to the Operational phase of the Project."

3.0 Report Structure

3.1 To assist with interpretation, the LMP has been divided into a series of headings dealing the primary matters relating to landscape and visual aspects as set out

[1] Network Utility Plan, and Stakeholders and Communication Management Plan

the proposed landscape mitigation by character area, a summary of which is included as Attachment 1. More detailed information on the key landscape matters is covered under specific headings later in this document.

3.2 The LMP has been addressed in relation to three aspects as prescribed in DC.7(e); that is setting out the overarching Principles, Methods and Procedures. These are covered in relation to the three main phases of the project - Pre-construction, Construction and Post-construction. There are different activities to be completed at each of these three main phases of the Project.

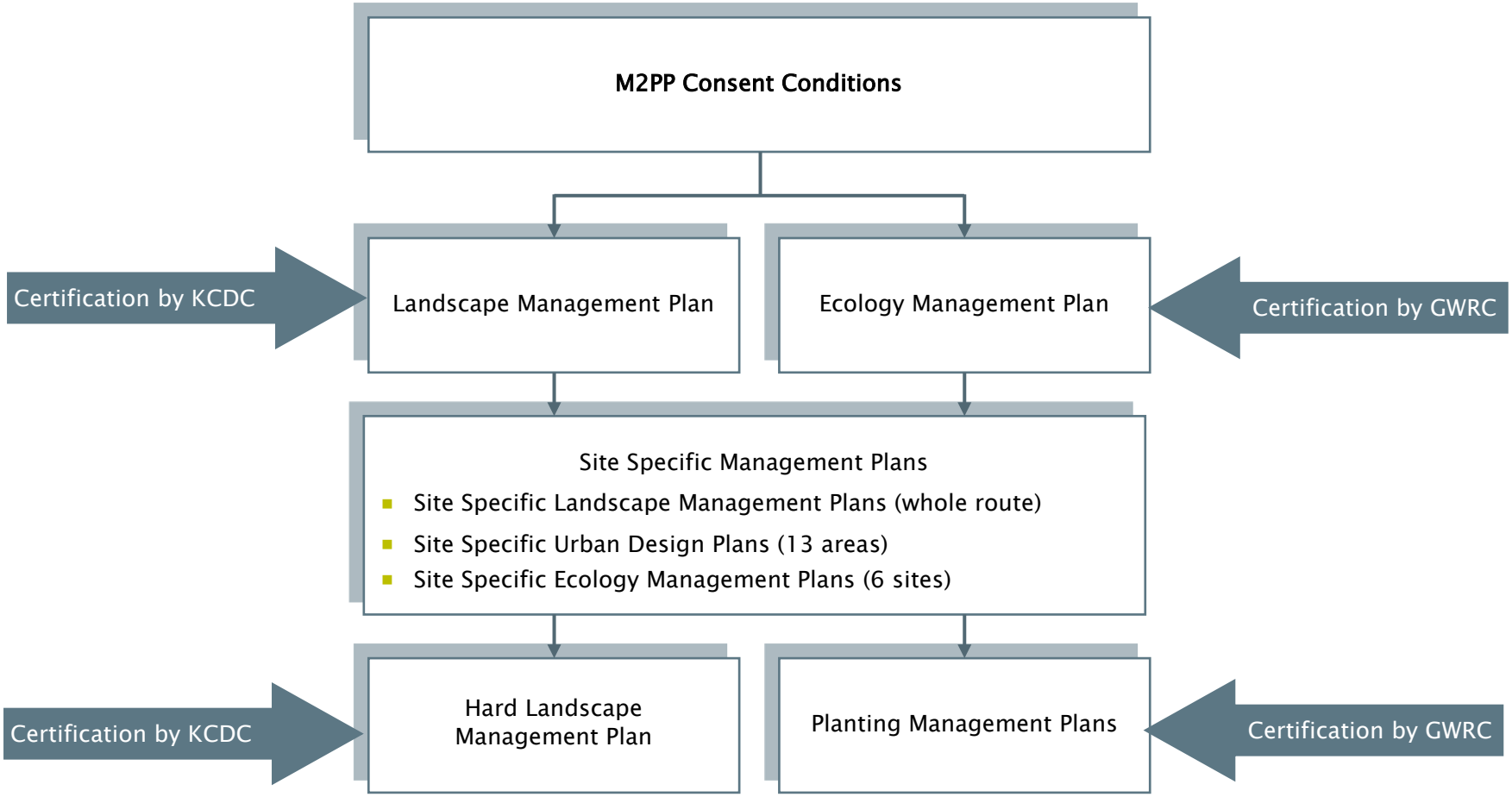
3.3 The Principles, Methods and Procedures are set out in tabular form to enable easy and quick reference to those matters and tasks that shall be carried out during the Pre-construction, Construction, and Post Construction phases and who is responsible and/or involved in each (Attachment 2)

3.4 Some aspects will straddle more than one of these phases, such as pest plant and animal control and management, mulching, and plant production. However, different tasks in relation to these aspects will be involved in the different phases.

3.5 Where the LMP provides the overall framework, the SSMPs will provide the details, particularly to methods and procedures in relation to matters to be addressed in the SSLMPs as set out in the consent conditions. It is proposed to use a similar tabular format in the SSLMPs setting out the specific tasks and responsibilities for each of the areas.

4.0 Linkages with Other Management Plans

4.1 The LMP has linkages with the Ecological Management Plan (EMP) and is to be consistent with EMP, which is required to be certified under the regional consent conditions (DC.55(b)). Input into the LMP from other experts is required – ecologist, acoustic and lighting specialists (DC.55(a)). The flow chart below illustrates the relationship between the various closely interrelated management plans that are referred to in this document.


M2PP Consent Conditions
Certification by KCDC
Landscape Management Plan
Ecology Management Plan
Certification by GWRC
Site Specific Management Plans
Site Specific Landscape Management Plans (whole route)
Site Specific Urban Design Plans (13 areas)
Site Specific Ecology Management Plans (6 sites)
Certification by KCDC
Hard Landscape Management Plan
Planting Management Plans
Certification by GWRC

4.2 As noted above Site Specific Landscape management Plans (SSLMPs) are to be prepared for "*all sectors/stages of the Expressway"* (DC.57(b)). These are to be *"consistent with the LMP, EMP, the Urban and Landscape Design Framework (Technical Report 5), the relevant Site Specific Urban Design Plans, and the Network Integration Plan"* (DC.57(c)). Consultation during preparation of SSLMPs is required with specific groups identified in DC.57(e) and consultation is also required in relation to the six areas identified as Landscape Focus Areas in DC.57A (a)(i) to (vi).

4.3 The designation conditions are silent on the specific relationship or consistency with Site Specific Ecological Management Plans, which focus on six specific ecological areas along the Expressway. However, resource consent condition G.42C(c) in relation to the preparation of Site Specific Ecological Plans (SSEMPs) states that *"The SSEMPs shall be prepared by a suitably qualified and experienced landscape architect (with input as required by other suitably qualified experts, including and ecologist)…"* It also sets out the range of matters to be addressed and identifies the parties who are to be consulted with in the preparation of the SSEMPs.

4.4 Site Specific Urban Design Plans (SSUDPs) focus on 13 specific areas. DC.59A(e) and DC.59(i) provides further information of the specific matters that are to be considered in relation to each of these 13 locations.

4.5 There is also a relationship between the LMP and two other management plans – Planting Management Plans (PMPs) and Hard Landscape Management Plans (HLMPs).

4.6 The PMPs apply to specified areas in DC.58 (a) (i) to (iii). The purpose of the PMPs is to outline the *"terrestrial planting maintenance following Final Completion (when the site is handed over from the contractor to the Requiring Authority to maintain the planting) to manage all planting and restorative work associated with the Project in order to maintain the outcomes and standards required under Condition DC.53C." (DC.58(b))".*

4.7 The PMPs are to be based on NZTA's 'Guidelines for Highway Landscaping' (2006) and *"detail the long term management regime (up to 10 years) for each of the specified areas identified".*

4.8 The HLMPs, which sit under the Urban Design consent conditions apply to particular public spaces and also the Landscape Focus Areas specified in DC.59A(a). The purpose of these is to "*outline the long-term programme of maintenance for hard landscape areas, including but not limited to fences, noise walls, under bridge walls and piers, gabion walls, paths, paving and signs."* (DC.59C(b)).

4.9 The LMP provides the overall framework, while the SSLMPs and SSEMPs will provide the detail for specific areas. The SSLMPs will be prepared as detailed design progresses, which will be largely controlled by the construction sequence and of the Expressway. The PMPs and the HLMPs will be prepared towards the end of the maintenance period prior to Final Completion; drafts of both of these plans are to be submitted to KCDC for review and comment 20 days before Final Completion of work occurs (DC.58(d) and DC.59C(c)).

4.10 Prior to the LMP being submitted to KCDC for certification it has been reviewed by a suitably qualified independent person (DC.55A). Linda Kerkmeester, an experienced landscape architect practising on her own accord, has been appointed as the independent reviewer for the LMP. Ms Kerkmeester has previously worked on several roading projects when she was employed by Opus, including Kaitoke Bypass and Ngauranga Flyover.

5.0 Site Specific Management Plans

5.1 Site Specific Management Plans are required in relation to landscape, ecology and urban design aspects (see flow chart, paragraph 4.1). Site Specific Landscape Management Plans (SSLMPS) are required to be prepared for all stages of the Expressway but with particular focus on several specific areas. The purpose of each SSLMP is *"to help ensure detailed design of the Project accords with the principles set out in the Urban and Landscape Design Framework (Technical Report 5) in order to achieve the outcomes and standards required Condition DC.53C…".*). The SSLMPs are to have regard to the local character and context and ecological conditions within each sector or stage of the route.

5.2 Site Specific Ecology Management Plans (SSEMPs) for six areas identified as Ecological Mitigation Sites, which involve establishment of *"at least 40.7 ha. of vegetation, wetlands, and streams planting and restoration for the purposes of landscape and ecological mitigation."* (G.42). The details of the composition of the 40.7 ha. are described in G.42 (b). Consent condition G.42C (c) outlines what information is to be provided in each of the SSEMPs.

5.3 While the consent conditions treat the SSLMP / SSEMP as separate documents they are closely linked and will share many common elements. To ensure consistency between the objectives of the LMP and EMP and through the development of the SSEMPs and SSLMPs, these plans will be combined, together with Site Specific Urban Design Plans (SSUDPs) and other inputs such as stormwater and hydrology, etc into a single Site Specific Management Plan for each area (SSMP).

5.4 This division of the SSMPs was based on several factors. They are primarily based on the 12 landscape character areas used in the Assessment of Landscape and Visual Effects (Technical Report 7) but with minor adjustments made to take account of the other two closely related Site Specific Management Plans - SSUDPs and SSEMPs. As a result, 11 Site Specific Management Plan areas are proposed, (two of the 12 character areas have been amalgamated at the southern end, see sheet 1 of Attachment 3). Within each of the SSMP areas there will be specific chapters covering SSLMPs, SSEMPs and SSUDPs; the series of annotated aerial photographs in Attachment 3 illustrates these. For example, in Kakariki / Smithfield SSEMP will be prepared in conjunction with up to half a dozen SSLMPs from Ngarara Road to north of Smithfield Road as well as two SSUDPs. This approach will improve integration between all disciplines and substantially reduce reporting and monitoring requirements.

5.5 Construction Stages of the Expressway are however broken down quite differently. Some of these stages are focused on a relatively small area, such as a bridge; in all 30 Construction Stages are proposed. In terms of the SSMPs, this will mean that in various places along the route several construction stages will fall within a single SSMP. Attachment 3 illustrates the relationship between the SSMPs and the construction stages.

5.6 The consent conditions specify that the SSLMPs shall be prepared in consultation with specific organisations and groups; consultation with the same groups or other groups is also a requirement of SSEMPs and SSUDPs. Consent condition DC.57(e) identifies specific organisations to be consulted for preparation of SSLMPs. :

i) Te Āti Awa ki Whakarongatai;

ii) Takamore Trust, where the works are within or directly affect the area between Te Mona Road and Waikanae River;

iii) Te Runanga O Toa Rangatira Inc, where the works are within or directly affect Queen Elizabeth Park;

iv) The GWRC where the works are within or directly adjacent to Queen Elizabeth Park, or Waikanae River corridor and Waimeha Stream;

v) As relevant, Friends of Queen Elizabeth Park, Friends of Wharemauku Stream, Friends of Waikanae River;

vi) As relevant, local residents associations such as Raumati South Residents' Association; and

vii) The Council.

5.7 Preparation of SSLMPs require consultation with residents whose properties are located close to the Expressway in six Landscape Focus Areas, which have been identified in DC.57A as being sensitive to visual effects. These areas are:

i) Conifer Grove;

ii) Eastern side of the designation between Kāpiti Road and Mazengarb Road including Greenwood Place, Elder Grove, Cypress Grove, Spackman Crescent, Makarini Street, Palmer Court, St James Court and Chilton Drive;

iii) Western side of the designation between Kāpiti Road and Mazengarb Road including Cheltenham Drive and Lincoln Court;

iv) Leinster Avenue;

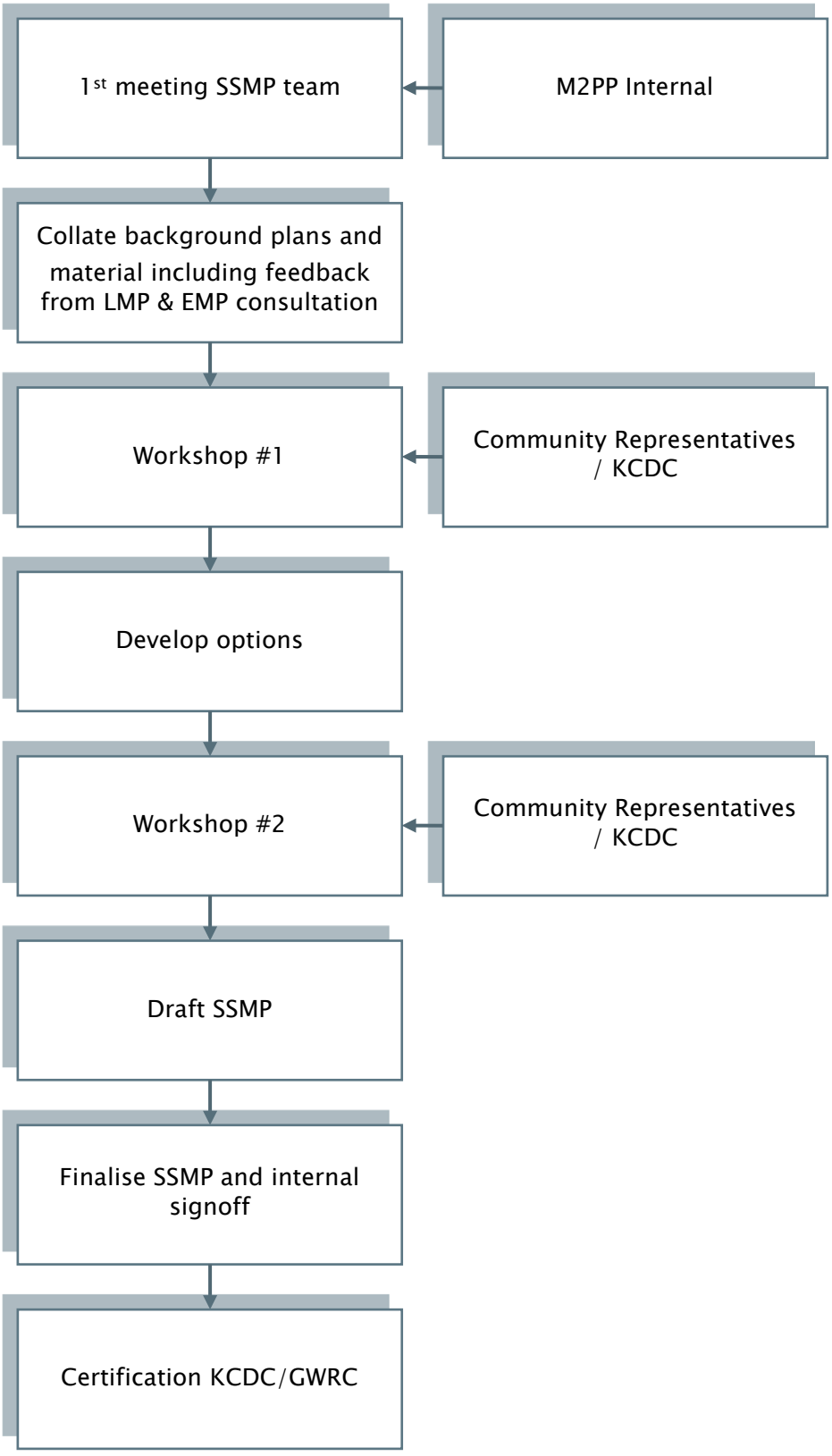
v) Milne Drive through to Quadrant Heights; and

vi) Puriri and Kauri Roads (including El Rancho).

5.8 Where the LMP and EMP are overarching documents that focus on principles, methods and procedures, the SSLMPs and SSEMPs will be far more detailed and specific, comprising primarily graphic material in the form of plans, annotated aerial photographs, cross sections, sketches design details, planting layouts and compositions, and will also include implementation details and maintenance procedures.

5.9 Preparation of the SSMPs will occur sequentially in accordance with the construction staging and in tandem with preparation of detailed design. The SSMPs and their component parts, the SSLMPs, SSEMPs and SSUDPs, will inform the detailed design and vice versa. The process proposed for developing the SSMPs is set out below.

Site Specific Management Plans (SSMPs) Process



6.0 Consultation

6.1 Consultation with various parties is required during the preparation of both the LMP and the SSLMPs. Condition DC.54(c) states that:

"The LMP shall be prepared in consultation with:

i) Te Ati Awa ki Whakarongotai and Takamore Trust;

ii) Te Rūnanga O Toa Rangātira Inc, where the works are within or directly affect Queen Elizabeth Park;

iii) The GWRC where works are within or directly adjacent to Queen Elizabeth Park, Waikanae River corridor and the Waimeha Stream;

iv) As relevant, Friends of Queen Elizabeth Park, Friends of Wharemauku Stream, Friends of Waikanae River; and

v) The Council.

This consultation shall commence at least 60 working days prior to submission of the finalised LMP to the Council. Any comments and inputs received from the parties listed above shall be clearly documented, along with clear explanation of where any comments have not been incorporated and the reasons why."

6.2 Consultation is also required during preparation of the SSLMPs, including with the same parties specified in relation to the LMP but given that the SSLMPs will focus on specific areas and details, the parties to be consulted with are far more extensive, including, relevant local residents' associations and residents whose properties are located close to the Expressway in the six Landscape Focus Areas, which were identified as such because of the sensitivity of these areas to visual effects (DC.57A (a)). In relation to the latter, DC.57A (b) sets out the process and time frame to be followed with regard to consultation during preparation of the SSLMPs.

7.0 Summary of Construction Activities

7.1 Through the sequence of construction phases there are different construction activities that have the potential to affect landscape and visual values; these are summarised in Table 1 below. The key landscape changes that will occur along the route and the landscape mitigation for each area are set out in Attachment 1.

Table 1 Summary of construction activities which have the potential to impact on landscape values or generate visual effects

Activity	Potential Effect	Landscape Receptor
Contouring of earthworks	Removal and/or modification of dune landscapes and biophysical features.	▪ Sand dune landscapes along alignment
Land disturbance	Damage or disturbance to vegetation through excavation, undercutting, or encroachment into the dripline of existing vegetation to be retained for landscape mitigation purposes.	▪ Existing vegetation to be retained
Construction of pre-loading embankment; & temporary stockpiling of the peat.	Height of stockpiles will be greater than the final earthwork levels	▪ Short – medium term effects on visual amenity in rural and residential environments along the alignment.
Establishment of construction areas along alignment (Project, Bridge, Intersection).	▪ Change to landscape from new temporary buildings, machinery, construction yards, surplus peat disposal; ▪ Glare from use of floodlights by contractors at the bridge sites; ▪ New buildings, fences, structures visible from the public roads and residential areas. ▪ Change to landform	▪ Amenity of nearby residents. ▪ Local road users ▪ Landscape along alignment including sand dune at Otaihanga construction yard
Bridge construction	Glare of floodlights towards residential properties or towards roads.	▪ Amenity of nearby residents. ▪ Local road users
	Effects on prominent landforms and natural character	▪ Riparian Vegetation ▪ Adjoining landforms
	Temporary closure of walking tracks and permanent realignment of tracks on both sides of the Waikanae River.	▪ Residents – recreational users and commuters
Construction of noise bunds,	Inappropriately shaped bunds, in relation to the flat or dune landscape.	▪ Urban environments (Raumati South, Paraparaumu, Waikanae)
Construction of noise walls and fences	▪ Visual effect of concrete noise walls, without earth ramps and planting. ▪ Visual effect (from road user view), and change in amenity of some private residents.	▪ Expressway corridor ▪ Future road users ▪ Some residential proprieties.

Activity	Potential Effect	Landscape Receptor
Implementing Planting Plan along route	Positive effects on amenity through: ▪ retention of existing amenity vegetation along the Expressway route; ▪ mass planting (native and exotic, depending on composition of surrounding area) ▪ canopy tree, specimen tree species, and larger exotic or indigenous trees. Potential negative effects on localised amenity through; ▪ shade from vegetation planted on residential boundaries ▪ Screening of views from house	▪ Immediate and distant view of Expressway, noise walls, integrate Expressway planting with existing adjacent vegetation, interchange areas. ▪ Integration of areas of ecological value, including wetlands. ▪ Amenity of adjoining residents

8.0 Key Issues

8.1 There is considerable overlap between the landscape and ecological requirements and outputs. While the consent conditions set out specific requirements for landscape and ecology what is actually carried out 'on the ground' for many aspects specified is similar. Creation of wetlands, formation of earthworks and planting will fulfil both landscape and ecology functions and so planting plans and details will be developed jointly by the landscape and ecology teams and also with input from the stormwater team. Given the close relationship between the LMP and EMP and to avoid unnecessary duplication the LMP and EMP should be read together.

8.2 The issues that will have significant bearing on the success of landscape and ecological mitigation along the route are:

- Earthworks
- Weed control and management
- Amount of existing vegetation that can be retained
- Form and design of wetlands
- Integration of areas of ecological value (eg wetlands, valued terrestrial vegetation)
- Incorporation of other dual values (eg flood storage requirements, stream hydrology, lizard and bird requirements)
- Planting substrate and soil mixes
- Plant establishment and growth
- Maintenance of planting.

Earthworks

8.3 The form and final shaping of earthworks will largely dictate the relationship of the Expressway to the surrounding landscape. Slopes (cut and fill) need to be graded out to integrate to the adjoining topography and along most of the Expressway this should be able to be achieved because of the relatively gentle dune topography. However, grading out of large cut and fill batters is not generally practicable in that it can often involve extending the earthworks well outside the designation area and into the surrounding land or it may result in encroaching on an area of vegetation identified to be retained. This situation occurs in places along the route and so will require a solution tailored to the particular location.

8.4 Civil earthworks engineering design tend to show earthworks in terms of cuts and batter slopes as very evenly formed and graded whereas in reality with natural landforms, such as dunes, there is much more subtlety These aspects will be considered in the detailed design and construction and also as part of the preparation of the SSMPs. A uniform shape and gradient is appropriate for grassed area that will be regularly mown but not so when slopes are being planted in woody vegetation, particularly when there are dual ecological requirements to consider.

8.5 While drawings can illustrate the form to be achieved, it is generally reliant on the skill of contractors, especially machine operators rather than trying to use detailed plans, drawings and cross sections to do this.

8.6 For planting with topsoil and mulch 1:3 is the maximum slope. For grass areas to be mown 1:4 is the maximum slope. In places where there is a steeper slope a more customised planting solution would be developed often using proprietary products such as biodegradable coconut fibre matting or hydroseeding/ hydromulching. In locations where access is difficult site specific design solutions will ensure planting is appropriate to maintenance requirements.

8.7 In Attachment 5 a series of diagrams from the Erosion and Sediment Control Plan that was submitted as part of the AEE illustrates how earthworks treatments can be achieved to reshape dunes where the Expressway cuts through them. In designing and constructing the earthworks consideration must be given to both the dune faces adjoining the Expressway and to the landform treatment around the dune sides to achieve a landform that is more sympathetic to the surrounding landscape. Included as part of Attachment 6 are the design principles and cross sections illustrating various dune shaping situations.

8.8 In several places along the route earth bunds are proposed to mitigate noise and/or to provide visual screening. The design principles referred to above also applies to the shaping of these bunds as they need to relate to their context.

8.9 Once engineering earthwork drawings are finalised, the Project Landscape Architect, Project Ecologist, Environmental Manager, KCDC landscape representative and members of the Constructors team (particularly the machine operators) will meet on-site prior to the commencement of earthworks for each stage to go through the drawings and discuss how to approach the earthworks within dune landscapes and in particular the details of the final shaping. This approach is an effective and efficient way of obtaining the best method to ensuring the final shaping as required is achieved. At this briefing meeting, 'hold points' would be identified and agreed to, in order for timely site visits by the Project Landscape Architect to monitor works before the next phase of activity commences.

8.10 As required by consent condition DC.54(e) it is proposed that KCDC's role in being included in relation to final shaping of earthworks will occur as follows:

- At the inception meeting of each construction stage as described in paragraph 8.8 above
- Upon completion of the final shaping of earthworks for each stage ; and if required
- Completion of any adjustments or remedial works.

8.11 Temporary earthworks will also be carried out, in particular pre-loading of the actual carriageway, which is a key ground improvement measure. This involves building up the earthworks in the peat areas with fill material to levels higher than the final road levels in order to surcharge the peat and compact it to provide a firm base for road construction. The surcharge material is removed once the road surface has settled to its final level. Following investigation since completion of the Landscape and Visual Effects Assessment (Technical Report 7), the extent of areas to be surcharged has been substantially reduced.

8.12 The surcharged areas generally occur in predominantly rural or low population areas, Poplar Avenue, Otaihanga and Peka Peka, which are separated from residential areas. The surcharge at Poplar Avenue extends to approximately chainage 3000.

8.13 The heights of the surcharge will vary from 2.0m to 3.9m above the finished road level. The finished road level compared to the existing ground level varies along the route. In places it may be at a similar height to the existing ground level but at interchange areas it would be up to 10.0 to 14.0m above existing ground. The surcharge will need to remain in place for 6-24 months depending on the location. The location and heights of the surcharge areas are shown in Attachment 7.

8.14 The following management techniques are proposed to assist reduce the temporary visual and dust effects from the pre-loading areas.

- For short-term surcharge areas (ie less than 6 months), a top layer of clean granular material, sub base course or mulch (straw, hay or wood/twig) will be applied over sand to minimise wind disturbance of the surface and to minimise dust
- For the surcharge areas that will remain in place longer than 6 months, a layer of topsoil will be applied and then grassed.

8.15 All areas disturbed by earthworks will be hydroseeded or hydromulched on completion to provide stability and to control runoff. For the areas being returned to grazing, pasture grasses will be used as this will be the final vegetation cover.

Weed Management

8.16 Controlling and managing weeds will be a major factor for both plant establishment and its ongoing management. There are large areas of aggressive pest plants at various locations along the route, particularly blackberry, convolvulus and in a few locations, tradescantia. Blackberry and convolvulus are fast growing and readily colonise disturbed sites.

8.17 Gorse is also present in many places and while it is nitrogen fixing and can function as a useful long term nurse crop it is intended generally not to retain areas of gorse within the permanent designation for this purpose. While many of the gorse areas will be removed and the areas planted, in some places, gorse will be retained and interplanted with native species; these areas will be determined in detailed design and in the SSLMPs and SSEMPs.

8.18 A trial is being set up in May 2013 near the substrate and plant trial in the north-eastern corner of Queen Elizabeth Park to investigate the most effective way to remove and manage weeds for the Project. Based on previous experience the process for dealing with large areas of blackberry and gorse is to mow it and then spray the regrowth; a second spray would be carried out later to deal with any further regrowth if required. The top surface of the soil would be scraped off to remove stumps and this material cast to the side of the construction area in 'wind rows' and then respread with peat and compost and other additives and then mixed to form the substrate for planting.

8.19 The aim is to potentially remove all weeds from areas to be planted or where topsoil is to be removed and used in soil mixes before any planting is carried out. The trial will help determine whether a single approach to dealing with removal and control of weeds or whether several methods may need to be adopted based on the particular weed species or situation.

8.20 Weed management will be the major issue to deal with during the maintenance periods with timing of maintenance tasks critical to minimise competition with planting and to avoid weed species becoming well established and therefore

requiring much greater effort to control. Weed control and weed monitoring will be a particular focus of the SSLMPs and SSEMPs.

Vegetation to be Retained

8.21 There is a level of planned vegetation removal within the Expressway alignment (the Project Footprint) to enable the construction and operation of the Expressway. However, through good environmental management there are opportunities during the construction phases to protect and minimise the amount of vegetation removal required, within the Project Footprint, thus enabling greater integration of existing amenity trees and vegetation with new landscape mitigation planting.

8.22 While there is not a significant amount of existing vegetation along the Expressway route that should be retained because of its intrinsic landscape and ecological value, its retention, where practicable, will assist in integrating the Expressway into the landscape. It provides a basis for developing planting plans and can provide protection and shelter for new planting.

8.23 Native and exotic vegetation worth retaining was identified as part of the AEE and was included on plans in the landscape and Visual Effects Assessment (Technical Report 7). It includes groups of trees, areas of wetland vegetation, and individual native and exotic trees. These maps were prepared by the ecology and landscape teams from analysis of aerial photographs and field work and recorded on 35 sheets of aerial photographs that cover the project. These are included in summary form in Attachment 8.

8.24 The Project team will use the mapped information on the vegetation to be retained in preparing the SSMPs and in developing detailed design plans. Construction activities will be carried out in accordance with the following measures:

- Any vegetation with ecological or landscape value within the Project Footprint and on the boundary of the designation will be confirmed and marked on site and fenced off[2]
- Minimise damage to any vegetation outside those areas to be cleared
- Vegetation clearance boundaries will be clearly defined with marker tape pegs or by marking perimeter trees
- Individual specimen/established trees will need to be clearly identified and fenced to avoid and prevent unnecessary disturbance or damage

[2] Identification of this vegetation will be done jointly by the Project landscape Architect and Project Ecologist in collaboration with the Constructors.

- Wherever practical, trees within the actual alignment area will be felled into alignment areas that have been previously cleared or are about to be cleared for construction purposes (e.g. plantation pine, large specimen trees etc.)
- Timbers that cannot be utilised, together with branches and leaves, will be mulched for landscaping or temporary stabilisation or spread on to planted areas to provide micro-climates and improve soil health by providing mycorrhizal fungi to the soil
- Careful selection of appropriate machinery to minimise disturbance
- Ensure no land disturbance within the dripline of trees or vegetation that is to be retained during construction works
- While working in close proximity to vegetation that is to be retained, ensure that machinery is kept well clear of the vegetation canopy and that any excavations do not undermine the vegetation stability or endanger its health
- Where there is a deviation from an approved route or outside the construction zone, any vegetation in the new construction area will be checked first by the Project Landscape Architect. Approval for removal will be required and areas to be retained are to be marked out on site by the Project Landscape Architect before proceeding further.

8.25 Preparation of the SSMPs will identify vegetation proposed to be retained in greater detail based on topographic survey work to be undertaken, further field work and through collaboration and discussions with other Alliance team members, including the Constructors. In refining these maps consideration will be given to how vegetation retention can be achieved within the constraints of achieving access and operation for machinery and carrying out earthworks and other construction aspects.

8.26 The route is being surveyed to precisely locate various elements such as property boundaries, services, culverts, etc and part of this will be to map the vegetation to be retained. A member of the landscape team with input from the Project ecologist will accompany surveyors to help identify and mark vegetation as desirable to retain. This information will be used in developing both detailed design and the SSMPs.

8.27 Vegetation to be retained will be shown on final plans and aerial photographs and it will also be marked on site and fenced prior to commencement of the particular construction stage. Fencing will extend at least to the dripline or beyond as required to ensure vegetation is not affected by changes to groundwater levels arising from Project works; this will ensure both the vegetation and the natural ground around it are not damaged.

8.28 Some areas of vegetation to be retained will require remedial work such as pruning or crown lifting to meet sight line or safety requirements or to improve form in the case of individual trees. While some of this work can be carried out

by skilled staff, the more specialised tasks will be carried out by an arborist to ensure the work is in accordance to best practice.

Wetlands

8.29 Several wetlands within the designation will be improved by removal and control of invasive weeds and by planting. These will pose particular challenges, especially with regard to control and ongoing management of aggressive pest plants. The creation of new wetland areas for stormwater management and landscape and ecological enhancement will provide different challenges.

8.30 The design, shaping and detail of new wetlands and some of the offset flood storage wetlands will be developed collaboratively with stormwater engineers, ecologists and landscape architects providing inputs to ensure these wetlands function effectively and that they also provide ecological and landscape benefits. Preparation of the SSMPs will provide the opportunity to develop the design and detail of these wetlands but the overall aim is for these to have a natural appearance and meet multiple ecological mitigation success requirements.

8.31 The key design principles for ecological mitigation wetlands, stormwater wetlands and planted offset flood storage areas include:

- An irregularly shaped shoreline to maximise the length and variety of edge habitat
- 25-50% of the water surface area should be shallow enough to support wetland plant establishment, and ideally provide habitat for ephemeral wetland species
- 50-75% of the water surface should be deeper than 1.0m to stabilise water temperatures
- Variation in water depth to provide for open water and shallow shelves and topographic variation along the shoreline
- Opportunities for different types of species to be planted and plant communities to become established
- Soil along the margins and shelves will often require biodegradable erosion control fabric, such as wool mat[3] to enable plants to become established
- Plants should be initially planted in water no deeper than 100mm with a minimum of foliage 150mm above the water level and once planted the water level increased.

8.32 There is an expectation that the wetlands will allow for seasonal water level fluctuations consistent with surrounding wetland areas.

[3] A wool/coir weave and using the 500gms/m2 grade will provide 9+ months of edge protection.

8.33 In places, it is proposed to lift clumps of sedges, reeds and rushes within indigenous wetlands situated in the path of the Expressway and either relocate them to new areas of wetland being formed or to supplement the vegetation in existing wetland areas within the corridor that are being restored (eg at Otaihanga).

8.34 Coordination and skilled machine operators will be the key to success for this work. It will require:

- Minimising the time between plants being lifted and transported and replanted in their new locations;
- Thorough briefing of machine operators by the landscape and ecology teams and setting up a couple of trial removals at the outset of construction to refine the process;
- The landscape and ecology teams clearly identifying and marking clumps of vegetation to be removed and marking the sites where they are to be relocated;
- Ensuring that the full root mass and soil is lifted out intact by the machine operator;
- Replanting sites to be prepared in advance so the relocated plants can be positioned and planted on the same day; and
- Cutting back foliage to reduce transplant stress.

Planting Substrate

8.35 In the parts of the route traversing deep areas of peat, the peat will be excavated and replaced with imported fill material in order to provide a suitable base for road construction. This peat will be excavated and stockpiled along either side of the route to enable it to dry out sufficiently. Similar to the situation with pre-loading as described in paragraphs 8.10 to 8.13, the temporary stockpiling of the peat along the edges will mean that for a period during the construction, the height of the earthworks will be greater than the final earthworks levels.

8.36 Given the large amount of peat that will be extracted from the route, it is proposed that it will provide the basis of the planting substrate to be used. Depth of topsoil varies but is generally no deeper than 100mm along the alignment. Topsoil will be salvaged and added to the peat, together with other material, such as compost and sand. The depths of soil mix will depend on the type of planting with a minimum of:

- 100mm for grass areas;
- 300mm for tree and shrub areas; and
- 1000mm for tree pits.

8.37 A substrate and planting trial was established in September 2012 in the north-eastern edge of Queen Elizabeth Park near Poplar Avenue. A 20m long 3.0m high sand embankment aligned north-south was formed using the same type of machinery and process that would be used for constructing the Expressway. It was formed to a 1:3 gradient.

8.38 Peat extracted from three different locations along the route were used for the soil mixes with various amounts of compost added (ie 15%, 25%, 35%); in addition pure peat from each of the three sites were included in the trials (ie 12 sites in total). The mixes were done off site and a sample of each of the soil mixes was sent to a laboratory for testing pH and for various minerals and fertility. Each of the soil mixes was spread to a depth of 300mm running vertically from the top to the bottom of both the eastern and western faces of the embankment.

8.39 A range of 25 native species selected from the species list proposed for planting along the Expressway were planted in each of the 12 soil mixes; the composition of species being the same in each of the soil mixes. Following planting 100mm of medium coarse mulch was spread around the plants. Plant establishment and growth is being monitored over a 2+ year period and this will help determine the composition of the soil mixes and species selection.

8.40 A second trial is being set up in May 2013 near the first site to establish the most effective way of mixing the peat, topsoil and compost on site, which will be far more efficient and cost effective.

Planting

8.41 Landscape and ecological mitigation planting is proposed throughout the Expressway alignment. A range of planting proposals will address specific landscape, ecology and visual amenity aspects such as to:

- Integrate the Expressway into the surrounding landscape;
- Protect and enhance ecological areas;
- Protect and improve bird and lizard habitat;
- To reflect existing vegetation structure and/or create distinct identity;
- Screen views of Expressway and specific elements such noise walls and fences;
- Enhance cycle/walkway amenity;
- Provide scale and to enhance visual amenity at interchange areas, or to provide shade/shelter in open interchange areas;
- To integrate adjoining pastureland with Expressway corridor to carriageway edge; and
- To reflect and enhance the existing tree structure (differing between rural and urban character).

8.42 As planting will fulfil several functions it will be developed collaboratively primarily by the landscape and ecology teams with input from the stormwater team for particular areas, such as stormwater wetlands, swales, and riparian areas. There will also be collaboration with the noise specialists in relation to the location and design of noise barriers and fences.

8.43 All planting will be carried out during a three month period from the beginning of June until the end of August. This means that while construction may be completed, planting may not immediately occur and instead will not happen until the following planting season. However, all earthworks upon completion will be hydroseeded or protected by some other means to stabilise the surface and reduce runoff and erosion and dust. Areas to be planted will be sprayed with herbicide to kill grass and any weeds well in advance of planting.

8.44 All native planting will be eco-sourced from the Manawatu Ecological Region with a focus on species sourced from the Foxton Ecological District. The wider region was specified in the AEE and picked up in the consent conditions because of the limited seed sources available in the Foxton Ecological District.

8.45 A master species list has been prepared drawn from the list prepared by KCDC[4] and from fieldwork carried out by the ecologists as part of the AEE. From these, a more targeted list of species will be prepared as part of developing the SSMPs and for detailed design. The planting trial will also play a role in helping to prepare a final species list.

8.46 Eight different types of planting treatment are proposed and these are illustrated, together with a selection of the key species proposed for each type, in Attachment 9.

8.47 Initial estimates indicate that approximately 2.2 million plants will be required for planting along the Expressway, including in ecological and wetlands, planted offset flood storage areas, swales, and along riparian margins. Reliance on eco-sourcing means that seed collection, propagation, growing on to the correct grade and supplying these when required in relation to construction staging has to be well planned. In addition the vagaries of nature also mean that in some years seed from certain species will not be produced, or if so, in low numbers.

8.48 A seed collection contract was awarded in January 2013 and this will run through until the end of September 2013. Between 5000 and 10,000 seeds of 28 targeted species were nominated and the contractor, Kauri Park Nurseries, submits a monthly report on progress (ie approximately 240,000 seeds). In addition, Kauri Park also includes in their reports, information on other species from the master

[4] *Kapiti District Endemic Floral Species List,* prepared by Mat Ward for KCDC, July 2011.

list and collects seed from some of these if available. As of the end of April 2013 the quantities of seed specified has been collected for 25 of the 28 species, all of which have come from KCDC reserves and from private land. Nga Manu Nature Reserve has also recently offered for seed to be collected from its stands of remnant native vegetation.

8.49 As part of this contract the seed collected has to be stored under controlled conditions and germination testing carried out on batches of seed to assess their viability. Further seed collection will be undertaken as part of the main landscape contract, which is scheduled to be awarded later in 2013.

8.50 Planting is based on using small grade well hardened plants at close spacings in order that canopy closure is achieved within the specified three and four maintenance time frames. Based on an assessment of similar large scale planting carried out on other roading projects, such as Northern Gateway, the intention is to use three specific plant grades, which have proven effective – 0.5, 1.0L, and 1.5L litre plastic containers. Plants grown to these grades in these containers have more soil around the root ball than root trainer grades and establish more readily with fewer deaths.

8.51 Terrestrial planting will use 1.0L and 0.5L grade plants at 1.0m spacings and wetland plantings mostly 0.5L grade plants at 0.75m spacings (or as otherwise determined by the Project Landscape Architect and Project Ecologist). Enrichment species will be interplanted two or three years after the initial plantings using 1.5L grade plants at various densities; timing of enrichment planting will depend on the establishment and growth of the initial mass planting and ecological mitigation requirements. Slow release fertiliser tabs will be applied in the backfill of each tree, shrub and sedge, etc in accordance with manufacturers application rates.

8.52 Selection of species for planting in wet swales need to take into account that these areas are often extreme environments experiencing rapid inundation and drought. Species selected are a function of flow rates and frequency and to enable the swales to function as required. The Project Ecologist and Stormwater Specialist will provide input into species selection.

8.53 All terrestrial, riparian and wetland planting above the natural waterline will be mulched. Coarse graded, long fibred mulch that self binds is preferred because it helps avoid mulch creep and movement, especially on slopes. Organic mulch of various grades (depending on the type of planting) will be used for most areas but stone mulch or wool mulch mat will be specified in riparian and wetland areas subject to inundation or scouring. Use of different mulch types and grades is part of the trials referred to in paragraph 4.9.

8.54 Planting design, species selection, and layouts will depend on the particular situation, including ecological mitigation requirements, such as lizard and bird habitat, etc. Key considerations are:

- Ensuring that sight lines are maintained;
- Locating planting well back from the road edge and barriers so that they are not subjected to spraying as part of maintenance of road edges;
- Allowing for no planting zones around signs, light poles drainage sumps, and other structures so that the planting in these areas is not sprayed or damaged as part of highway maintenance;
- Planting is 'tiered' along road edges with low growing shrubs and grasses sited along the outer edges to avoid opening up as taller shrubs grow;
- Avoid planting in narrow isolated areas which are difficult to access to maintain;
- Ensuring that planting in particular areas for fernbird and lizard habitat is fit for purpose in terms of species composition and layout.

8.55 At the start of each construction stage an inception meeting will be held between the Project Landscape Architect and the Constructors to discuss planting details and implementation and to confirm 'hold points', site visits and monitoring and reporting. Reporting will comprise of written documentation detailing progress against anticipated outcomes and will include photos to illustrate these outcomes.

8.56 Finalising the areas of vegetation to be retained will be used as baseline data to monitor any change in the condition of this vegetation throughout the construction process. A photographic record of each area of vegetation will be undertaken prior to works commencing and at the completion of works.

8.57 Monitoring reports to include:

- Dates of visits;
- Condition of the vegetation;
- Condition of protective fencing;
- Works undertaken in the vicinity since the previous visit; and
- Any actions required.

8.58 As part of this monitoring process, the Project Landscape Architect will make recommendations to the Environmental Manager to improve the health or safety of the retained and newly planted vegetation.

8.59 Following the practical completion of the planting in each construction stage, there will be a three year maintenance period for planting on embankments, batter slopes, wet and dry swales. A four year maintenance period is proposed for the ecological wetlands, riparian planting and planted flood storage wetlands.

Maintenance of Planting

8.60 Often long-term maintenance problems can be directly attributed to poor construction practices, such as compaction of soils and sometimes these do not manifest until a year or more after construction has been completed. Maintenance of planting is very reliant on the work that has gone in previously in terms of removal and control of weeds, plant species selection, quality and hardening off of plant stock, and mulching. The tasks and timing of maintenance work will be set out in the contract documentation and specifications. Monitoring of maintenance work and responding to issues quickly as they arise is important to overcome situations that may be difficult to control if left, particularly in light of the multiple mitigation requirements for some areas of planting (eg ecological, flood storage.) While maintenance will be the responsibility of the landscape contractor, regular monitoring and reporting will be carried out by the Project Landscape Architect and Project Ecologist.

8.61 Once monitoring has occurred, the assessment of monitoring results will lead to 'adapted' development and operation, either to anticipate potential problems identified by the monitoring, or to ensure any effects of the existing activity are reduced to acceptable level.

8.62 Maintenance will include such things as:

- Regular checks for problem weeds, especially those that are aggressive and invasive, and to deal with these in the early stages of infestation when control is relatively easy;
- Observation to detect damage from pests and diseases, waterlogging, and vandalism;
- Checks following heavy rainfall or severe weather events or prolonged dry periods so remedial action can be taken;
- Modification of planting around wetlands and stormwater management areas o align with water levels, including seasonal variations;
- Modification to planting around barriers, signage and other structures to ensure setbacks are maintained;
- Modifications to planting around access routes such as the pedestrian walkway and cycleway to ensure planting does not obscure visibility or access;
- Checking grass swales to ensure that areas are not 'scalped' during mowing and if so carrying out remedial work to avoid this occurring;
- Checking areas of scour to ensure plant success.

9.0 Construction Yards and Fencing

9.1 All of the activities within the construction designation will be fenced and the defined within the construction yards proposed along the route. The extent of

these will vary according to their purpose – Project Yard, Bridge Yard or Intersection Yard. All yards will be fully fenced and made secure.

9.2 The Expressway Project Office is proposed to be located in the former Telstra building on Ihakara Street. The Expressway Central Project Yard will be established at the Otaihanga Landfill and waste transfer site on Otaihanga Road, which is about at the mid point of the Expressway route and within 1km of SH1. This main yard will be 20,000m^2 in area and comprise one temporary office building (ie Portacoms), workshops covering approximately 10,500m^2 and plant and material laydown areas. The site will be fenced with 2.0m high mesh and it will be lit at night to provide security.

9.3 Each Bridge Yard and Intersection Yard will comprise a small construction yard for material and plant storage, and facilities for staff. Bridge Yards will be located at Raumati Road, Wharemauku Stream, Mazengarb Road, Waikanae River, Ngarara Road and Smithfield Road. Intersection Yards will be established at Poplar Avenue, Kāpiti Road, Te Moana Road and Peka Peka Road. Each yard will be fenced with a 2.0m high mesh security fence. Intersection Yards will be lit at night but not Bridge Yards. However, during night time bridge construction operations Bridge Yards will be lit.

9.4 The Central Project Yard site was selected because of its location, good access off Otaihanga Road and that it is well segregated from adjoining residential and other areas. However, to avoid potential glare effects from this main site or any of the other Yards the following must be implemented:

- The design and installation of all construction yards to be carried out using best practice to minimise adverse or stray lighting effects.
- The lighting of construction yards to be fully compliant with the relevant lighting standards of the Kāpiti Coast District Plan and relevant clauses of the Australian Standard (AS 4282)
- A 10.0m buffer zone between any equipment requiring light and a residential boundary and lighting layout and design for the construction yards will be reviewed and approved by an accredited illumination engineer to ensure avoid adverse environmental effects from lighting prior to it being installed.
- Contractors using portable or temporary floodlights during night time bridge construction operations will ensure the ensure glare is not directed towards any residential properties or towards roads and also ensure the correct selection of the type of luminaire.

9.5 The extent of the construction yards and activities will be securely fenced. This will secure the construction site in terms of health and safety perspective and will also ensure that areas of vegetation within the construction designation but outside of the fenced area, which have been identified to be retained as part of landscape mitigation, are not inadvertently damaged or disturbed.

9.6 The fencing will be 5-wire stock proof farm fencing for much of the route. However, in the areas where there is public access 2.0m high mesh fencing will be erected.

9.7 On completion of construction the areas for construction yards will be reinstated and the type of reinstatement will depend on where the yard is located; that is, where the yard is located within the permanent designation reinstatement will comprise the mitigation measures as set out in the Landscape and Visual Effects Assessment (Technical Report 7). In places, parts of some yards are located outside the permanent designation and these areas will be topsoiled and grassed. A summary of the proposed mitigation and reinstatement works for each of the yard areas is set out below. The details of the reinstatement will be included in the SSMPs.

Otaihanga Yard

9.8 The yard located immediately south of Otaihanga Road is the Central Project Yard and its function and details are described in the Construction Methodology report. The dune areas along Otaihanga Road will be modified to create the yard footprint, which may require cutting into the back of one dune. The dune face, when viewed from Otaihanga Road, will also require some modification to allow widening of Otaihanga Road at the yard entrance. The adjoining dune, adjacent to the Expressway where the proposed access road to the yard is located, will be removed leaving a gap between the dunes (see Attachment 10).

9.9 At completion of the Project the disturbed parts of the dune areas will be reshaped, the form and details of which will be developed in discussion with KCDC. The areas within the permanent designation will be reinstated as part of the permanent works, which will be developed during the SSMP for this area.

Poplar Avenue Interchange

9.10 The yard will be located on the northern side of Poplar Avenue within the footprint of the Expressway and associated works; much of this area is on hardfill as it is where the garden centre is located. The road, roundabout and cycleway will actually occupy most of the area used as the construction yard with the balance of the area reinstated as part of the permanent works (eg mitigation planting).

Raumati Road

9.11 The main part of the yard is located on the south side of Raumati Road in area mostly covered in blackberry. Once no longer required this yard will be reinstated in accordance with the landscape mitigation plans, the details of which will be formulated as part of the SSMP for this area. Some of the area used for

the yard lies outside the permanent designation and this will be topsoiled and grassed.

9.12 On the northern side of the road a pull off area is proposed on the flat land at the top of the dune. This area will also be reinstated as part of the landscape mitigation proposals, which will be detailed as part of the SSMP process.

Wharemauku

9.13 The yard in this area is two parts, one south of the Wharemauku Stream with access from the end of Ihakara Street and an area on the northern side of the stream. These areas will be reinstated as part of the landscape mitigation works and associated flood offset storage area. Any areas outside the permanent designation will be topsoiled and grassed.

Kāpiti Road

9.14 The yard is located within the Expressway footprint and it will be reinstated as part of the landscape mitigation works and associated flood offset storage area.

Mazengarb Road

9.15 The yard within the Expressway footprint will be reinstated as part of the landscape mitigation works and the flood offset storage area.

Waikanae River

9.16 The main construction yard is on high ground outside the potential flood area on the south bank of the river; the cycleway skirts along the edge of the construction yard and will be formed when the yard is no longer needed. There is a smaller construction yard on the northern bank and it too is on higher ground. These yards within the permanent designation will be reinstated as part of the landscape mitigation works; areas outside the permanent designation will be topsoiled and grassed.

Te Moana Road

9.17 Two construction set ups are proposed, one on each side of Te Moana Road. The yard on the south side of the road will utilise the existing infrastructure (hardstand, carparks, etc) and there is a similar but smaller setup on the north side with temporary access across the Waimeha Stream. Both of these yards will be reinstated as part of the overall landscape mitigation works.

Ngarara and Smithfield Roads

9.18 The construction yards in both of these locations will be small setups located in the inter-dunal areas and when no longer needed the areas within the permanent designation will be reinstated as part of the landscape mitigation works.

Peka Peka Interchange

9.19 The construction yard and laydown areas are located within the footprint of the interchange. Those areas within the permanent designations will be reinstated as part of the landscape mitigation works and any areas that lie outside the permanent designation will be topsoiled and grassed.

10.0 Construction Monitoring

10.1 Construction monitoring will include on-going monitoring and reporting during the implementation and maintenance periods of the landscape works with the objective of ensuring the outcomes set out in the conditions are achieved (DC.53C).

10.2 The framework for monitoring of landscape works are set out in this document. Each of the Site Specific Management Plans will collate and detail monitoring requirements in relation to landscape, urban and ecological aspects specific to that sector. Each Site Specific Management Plan will include a Monitoring Plan and Reporting Plan, with a consistent format across all of the SSMPs.

10.3 Monitoring is be undertaken by the Project Landscape architect/ecologist/Urban designer in co-ordination with the Project Environmental Manager.

Monitoring Plan

10.4 The Monitoring Plan will identify; the activities to be monitored within each sector, prior to, during and following construction as appropriate, the methods for monitoring, who will undertake the monitoring and the timing and frequency of monitoring Refer Attachment 11.

Broadly the monitoring activities will relate to:

- Protection of existing vegetation and landforms to be retained
- Integration and finishing of earthworks (particularly dunes, wetlands, streams)
- Hard landscape works (particularly at road crossings)
- Cycle walkway bridleway
- Topsoil and mulch storage and application
- Planting and grassing
- Maintenance of planted areas, including plant survival and weeds

- Success of planting in relation to the performance criteria set out in the conditions DC.53c and in discussion with ecological mitigation requirements as set out in the EMP.
- The monitoring plan will outline the on- going monitoring of the construction works. This monitoring will be internal monitoring undertaken to ensure compliance with conditions of consent and for quality assurance purposes. (Attachment 11) .

Reporting Plan

10.5 The reporting plan will set out the timing and frequency for reporting in relation to relevant conditions and compliance requirements. (see Attachment 12).

10.6 A regular compliance meeting with KCDC and GWRC has been started and will continue throughout construction. This is the chance for on-going feedback and discussion regarding issues. In addition to these regular meetings, regular site visits for Council staff as and when required will be arranged.

10.7 At key stages of the project, invites for Council to attend site inception meetings with construction staff will be provided. This will ensure staff understand the proposed plans and outcomes and will facilitate a 'no surprises' approach. (See Attachment 12)

Monitoring Report Content:

- Dates of visits;
- Photographs as appropriate;
- Condition of the vegetation;
- Condition of protective fencing;
- Works undertaken in the vicinity since the previous visit;
- Pest and weed status;
- Condition of plant health;
- Hard landscape elements;
- Identification of any arising issues that require special monitoring including in relation to ecological mitigation planting requirements as set out in the EMP;;
- Any actions required.

Response to Indicators of Significant Effects

10.8 Adaptive management will respond to indicators of significant effects, where methods or actions may need to be modified. Effective adaptive management requires monitoring, research and review. If necessary the assessment of monitoring results will lead to 'adapted' development and operation, either to anticipate potential problems identified by the monitoring, or to ensure any effects of the existing activity are reduced to acceptable levels. Review conditions

provide flexibility to either expand or cut back activity should the research suggest it is necessary.

10.9 Following the practical completion (pending defects liability requirements), a three year maintenance period is required for planting on embankments, batter slopes, wet and dry swales, and for riparian planting. A four year maintenance period is required for the ecological, stormwater treatment and planted flood storage wetlands.

Weed Control

10.10 The newly planted areas associated with the Expressway will be subject to maintenance periods of 3 or 4 years as part of the landscape contract..

10.11 Newly planted and established landscaped areas are particularly susceptible to weed invasion. It is important that these areas are monitored for all weeds, including pest plants.

10.12 It is the responsibility of the Project Landscape Architect and Project Environmental Manager to monitor and maintain these areas, including pest plant and browsing pest control. Regular inspections will take place to ensure plant establishment and weed control is appropriate as per the Planting Specifications. Inspections will involve identifying pest plant species and severity of weed infestation, as well as identification of appropriate controls and implementing these controls immediately.

Earthworks - Dunes, Wetlands and Streams

10.13 Monitoring of the dune reshaping construction activities shall require the Project Landscape Architect/ Project Ecologist (in relation to ecological mitigation planting) and Civil Engineer to be on site at critical phases during the final shaping of the earthworks through and on the edge of dune landscapes and formation of wetland and stream restoration areas.

10.14 The inception meetings will arrange timely site visits for the Project Landscape Architect, Project Ecologist, Civil Engineer and Project team (specifically the machine operators) to discuss the daily, weekly and monthly approach to the works. It is likely that regular site visits during the most critical stages will be required and 'hold points' allow key experts to meet, assess, and report on progress, before the machinery and Project teams move on to another site or activity.

10.15 Critical phases shall be photographed and appropriately reported on by the Project team and the Project Environmental Manager and representatives from KCDC will inspect the finished earthworks and post-mitigation planting phase.

11.0 Standards and Guidelines

11.1 The consent conditions specify various performance standards to be met and they also specify guidelines that must be given regard to (DC.53C (b) and (c) and DC.55(a)).

11.2 In summary, the landscape performance standards applying to planting are:

- Three year defects liability and maintenance period for terrestrial planting and a four year defects liability period for wetland planting (DC.53C (c) (i));
- Planting success for mass planting is defined as 80% canopy closure at time of Final Completion (DC.53C (c) (ii));
- Planting success for shelterbelts and amenity rural tree planting is defined as 100% plant survival and 100% in full leaf at time of Final Completion (DC.53C (c) (iii));
- Planting success in relation to specimen trees is defined as 100% plant survival and 100% in full leaf and of good form at time of Final Completion (DC.53C (c) (iv)).

11.3 Ecological mitigation success standards are also set out in the EMP and will be specifically outlined in the development of the SSMPs.

11.4 Other standards, the guidelines, and other documents where there needs to be specific regard to are:

- Transit (NZTA) Guidelines for Highway Landscaping (2006);
- TP10 Design of Stormwater for Management Devices (Auckland Council);
- AUSTROADS standards where these are relevant to pedestrian and cycle paths;
- The principles and outcome sought by the Landscape and Urban Design Framework (Technical Report 5);
- In general accordance with the landscape plans submitted as part of the Assessment of Landscape and Visual Effects (Technical Report 7)
- The principles and outcomes sought by the Ecological Impact Assessment (Technical Report 26).

Transit (NZTA) Guidelines for Highway Landscaping (2006)

11.5 These guidelines cover a wide range of matters, from an outline of NZTA's expectations of what is to be achieved, how landscape assessment of new highways is to be carried out through to landscape design, landscaping maintenance and a series of appendices on information on indigenous plant selection.

11.6 NZTA are in the final stages of reviewing the guidelines, with some parts of the updated guidelines being trialled on highway projects in Auckland. The new

'Landscape Guidelines' are more comprehensive and reflect current best practice across a range of topics.

11.7 The opening section of the current Guidelines sets out the strategic context and significance of highway landscaping, noting the following:

- *The planning, design and maintenance of the highway provides numerous opportunities to positively affect the visual quality, landscape values and urban design of the surrounding environment, in a way that recognises the historical, cultural and community values associated with landscapes.*
- *Highway landscaping is a significant component of the wider environment, and best practice can contribute positively to the environment as well as contributing to desirable social and economic outcomes.*
- *A sound, consistent and proactive approach to highway landscaping and planting will:*
  - *optimise planting costs to reduce ongoing maintenance implications;*
  - *improve the overall quality and longevity of highway landscaping;*
  - *streamline the landscaping component of the Resource Management Act 1991 (RMA) approvals process and help manage legislative compliance.*

TP10 Design of Stormwater for Management Devices

11.8 The stormwater engineers are not directly using TP10 for stormwater design but the same high level principles contained within it are covered in the standard that we are using. Although TP10 is not being used, NZTA's Stormwater Treatment Standard for State Highway Infrastructure (2010) is. NZTA's standard has been prepared specifically for highways and is applicable nation-wide rather than TP10 that covers all types of land development and was prepared by the former Auckland Regional Council. However, both documents incorporate many of the same features and methods and are based on the same underlying principles, including treatment of runoff and attenuation of flood flows. For the Expressway this has shown up primarily in the use of wetlands, planted offset flood storage areas, and swales for stormwater management.

11.9 Offset flood storage areas, ecological wetlands and swales are integral parts of the landscape and ecological mitigation measures and the planting associated with these has been developed jointly by the stormwater, ecology and landscape teams (see cross sections in Attachment 6 and sketch in Attachment 9). This close collaboration will continue through the detailed design and through the preparation of the SSLMPs and SSEMPs.

AUSTROADS Standards

11.10 A SSUDP is required to be prepared for the combined pedestrian, cycle and bridleway (CWB) path and details of path widths, construction, planting, and maintenance will be set out in this in accordance with the standard.

Urban and Landscape Design Framework

11.11 The Urban and Landscape Design Framework sets out a series of design principles for various elements – landform, planting noise walls, bridges, road furniture, and the pedestrian, cycle and bridleway. It also describes for each of the four sectors of the Expressway the urban and landscape design response in relation to landform, hydrology, vegetation ecology, built environment and land use, movement networks and heritage.

11.12 Based on the UDLF, the 11 SSMPs as described in section 5.4 will translate these design principles and responses into specific design details and management. Attachment 6 includes the sections of the UDLF covering the design principles for local road interface, bridges, noise, landform, planting, pedestrian, cycle and bridleway and road furniture.

Assessment of Landscape and Visual Effects (Technical Report 7)

11.13 This report, which comprises a written A4 report and two A3 appendices of figures, describes and illustrates the landscape mitigation measures proposed for each of the 12 landscape character areas along the Expressway. The landscape mitigation measures seek to address two particular aspects:

- Effects on biophysical factors by retaining existing trees and vegetation where desirable and practicable, earth bunding, sensitive re-contouring of earthworks and tree and shrub planting to help integrate the Expressway into the surrounding landscape; and
- Effects on the visual amenity from beyond the road corridor by including measures such as earth bunding and planting that can as far as practicable, screen views of the Expressway and also traffic movement, particularly for nearby residents.

11.14 Technical Report 7 describes each of the proposed mitigation measures Appendix A comprises plans, cross sections, and photographs illustrating various aspects of landscape mitigation, including sketches and details of the eight different types of planting treatment, the types of species proposed and where the different planting will be established along the route. The relevant pages from the report are included in Attachment 9.

11.15 Technical Report 7 Appendix A also includes cross sections at various defined locations along the route to illustrate the Expressway's relationship to the adjoining landscape and the planting that is proposed on the embankments,

swales, wetlands and adjoining areas. In addition, Technical Report 7, Appendix B comprises 16 visual simulations that illustrate the Expressway at completion of construction but without any landscape mitigation planting and also images of how the Expressway will appear with planting after 10 years of growth.

Ecological Impact Assessment (Technical Report 26).

11.16 The EMP addresses in detail the ecological mitigation measures and because of the interrelationship between landscape and ecology, this directly influences landscape outcomes and standards. A substantial amount of baseline monitoring of the existing environment has been and is being carried out in response to the ecology consent conditions (eg freshwater, estuarine, contaminated water, fernbird). The results from this work will in turn inform the approach taken in relation to both the detailed formulation of both the ecological and landscape mitigation measures, which will be developed as part of the SSMPs and in detailed design.

12.0 Roles and Responsibilities

12.1 The Environmental Manager has the responsibility for supporting the implementation of all required landscape mitigation works, which in part involves ecological mitigation through the construction of wetlands and all planting along the route (ie terrestrial, riparian, and wetland). Monitoring, reporting and communicating any issues associated with landscape and ecological mitigation to the Alliance Management Team is also part of the Environmental manager's role.

12.2 Suitably qualified landscape architects will be involved in the preparation of detailed landscape design and planting mitigation plans and specifications and in preparing these they will work closely with the ecology and stormwater specialists in particular. The landscape architects will also be involved together with the ecological and stormwater specialists in monitoring the effects of construction on the receiving environment and also in monitoring the success of planting over the three and four year maintenance periods required for terrestrial planting and wetland and riparian planting respectively.

12.3 There is no real separation between much of the detail of landscape and ecological mitigation outputs with planting along the route fulfilling both landscape and ecological functions (as well as hydrological and stormwater treatment functions). As required by the conditions five ecological disciplines will provide specialist input into the mitigation planting proposed for the wetland and/or terrestrial areas (including as relevant, botanist, freshwater ecologist, marine ecologist, ornithologist, and herpetologist).

Training

12.4 Environmental training for all staff will be undertaken as part of the site induction programme). This requires all new staff to go through an induction training session when they commence work and then as part of annual refresher courses. Environmental Induction will include information on the following aspects of this plan:

- Information about the activities and stages of construction that may cause impact to landscape and ecological features and values;
- An explanation of the significance of identified trees, areas of amenity vegetation (both exotic and native) and how they are to be protected from direct and indirect construction activities;
- Earthworks near or within dunes and the reshaping of dunes as part of the finishing earthworks;
- Consent and designation requirements;
- Landscape and ecological mitigation monitoring procedures.

Construction Team

12.5 In accordance with the conditions, all personnel working on the Project, including Project team members and subcontractors, have a responsibility for following the requirements of the LMP and the EMP. The key construction management roles are:

Alliance Project Manager

- Takes ultimate responsibility for compliance with specifications, designation and resource consent conditions.
- Reporting on environmental performance, incidents, and issues to the Project Alliance Board (PAB).
- Reviews and approves environmental plans prior to issue.
- Ensuring adequate resources are provided to staff to enable environmental issues to be appropriately managed.
- Approves training needs.

Design Manager

- Incorporates environmental requirements into design as required by consent conditions and environmental management plans; and
- Advises Environmental Manager of any design issues that may impact on environmental compliance.

Consents Manager

- Ensures all resource consents are gained prior to works starting.

Environmental Manager

- The Environmental Manager has the responsibility for supporting the implementation of all required landscape and ecological mitigation, monitoring, reporting and communicating any issues to the Project Management Team and the NZTA.
- Provides leadership to ensure staff are motivated to achieve environmental standards, and comply with all consent conditions and environmental management plan requirements including SSMPs;
- Develops, implements and reviews environmental management systems and environmental management plans and strategies for the project;
- Coordinates environmental management interfaces with external agencies and stakeholders in conjunction with the Stakeholder Manager;
- Provides a liaison point between site staff, landscape contractors and arborists with respect to tree removal / relocation works;
- Manages and co-ordinates all environmental monitoring required by consent conditions and maintains and submits relevant reporting and records to the Greater Wellington Regional Council and Kāpiti Coast District Council as required;
- Coordinates all environmental auditing functions and ensures relevant records are maintained;
- Responds to and investigates all environmental complaints, issues or incidents;
- Reports on environmental performance, incidents and issues;
- Notifies Alliance Project Manager and Regulatory Authorities of any significant non compliances;
- Coordinates environmental emergency responses; and
- Responsible for resolving issues of environmental non compliances.

Environmental Specialist

- Supports Environmental Manager and provides leadership to ensure all staff comply with environmental management systems;
- Coordinates the preparation of Erosion and Sediment Control plans;
- Undertakes building of environmental controls and lodging required certification to GWRC and KCDC;
- Undertakes regular site inspections and audits to ensure compliance with the CEMP and Site Specific Management Plans (SSMPs), consent and designation conditions;
- Coordinates all site monitoring including but not limited to groundwater, settlement, water quality, ecological, dust, noise, and vibration monitoring;
- Manages maintenance and monitoring of Chemical Treatment Systems;

- Ensures spill kits are available and stocked and provides training on equipment use;
- Coordinates the development and lodgement for certification of Site Specific Management Plans;
- Co-ordinates construction vibration monitoring and preparation of building condition surveys;
- Undertakes environmental monitoring (following the completion of appropriate training) for groundwater, settlement, water quality, ecological, dust and noise monitoring;
- Coordinates site archaeological protection requirements and provides necessary training and advice to site staff;
- Conducts regular site inspections of erosion and sediment control devices and co-ordinates maintenance where necessary;
- Coordinates as-built information for erosion and sediment control devices;
- Monitors site controls during rain storms;
- Input all environmental monitoring results to a CS-VUE database;
- Ensures staff on-site are aware of environmental requirements at all times; and
- Trains staff in site specific environmental procedures.

Community Liaison Person

- Co-ordinates contact and consultation regarding landscape mitigation related matters in relation to neighbouring properties (i.e. SSLMPs, SSEMPs);
- Advocates community and stakeholder environmental aspirations to construction team; and
- Primary contact for stakeholder complaints and enquiries.

Construction Manager

- Provides leadership to the site team to achieve Project environmental objectives and targets to ensure a high level of performance is achieved;
- Ensures adequate resources are provided to ensure environmental issues are appropriately managed;
- Reports all environmental incidents and complaints to the Environmental Manager
- Responsible for ensuring erosion and sediment control systems are designed, installed and modified as appropriate for each stage of construction;
- Reviews, develops, implements and monitors construction methods ensuring compliance with consents; and
- Assists in the development, implementation and review of Project environmental objectives.

Site Superintendents

- Provides leadership to the site construction team to achieve project landscape and environmental objectives and targets to ensure high performance is consistently achieved;
- Ensures environmental controls including erosion and sediment control works are protected and maintained on a day to day basis;
- Ensures that the CEMP and the SSMPs are implemented appropriately by the construction team;
- Leads the emergency response crew;
- Reports all environmental incidents, and complaints to the Environmental Manager; and
- Reviews the need to use a water cart or sprinklers to control dust.

Project Engineers

- Provides leadership to the site construction team to achieve project environmental objectives and targets to ensure a high level of performance is achieved;
- Responsible for ensuring environmental controls and erosion and sediment control works are installed and modified as appropriate for each stage of construction;
- Assist in the development, implementation and review of project environmental objectives;
- Develops, implements and monitors construction methods and environmental protection measures to ensure compliance with consents, designations, the CEMP and SSMPs;
- Demonstrates understanding of major environmental and community issues and environmentally sensitive areas;
- Coordinates environmental interfaces with subcontractors and suppliers;
- Reports all environmental incidents and complaints to the Environmental Manager;
- Ensures staff on-site are aware of environmental requirements community relation protocols at all times.

Foreman

- Manages the construction of critical erosion and sediment control devices, temporary stormwater ponds and removal of vegetation;
- Co-ordinates daily site inspections of environmental controls including erosion and sediment control devices and co-ordinates maintenance where necessary;
- Monitors the site during rainfall events and high wind events;
- Ensures staff on site are aware of environmental requirements at all times.

Project Landscape Architect

- Responsible for preparing LMP and SSLMPs;
- Responsible for liaising with the Project Ecologist during development of the SSLMPs and SSEMPs;
- Provide input into SSUDPs;
- Responsible for incorporation of indigenous wetland vegetation in design of revegetation programmes in SSEMPs and SSLMPs;
- Observation of final shaping of earthworks in conjunction with Environmental Manager and Project Engineers;
- Responsible for developing, in conjunction with the Project Ecologist, weed and browsing pest management programmes within the SSLMPs and SSEMPs;
- Responsible, in conjunction with Environment Manager and Project Ecologist, for identification and demarcation of sites of valued indigenous vegetation and exotic vegetation to be retained prior to earthworks;
- Input into briefing and training of Constructors regarding final shaping of earthworks, including wetland areas;
- Responsible with Project Ecologist for observing any indigenous vegetation clearance or modification;
- Monitoring and observation with Environmental Manager of manufacture and placement of soil mixes and mulch;
- Responsible for planting design plans and specifications;
- Observation and monitoring planting and monitoring of planting maintenance;
- Responsible for developing, in conjunction with Environment Manager and Project Ecologist, any adaptive management programmes in the event Project effects are greater than consent conditions allow.

Project Ecologist

- Responsible for liaising with design teams during detailed design to ensure that impacts on areas of indigenous vegetation are minimised as far as practicable;
- Responsible, in conjunction with the Project Landscape Architect and Project Stormwater Engineer, for developing the SSEMPs, including liaison and inputs from specialist technical ecologists (avi-fauna, freshwater, terrestrial, herpetofauna and wetland);
- Responsible for input into specialist ecological aspects of Environmental Awareness Training of personnel responsible for supervising construction and earthwork site staff;
- Responsible, in conjunction with Environment Manager and Project Landscape Architect, for identification and demarcation of sites of valued indigenous vegetation to be retained prior to earthworks;

- Responsible for observing any indigenous vegetation clearance or modification within the areas of valued indigenous vegetation during construction;
- Responsible, in conjunction with the Construction and Earthworks Team, for identifying areas and particular species of wetland vegetation to be salvaged within the Project Footprint and advising on appropriate removal, storage and transplanting of wetland vegetation within the ecological mitigation areas (SSEMPs);
- Responsible, in conjunction with the Project Landscape Architect, for input into wetland and water retention areas including formation, shaping and earthworks required to recreate and restore ecologically functioning and sustainable natural wetland areas
- Responsible for developing, in conjunction with the Project Landscape Architect, weed and browsing pest management programmes within the SSLMPs and SSEMPs;
- Responsible for carrying out ongoing monitoring of the ecological components of wetlands, including reviewing piezometer results from Groundwater Team, and reporting;
- Responsible for responding, in conjunction with the Environment Manager, to any unintended adverse effects or breaches of monitoring triggers for the areas of valued indigenous vegetation and habitat;
- Responsible for developing, in conjunction with Environment Manager and Project Landscape Architect, any adaptive management programmes in the event Project effects are greater than consent conditions allow;
- Responsible for sign off of all ecological mitigation components of each SSEMP area following completion of plant maintenance periods (including relevant sign off from specialist ecologists as appropriate);
- Responsible for developing, in conjunction with Environment Manager and Project Landscape Architect, any mitigation for effects on the areas of indigenous vegetation and habitat beyond that consented (as outlined in EMP).

Project Urban Designer

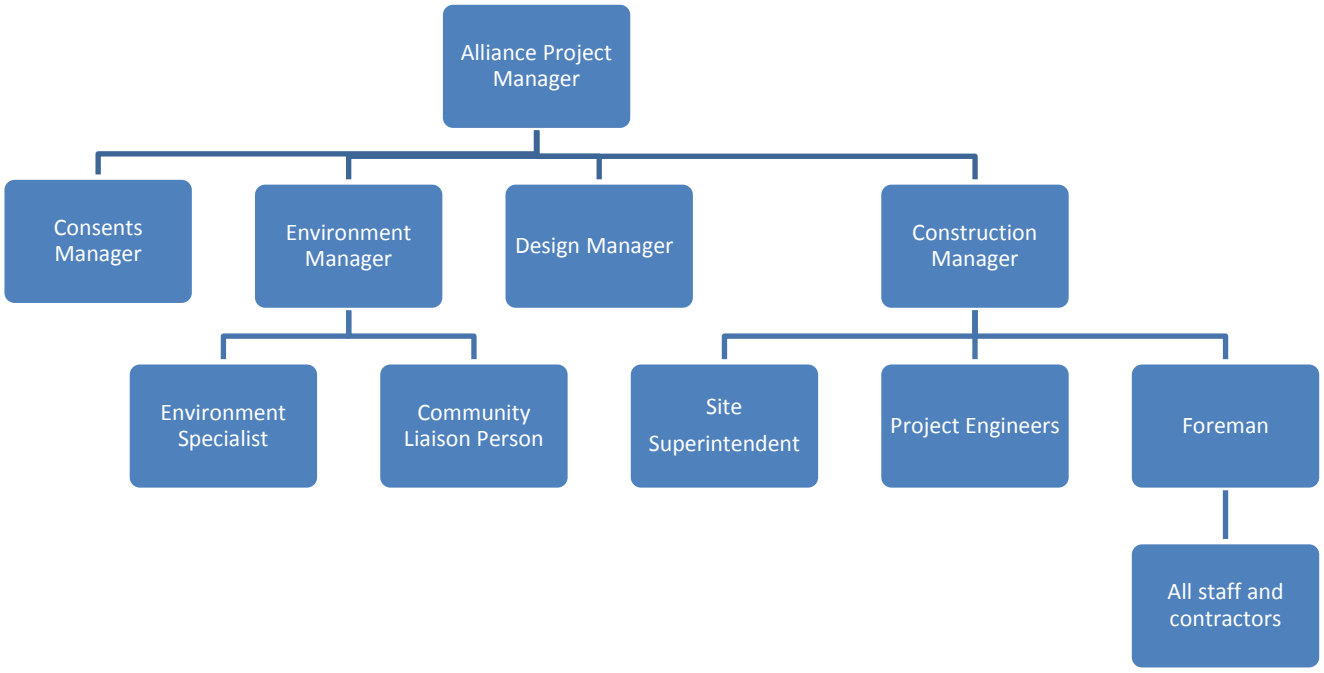
- Responsible for preparing SSUDPs;
- Responsible for liaising with Project Landscape Architect and Project Ecologist during development of SSMPs;
- Reviewing quality and finishes on precast panels and other hard landscape elements.

All Staff & Contractors

- Attend and actively participate toolbox talks and environmental training including Site Specific Management Plan briefings;
- Responsible for reporting incidents, defects and other problem areas to senior site staff as they arise on site;

- Ensure that required processes and procedures for landscape and environmental management are followed;
- Carry out routine maintenance and emergency work when directed;
- Care for all environmental works and controls; and
- Ensure the site is kept tidy and all waste is placed in appropriate bins.

Construction Team Structure



Key relationships for the Project Landscape Architect are with:

- Project Ecologist (EMP, SSEMPs)
- Project Urban Designer (SSUDPs)
- The Environment Manager for planning (LMP, SSLMPs, EMP, SSEMPs, SSUDPs) and coordination;
- The Construction Manager for staging issues;
- The Design Manager and Project Engineers for earthworks design and review of design changes;
- The Foreman for physical works (e.g. vegetation clearance);
- All staff and contractors for training.

13.0 Complaints

13.1 Consent conditions DC.14 and G.8 set out the complaints procedures that will operate. A permanent complaints register is to be kept and the conditions identify what information is to be included in the register. A copy of the register is to be provided to the Council every month. As consent holder, NZTA must respond within 10 working days of the complaint being made and they must also maintain a record of the responses and remedial actions taken.

13.2 The obligations on NZTA regarding complaints continues for 6 months following commissioning of the Project and any complaints after that period will be managed as part of NZTA's standard complaints procedures.

14.0 Cultural Values and Consent Requirements

14.1 As outlined in the cultural impact assessment reports (Technical Reports 11 and 12), the indigenous flora and fauna and associated ecological systems of the Kāpiti Coast are considered to have high cultural importance to tangata whenua. Consistent with their role as kaitiaki (stewards or guardians), Te Āti Awa ki Whakarongotai and Takamore Trust (and Ngati Toa in respect of the southern end of the Expressway) have a specific role in ecological mitigation and monitoring as outlined in the following consent conditions:

14.2 As required in consent conditions DC.54 and DC.57, the LMP and the SSLMPs are to be prepared in consultation with Te Āti Awa ki Whakarongotai, Takamore Trust and Te Runanga O Toa Rangatira Inc as described in section 6.0. In addition, Te Āti Awa ki Whakarongotai and Takamore Trust will be consulted in the development of the EMP and SSEMPs, including discussion and agreement on the role of iwi monitors with regard to observing monitoring activities.

14.3 The monitoring is to be undertaken pre-construction, during construction and post-construction as required in consent conditions G.38-G.40, including the role that Te Āti Awa ki Whakarongotai and Takamore Trust will have in observing monitoring. Based on these requirements

14.4 The EMP has been developed on the basis that the maintenance and protection of existing areas of ecological value and the restoration and enhancement of new areas as ecological mitigation outlined in the EMP and associated SSEMPs will also have commensurate cultural values to Te Āti Awa ki Whakarongotai and Takamore Trust.

14.5 Through protecting, enhancing and restoring indigenous ecosystems, the EMP and associated SSEMPs and SSLMPs will also enhance Maori cultural values through improving mahinga kai values and through establishing ecological linkages with sites of importance to Te Āti Awa ki Whakarongotai and Takamore

Trust. For example, the large Kakariki/Smithfield mitigation area near Nga Manu Nature Reserve will have the following benefits for tangata whenua:

- Enhance downstream water quality through riparian planting and stormwater treatment of Expressway run-off for downstream mahinga kai areas (the Waimeha and Ngarara Streams and estuary);
- Provide habitat for indigenous fauna of particular importance to iwi – such as tuna, kokopu, inanga, kereru – consistent with the traditional habitats of these species.
- Provide habitat for indigenous flora of particular importance to iwi – such as ti kouka (cabbage tree), harakeke (flax), totara, kahikatea etc. – consistent with the traditional habitats of these species.

14.6 Through the development of the SSEMPs and SSLMPs, consultation will be undertaken with representatives of Te Āti Awa ki Whakarongotai and Takamore Trust on the creation of these mitigation areas, including where practicable, consideration of connections to mahinga kai.

14.7 The environmental awareness training shall include a process and programme for training of new staff members joining the Project team, and for any staff moving to a new Site Specific Management Plan (SSMP) area within the Project in accordance with Condition G.11. This training should take into account any requirements for Te Āti Awa ki Whakarongotai and Takamore Trust to undertake cultural ceremonies in relation to mahinga kai values, wahi tapu and regulatory controls (i.e. rahui) prior to the commencement of Work within any of the SSEMP areas.

Attachments

Attachments

Attachment 1: Landscape Mitigation by Character Area

Attachment 2: Principles, Methods and Procedures

Attachment 3: Site Specific Management Plans

Attachment 4: Removed- Summary of Proposed Mitigation (see Attachment 2)

Attachment 5: Earthworks Diagrams

Attachment 6: Urban and Landscape Design Framework

Attachment 7: Ground Improvements, Pre-Loading

Attachment 8: Planting Plans (including vegetation to be retained)

Attachment 9: Planting Types

Attachment 10: Otaihanga Construction Yard

Attachment 11: Monitoring Plan

Attachment 12: Reporting Plan

Attachment 1: Landscape Mitigation by Character Area

The following table is from the draft Landscape Management Plan, CEMP, Appendix T that formed part of the AEE.

Attachment 1: Landscape Mitigation by Character Area

The following table is from the draft Landscape Management Plan, CEMP, Appendix T that formed part of the AEE.

Landscape Character Areas	Key Landscape Change	Mitigation
Queen Elizabeth Park Character Area	▪ Expressway footprint extending approximately 20m into QE Park at the southern end and up to 120m at the northern end by Poplar Avenue. ▪ Removal of dense, 5.0m wide buffer of indigenous vegetation between SH1 and QE Park at southern end. ▪ New stormwater swale planted with wetland species between SH1 and QE Park ▪ Interchange at Poplar Avenue including Expressway embankments (up to 7.0m high) and over bridge, on/off ramps and two round-a-bouts. ▪ Overhead lighting on ramps and at Poplar Avenue. Under bridge lighting on Expressway overbridge. ▪ Temporary Project yard (Bridge Yard) on clean fill site adjacent to Poplar Avenue.	▪ Establish dense buffer (10.0m wide) of indigenous vegetation between the Expressway and QE Park at southern end and up to 20.0m wide at Poplar Avenue. ▪ Mass planting of indigenous vegetation at Poplar Avenue interchange, between ramps, Expressway and cycle path. ▪ 320m of riparian planning along realigned drain (20m wide). ▪ Construction designation area to be securely fenced; . GWRC to be involved in discussion of fence alignment.
Raumati South Character Area	▪ Approximately 500m Expressway footprint through Leinster Avenue residential properties adjacent to SH1. ▪ Approximately 1km of 'greenfields' Expressway through small rural properties and undeveloped land currently in the existing WLR designation (low dunes and drained wetland) supporting gorse, rank grass, and exotic trees. ▪ Expressway on elevated 2.0m high embankment across the low lying ground and cuts into the dunes at the northern end with 5.0m-6.0m high cuts. ▪ Removal of semi- mature kanuka and loss of small area of wetland at raumati Manuka Wetland ▪ New 500m long right-of- way to provide access to residential properties whose access is severed by the Expressway. ▪ 2.0m high earth noise bund between right-of-way and Expressway with shared 3.0m wide cycle/footpath on top. ▪ Pedestrian bridge across Expressway between chainage 3000 and 3300, Position and design not finalised ▪ Formation of stormwater treatment wetlands and flood storage areas planted with eco-sourced indigenous wetland and other species adjoining Expressway. ▪ No Expressway lighting.	▪ Mass planting of indigenous vegetation both sides of Expressway, and Raumati Manuka Wetland to west. ▪ Retain existing vegetation- semi-mature kanuka and mature exotic trees (pine, macrocarpa) where possible. ▪ Retain area of manuka-dominated wetland with spaghnum and carex in Raumati Manuka Wetland. ▪ Planting of 6.0m wide median begins near Upper Drain 7 crossing ▪ SSEMP area for Drain 7 Restoration planting (riparian). ▪ Large area of planted flood offset storage area south of Wharemauku Stream as ecological and landscape mitigation.

Landscape Character Areas	Key Landscape Change	Mitigation
Raumati Road Landscape Character Area	▪ Expressway footprint including swales, requires significant modification of (cutting into) dune landforms. ▪ Expressway elevated above some of the surrounding residential properties. ▪ Expressway overbridge elevated approximately 5.0m above Raumati Road. ▪ Shared cycle/walkway located on western side of Expressway, and crosses Raumati Road on Expressway bridge. ▪ 2.0m high concrete noise walls; on the eastern side of the Expressway (chainage 4100-4450) and western side between 4550-4800. ▪ Lighting under the Expressway bridge and in-ground uplighting of piers. ▪ Lighting on cycleway begins here and continues north to Mazengarb Road.	▪ Retain as many of the existing groups and individual mature exotic trees as is practicable. ▪ Planting additional trees to strengthen groups of existing trees that are retained. ▪ Mass planting of indigenous vegetation, including some species enrichment to enhance long term biodiversity.
Wharemauku Basin Landscape Character Area	▪ Expressway embankments elevated up to 8.0m above low lying ground – at Wharemauku Stream and on top of the dunes at Kāpiti Road. ▪ Expressway bridge across Wharemauku Stream and walkway – 89m long and approximately 5.0m above ground (to underside of bridge). ▪ Full interchange at Kāpiti Road, including on/off ramps, retaining walls, split overbridge. ▪ Two large flood storage areas on the south side of Wharemauku Stream planted with native vegetation as landscape and ecological mitigation. ▪ Stormwater treatment wetland adjacent to Kāpiti Road interchange. ▪ Shared cycle/footpath on top of earth bunds -located on western side of Expressway. ▪ An earth noise bund will be constructed between the dunes, at chainage 5670, to provide mitigation of the Expressway for Quadrant Height dwellings. ▪ Three, 2.0m high timber noise fences along four property boundaries west of Expressway (Quadrant Heights, Observation Place, Milne Drive). ▪ Concrete noise walls adjacent to the west side of Expressway and northbound off-ramp (3.0m) and Kāpiti Road bridge approach (2.0m). North of Kāpiti Road concrete noise walls (1.1m) on east side of Expressway and south bound off ramp. Overhead lighting	▪ Retain lengths of mature shelterbelts of exotic trees where possible ▪ Add to shelterbelt planting in places to strengthen visual connections to wider landscape ▪ Large area of mass planting of indigenous vegetation in the flood storage area south of Wharemauku Stream; planting to comprise species that can tolerate occasional inundation. ▪ Mass planted indigenous vegetation either side of the Expressway and cycleway extends to the beginning of the Kāpiti Road interchange. ▪ Mass planting of indigenous vegetation north of Wharemauku stream to also include enrichment planting of canopy tree species to enhance the long term biodiversity of the local area. ▪ Specimen trees with massed underplanting at Kāpiti interchange to recognise proximity to Paraparaumu Town Centre zone.

Landscape Character Areas	Key Landscape Change	Mitigation
	of Expressway and on/off-ramps at Kāpiti Road interchange, for approximately 1300m. Under-bridge lighting and inground uplighting of bridge piers. ■ No lighting at Wharemauku Stream bridge. ■ Lighting on cycleway.	
Kāpiti Road - Mazengarb Road	■ Substantial modification of remnant 10-13m dune landforms. ■ Expressway cut down into dune remnants and with construction of noise bunds between the low points in the dunes, a continuous 3.0m-7.0m high bund will be created either side of the Expressway providing visual screening and noise mitigation to the adjoining residential areas. ■ Expressway elevated either side of Mazengarb and Kāpiti Road bridges. ■ Concrete noise walls north of Kāpiti Road (1.1m) on east side of Expressway and south bound off ramp. ■ Concrete noise wall (2.0m) east side on top of bund chainage 7700-7900 just south of Mazengarb Road adjacent to St James Court & Chilton Drive dwellings, and between 7800 and Mazengarb Road. ■ Earth noise bund on west side, adjacent to Metlife Retirement Village (chainage 7150-7450) and 2.5m concrete noise wall on west side adjacent to Expressway near Metlife Retirement Village (chainage 7150-7680). ■ Overbridge across Mazengarb Road bridge (not split). ■ 4.5m-5.0m high retaining walls either side of Mazengarb Road, east of the Expressway. ■ Shared cycle/ walkway on western side of Expressway. ■ Cycleway bridge across Expressway (location yet to be determined). ■ Stormwater swales either side of Expressway. ■ Stormwater treatment wetland near Mazengarb Road. ■ No significant vegetation to be removed. ■ Expressway, and on/off ramps at Kāpiti Road lit with overhead lighting. ■ Underbridge lighting and inground uplights at Kāpiti Road and at Mazengarb Road. ■ Cycleway lit (lighting ends at Mazengarb Road).	■ Utilise dune remnants and noise bunding for visual and noise mitigation. Mass planting of indigenous vegetation either side of the Expressway and cycleway. ■ Mass planting on bunds and interchange embankments to screen noise walls, traffic and roadway. (eg from Makarini Street Reserve, St James Court, Chilton Place)

Landscape Character Areas	Key Landscape Change	Mitigation
Otaihanga South Landscape Character Area	▪ Expressway cuts through dunes (up to 10.0m -12.0m cuts). ▪ Loss of high value wetland areas. ▪ Otaihanga SSEMP focus area. ▪ New stormwater wetlands and flood storage areas. ▪ Expressway bridge over Otaihanga Road (alignment of Otaihanga Road left as is). ▪ Removal of some of the mature pine plantation (extent of removal of pine plantation is yet to be determined and will be clarified during the preparation of the SSMP for this area). ▪ Shared cycle/walkway on western side of Expressway crosses to east side at Otaihanga Road and continues on the eastern side north of Otaihanga Road. ▪ Concrete noise wall (2.0m) on western side at southern end, (chainage 8000-8400), and shorter 2.0m high wall on eastern side near Mazengarb Road. A 1.1m high concrete noise wall at the northern end on the western side immediately south of Otaihanga Road. ▪ The construction yard at Otaihanga Road will require cutting into the back of the dunes along Otaihanga Road and the removal of a dune to provide access to the yard, access between the yard and Expressway. and construction of the Otaihanga bridge abutments.	▪ Retain mature pine trees between Expressway and properties to the west. ▪ Retain as much of the Carex dominated wetlands and regenerating kanuka as possible. ▪ Restore and enhance wetland areas and riparian margin of Mazengarb drain. ▪ Mass planting of native species in Expressway corridor. ▪ Off-set ecological mitigation- new wetland area near Mazengarb Road to offset loss of wetlands. ▪ Restore and enhance Otaihanga Central Wetland on western side of Expressway. ▪ Otaihanga yard design should minimise cut into the dunes and avoid disturbance of the Otaihanga Road face of the dunes.
Otaihanga North Landscape Character Area	▪ Expressway cut into dunes (up to 15.0m cuts). ▪ 700m of new right-of-way on east side to link existing right-of-way to Otaihanga Road. ▪ New stormwater wetlands and flood storage areas. ▪ Shared cycle/walkway on eastern side of Expressway. ▪ 1.1m high noise wall on the western side just north of the Otaihanga Road overbridge (chainage 9200-9420).	▪ Retain several stands of mature trees within the existing WLR designation. ▪ Pasture and rural scale tree plantings proposed to retain the existing open character of the area. It is intended that grazed pasture (or mown grass) will extend as close as possible to Expressway. If visual screening is required from particular locations (such as dwellings) 'shelter belts' or strategically placed groups of trees could be planted.
Waikanae River Landscape Character Area	▪ 182m long bridge over river corridor 7.0m above the ground. ▪ Eight bridge piers in river corridor, four immediately adjacent to the river channel (two either side). ▪ Riprap reinforcement of river on both sides of the channel and 30m wide strip of riprap extending across the floodplains to the bridge abutments, (100m north bank, 38m south bank covering approximately 4000m^2). ▪ Realignment of approximately 200m of river channel. ▪ Riprap in river channel to protect bridge piers. ▪ Realignment of Muaupoko Stream at its confluence with the Waikanae River, including, reinforcement with riprap.	▪ Planting of native vegetation along Muaupoko Stream (SSEMP focus area) and Waikanae River to replace the existing vegetation in the river corridor that will be removed. ▪ Replanting of willows for flood protection along realigned river edge with interplanting of local indigenous species. ▪ Floodplain on northern bank needs to allow for flood flows and cannot be densely planted. ▪ GWRC to be consulted on all planting proposed in Waikanae River corridor to ensure that it does not conflict with flood protection requirements. ▪ Activities in the Waikanae River corridor should seek to align with

Landscape Character Areas	Key Landscape Change	Mitigation
	▪ Works in the river will require removal of riparian vegetation (both willow and native vegetation plantings) for approximately 200m up/down stream. Willow to be replanted to stabilise river channel banks. ▪ Minor relocation of walkway on north bank to allow for bridge pier. ▪ Shared cycle/ walkway crosses river on Expressway bridge and access to the river also provided on both sides of the river to connect with paths that run along the river. ▪ Access road to El Rancho passes under bridge adjacent to the abutment on the north bank. ▪ Concrete noise wall (1.1m) on west at El Rancho (chainage 10750-11000) and continues into next character area.	the *Waikanae River Environmental Strategy*. ▪ GWRC are seeking to have dual pathways on the true left bank so hardstand areas, formed in this area as part of construction, could be retained, at least in part, and be accommodated into the new walkway/cycleway. ▪ Provision of directional and interpretative signage as part of the walkway/cycleway.
Te Moana Landscape Character Area	▪ Expressway is on raised embankments through this character area (7.5m high at El Rancho, and 9.0m high ramps at Te Moana) and cuts the side off a high dune with a 13m cut just south of Te Moana interchange. ▪ 215m long, 4.0m-5.0m high earth noise bund near Puriri Road (chainage 11100-11300). ▪ 1.1m high concrete noise wall on the embankment just north of the Waikanae River bridge, adjacent to El Rancho (chainage 10720-11000) continued from Waikanae River character area. ▪ Full interchange at Te Moana Road including on/off ramps, embankments, Expressway bridges over Te Moana Road and Waimeha Stream, two roundabouts and large areas of open space between the paved road areas for residual overland flood flow path. ▪ New stormwater treatment wetlands near Puriri Road and overland flow path east of Te Moana Road. ▪ Cycle/walkway on eastern side of Expressway which diverges from the Expressway alignment along Kauri Road. ▪ New access road to Takemore Urupa - off Te Moana Road west of Expressway. ▪ 1300m length of Expressway lit at Te Moana interchange. ▪ Expressway and on/off ramps lit as well as both roundabouts and underbridge lighting and in-ground up-lighting under the Expressway.	▪ Retain areas of existing vegetation, wetlands, regenerating broadleaf scrub and areas of mature exotic trees. ▪ Mass planting of indigenous species throughout the interchange, provides some visual screening.

Landscape Character Areas	Key Landscape Change	Mitigation
Ngarara Landscape Character Area	▪ Substantial earthworks required through series of large dunes between Te Moana and Ngarara Roads with the Expressway being cut down into the dunes resulting in many large cuts ranging from 13m-16m high. ▪ Removal of small areas of regenerating broadleaf forest. ▪ Inter-dunal areas modified and native vegetation removed. ▪ Rural landscape and farming operation split by Expressway. ▪ Shared cycle/ walkway on eastern side of Expressway south of Ngarara Road, crosses to west north of Ngarara Road. ▪ Ngarara Road bridged over the Expressway near Nga Manu access road, including 16m high cuts into dunes. ▪ Smithfield Road realigned partly along Nga Manu access road, 1.2km of new road including approximately 500m on raised embankments to cross Expressway (up to 9.0m high embankments). ▪ Construction of large stormwater treatment/storage wetlands, most to be planted with indigenous vegetation. ▪ Restoration of drain to more naturalised stream and riparian planting. ▪ Riparian planting along 520m of Kakariki Stream.	▪ Retain existing native and exotic vegetation/trees wherever possible and strengthen with additional plantings. ▪ Construction design avoids heritage tree (pohutukawa near Smithfield Road, see Figure 49). ▪ Mass planting of native vegetation including canopy species to contribute to key east-west ecological corridor. ▪ Reshaping of cut faces to high dunes along this part of the route to integrate Expressway into the landscape. ▪ Large area (approximately 9ha) of indigenous planting associated with the stormwater wetlands, planted flood storage areas, riparian restoration of drain ('Smithfield Stream diversion') and riparian enhancement of Kakariki Stream will enhance the local biodiversity and enrich the ecological corridor (as part of SSEMP area). ▪ Planting for fernbird habitat.
Peka Peka South Landscape Character Area	▪ Expressway marginally higher than the existing ground level, embankments 2.0-3.0m high ▪ Shared cycle/walkway on western side of Expressway. ▪ Partial interchange at Peka Peka Road has an elongated footprint covering approximately 18ha. and extends into this character area at the northern end. ▪ One roundabout, one bridge over the Expressway with embankments up to 9.0m and new local road. ▪ Construction of large flood storage area.	▪ Riparian planting 10m wide along 200m of Paetawa Drain. ▪ Planting along either side of the Expressway and cycleway will reflect the current open/grazed pasture character with grazed pasture extending as close as possible to Expressway. Rural scale trees, in groups/as shelterbelts will be included in the grassed areas and can be strategically located to provide visual screening, if required.

Attachment 2: Principles, Methods and Procedures

The following table sets out the Principles, Methods and Procedures in relation to Pre-construction, Construction and Post Production stages of the Project.

Attachment 2: Principles, Methods and Procedures

The following table sets out the Principles, Methods and Procedures in relation to Pre-construction, Construction and Post Production stages of the Project.

PRE-CONSTRUCTION

PRINCIPLES	METHODS	PROCEDURES
Modification of Landforms		
▪ Earthworks design shall seek to minimise loss or modification of dune landforms.	▪ Close collaboration between civil engineers, landscape architects and ecologists through all stages design and documentation.	▪ Landform loss and modification design parameters established jointly by all disciplines involved in earthworks and landform modification. ▪ SSLMPs to identify landforms to be modified and how modification will be addressed.
Existing Vegetation to be Retained, Reinstated or Relocated		
▪ Retain as much of desirable existing vegetation as practicable to help integrate the Expressway into the environment and to provide the framework for new planting. ▪ Ensure health and viability of vegetation to be retained by avoiding situations where it could be damaged by other works (eg compaction of root zone, encroachment into the dripline, damage by machinery, diesel & chemical spillage, etc). ▪ Where practicable relocate clumps of existing sedges, rushes and reeds in wetland areas that will be affected by construction to adjoining areas to be reinstated.	▪ Timely identification as part of detailed design of all vegetation to be retained to avoid it being removed or damaged in error. ▪ Any remedial work to be carried out on vegetation to be retained to be described and programmed to minimise adverse effects on its viability (eg pruning, crown lifting, etc). ▪ Ensure machinery, laydown areas or storage of materials, fuel and chemicals are located well away from vegetation to be retained. ▪ Project Ecologist and Project Landscape Architect to collaborate on identifying plants or groups of plants to be lifted and relocated in the wetland sites identified as Proposed Ecological Mitigation Sites (G42(b). ▪ Appoint arborists for specialist tree work.	▪ Identify vegetation to be retained on aerial photographs and included in the SSLMPs, SSEMPs together with any specific procedures to be followed. ▪ Retained vegetation also to be clearly marked on site and temporary fences erected to protect it prior to earthworks and construction commencing. Instructions provided to Constructors re any actions required. ▪ Project Landscape Architect and Project Ecologist to hold briefings and training sessions with Constructors prior to commencement of vegetation clearance work for each stage of construction with specific focus on vegetation to be retained. ▪ Include remedial work on vegetation (eg crown lifting, pruning, etc).on detailed plans and in specifications, and in training. ▪ Remedial work to be carried by appropriately experienced contractor; any specialised work on semi-mature and mature trees to undertaken by qualified arborist. ▪ SSMPs to identify areas where existing vegetation (native and exotic) will be relocated and where it will be reinstated. ▪ Contract documentation to outline the process to be followed where wetland species are to be lifted and relocated to new wetland areas.

Weed Control		
▪ Reduce the pest plant burden within the earthworks footprint to minimise the spread of vegetative and seed material from infested areas to 'clean' areas. ▪ Target pest species include those that reproduce by vegetative means including convolvulus, blackberry and trandescantia. ▪ Reducing the virulence of weed load in the soil prior to the beginning of earthworks will reduce the spread of weed species across the site.	▪ Identify areas of high infestation of blackberry, convolvulus and trandescantia and other weeds that will require treatment prior to the commencement of earthworks. ▪ Develop methodology for treatment process to maximise success. ▪ Treatment will include a combination of physical removal, spraying regrowth, cultivation.	▪ Project Landscape Architect and project Ecologist to ensure detail of methodology and programme of works is included in the contract documentation package. ▪ Collaboration and coordination with Constructor team and Project Ecologist re development of best methodology and programme.
Vegetation Removal		
▪ Care taken to avoid damaging existing vegetation to be retained when removing native vegetation, amenity trees and shelterbelts to facilitate construction. ▪ Minimise impacts of vegetation removal on wildlife (eg, lizards, native birds, etc). ▪ All woody vegetation to be removed has potential to be mulched and retained for use on the project as temporary soil stabilisation, and also to assist with lizard refuge. ▪ Select vegetation that could be re-spread as a seed source for regeneration.	▪ Regenerating native or mature amenity trees and shelterbelts to be removed to be cut at ground level and stump removed or ground below ground level. ▪ Woody vegetation mulched and stockpiled for future use. ▪ Areas of manuka and kanuka with seed capsules intact to be used to supplement planting where appropriate. ▪ Any woody vegetation infested with unwanted aggressive pest plants to be removed off site to appropriate dumping area.	▪ Project Landscape Architect in conjunction with Project ecologist to mark individual regenerating native vegetation and amenity trees to be cut and stumped. ▪ Project Landscape Architect (with input from project ecologist) to work with Project Surveyors to demarcate areas for vegetation removal. ▪ Project Landscape Architect and Project Ecologist to identify areas of manuka and kanuka that could be used as slash to provide a seed source to supplement planting in specified areas.
		▪ Plans and annotated aerial photographs to identify areas of woody vegetation to be mulched and stored. Protect mulch piles from weed incursion or contamination. Constructors to liaise with Project Landscape Architect to confirm.
Eco-Sourcing of Plants		
▪ Native plant species to be sourced from Manawatu Ecological Region. [Note: In two locations, the Kāpiti Road and Te Moana Road interchanges, where advanced grade native species are proposed to be used it is unlikely that given the time frames and circumstances that these will be sourced from the Manawatu Ecological Region. However, in all other locations all native species will be eco-sourced.]	▪ Seed collection and storage to commence in advance of planting to ensure plant numbers and grades available in accordance with construction and planting programme. ▪ Include eco-sourced seed collection and storage as part of plant supply and landscape contract to minimise risk. ▪ Areas of manuka and kanuka with seed capsules intact that area removed to be used as slash to supplement planting in specified areas.	▪ Prepare specifications and contract documentation for seed collection and storage. ▪ Seed collection and storage contract tendered to nurseries with proven eco-sourcing track record and experience. ▪ Contractor to provide monthly update report on seed collection (species and quantity), germination trials, and storage. ▪ Project Landscape Architect to monitor seed collection progress and quality. ▪ Project Landscape Architect and Project Ecologist to identify areas of manuka and kanuka to be removed from designation to facilitate construction for potential to supplement planting.

Plant Production and Supply		
▪ All plants to meet species, grade and quality as specified; substitute species unacceptable. ▪ All plants to be acclimatised to local environmental conditions by 'hardening off' in local holding area 2 months minimum prior to planting.	▪ Plant supply contracts to set out requirements and specifications. ▪ Plant supply contracts to be tendered to reputable suppliers with proven track record on similar type and scale of projects. ▪ Establish plant trials to ensure suitability and performance of native species to be used. ▪ Establish secure nursery on site holding area in suitable location at least three months prior to first stage of planting on site.	▪ Project Landscape Architect to monitor plant production and supply to ensure it adheres to specifications and programme. ▪ Project Landscape Architect to coordinate programme of plant supply for planting during appropriate season. ▪ Plant trial established in QE Park in September 2012 and to run for duration of project. ▪ Plant trials to be regularly monitored and results used to inform plant selection and maintenance. ▪ Landscape Constructor responsible for setting up and managing on site nursery holding area.
Soil Mixes		
▪ Use peat extracted from the Expressway corridor as base for soil mixes used for areas to be planted. ▪ Ensure soil mixes are fit for purpose and can sustain plant growth in the long term. ▪ Ensure no live weed material in soil mixes.	▪ Establish substrate trials using different grades of peat sourced from sites along the Expressway corridor, together with various other materials (soil, compost, fertiliser) to determine composition of soil mixes to be used. ▪ Develop methods for extracting and processing peat to minimise weed content. ▪ Ensure peat extracted from Expressway corridor for use in soil mixes is appropriately stockpiled to avoid contamination. ▪ Assess availability and viability of alternative soil mixes as back up if soil mix trials do not prove to be satisfactory..	▪ Combined soil mix and plant trial established in QE Park in September 2012 used to develop suitable soil mixes. ▪ Regular monitoring of trial by Project Landscape Architect to ascertain suitability of peat as primary component of soil mixes and to determine proportions to be used. ▪ Collaborate with Constructors to trial methods of peat extraction to minimise weed content (eg discard top 300mm of peat extracted). ▪ Constructors to identity peat storage areas and where soil mixes will be processed and stored to avoid weed incursion or contamination. ▪ Contract documentation to specify composition of soil mixes and the process for monitoring quality during production and supply.
Mulch Production		
▪ Woody vegetation to be removed along the corridor during site clearance that is free of pest plants mulched and used on planting areas. ▪ Ensure suitability of mulch prior to placement.	▪ Mulch production, handling, and storage areas to be identified. ▪ Where practicable remove and mulch logs and branches from peat extraction or retain these for temporary soil stabilisation. ▪ Mulch to be seasoned for a minimum of 6 months prior to spreading on site.	▪ Detailed design package to identify areas of woody vegetation suitable for mulching. ▪ Contract documentation to specify type and depths of mulch for different areas of planting (i.e 100mm depth mulch for terrestrial planting, riparian planting outside flood zone, and for wetland planting outside design water level. Stone mulch or wool mulch mat to be used in riparian and wetland areas subject to inundation or scouring). ▪ Constructors to submit samples of agreed mulch types to provide benchmark for ongoing mulch production.

Planting in General		
▪ Ensure extent and type of planting is consistent with proposals in landscape and Visual Effects Assessment (Technical Report 7) and Ecological Assessment (Technical Report 26). ▪ Avoid planting in areas where regular access to underground services is required.	▪ Planting proposed in Technical Report 7 to form basis of SSLMPs and SSEMPs and detailed design plans. ▪ Coordination of all plans and specifications to ensure underground services where regular access is required are clearly identified.	▪ Contract documentation to include details on species, mixes, grades, and densities. Plant grades for mass planting to be a combination of 1.0 litre and 0.5 litre planted at 1.0m densities; primarily 0.5 litre grade for wetland planting at 75mm densities; a combination of 1.5L and 1.0L grades for enrichment planting at various densities depending on location and species. ▪ Contract documentation to identify areas where planting to be excluded.
Planting in Special Areas		
▪ Ensure consultation and appropriate input into planting identified for special areas as identified in DC.57 and DC.57A (i.e. Takemore, Waikanae River, Wharemauku Stream, QE Park, the Landscape Focus Areas, and in relation to fernbird habitat, lizard habitat) and as required by G.42C. ▪ Ensure LMP and EMP and SSLMPS and SSEMPs are consistent.	▪ Consultation meetings with identified groups and input from appropriate specialists as identified in the consent conditions. ▪ Identified groups and specialists to review LMP and SSLMPs, and SSEMPs. ▪ Project Landscape Architect and Project Ecologist to work closely when developing the respective Management Plans and Site Specific Management Plans as specified in the conditions. ▪ Certification of SSLMPs and SSEMPs by KCDC and GWRC prior to planting.	▪ Project Landscape Architect and Project Ecologist to meet with each group identified in consent conditions to discuss draft LMP and EMP, identify issues each group is concerned about, and determine consultation programme. ▪ Project Landscape Architect and Project Ecologist to hold follow up meeting(s) with each of the groups identified to review draft LMP and EMP. ▪ Project Landscape Architect and Project Ecologist to meet with each of the groups identified to review final LMP and EMP. ▪ Project Landscape Architect and Project Ecologist to document any aspects of the LMP and EMP where there is disagreement with any of the groups identified and the reasons for disagreement. ▪ Project Landscape Architect and Project Ecologist to follow similar programme of consultation meetings each of the groups identified to review and finalise SSLMPs and SSEMPs. ▪ EMPs and LMPs aligned and in compatible format to make it easier to cross reference ▪ Planting plans and maintenance regimes to incorporate agreed outcomes from consultation meetings.
Noise Barriers and other free standing items		
▪ Ensure noise barriers as identified in the AEE (ie earth bunds and noise walls) are integrated into the surrounding landscape. Other structures such as lighting, crash barriers signage and in-ground services will not be planted to the base to allow for easy maintenance. Typically these items will have a gravel/spray able zone immediately adjacent to them.	▪ Planting plans for landscape mitigation need to take account of the location and specific requirements and design parameters of noise barriers. ▪ Close liaison at the early stages of detailed design required between the Project noise specialists, road furniture and structural engineers, urban design and the landscape experts.	▪ Noise and structural team to provide Project Landscape Architect with design parameters for all noise barriers long Expressway route. ▪ Project Landscape Architect to ensure draft planting plans are reviewed by noise experts. ▪ Planting plans amended and finalised and contract documentation to include all necessary notation and details re noise barriers.

CONSTRUCTION

PRINCIPLES	METHODS	PROCEDURES
Preloading		
▪ Minimise landscape and visual effects of preloading.	Ensure all preloaded areas upon completion are hydroseeded to reduce visual effects, minimise dust, and reduce runoff and erosion.	▪ Contract documentation to specify treatment and timing of all preloaded areas.
Earthworks		
▪ Ensure finished earthworks physically and visually relate to adjoining landforms and that they reflect the Design Principles as set out in the Urban and Landscape Design Framework (see Appendix 7). ▪ Shape noise and visual mitigation bunds to appear as 'natural' landforms where practicable. ▪ Wetland profile and edges shaped to meet ecological requirements and functioning. ▪ Avoid unnecessary disturbance to natural landforms. ▪ Where practicable natural ground topsoils should remain untrafficked. ▪ Recovery and storage of topsoil for future use. ▪ Special care and provision required when realigning waterways and forming wetlands. ▪ Close liaison with GWRC Flood Protection for earthworks associated with the Waikanae River corridor. ▪ No stockpiles to be located in flood hazard areas. ▪ Manage the effects of soil instability and erosion. ▪ Ensure unforeseen ground conditions do not affect landscape outcomes.	▪ Civil engineering drawings to include sufficient information and detail to ensure desired end result is achieved as set out in the Urban and Landscape Design Framework. ▪ Re-shaping of dunes to achieve a 'natural' appearance is likely to require extending earthworks into surrounding topography. ▪ Limits of earthworks and access and operating areas for earthmoving machinery to be clearly defined in SSMPs. ▪ Establish process and procedures for Council representative to be involved in final shaping of earthworks at outset of construction in accordance with DC.54(e). ▪ Project Ecologist and Project Landscape Architect to review earthworks drawings and specifications as part of detailed design process. ▪ Topsoil to be stripped to full natural depth at one time to preserve soil structure and minimise compaction, taking care to avoid contamination with subsoil or foreign materials. ▪ Topsoil stripped from areas to be stockpiled in accordance with best practice and subsequently incorporated in soil mixes (i.e minimise handling, stockpiles to be graded to shallow falls to a maximum height of 2.0m, avoid compaction and trafficking by any machinery, apply straw mulch or hydroseed stockpiles, storage period not to exceed 18 months). ▪ Stockpiles of peat and topsoil to be sited well clear of outside flood hazard areas along all waterways. ▪ Devise methods and agree on processes to deal with unforeseen ground conditions that emerge during earthworks (eg springs, heavily compacted subsoils, boulders, buried foreign material, etc to be identified and referred to Project Engineer and Project Landscape Architect). ▪ Monitor weather conditions and programme work to suit weather	▪ Project Landscape Architect and Project Ecologist to review and comment on earthworks drawings and specifications and provide input as required. ▪ Contract documentation to clearly identify extent of ground disturbance and access and operating areas for all earthmoving machinery. ▪ Contract documentation to set out protocols and procedures for Project Landscape Architect (and Project Ecologist where required), KCDC representative and Constructors regarding final shaping of earthworks. [KCDC has observation role – see paragraphs 8.9 and 8.10.] ▪ Project Landscape Architect (and Project Ecologist where required) to hold briefings and training sessions with Constructors prior to each construction stage and then on an ongoing basis as required. ▪ Contract documentation to specify methodology for removal, re-spreading, and storage of topsoil. ▪ Project Landscape Architect and Project Ecologist to monitor all realignment and shaping of waterways and wetland areas. ▪ Project Landscape Architect Project Ecologist. and Project Stormwater Specialist to monitor formation and shaping of all offset flood storage wetland areas. ▪ Contract documentation to include protocols and procedures to deal with unforeseen ground conditions (eg springs or extremely wet areas revealed during earthworks, etc) ▪ Project Landscape Architect and Constructors (and Project Ecologist for wetland areas) to coordinate final shaping of earthworks to minimise any adverse effects of wind and water erosion (including location and placement of logs for habitat, etc).

	conditions. Ensure procedures are in place to minimise the effects of wind and water erosion (eg avoid stripping topsoil in the rain, re-spread topsoils when they are slightly moist but not wet to yield the greatest structural stability). ▪ Stockpiling of logs from peat extracted for use in wetlands and streams to provide habitat for instream fauna and bank stabilisation.	
Protection of Earthworks and Planted Areas Prior to Planting		
▪ Protect and stabilise all earthwork surfaces from scouring once final shaping has been completed. ▪ All finished earthworks to be hydroseeded or similar or mulched on completion. In accordance with ESCP requirements. ▪ Protect all final earthworks from damage and compaction.	▪ Soil surface to be stabilised by hydroseeding, hydromulching, mulching, and/or use of brush or straw or other proven methods. ▪ Measures required to temporarily control stormwater and to manage runoff prior to hydroseeding/hydromulching to prevent scouring. ▪ Hydroseeding species mix and methods to maximise germination success. Two mixes proposed: 1. Standard ryegrass hyroseed mix for temporary grassing of earthworks prior to planting. 2. Low Grow Grass- If appropriate areas to be permanently grassed will be sown with low-grow mix immediately following earthworks. Low grow/low maintenance mix as per NZTA Specification of 60% turf ryegrass, 15% browntop, 25% huia white clover. ▪ Temporary fencing of finished earthwork areas to be installed prior to planting.	▪ Contract documentation to set out measures for soil stabilisation, hydroseeding/hydromulching/mulching and temporary fencing requirements. ▪ Project Landscape Architect to hold briefings and training sessions with Constructors prior to commencement of each construction stage and then as required. ▪ Project Landscape Architect to monitor stabilised/ hydroseeded earthworks given that planting will occur during a 3 month planting season only (i.e. June-August). Depending on when final earthworks are completed, some finished earthwork areas will therefore remain unplanted for 8-9 months.
Placement of Soil Mixes		
▪ Soil mixes not to be placed on unduly compacted areas; such areas to be loosened by ripping or discing prior to final levelling. ▪ Soil mixes to be spread over final bulk earthworks to specified depth and 'keyed in' to substrate.	▪ Method(s) of placing soil mixes to compensate for bulking factor to ensure correct final depth and avoid over compaction (ie use low ground pressure machinery or lightweight tracked or balloon tyred equipment; soil mixes applied in layers of 250-300mm. ▪ Once placed soil to be tamped to lightly compact and bind surface prior to hydroseeding/hydromulching.	▪ Contract documentation to set out depth of soil mixes and measures for placement and compaction (ie, 100mm minimum depth for grass areas, 300mm minimum for tree and shrub areas, and 1000mm minimum for tree pits). ▪ Soil mix placement trial to be established in May 2013 and monitored on an ongoing basis. ▪ Project Landscape Architect to hold briefings and training sessions with Constructors prior to commencement of each construction stage and then as required. ▪ Project Landscape Architect monitor soil placement.

Pest Plant and Weed Control		
▪ Ensure aggressive pest plants present in areas to be planted such as convolvulus blackberry and tradescantia, are eliminated from areas to be planted well in advance of planting ▪ Planting to be carried out in only areas identified as weed-free to minimise competition. ▪ Aggressive weed species to be monitored and controlled following planting.	▪ Set up weed control trial to determine most effective weed control methods for different situations (i.e. terrestrial, riparian, wetland areas). ▪ Formulate weed control method and programme based on overall construction and planting programme. Weed control programme will involve mowing, followed by one and in some cases two sprays to kill regrowth using proprietary herbicides.	▪ Monitored weed control trial to be established in May 2013. ▪ Weed control trial and methods to be reviewed and approved by Project Ecologist and Project Landscape Architect. ▪ Requirements for weed control to be incorporated into specifications and contract documentation.
Pest Animals		
▪ Reduce browsing pest animal (rabbits, hares, possums) numbers in advance of planting.	▪ Browsing pest animal control methods and programme to be prepared by Landscape Constructor. ▪ Planted areas to be fenced to exclude browsing pest animals prior to planting. Fence to have mesh on lower section and buried 300mm below ground surface to prevent access by rabbits and hares.	▪ Requirements for browsing pest animal control to be incorporated into planting specifications. ▪ Success of browsing pest animal control to be monitored by Project Landscape Architect and Project Ecologist. ▪ Browsing pest control procedures adapted to suit results from monitoring.
Planting		
▪ Planting to meet landscape, ecological and amenity requirements as stated in AEE (Technical Report 7, Assessment of Landscape and Visual Effects and Technical Report 5, Ecological Assessment) and as specified in consent conditions. ▪ Planting associated with Waikanae River and Muaupoko Stream to conform to specific requirements of GWRC and as set out in the GWRC '*Waikanae River Environmental Strategy*', August 2011. ▪ Planting plans in the Waikanae River corridor to be approved by GWRC Flood Protection. ▪ KCDC input and review of planting as part of the SSLMP preparation process. ▪ Planting in the vicinity of the Takemore Cultural Precinct to reflect iwi requirements. ▪ Planting in areas identified as Landscape Focus areas and in other areas identified in conditions to take account of specific requirements of parties in these areas. ▪ Planting plans for urban areas and CWB to meet Crime Prevention Through Environmental Design (CPTED) principles. ▪ Ensure planting design provides sufficient habitat in the appropriate areas for lizards and fernbird and other ecological	▪ Consultation with all parties identified in consent conditions during preparation of the LMP and SSLMPs. ▪ Close liaison with GWRC Flood Protection when planting plans for Waikanae River are being developed. ▪ Documentation of outcomes of consultation, either as being adopted in LMP and SSLMPs or reasons stated why requirements are unable to be met. ▪ Planting success determined by standards as stated in consent conditions. ▪ Species composition and mixes, plant densities and details for all planting to be jointly developed by Project Landscape Architect and Project Ecologist. ▪ Species composition and mixes, plant densities and details for planting in swales and stormwater wetlands to be jointly developed by Project Landscape Architect, Project Ecologist, and Project Hydrologist/Stormwater Specialist. ▪ All planting to be carried out in specified planting season only; this will run each year from the beginning of June until the end of August. ▪ CPTED review of planting plans in urban areas undertaken by	▪ Refer to procedures as set out in 'Planting in Special Areas' above under Pre construction. ▪ Project Ecologist to provide input into development of and review of final planting plans and documentation to ensure there are sufficient provisions for lizard and fernbird habitat, and also other habitat requirements. ▪ CPTED approval for all planting plans in urban areas prior to issue to Constructors. ▪ Contract documentation to set out planting requirements in terms of species composition and mixes, plant grades, sizes, densities, timing and the planting standards to be met. ▪ Project Landscape Architect and Project Ecologist to hold briefings and training sessions with Constructors prior to planting in each construction stage and then as required. ▪ Project Landscape Architect to approve all areas for planting 5 days prior to commencement. Only those areas where there is no evidence of pest plants and weeds will be approved for planting to proceed. ▪ Project Landscape Architect to monitor all planting and liaise with Project Ecologist as required in relation to areas of ecological

mitigation requirements as set out in SSEMPs. ▪ Planting to occur only in weed and pest plant free areas. ▪ Planting to proceed only when area has been securely fenced to prevent access from pest animals. ▪ Only plants that have been properly conditioned to be planted. ▪ Potential to use manuka and kanuka slash cleared from Project area to supplement planting in specific areas. ▪ Ensure successful establishment of all plants.	suitably qualified specialist prior to being issued. ▪ Monitor ground moisture conditions prior to and following planting to avoid new planting to become stressed. ▪ Landscape contractor to reject diseased or unthrifty plants and any plants that are not true to type or grade. ▪ Identify areas of manuka and kanuka that will be removed from Project area.	mitigation planting. Monitoring will involve monthly inspections and documentation of findings, together with regular meetings and liaison with Constructors. ▪ Project Landscape Architect and Project Ecologist to determine where manuka and kanuka slash could be used to supplement planting. ▪ Contract documentation to include provisions for dealing with unseasonally dry conditions, such as provision for watering.
Mulch Placement		
▪ Consistent composition and depth of mulch on all planting areas where specified. ▪ Mulch placement to avoid damage to planting and to avoid mulch 'creep'.	▪ Organic mulch of various grades depending on the type of planting will be used for most areas but stone mulch or wool mulch mat to be used in riparian and wetland areas subject to inundation or scouring. ▪ Constructor to devise mulch placement method(s); these could involve mulch being blown on or spread by machinery on to areas prior to planting or placement post planting.	▪ Contract documentation to state type of mulch to be used, grade of organic mulch, and depth for each area to be planted and how mulch will be maintained. Depth of organic mulch on all areas to be 100mm when applied; depth of stone .mulch 100mm. ▪ Mulch placement method(s) to reviewed and approved by Project Landscape Architect. ▪ Constructors to supply mulch samples for each area to be planted for approval by the Project Landscape Architect 5 days prior to placement.
Cycleway/Walkway/Bridleway (CWB)		
▪ Planting to avoid interference with cyclists and walkers or creation of unsafe conditions along CWB or long term vegetation management issues.	▪ Plant composition and patterns to take account of use and function of CWB into account, especially when planting is mature. ▪ CPTED review of planting plans along CWB to be undertaken by suitably qualified specialist prior to being issued. ▪ KCDC Recreation specialist to review input to planting associated with CWB.	▪ Project Landscape Architect to arrange for CPTED review as part of development of planting plans for each stage. ▪ Project Landscape Architect to arrange KCDC Recreation specialist input into planting associated with CWB.
Specimen Grade Trees		
▪ Maximise survival rates for all specimen tree planting.	▪ Stake and protect as required all large grade specimen trees proposed as part of the planting at the Kāpiti Road and Te Moana Road interchanges and other areas yet to be defined. ▪ Provide for irrigation of specimen trees at Kāpiti Road and Te Moana Road interchanges. ▪ Liaise with KCDC to select species, grades, tree pit details and means of protection for specimen tree planting at Kāpiti Road and Te Moana Road interchanges	▪ Contract documentation to include details for successful planting, protection, and growth for all specimen trees. Depth of tree pits 1000mm; trees to be staked and protected as required, depending on species and location. ▪ Constructors to provide connection points for irrigation and provision for secure location of irrigation controller for specimen tree planting at Kāpiti Road and Te Moana Road interchanges.

Enrichment Tree Planting		
▪ Ensure timely introduction of enrichment tree planting in all areas identified. ▪ Protect existing planting during the enrichment process. ▪ Locations of enrichment species to be determined in SSMPs and/or on site.	▪ Enrichment tree planting, which is proposed at various locations along the Expressway, to be inter-planted once initial mass planting well established; timing will vary depending on location and circumstances (i.e. after 1-3 years). ▪ Timing of enrichment tree planting to be coordinated with KCDC. ▪ Maintenance period of enrichment planting to run for 3 year period from time of planting of enrichment species.	▪ Contract documentation to clearly identify and describe areas for enrichment planting including species composition and all details regarding inter-planting and maintenance (eg staking, temporary protection, etc). ▪ Project Landscape Architect to approve timing of enrichment planting based on monitoring the success and development of mass planting, in consultation with Project Ecologist. ▪ Project Landscape Architect and Project Ecologist as required, to hold briefings and training sessions with Constructors prior to commencement of enrichment planting in each area where specified to ensure mitigation success requirements have been achieved.

POST CONSTRUCTION

PRINCIPLES	METHODS	PROCEDURES
Pest Plant and Animal Control		
▪ New planting to be protected from pest plant and animals.	▪ Presence of pest plants and animals to be monitored post planting and ongoing control carried out as required. ▪ Ensure pest animal proof fencing around planted areas is secure; inspection and monitoring required. ▪ Individual plant protectors to be used if required (eg for pukeko-prone disturbance).	▪ Contract documentation to include details for ongoing pest plant and animal monitoring and control. ▪ Contract documentation to include specifications and details for pest animal proof fencing and monitoring its effectiveness post planting on an ongoing basis.
Planting Maintenance		
▪ All planting to be maintained to a high standard in accordance with best practice and consent conditions..	▪ Maintenance specifications to clearly set out the procedures that are acceptable for plant establishment and grass care in accordance with appropriate standards. ▪ Planting maintenance plans to incorporate methods where appropriate from NZTA and other standards as specified in the consent conditions. ▪ Project Landscape Architect to coordinate maintenance levels and expectations with KCDC.	▪ Contract documentation to stipulate monitoring required and the maintenance tasks and timing during the specified maintenance periods as set out in the consent conditions. ▪ Landscape Constructor to prepare maintenance plans for all planting areas for review and approval by the Project Landscape Architect. ▪ Project Landscape Architect and Project Ecologist to monitor ongoing plant establishment, ground conditions and levels of maintenance. ▪ Project Landscape Architect in conjunction with Project Ecologist for ecological mitigation areas, to determine when plant replacement or remedial works are required. ▪ Project Landscape Architect to establish regular liaison and reporting on plant establishment and maintenance with KCDC and GWRC (for Waikanae River and Waimeha Stream areas)..
Mulch Top Up		
▪ Mulch depth to be maintained throughout maintenance periods.	▪ Mulch depth to be monitored as part of overall planting maintenance.	▪ Contract documentation to stipulate mulch depth and periodic monitoring required. (Organic mulch depth to be maintained at 75mm, stone mulch at 100mm). ▪ Landscape Constructor to top up organic mulch to maintain required depth during maintenance period.

Rehabilitation of Sand Dune at Otaihanga Yard		
▪ See Section 9.8 and 9.9 ▪ To retain the dune landform that will separate the construction yard from Otaihanga Road, with as little modification as possible.	▪ Co-ordination with construction design team to design footprint that reduces the extent of modification of the dune.	▪ At completion of the Project the disturbed parts of the dune areas will be reshaped, the form and details of which will be developed in discussion with KCDC. The areas within the permanent designation will be reinstated as part of the permanent works, which will developed during the SSMP for this area.

Attachment 3: Site Specific Management Plans

The 10 sheets of annotated aerial photographs of the Site Specific Management Plans that follow, shows the relationship between the Site Specific Landscape Management Plans (SSLMPs), the Site Specific Ecological Management Plans (SSEMPs), and the Site Specific Urban Design Plans (SSUDPs).

The final annotated aerial photograph in this series shows the 16km route to show the relationship between the 12 Landscape Character Areas and the 33 Construction Stages.

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SSP 1

CHARACTER AREA BOUNDARY

0 2550 100 m

- Construction Designation
- Permanent Designation
- Indicative Footprint - Otaihanga Yards
- Construction Section
- Riparian Mitigation Planting
- Wetland Mitigation Planting
- SS UDMP
- SS LMP

No.	Revision	By	Chk	Appd	Date
2	MANAGEMENT PLANS	PM	BF	BF	08-07-13
1	MANAGEMENT PLANS	PM	BF	BF	01-05-13

Original Scale (A1): VARIOUS
Reduced Scale (A3):
Design | Drawn | Dsg Verifier | Dwg Check | Approved For | Date
* Refer to Revision 1 for Original Signature

NZ TRANSPORT AGENCY WAKA KOTAHI
Mackays to Peka Peka

Project: SH1 MACKAYS TO PEKA PEKA EXPRESSWAY
FOR INFORMATION

Title: SITE SPECIFIC MANAGEMENT PLAN OPTIONS

Document Set#
Drawing No: M2PP-12R-D-GPH-0001 Rev
Sheet 1 of 10

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Document No: W09181B_LSC_MgtPlan_A3dp

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No.	Revision	By	Chk	Appd	Date
2	MANAGEMENT PLANS	PM	BF	BF	08-07-13
1	MANAGEMENT PLANS	PM	BF	BF	01-05-13

Original Scale (A1) VARIOUS Reduced Scale (A3)

Design | Drawn | Dsg Verifier | Dwg Check | Approved For | Date

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NZ TRANSPORT AGENCY

Mackays to Peka Peka

Project: SH1 MACKAYS TO PEKA PEKA EXPRESSWAY

FOR INFORMATION

Title: SITE SPECIFIC MANAGEMENT PLAN OPTIONS

Document Set:

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Sheet 2 of 10

Document No. W09181B_LSC_MgPlan_A3dp

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No.	Revision	By	Chk	Appd	Date
2	MANAGEMENT PLANS	PM	BF	BF	08-07-13
1	MANAGEMENT PLANS	PM	BF	BF	01-05-13

Original Scale (A1): VARIOUS
Reduced Scale (A3):
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NZ TRANSPORT AGENCY
Mackays to Peka Peka

Project: SH1 MACKAYS TO PEKA PEKA EXPRESSWAY
FOR INFORMATION

Title: SITE SPECIFIC MANAGEMENT PLAN OPTIONS

Document Set:
Drawing No: M2PP-12R-D-GPH-0001
Sheet 3 of 10
Rev

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Document No: W091918_LSC_MgtPlan_A3dp

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SSP 5

Construction Designation
Permanent Designation
Indicative Footprint - Otaihanga Yards
Construction Section
Riparian Mitigation Planting
Wetland Mitigation Planting
SS UDMP
SS LMP

0 25 50 100 m

No.	Revision	By	Chk	Appd	Date
2	MANAGEMENT PLANS	PM	BF	BF	08-07-13
1	MANAGEMENT PLANS	PM	BF	BF	01-05-13

Original Scale (A1): VARIOUS
Reduced Scale (A3):
Design | Drawn | Dsg Verifier | Dwg Check | Approved For | Date
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NZ TRANSPORT AGENCY
Mackays to Peka Peka

Project: SH1 MACKAYS TO PEKA PEKA EXPRESSWAY
FOR INFORMATION

Title: SITE SPECIFIC MANAGEMENT PLAN OPTIONS

Document Set:
Drawing No: M2PP-12R-D-GPH-0001
Sheet 4 of 10
Rev

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No.	Revision	By	Chk	Appd	Date
2	MANAGEMENT PLANS	PM	BF	BF	08-07-13
1	MANAGEMENT PLANS	PM	BF	BF	01-05-13

Original Scale (A1) VARIOUS Reduced Scale (A3)

Design | Drawn | Dsg Verifier | Dwg Check | Approved For | Date

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NZ TRANSPORT AGENCY

Mackays to Peka Peka

Project: SH1 MACKAYS TO PEKA PEKA EXPRESSWAY

FOR INFORMATION

Title: SITE SPECIFIC MANAGEMENT PLAN OPTIONS

Document Set:

Drawing No: M2PP-12R-D-GPH-0001

Sheet 5 of 10

Rev

Document No. W09181B_LSC_MgtPlan_A3dp

Drawing File 8/07/2013 4:27:17 p.m.

No.	Revision	By	Chk	Appd	Date
2	MANAGEMENT PLANS	PM	BF	BF	08-07-13
1	MANAGEMENT PLANS	PM	BF	BF	01-05-13

Original Scale (A1): VARIOUS
Reduced Scale (A3):
Design | Drawn | Dsg Verifier | Dwg Check | Approved For | Date
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NZ TRANSPORT AGENCY WAKA KOTAHI
Mackays to Peka Peka

Project: SH1 MACKAYS TO PEKA PEKA EXPRESSWAY
FOR INFORMATION

Title: SITE SPECIFIC MANAGEMENT PLAN OPTIONS

Document Set:
Drawing No: M2PP-12R-D-GPH-0001
Sheet 6 of 10
Rev

Document No: W91818_LSC_MgtPlan_A3.tp