Landscape & Ecological Management Plan (LEMP)

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Author	Elisa Chillingworth
Project Manager	James Lake

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Draft: Draft issue for internal review and comment.
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Revision Details

Once 'Issue for Construction' status is achieved, the LEMP should be treated as a 'live' working document, with additional information added as the project lifecycle develops.

A summary of the amendments is to be recorded on the Amendments Record below.

Revision	Details
01	Initial Draft
02	Revised to accommodate comments provided by WCC: • Email from Joel De Boer 15-05-2020 at 2:00pm • Email from Joel De Boer 18-05-2020 at 9:30pm • Email from Joel De Boer 19-05-2020 at 3:15pm • Email from Joel De Boer 21-05-2020 at 7:36am • Email from Joel De Boer 26-05-2020 at 10:00am
03	Revised to accommodate comments provide by the CRG.
04	Revised for certification following final comments from WCC
A	Updated to reflect certified status

Contents

Acronyms and Abbreviations

AEE	Assessment of Environmental Effects
CMO	Compliance Monitoring Officer
CPTED	Crime Prevention through Environmental Design
CLG	Community Liaison Group
CLP	Community Liaison Person
CRG	Community Reference Group
DC	Designation conditions
DoC	Department of Conservation
EIA	Environmental Impact Assessment
GWRC	Greater Wellington Regional Council
GWRCRC	Greater Wellington Regional Council Resource Consents
LEMP	Landscape and Ecological Management Plan
LC	Licence Conditions
PFMP	Playing Field Management Plan
POWP	Prince of Wales Park
RC	Resource Consent
RCC	Resource Consent Conditions
TBA	Town Belt Act
TBAC	Town Belt Act Licence Conditions
WCC	Wellington City Council
WCCD	Wellington City Council Designation
WWL	Wellington Water

1 Introduction

The proposal is to construct a buried concrete reservoir, named Omāroro reservoir, with a capacity of 35,000m^3 in the Town Belt, immediately southwest of the Upper Field of the Prince of Wales Park in Mount Cook, Wellington. This Landscape and Ecological Management Plan (LEMP) incorporates the Playing Fields Management Plan (PFMP). This LEMP is to be applied to the environmental management of the Omaroro project along with a series of other Environmental Management Plans. This LEMP addresses all aspects of the landscape, ecological and playing fields management initiatives during the construction of the Omāroro reservoir.

This LEMP has been prepared in consultation with the Wellington City Council Manager Open Space and Recreation Planning and is in general accordance with the Landscape Strategy and Ecological Impact Assessment provided as part of the Assessment of Environmental Effects (AEE).

The purpose of this LEMP is to outline the methods and measures whilst guiding HEB Construction in managing, remedying, and mitigating environmental effects regarding Landscape, Ecology and Playing Fields Management in order to meet resource consent and designation conditions, relevant legislation, and WCC and WWL's environmental objectives.

This LEMP shall document the permanent mitigation measures, as well as the necessary monitoring and management required to successfully implement those measures during construction and the transition to the operational phase of the Omāroro Project.

2 Project Description

The Project relates to the construction, operation, and maintenance of a 35,000 m^3 reservoir within the Wellington Town Belt in the Prince of Wales Park, Mount Cook. The circular concrete reservoir will be completely buried except for two small access hatches on the roof of the reservoir and a 2.5m by 2.5m doorway and 10m wide service access area to the reservoir's buried service and pipe tunnel.

These accesses are necessary for the on-going operation and maintenance of the reservoir. The reservoir is required to service the Wellington Low Level Water Supply Zone, which provides potable water to approximately 70,000 residents and a range of significant commercial, industrial, and critical community facilities. The Project includes approximately 3.6ha of earthworks and requires clearance of approximately 4ha of land and including approximately 1.7ha of established vegetation.

2.1 *Site Location*

The proposed Omāroro Reservoir site is located on a spur within the Prince of Wales Park. The Prince of Wales Park is located within the Wellington Town Belt in the Brooklyn Hills, Wellington (Figure 1). The park is bordered by the suburbs of Mount Cook, Brooklyn, Vogeltown, and Newtown, with the Renouf Tennis Centre to the north and Macalister Park further to the south.

Figure 1: Proposed reservoir location within Prince of Wales Park showing surrounding streets (Image source: WCC Local Maps)

3 Regulatory Framework

The Omāroro Reservoir Project has been issued numerous regulatory permissions in the form of Resource Consents (4), Designation (1), and a Licence (1). These are identified below:

I. An easement under the Wellington Town Belt Act 2016 (***Licence***)
II. A ***Designation*** under the Resource Management Act 1991 and the Wellington City District Plan
III. ***Resource Consents*** under the Resource Management Act 1991, the operative Greater Wellington Regional Plans, and the proposed Natural Resources Plan ***WGN180065*** [***35008****]* – Water Permit, [***35009***] – Discharge Permit, [***35010***] – Land Use Consent.
IV. District Consents under National Environmental Standard (**NES**) for Assessing and Managing Contaminants in Soil to Protect Human Health

The Greater Wellington Regional Council Resource Consents (GWRCRC), Wellington City Council Designation (WCCD) and Town Belt Act Licence Conditions (TBAC) specify the purpose and objectives of the five (5) management plans. Conditions from each of these regulatory permissions which specifically relate to this LEMP are identified below in Tables 1, 2 and 3. This LEMP along with the other management plans will demonstrate how HEB Construction will achieve compliance with these regulatory requirements and constraints. Column 3 of each table below named "LEMP Section Reference or Relevant Management Plan" will direct the reader to which section of the LEMP, or

other relevant management plan, relating specifically to conditions and requirements of the various regulatory permissions.

2.2 Wellington Town Belt

It is widely accepted that the Wellington Town Belt is essential to not only the character and function of the city but the physical, emotional and spiritual health and wellbeing of its people. The Town Belt protects a large, predominantly natural, open-space environment with a huge range of direct and indirect environmental, social, recreational and economic benefits to the city and its residents. This LEMP is development and will be implemented to ensure these Town Belt values are retained and returned as part of the Omaroro Reservoir Construction Project.

3.1 *Greater Wellington Regional Council Resource Consents*

Table 1 below lists the resource consent condition numbers and requirements concerning the Landscape and Ecological Management plan (LEMP), provided by The Greater Wellington Regional Council (GWRC). Table 1 also directs the reader to which section of the LEMP, or corresponding management plan, relates to these conditions.

I. ***WGN180065*** [***35008***] – Water Permit: To take and use groundwater for the purposes of dewatering excavations, dust suppression and other purposes related to the construction of the Omāroro Reservoir.
II. ***WGN180065*** [***35009***] – Discharge Permit: To discharge stormwater runoff from areas of bulk earthworks and de-watered groundwater both treated with chemical flocculants to land, the stormwater network or directly to water related to the construction of the Omāroro Reservoir.
III. ***WGN180065*** [***35010***] – Land Use Consent: To undertake earthworks of an area of more than 3,000m^2 including to excavate land that may intercept groundwater (bore) required to construct of the Omāroro Reservoir.

Table 1: Greater Wellington Regional Council Conditions

GWRC Resource Consent Conditions		
Pre-Construction Requirements		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
7b(ii)	Confirmation of playing fields use and/or raising of levels i.e. a 'Playing Fields Management Plan'	9.1 Purpose and Scope
7b(iii)	Details of enhancement of riparian vegetation along all waterways within the site area	8.2 Riparian Planting
7d(i)	Methodology and proposed trigger limits for water quality monitoring and discharges	7.4 Stream Discharges
7d(ii)	Procedures for environmental auditing, monitoring and reporting	8.11 Monitoring, Inspection and Defects Period 8.11.4 Monitoring and inspection plan
8e(v)	Any "no go" and/or buffer areas to be maintained undisturbed, including minimum buffer strips of riparian vegetation to be retained	8.1 Buffer Zones
8(f)	Timetable and nature of progressive site rehabilitation and re-vegetation proposed	Erosion and Sediment Control Plan (ESCP) 8.4 Planting Programme

8(h)	Rainfall response and contingency measures including procedures to minimise adverse effects in the event of extreme rainfall events and/or the failure of any key erosion and sediment control measures or devices	7.4.1 Rainfall Event Monitoring 7.4.2 Actions Resulting from a Discharge Erosion and Sediment Control Plan – Section 11.7.3
Discharge Activities		
21(e)	Notwithstanding the requirements of any other conditions of this consent, the consent holder shall ensure that, after a reasonable mixing zone, discharges from the site shall not give rise to any of the following effects in any receiving waterbody: Any significant adverse effects on aquatic life. *Note: For the purposes of this condition, the end zone of reasonable mixing is defined as a point 50 metres downstream from any point of discharge to a waterbody.*	7.4.1 Rainfall Event Monitoring 7.4.2 Actions Resulting from a Discharge
Site Auditing Activities		

33(a-j)	The consent holder shall ensure that the site is audited by a suitably qualified and experienced person on a minimum of: • A weekly basis, and • After a rainfall event of greater than 20mm in a 24-hour period, or 7mm in a one-hour period, as measured at the Greater Wellington Regional Council's 'Newtown at Mansfield Street' rainfall monitoring site, or • At a longer frequency to the satisfaction of the Manager The audits are to ensure that the erosion and sediment control methods are being maintained in accordance with the approved final ESCP referred to in condition (8) and the relevant phase-specific ESCP referred to in condition (9). The audits shall include, but not be limited to, the following information: a) Date; b) Name of auditor; c) Site condition; d) Weather conditions; e) Sediment management (including identification of problem areas that are not being treated by sediment control measures, and any measures put in place to treat these areas); f) Runoff control (check of diversion channels and check sediment retention pond); g) Condition and effectiveness of erosion and sediment control measures and devices, including silt fences, contour drains and sediment retention ponds; h) Maintenance required and the date this will be completed by; i) Contractor responsible for the maintenance; and j) General comments. *Note: Audits will be required while any area is being cleared of vegetation and soil, or earth worked. Once an area has been stabilised in accordance with condition (24) and there are no works occurring on site, the audits for this condition are no longer required.*	Erosion and Sediment Control Plan – Section 11.7.3 7.4.1 Rainfall Event Monitoring

3.2 *Wellington City Council Designation*

Table 2 below lists the designation condition numbers, and their requirements, provided by The Wellington City Council (WCC) which specifically relate to the Landscape and Ecological Management Plan (LEMP). The table also directs the reader to which section of the LEMP, or corresponding management plan, relates to these conditions.

Table 2: Wellington City Council Designation Conditions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape & Ecology Management Plan		
DC.32(a)	At least 15 Working Days prior to Commencement of Construction	6.1 Pre-construction Notification Requirements

	or vegetation removal, the Requiring Authority shall submit a LEMP to the CMO for certification	
DC.32(b)	The LEMP shall be in general accordance with the Landscape Strategy and Ecological Impact Assessment provided in the AEE and address the matters in condition DC. 33	8.0 Key Landscape Issues and Strategy
DC.32(c)	Construction shall not commence until the Requiring Authority has received the CMO written certification of the LEMP	4.2 Management Plan Submission & Approval Process
Advice Note:	The LEMP may be part of a combined document including the Playing Fields Management Plan.	
DC.33	The purpose of the LEMP is to outline the methods and measures to be implemented prior to the Works, during the construction phase, and for a defined period thereafter to avoid, remedy, and mitigate adverse effects of the construction and the Project on landscape amenity, use and function. The LEMP shall document the permanent mitigation measures, as well as the necessary monitoring and management required to successfully implement those measures during construction and the transition to the Operational phase of the Project. The LEMP shall, as a minimum, address the following:	
DC.33(a)	Final landscape strategy	8. Key Landscape Issues and Strategy
DC.33b	Confirmation of an appropriate buffer between the earthworks and waterways including confirmation of waterway location by longitudinal and cross-section survey. In the case of the Papawai Stream the buffer shall be no less than 10m on the stream's west bank (hillside). In the case of the Waitangi Stream Tributary, to the west of the project site, no buffer shall be less than 5m.	8.1 Buffer Zones 6.2 During construction notification requirements
DC.33c	How the final reservoir backfill design will support a smooth integration with adjacent topography and optimise effective revegetation conditions	8.3.6 Reservoir Backfill Design
DC.33d	Details of replaced pathways through the site, which shall be designed with reference to the WCC "Short Walk Standard"	8.5.1 Final Track Network
DC.33e	Consideration of CPTED principles in relation to the pipe tunnel access door	8.6.1 Pipe tunnel access door
DC.33f	Identification of vegetation to be retained, including retention of as many as practicable significant trees and areas of regenerating indigenous vegetation	7.3 Vegetation Removal & Retention
DC.33g	Protection measures for vegetation to be retained and vegetation clearance methodology as outlined in condition DC.34, including specifying a requirement that the removal of large trees shall be undertaken by an arborist to minimise damage to adjacent vegetation.	7.3 Vegetation Removal & Retention & 7.3.1 Vegetation Protection Measures & Edge Effects
DC.33h	Under conditions DC.33 f) and (g) above, particular attention shall be given to minimisation of the loss of trees in the Seral Forest B and to the protection of trees in the Seral Forest B that do not need to be removed. Where any vegetation is required to be removed from Seral Forest B, the Requiring Authority shall provide the CMO with a written explanation for why the removal is needed.	7.3.3 Seral Forest
DC.33i	A methodology for the monitoring of the nest boxes required by condition DC. 34 during construction, to be prepared by a suitably qualified and experienced ornithologist	7.1.1 Nest Boxes
DC.33j	A methodology for surveying lizard presence prior to vegetation clearance, and minimising effects on lizard populations as required by condition DC.35.	7.2 Lizard Survey
DC.33k	Details of proposed mass planting and specimen tree planting including plant species, plant/grass mixes, spacing/densities, sizes (at the time of planting) and layout and planting methods. The	8.4.1 Planting Species and Planting Specifications

	intention is to achieve a dense canopy of complementary plant communities which will achieve a variation in plant height.	
DC.33l	Planting programme – the staging of planting in relation to the construction programme which shall, as far as practicable, include provision for planting within the first planting season following completion of the Project	8.4 Planting Programme
DC.33m(i)	Detailed specifications relating to (but not limited to) the following: Weed control and clearance	8.7 Weed Control
DC.33m(ii)	Ground preparation	8.3.2 Ground Preparation
DC.33m(iii)	Mulching	8.3.3 Substrate
DC.33m(iv)	Plant supply and planting, including hydro-seeding and grassing	8.4.1 Planting Species and Planting Specifications
DC.33m(v)	Proposed maintenance of plantings, including the replacement of unsuccessful plantings	8.11.1 Maintenance
DC.33m(vi)	Response maintenance for existing vegetation affected by opening of the canopy during construction (this is required to address potential windfall effects that may arise as a result of peripheral tree removal)	8.11.1 Maintenance
DC.33n	Subject to achieving the success standards in paragraphs i), ii) and iii) below, there shall be a five-year defects liability and maintenance period for all terrestrial planting, but the maintenance period may be shorter if the success measures have been achieved earlier. At the end of that period, the Requiring Authority shall provide information to the CMO to demonstrate that the planting has been successful, with success defined as follows:	8.11.7 Defects and liability period – Planting and Landscaping 6.3 Post Construction Notification Requirements
DC.33n(i)	In relation to mass planting, successful planting shall be defined as 80% canopy closure whereby a sustainable plant community has been established and where plants have grown to create a canopy that shades the ground and suppresses weed growth	8.11.7 Defects and liability period – Planting and Landscaping 6.3 Post Construction Notification Requirements
DC.33n(ii)	In relation to the planting of specimen trees, successful planting shall be defined as 100% plant survival, with 100% of trees in full leaf(if the relevant species is typically in leaf at that time of year) with the trees to have a habit of growth that is normal to the species and are to be sound, healthy and vigorous with normal and well-developed branch systems	8.11.7 Defects and liability period – Planting and Landscaping 6.3 Post Construction Notification Requirements
DC.33n(iii)	Success in relation to wetland and riparian planting shall be defined as nearly as practicable to the criteria in i), or ii) and in any event as agreed by expert ecologists.	8.11.7 Defects and liability period – Planting and Landscaping 6.3 Post Construction Notification Requirements
DC.34	Prior to any vegetation clearance occurring:	7.3 Vegetation Removal & Retention
DC.34(a)	The maximum extent of clearance is to be clearly identified and confirmed by the Project Ecologist in consultation with the Project Landscape Architect and Project Construction Manager	7.3 Vegetation Removal & Retention
DC.34(b)	Vegetation to be retained will be clearly marked on site, with special attention given to large trees and Seral Forest B	7.3 Vegetation Removal & Retention
DC.34(c)	As far as practicable, vegetation clearance will occur outside the breeding season of kaka, falcon, kakariki, and morepork (1 September to 30 March)	7.1 Nesting Bird Survey

DC.34(d)	If vegetation clearance must occur during the period identified in condition DC.34 c), a survey shall be undertaken prior to clearance by a suitably qualified and experienced ornithologist to determine if a nest or nests are present. If a nest of any of the species identified in DC. 34c) is located on a tree to be felled, that tree must not be felled until the chick(s) has left the nest	7.1 Nesting Bird Survey 6.2 During Construction Notification Requirements
DC.34(e)	The Requiring Authority shall engage a suitably qualified and experienced ornithologist to provide a recommendation on the type, location and number of nest boxes that must be installed in adjacent areas of vegetation specifically for resident kaka and morepork.	7.1 Nesting Bird Survey
DC.34(f)	Nesting boxes required under DC.34 e) shall be installed under the supervision of the ornithologist prior to the commencement of any tree removal.	7.2 Nest Boxes
Advice Note:	Evidence that the above process has been followed is to be provided to the CMO upon request. The CMO shall consult with an ecologist within the Council.	
DC.35(a)	Prior to any vegetation clearance occurring, a lizard survey is to be undertaken of the project site and surrounding area by a herpetologist.	7.2 Lizard Survey
DC.35(b)	If any lizards are found or their presence is suspected measures must be developed to minimise the effect of the project on the lizard population, this may include lizard relocation prior to vegetation clearance, and habitat re-creation associated with post construction site remediation and landscaping. These measures must be included in Landscape and Ecology Management Plan required under conditions DC.32 and DC.33.	7.2.1 Lizard Habitat Construction
DC.36	Prior to commencing construction the Requiring Authority shall remove and store the existing bench seat and plaque located on the reservoir site. Within six months of the completion of construction the bench seat and plaque shall be re-instated.	8.10.2 Existing bench seat and plaque 6.3 Post Construction Notification Requirements
DC.37	A planting review must be undertaken by a suitably qualified and experienced landscape architect within 3 years of completion of construction of the reservoir. The review will focus on the revegetation and assess the effectiveness of plant growth, particularly on mechanically stabilised slopes. Where required, remedial works shall be undertaken to ensure that planting treatments are successful and have the potential to improve the landscape values of the site. Evidence of this review must be provided to the CMO.	8.11.3 Planting review 6.3 Post Construction Notification Requirements
Playing Fields Management Plan		
DC.38		
a)	At least 15 Working Days prior to Commencement of Construction the Requiring Authority shall submit a Playing Field Management Plan (PFMP) to the CMO for certification	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements 6.1 Pre-construction Notification Requirements
b)	The PFMP shall address the matters in condition DC.39	
c)	Construction shall not commence until the Requiring Authority has received the CMO written certification of the PFMP	6.1 Pre-construction Notification Requirements
Advice Note:	The PFMP may be part of a combined document including the Landscape Ecology Management Plan	

DC.39	The purpose of the PFMP is to outline the methods and measures to be implemented prior to the Works, during the construction phase, and for a defined period thereafter to avoid, remedy, and mitigate adverse effects of the construction and the Project on the Upper and Lower Prince of Wales Park playing fields.	9.1 Purpose and Scope
	The PFMP shall, as a minimum, address the following:	
a)	Final design of the fields including levels and improved drainage (where practicable)	**9.2** Ground Preparation - Upper and Lower Playing Fields Reinstatement
b)	Surface specifications	9.2.1 Surface Specifications
c)	Retaining works, including any retaining structure design, where necessary	9.2.3 Retaining Works
d)	Permanent access for maintenance vehicles to both fields	9.2.4 Permanent Access for Maintenance
e)	Fencing	9.2.5 Fencing
f)	Design of the access track between the upper and lower playing fields.	9.2.6 Access Track between Upper and Lower Playing Fields
DC.40		
a)	The PFMP shall be prepared in consultation with the Manager, Open Space and Recreation Planning and the Manager, Sports and Recreation Operations and Contracts.	4.2 Management Plan Submission & Approval Process
b)	The PFMP shall demonstrate how the outcomes of the consultation have been incorporated and, where they have not, the reasons why.	4.2 Management Plan Submission & Approval Process
DC.41	The Requiring Authority shall not permanently raise the upper and lower playing field as part of the Project for the expressed purpose of permanently storing surplus excavated material from the proposed reservoir site.	9.2.1 Raising of Upper and Lower Playing Fields
DC.41	This condition shall not affect or limit any reasonable works required as part of field reinstatement, involving field re-shaping or re-profiling, required to appropriately reinstate playing surfaces as agreed with the Manager Open Space and Recreation Planning and the Manager, Sports and Recreation Operations and Contracts.	9.2.1 Raising of Upper and Lower Playing Fields
DC.42		
a)	There shall be a 1-year defects liability period for works associated with the reinstatement of each of the upper and lower playing fields, including access tracks, retaining walls (where required), fencing and drainage. This 1 year period will commence from the date that the CMO (in consultation with the Manager, Open Space and Recreation Planning and the Manager, Sports and Recreation Operations and Contracts), confirms in writing that the reinstated field or fields, and related tracks, retaining walls, fencing and drainage are suitable for organised sports use and public activities to commence.	9.3.1 Defects and liability period – Playing Fields 6.3 Post Construction Notification Requirements
b)	Within the defects liability period the Requiring Authority is responsible for meeting all reasonable costs associated with ensuring the successful reinstatement of the fields.	9.3.1 Defects and liability period – Playing Fields
c)	At the end of the period in DC.42 a), the Requiring Authority shall provide confirmation to the CMO that the playing field reinstatement, including any required retaining works, permanent maintenance vehicle access works (including the access track between the upper and lower field), fencing and any required defect remedial work/s has been successful. This confirmation shall involve an appropriately qualified and experienced sports turf specialist.	9.3.1 Defects and liability period – Playing Fields
Note:	DC42a) includes flexibility to separately stage the reinstatement of the upper and lower playing fields. For the avoidance of doubt, where this occurs the 1-year defects liability period will vary (in terms of its start and end date) for each field.	

3.3 *Wellington Town Belt Act Licence*

Table 3 below lists the Town Belt Act licence condition numbers, and their requirements, under the Wellington Town Belt Act specifically relate to the Landscape and Ecological Management Plan. The table also directs the reader to which section of the LEMP, or corresponding management plan, relates to these conditions.

Table 3: Town Belt Act Licence Conditions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Protection of Streams		
LC.14	Stream damage to be reinstated and offset:	
	Any damage to the Papawai Stream or Waitangi Stream tributary bed or margins within the Town Belt, not otherwise provided for within the application documents or any consents obtained from Greater Wellington, will be subject to a requirement for reinstatement and offsetting by Wellington Water, in accordance with LC15-LC24. *Note: The intention of this condition is to set a high bar for avoidance of ANY stream disturbance or damage. While a high bar is set, if damage does occur, the remediation will be commensurate with the damage as determined by professionals (refer condition 16). For example, damage ta vegetation at the bank will require replanting of that area and an offset area but will not mean that the offset area needs to be completely redeveloped as a comprehensive stream restoration project.*	7.5 Protection of Streams
LC.15	Stream reinstatement and offset works: Any reinstatement and offset works required by LC.14 shall, unless otherwise agreed by the Manager Open Space and Recreation Planning, be three times the length of the stream bed or margin that is damaged.	7.5.1 Stream Reinstatement and Offset Works
LC.16	Reinstatement and offset works plan to be produced by landscape architect and/ or ecologist: Wellington Water must employ a suitably qualified landscape architect and/or ecologist, to produce a reinstatement and offset works plan, and supervise implementation of any reinstatement works under LC.15.	7.5.1 Stream Reinstatement and Offset Works
LC.17	Reinstatement and offset works plan consultation: If required by the Manager Open Space and Recreation Planning the planning and implementation of works required under LC. 15 shall occur in consultation with any landscape architect and/or ecologist appointed by the Manager Open Space and Recreation Planning.	7.5.1 Stream Reinstatement and Offset Works
LC.18	Damage documentation and reporting: Wellington Water must also formally document any damage incident under LC.14, and include details of this incident on a breach register and provide an update of this breach and its response to this in a report to the next available CRG, or CLG, meeting.	7.5.2 Damage Documentation and Reporting
LC.19	Deleted	
LC.20	Reinstatement and offset works plan approval: The reinstatement and offset plan shall be provided to the Manager Open Space and Recreation Planning for approval 20 working days prior to commencement. Works shall not commence prior to receipt	6.1 During Notification Requirements 7.5.1 Stream Reinstatement and Offset Works

	of written approval.	
LC.21	Reinstatement and offset works completion: Any reinstatement and offset works required under LC. 15 must be completed within three months of the damage, or within an appropriately suitable reinstatement period set out in the reinstatement and offset plan.	7.5.1 Stream Reinstatement and Offset Works
LC.22	Reinstatement and offset works certification: Any agreed reinstatement and offset works under LC. 20 must be inspected by the Manager Open Space and Recreation Planning, or by any appointee of the Manager, and certified in writing as being completed.	7.5.1 Stream Reinstatement and Offset Works
LC.23	Reinstatement and offset maintenance : Any reinstatement and offset works must be maintained by Wellington Water or its contractor to establish as intended. Any reinstatement and offset works plan and reinstated or offset works stream area/s must be added to any draft or final Landscape and Ecology Management Plan (LEMP) required under the designation conditions to ensure the area is subject to ongoing management and maintenance under the LEMP.	7.5.3 Reinstatement and Offset Maintenance
LC.24	Reinstatement and offset works consenting responsibilities: Wellington Water or its contractor will have responsibility for obtaining any consents required from Greater Wellington Regional Council for any stream damage or stream reinstatement and offset works.	7.5.3 Consenting and Cost Responsibilities
LC.25	Reinstatement and offset costs: Any costs associated with LC. 14- LC. 24 will be met by Wellington Water or its contractor, unless otherwise agreed with the Manager Open Space and Recreation Planning.	7.5.3 Consenting and Cost Responsibilities
Notes:	The two streams in or immediately adjacent to the licence area /Papawai Stream, and Waitangi Stream tributary) have acknowledged and significant ecological values. The intention of all conditions is to avoid any disturbance to these streams, and protect the stream habitat, environment and function. Any damage to these streams must be reinstated and appropriately offset.	
	If damage occurs, notwithstanding any other RMA consenting or NOR implications that this may have for Wellington Water, it is anticipated that Wellington Water will provide for the reinstatement and offsetting of any disturbance that occurs. Wellington Water will advise the Manager Open Space and Recreation Planning and the CRG or eLG of any breach, and the actions that it proposes to take to address any damage.	
	The Manager Open Space and Recreation Planning will, on behalf of WCC as Town Belt Trustee, reserve the right to require, where it is considered any licence breach is significant, a modification to the licence or even additional licencing for damage to Town Belt streams.	
Protection of land or Vegetation Outside of the licence Area		
LC.26	Land and vegetation damage to be reinstated and offset	
	Any damage to any land or vegetation outside of the licence area will be subject to a requirement for both the reinstatement of the damage and the provision of offset planting by Wellington Water, in accordance with LC. 27- LC. 37.	7.6 Protection of land or Vegetation Outside of the licence Area
LC.27	Offset planting area	7.6.1 Offset Planting Works
	Any offset planting area required by LC. 26 shall, unless otherwise agreed by the Manager Open Space and Recreation Planning, be:	7.6.1 Offset Planting Works
(a)	Three times the size of the area of land disturbed, or	7.6.1 Offset Planting Works
(b)	In the case of the disturbance of vegetation three times the area of	7.6.1 Offset Planting Works

	land contained within the drip line of any damaged or removed vegetation, or	
(c)	Whichever is the greater of (a) or (b).	7.6.1 Offset Planting Works
LC.28	Damage documentation and reporting	7.6.2 Damage Documentation and Reporting
	Wellington Water must also formally document any damage incident under LC.26 and include details of this incident on a breach register and provide an update of this breach and its response to this in a report to the next available CRG, or CLG, meeting.	7.6.2 Damage Documentation and Reporting
LC.29	Reinstatement and offset planting plan to be produced by landscape architect and ecologist	7.6.1 Offset Planting Works
	Wellington Water must employ a suitably qualified landscape architect and ecologist, agreed to by the Manager Open Space and Recreation Planning to produce a draft reinstatement and offset planting plan, and to plan and implement any reinstatement and offset planting works required under LC.27.	7.6.1 Offset Planting Works
LC.30	Reinstatement and offset planting plan consultation	7.6.1 Offset Planting Works
	If required by the Manager Open Space and Recreation Planning the preparation of the plan and any planning and implementation of works required under LC.27 shall occur in consultation with any landscape architect and/or ecologist appointed by the Manager Open Space and Recreation Planning.	7.6.1 Offset Planting Works 6.2 During Construction Notification Requirements
LC. 31	Review of draft reinstatement and offset planting plan	
	Any draft reinstatement and offset planting plan required under LC. 29 must be provided to the Manager Open Space and Recreation Planning for review and feedback at least 20 working days prior to the commencement of any reinstatement works, unless otherwise agreed by the Manager.	6.1 During construction Notification Requirements
LC. 32	Reinstatement and offset plan approval	
	Reinstatement works required under LC. 27 shall not commence until a final reinstatement plan is approved by the Manager Open Space and Recreation Planning.	7.6.3 Approvals and Certification
LC. 33	Reinstatement and offset planting works completion	
	Any reinstatement and offset planting works required under LC. 27 must be completed within three months of the damage, or within an appropriately suitable period agreed with the Manager Open Space and Recreation Planning.	7.6.3 Approvals and Certification
LC. 34	Reinstatement and offset works certification	
	Any agreed reinstatement and/or offset works under LC. 32 must be inspected by the Manager Open Space and Recreation Planning, or by any appointee of the Manager, and certified in writing as being completed.	7.6.3 Approvals and Certification
LC. 35	Reinstatement and offset planting maintenance	
	Any reinstatement and offset planting works must be maintained by Wellington Water or its contractor to establish as intended. Any reinstated or offset planting area/s must be added to any draft or final Landscape and Ecology Management Plan (LEMP) to ensure the area is subject to ongoing management and maintenance under the LEMP.	7.6.4 Reinstatement and Offset Maintenance
LC. 36	Reinstatement and offset planting works consenting responsibilities	
	Wellington Water or its contractor will have responsibility for obtaining any consents required from Greater Wellington Regional Council and/or Wellington City Council for any land or vegetation damage or reinstatement or offset planting works required outside of either the licence or designation area.	7.6.5 Consenting and Cost Responsibilities
LC. 37	Reinstatement and offset planting costs	

	Any costs associated with LC. 26- LC. 36 will be met by Wellington Water or its contractor, unless otherwise agreed with the Manager Open Space and Recreation Planning.	7.6.5 Consenting and Cost Responsibilities
Notes:	The intention of this condition set is to recognise that any encroachment of reservoir site clearance or construction activities outside of the agreed licence area is not anticipated in the licence terms.	
	However, should this occur, notwithstanding any other RMA consenting or NOR implications that this may have for Wellington Water, it is anticipated that Wellington Water will provide for the reinstatement of any disturbance that occurs, and provide suitable 'compensatory' offset planting for this licence breach. Wellington Water will advise the Manager Open Space and Recreation Planning and the eRG or eLG of any breach, and the actions that it proposes to take to address any damage.	
	The Manager Open Space and Recreation Planning will, on behalf of wee as Town Belt Trustee, reserve the right to require, where it is considered any licence breach is significant, a modification to the licence or even additional licencing for any activity encroachment outside of the agreed licence area.	
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 52	**Draft LEMP consultation**	
	The draft **Landscape and Ecological Management Plan** (LEMP} required by Designation condition DC 32 or any proposed variation to any approved LEMP must be prepared in consultation with the **Manager Open Space and Recreation Planning**.	4.2 Management Plan Submission & Approval Process
LC. 53	**Draft PFMP consultation**	
	A draft **Playing Fields Management Plan** (PFMP}, required by Designation condition DC 38, or any proposed variation to any approved PFMP, must be prepared:	
(a)	**Sports Turf Specialist**: With input from a suitably qualified sports turf specialist agreed to, in writing, by the **Manager Open Space and Recreation Planning**	4.2 Management Plan Submission & Approval Process
(b)	***Consultation***: In consultation with the **Manager Open Space and Recreation Planning.**	4.2 Management Plan Submission & Approval Process
LC. 54	**Draft LEMP and PFMP design detail**	
	In addition to the matters listed in the designation conditions, the LEMP and PFMP management plans must include the details set out in LC. 55- LC. 61 for approval by the Manager Open Space and Recreation Planning.	
LC. 55	**Earthworks and ground preparation**	9.2 Ground Preparation - Upper and Lower Playing Fields Reinstatement
	Earthworks and ground preparation design and management must include the following:	
(a)	***Upper and Lower playing field reinstatement:*** The lower and upper fields will be reinstated to function for sports fields use	9.2 Ground Preparation - Upper and Lower Playing Fields Reinstatement
(b)	***Proposed finished ground levels:*** Proposed ground levels across the site that will result in all areas of the park, including any playing or sports fields, being fit for purpose	9.2 Ground Preparation - Upper and Lower Playing Fields Reinstatement
(c)	***Proposed finished ground and land drainage:*** Anticipated final overland flow paths for stormwater including details of how final ground levels and slope treatment will manage site run-off into the stream environments and not exacerbate sediment discharge to streams or result in erosion.	8.3.7 Ground and Land Drainage
(d)	***Reinstatement Areas:*** Details illustrating how areas disturbed or impacted by the construction project will be reinstated to be fit for purpose, and will be designed to be able to be practically and cost	8.3.8 Reinstatement Areas

	effectively maintained and managed	
(e)	***Topsoil management:*** Methods for ensuring that topsoil used for reinstating areas will be weed free	8.3.4 Topsoil Management
(f)	***Compaction areas:*** Methods to be employed to repair compacted ground and ensure new ground material build up is suitable for the intended end use and long-term sustainability and maintenance of that use. Methods must ensure that areas subject to compaction or backfilling do not create areas that will not drain and/or will not allow new planting to successfully establish and grow in the long term or ground conditions that result in sports fields or walking tracks that do not drain or function properly	8.3.5 Compaction
(g)	***Backfill inspection and monitoring:*** An inspection and monitoring programme for backfilled areas to be undertaken by the project landscape architect to ensure that suitable material is being used for the intended end result.	8.3.6 Reservoir Backfill Design
Note:	This condition set is intended to ensure that methods and details of ground stabilisation, ground surface finishing, and reinstatement of engineered and/or compacted areas have taken account of and addressed landscaping and ecological enhancement requirements, long term park function and use, along with the appropriate management of permanent surface run off and fang term reinstatement stability and planting reestablishment success. This applies to both reinstated 'natural' slope and backfill areas, and finished track and sport field surfaces.	
	Any areas of engineered fill or geotextile or any other products designed to enable planting into steep slopes or difficult ground conditions must be clearly identified on landscape plans to enable effective monitoring of planting associated with those areas.	
LC. 56	**Landscape design and management**	
	Landscape design and management must include the following:	
(a)	***Landscape and planting strategies:*** A landscape and planting strategy for the site, including:	8.4.1 Planting Species and Planting Specifications
i.	Use of planting that is varied in height and scale to disguise any uniform slope areas	8.4.1 Planting Species and Planting Specifications
ii.	The identification and intention of area specific planting strategies and landscape design treatments, including species selection and maintenance requirements, for reference in monitoring the success of planting and landscape works	8.4.1 Planting Species and Planting Specifications
iii.	Any planting or planting areas to be planted outside the standard planting seasons that will require maintenance to address potential plant stress (for example irrigation)	8.4.1 Planting Species and Planting Specifications
iv.	Any areas where planting may need to be delayed until a suitable planting period (to maximise planting success), and that may need to be suitably maintained and stabilised in the interim period	8.4.1 Planting Species and Planting Specifications
v.	Eco-sourced native plants and providing sufficient lead times to supply and where necessary harden plants, to achieve the quantities needed.	8.4.2 Eco-Sourcing
(b)	***Landscaping of backfill areas:*** Plans and details that show earthworks backfilling methods and materials have been tested and approved by a suitably qualified landscape architect who can confirm that the landscaping and vegetation proposed will be able to grow in the materials proposed	8.3.6 Reservoir Backfill Design
(c)	***Landscaping of reservoir 'top' and identified areas to be kept clear of trees:*** Final design of the top of the reservoir and any areas identified by Wellington Water that must be kept clear of trees must:	8.4.3 Landscaping of Reservoir Top

i.	Clearly define areas that must be kept clear of vegetation in perpetuity	8.4.3 Landscaping of Reservoir Top
ii.	Limit open grass area as far as possible to try and achieve a character similar to that which existed pre-construction	8.4.3 Landscaping of Reservoir Top
iii.	Within any open space area on the top of the reservoir, create an informal lookout space	8.4.3 Landscaping of Reservoir Top
(d)	**Track network planning:** Plans and details that show the location and design specification for the final track network, including reinstatement of closed tracks. This shall be integrated with temporary track planning and design requirements (LC 72 (b))	8.5.1 Final Track Network
(e)	**Landscape treatment integration:** Specific landscape treatments that will be applied at the edge of the reinstated licence area to integrate new ground levels and associated landscape treatments within the licence area into the undisturbed landform and vegetation patterns outside of the licence area in a way that provides for the intended use and management of that land and minimises visual effect	8.6.3 Landscape Treatment Integration
(f)	**Landscape modification and review:** If proposed landscaping fails or is compromised by either the methods and materials of backfilling, and must be changed, a landscape review and amendment process, involving a suitably qualified landscape architect and ecologist, for presenting changes to Manager Open Space and Recreation Planning that will achieve the same outcome anticipated for mitigating the effects of the reservoir project	8.11.1 Maintenance
LC. 57	**Maintenance and management schedule and costs**	
	The LEMP and PFMP must include a long-term maintenance and management plan and schedule for the licence area and surrounding landscape that has been disturbed or used by the project. The finished site must be maintained and managed for the primary purpose of Wellington Town Belt Reserve while allowing for the operation of the reservoir and associated infrastructure. The maintenance and management schedule must outline all changes in level of service from the preconstruction site state and clearly define costs associated with the change.	8.11.2 Maintenance and Management Schedule and Costs
Notes:	The Landscape Design and Management condition set is intended to ensure that strategies and methods are developed for appropriately landscaping and planting cleared and reengineered remediated licence areas and integrating modified and re-landscaped areas with adjacent undisturbed areas of the Town Belt.	
	These strategies need to be supported by examples or evidence, including appropriate expert advice, which show that the proposed solutions and methods for landscaping and planting areas that have been stabilised, re-topsoiled and have been tested and will be sustainable and successful in the long term.	
	Methods to replace or provide for alternative methods in these areas, where initially preferred methods or solutions have not worked, must be outlined in the planting	

	specification.	
	The intention is that Wellington Water will return the licence area to Wellington City Council to manage with no outstanding work to complete and no increase in maintenance levels of service (unless the cost of this has been added to operational budgets). All areas disturbed by the project will be reinstated to function as intended as Wellington Town Belt reserves.	
LC. 58	**Exposed Reservoir Infrastructure**	
	The design and look of any exposed above ground infrastructure associated with the reservoir and associated pipe work must provide for the following:	8.6 Exposed Reservoir Infrastructure
(a)	Integration with landscape: Design, materials and colours must be selected to integrate the infrastructure into the park and the natural landscape as far as practical. Opportunities to create bespoke solutions that can also serve a recreation or amenity purpose must be considered in design.	8.6 Exposed Reservoir Infrastructure
(b)	Reservoir service tunnel access door area: In preparing a draft landscape design for the reservoir service tunnel access door area attention shall be given to preparing a reasonable selection of design alternatives for this area, prior to final design selection.	8.6.1 Pipe Tunnel Access Door
(c)	Reserve maintenance: Design and infrastructure installation must enable easy and practical access for ongoing maintenance of the area/s around any structure/s.	8.6.2 Reserve Maintenance
LC. 59	**Reservoir Service Tunnel Access Way Track**	
	Landscape design and management of the service access way to the reservoir service tunnel must provide for the following:	8.5.2 Reservoir Service Tunnel Access Way Track
(a)	Service tunnel access track design: The tunnel access way track must be as narrow as practicable and comprise a permeable surface that blends into the natural park landscape and functions primarily as a walking track	8.5.2 Reservoir Service Tunnel Access Way Track
(b)	Service tunnel access track use: Alignment, design and materials used on the service tunnel access way track will ensure the track can only be accessed by WCC, Wellington Water or approved contractor vehicles for normal reservoir and park maintenance, servicing and management activities	8.5.2 Reservoir Service Tunnel Access Way Track
(c)	Culvert for Waitangi Stream: Provision for the safety of track users in the final design of the Waitangi Stream tributary stream culvert that goes underground into the stormwater network.	8.5.3 Culvert for Waitangi Stream
LC. 60	**Access Track between Upper and Lower Playing Fields**	
	Landscape design and management of the access track between the upper and lower playing fields must provide for the following:	9.2.6 Access Track between Upper and Lower Playing Fields
(a)	Access way use for walkway and maintenance vehicles: A final reinstatement design for the access way track between the upper and lower field that provides for the use of the access	9.2.6 Access Track between Upper and Lower Playing Fields

	way as part of the park's walking track network and as a route for park maintenance vehicles.	
(b)	Stability and erosion control: An access way design and construction that avoids erosion of the access way surface and any erosion and sedimentation impact on the Papawai stream environment	9.2.6 Access Track between Upper and Lower Playing Fields
(c)	Access way stream edge planting: Planting along the access way stream side edge that protects and strengthens the top of the stream bank adjacent to the access way and the stream crossing at the bottom of the access way	9.2.6 Access Track between Upper and Lower Playing Fields
LC. 61	**Licence Area Park Entrances and Edge Design**	
	Landscape design and management of the licence area's park entrance areas and edges (both with adjacent Town Belt land and residential areas) must provide for the following:	8.7 Park Entrances and Edge Design
(a)	***Rolleston Street park entrance design:*** Design of the Rolleston Street road entrance and western upper field edge that provides for access to the pipe tunnel entrance, walking access to the track network and improved sports field parking and vehicle manoeuvring space while not impacting sports field and side-line activity, function and maintenance.	8.7.1 Rolleston Street
(b)	***Upper field northern and southern edges:*** The northern and southern edges of the upper field may require ground level changes and new planting to successfully integrate the uncompacted and resurfaced field into the undisturbed field edges and incorporate any new drainage and side-line areas for spectators.	8.7.2 Upper Field Edges
(c)	**Reinstatement of the Hargreaves Street entrance**	8.7.3 Hargreaves Street
(d)	**Lower playing access from southern car park area:** Reinstatement of the driveway and entrance to the lower playing field at the south eastern corner. Access for maintenance is required while stopping public vehicle access onto the field. Parking and manoeuvring space will be designed to maximise public parking for visitors to the park	8.7.4 Lower Playing Field Access from Southern Car Park
(e)	**Fencing plan and reinstatement:** A fencing plan and list of all fencing to be reinstated and/or newly installed across the site that is fit for purpose and meets WCC parks infrastructure specifications. The fencing will be located, specified and installed in such a way that the maintenance of the fences and the land around them has been considered and is practical.	8.7.5 Fencing Plan and Reinstatement
LC. 62	**Lower playing field flood management, final field design and Papawai Stream edge**	8.8.1 Lower Playing Field Flood Management
	Prior to commencing construction Wellington Water shall investigate (in consultation with the Manager Open Space and Recreation Planning) whether:	
(a)	***Flood management:*** Any feasible options may exist to improve the management of flood events in the Papawai Stream that could avoid or reduce the flow of stormwater over the stream's bund edge onto the field and general seepage through the bund into the field	8.8.1 Lower Playing Field Flood Management

(b)	***Papawai Stream ecological enhancement:*** Any feasible options may exist to enhance the ecological function of the stream in conjunction with any flood management enhancements	8.8.2 Papawai Stream Ecological Enhancement
(c)	***Stream enhancement incorporation in lower playing field reinstatement:*** Any design solutions arising from (a) and/or (b) could be practically incorporated into works associated with reinstating the lower playing field following the completion of reservoir backfilling.	8.8.2 Papawai Stream Ecological Enhancement
Note:	The intention of this condition is to ensure that Wellington Water investigate opportunities for improving the flood management of Papawai Stream and the lower playing field edge design and drainage prior to finalising the PFMP and LEMP. Where a feasible option is identified to address these matters, it is expected that this will feature in the final reinstatement design for the lower playing field.	
LC. 63	**Draft LEMP and PFMP feedback**	
	A draft LEMP and PFMP, including any proposed variation to an approved LEMP or PFMP, must be submitted to the WCC Manager Open Space and Recreation Planning for comment and feedback at least 20 working days prior to the final management plan/s being lodged with the CMO for certification.	4.2 Management Plan Submission & Approval Process
Note:	The intention of this condition set is to ensure that the Manager Open Space and Recreation Planning is consulted prior to preparing any draft LEMP and PFMP for the site, and prior to these draft documents being lodged with the Manager for formal review and feedback.	
	The Manager Open Space and Recreation Planning will have the opportunity to formally comment and provide feedback on any draft LEMP and PFMP prepared by Wellington Water or its contractor/s, prior to these draft documents being finalised and submitted to the CMO for final Manager assessment and approval through the designation condition management plan certification process {DC11).	4.2 Management Plan Submission & Approval Process
	In providing feedback or comment on any draft management plans, the Manager will focus on the matters outlined in LC LC. 55- LC. 61, and can request that any draft management plan is amended or redrafted and/or can require further detail or information to be included in the draft plan prior to it being either resubmitted as a draft plan or submitted for certification.	4.2 Management Plan Submission & Approval Process
	It is expected that the Manager will be informed of any CRG feedback received on any draft plan, and how this has been considered in the draft. This should include details of where feedback has or has not been addressed or incorporated in the draft document, and the reasons for this action.	4.2 Management Plan Submission & Approval Process
	The Manager in responding to any draft management plan must be satisfied that the final outcome of the proposal on the Town Belt is as intended when approval was granted to the licence and easement.	4.2 Management Plan Submission & Approval Process
Temporary Construction Site Area: Site Fencing		

LC. 66	**Fencing plan:** In conjunction with preparing a draft Construction Management Plan (CMP), as required under designation conditions DCll, 12, 16 and 17, Wellington Water must include in its draft CMP for CMO feedback a plan of all perimeter fencing that will mark or enclose the total extent of site used, or licenced for use, during the construction period. This plan shall include the following information:	8.7.6 Construction Temporary Fencing
(a)	Location and Type: Fence location, and fencing typology and form (i.e. security fencing, acoustic screening, silt fencing etc)	8.7.6 Construction Temporary Fencing
(b)	***Staging:*** Fencing staging, where it is anticipated that fencing may be shifted or altered or amended over the course of the reservoir excavation1 construction, backfill, remediation and site landscape and sport field remediation phases,	8.7.6 Construction Temporary Fencing
(c)	***installation and removal method:*** Installation and removal methodology for fencing, intended to minimise damage to vegetation, tree roots and land outside of the licence area licence area.	8.7.6 Construction Temporary Fencing
(d)	***Inspection and maintenance:*** An inspection and maintenance regime to ensure that fencing is maintained in good order and functioning at all times as intended.	8.7.6 Construction Temporary Fencing
(e)	***Final removal:*** A requirement for all fencing to be removed within 20 working days of the completion of construction.	8.7.6 Construction Temporary Fencing
(f)	***Fencing retention approval:*** Any fencing proposed to be retained within the licence area beyond this period must be approved in writing by the Manager Open Space and Recreation Planning.	8.7.6 Construction Temporary Fencing
Maintenance and reinstatement of access way between Salisbury Terrace and Harriers Club Building		
LC.73	**Maintenance of access way to lower playing field.**	
	Wellington Water, or its contractor, will be entirely responsible over the duration of the project for the maintenance of the public vehicle access from Salisbury Terrace to the Harriers Club building located on the east side of the Prince of Wales Park lower playing field (the lower field public access way). This will include a responsibility for ensuring that any potholes and other damage resulting from construction of the works are identified and fixed.	8.9 Maintenance and Reinstatement of Access Way
LC.74	**Preconstruction condition survey: access way and car parking area**	
	At least 20 working days prior to construction commencing Wellington Water, or its contractor, shall carry out a preconstruction condition survey of the lower field public access way and the public car parking area to the south of the lower field, using an appropriately qualified engineer. A report of this survey will be supplied to the Manager Open Space and Recreation Planning.	8.9.1 Preconstruction Condition Survey & 6.1 Pre-construction Notification Requirements
LC.75	**Timeframes for repairing project damage to access way and/or car parking area**	
	Wellington Water or its contractor shall repair pot holes or other damage resulting from the project to the lower field public access way and/or car parking area either within 10 working days of being notified to the CLP, the CMO or the Manager Open Space and Recreation Planning, or within any other timeframe otherwise agreed in writing with the Manager Open Space and Recreation Planning.	8.9.2 Access Way and Car Parking Inspection

LC.76	**Access way and car parking area inspection following lower playing field remediation**	
	Unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, within 20 working days of the completion of the remediation of the lower playing field, Wellington Water or its contractor shall organise with the Manager a joint inspection of lower field public access way and public car parking area to determine and agree whether remedial/repaving work, if any, are required, as a result of the project, to reinstate the access way and/or car parking surface.	8.9.2 Access Way and Car Parking Inspection& 6.2 During Construction Notification Requirements
LC.77	**Access way and car parking area remedial works**	
	Any agreed remedial or reinstatement works, including repaving, shall be completed and certified by the CMO, prior to the Manager, Open Space and Recreation Planning and the Manager, Sports and Recreation Operations and Contracts, confirming in writing, under designation condition DC42 that the reinstated lower field, and related tracks, retaining walls, fencing and drainage are suitable for organised sports use and public activities to commence.	8.9.3 Remedial Works and Costs
LC.78	**Access way and car parking area remedial works costs:** Wellington Water shall meet all fair and reasonable costs of undertaking any agreed remedial and/or reinstatement work/s.	8.9.3 Remedial Works and Costs
Existing Park Infrastructure		
LC.83	**Preconstruction inspection: parks infrastructure**	
	At least 40 working days prior to commencing any work on site the site manager or CLP must, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, arrange a site walkover with the project landscape architect and the Manager Open Space and Recreation Planning to identify and inventory all existing park infrastructure (e.g. gates, barriers, seats, signs, fences, retaining walls, goal posts etc) that must be removed, stored, relocated or disposed of by Wellington Water or its contractor. Any items scheduled for relocation or disposal that will need to be replaced in conjunction with site remediation will be identified.	6.1 Pre-construction Notification Requirements
LC.84	**Draft parks infrastructure inspection and inventory management report:** A draft report of the parks infrastructure inspection, including an inventory management schedule and plan must be produced by Wellington Water or its contractor, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, and supplied to the Manager Open Space and Recreation Planning for review at least 20 working days prior to commencing any work on site. This draft report shall include:	8.10.1 Infrastructure Inventory and Inspection & 6.1 Pre-construction Notification Requirements
(a)	***Site map:*** a map of the licence area,	8.10.1 Infrastructure Inventory and Inspection
(b)	***Asset schedule:*** the location and schedule of all identified park assets,	8.10.1 Infrastructure Inventory and Inspection
(c)	***images:*** photographic images of all identified inventoried items, to assist with identification, tracking and management	8.10.1 Infrastructure Inventory and Inspection
(d)	***Management plan:*** a management plan or schedule for each inventoried item, clearly identifying for each asset/s whether it will be:	8.10.1 Infrastructure Inventory and Inspection
i.	Removed and relocated, and not replaced as part of future site reinstatement	8.10.1 Infrastructure Inventory and Inspection
ii.	Removed and relocated, and scheduled for replacement as	8.10.1 Infrastructure Inventory and Inspection

	part of future site reinstatement	
iii.	Removed and stored by Wellington Water for future reinstatement	8.10.1 Infrastructure Inventory and Inspection
iv.	Removed and disposed of, and scheduled for replacement as part of future site reinstatement	8.10.1 Infrastructure Inventory and Inspection
v.	Removed and stored by Wellington Water, with a decision to be made by the Manager Open Space and Recreation Planning, prior to commencing site remediation, regarding asset relocation, disposal, reinstatement and/or replacement	8.10.1 Infrastructure Inventory and Inspection
vi.	Retained and managed in situation, including any management plan for the monitoring, protection and maintenance of the asset.	8.10.1 Infrastructure Inventory and Inspection
LC.85	Parks infrastructure inventory report to be confirmed prior to construction commencing	6.1 Pre-construction Notification Requirements
	A final report of the infrastructure inspection and inventory management schedule must, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, be confirmed in writing by the Manager Open Space and Recreation Planning prior to the commencement of any site clearance, enabling works or construction related activity.	6.1 Pre-construction Notification Requirements
LC.86	**Park asset removal, relocation, storage, reinstatement and replacement costs:**	
	Wellington Water shall meet all fair and reasonable costs for removing, relocating, storing, replacing and/or reinstating any park assets within the licence area.	8.10.1 Infrastructure Inventory and Inspection
Notes:	This condition set is required to ensure that parks assets within the licence area are jointly inspected by the Manager Open Space and Recreation Planning and Wellington Water, or its contractor, well in advance to the commencement of construction, and that an agreed management plan is developed for asset removal, relocation, storage, disposal, reinstatement and/or future replacement.	
	It is anticipated that some items will not be able to be removed in no way that would enable them to be appropriately and/or cost effectively reused or reinstated. In these cases, assets will need to be disposed of by Wellington Water.	
LC.87	**Confirmation whether lower playing field Sports Pavilion will be used:** Prior to commencing construction Wellington Water or its contractor shall confirm whether the sports pavilion building on the lower field will be needed in support of site operations.	8.10.1 Infrastructure Inventory and Inspection
LC.88	**Sports Pavilion not required for use -subject to monitoring and management:** Where the sports pavilion is not required for use, Wellington Water or its contractor shall suitably monitor and protect the building from any use or damage during the construction period. The monitoring and management of the sport pavilion shall be included in the parks infrastructure inspection and inventory management report detailed in LC 84.	8.10.1 Infrastructure Inventory and Inspection
LC.89	**Sports Pavilion potentially required for use-subject to monitoring and management:** Where the sports pavilion is identified is potentially being needed for use, but no timeline has been agreed for when this may occur, Wellington Water or its contractor shall suitably monitor and protect the building from any use or damage. The monitoring and management of the sport pavilion shall be included in the parks infrastructure inspection and inventory management report detailed in LC 84.	8.10.1 Infrastructure Inventory and Inspection

LC.90	**Sports Pavilion identified for use-Licence variation required:** Where the sports pavilion is identified for use, either prior to construction or at any stage throughout the project, Wellington Water or its contractor shall apply in writing to the Manager Open Space and Recreation Planning to vary the licence agreement area to include the pavilion.	8.10.1 Infrastructure Inventory and Inspection
LC.91	**Sports Pavilion identified for use-consenting approvals and costs:** Where the sports pavilion is identified for use, Wellington Water or its contractor shall meet all costs associated with varying this licence to include the use of this building, and shall be responsible for obtaining any other required statutory approvals to use the building and any associated costs**.**	8.10.1 Infrastructure Inventory and Inspection
Note:	The TBA application did not include use of the sports pavilion within the temporary construction area covered by this licence.	8.10.1 Infrastructure Inventory and Inspection
	Acknowledging that the building could be used by the project team during the construction, this condition sets out the terms that would apply to the use of this building.	
	Terms and conditions of use /building inspection, maintenance, repair and/or reinstatement) would farm part of any licence consideration and approval process.	
Vegetation Clearance		
LC.92	**Certification of vegetation clearance:** Following the completion of programmed vegetation clearance from the licence area, described in the CMP, Wellington Water, or its contractor, shall provide certification to the Manager Open Space and Recreation Planning that vegetation clearance has been carried out in accordance with any approved LEMP, CMP and in accordance with any required designation and/or resource consent conditions.	7.3 Vegetation Removal & Retention 6.2 During Construction Notification Requirements
Monitoring, inspection and defects period		
LC.93	Condition and site monitoring	
(a)	Record of site monitoring: The CLP must keep a record of site monitoring associated with the Designation and GWRC conditions and make this available to the CRG.	8.11.4 Monitoring and Inspection Plan
(b)	Monitoring and inspection plan: The LEMP and PFMP must include a monitoring and inspection plan prepared by the Wellington Water Project Landscape Architect with input from their specialists in maintenance of the various areas of the site {e.g. ecologists, sports turf specialist, landscapers, nursery managers, irrigation designers, engineers etc). The plan must outline:	8.11.4 Monitoring and Inspection Plan
i.	key stages of the project where monitoring and inspection is required	8.11.4 Monitoring and Inspection Plan
ii.	the intention of inspection and	8.11.4 Monitoring and Inspection Plan
iii.	success measures.	8.11.4 Monitoring and Inspection Plan
iv.	describe agreed processes for remedy of defects and failed planting including timeframes and re-inspections.	8.11.4 Monitoring and Inspection Plan
(c)	Monitoring and inspection parties: Monitoring and inspections required under LC.93{b) will include, the CMO, CLP, the Manager Open Space and Recreation Planning and any others required to properly consider the issues being monitored or inspected, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning.	8.11.4 Monitoring and Inspection Plan

(d)	Monitoring and inspection frequency: Monitoring and inspections will occur at a minimum:	8.11.4 Monitoring and Inspection Plan
i.	On completion of any area of ground works including tracks, sports fields or other earthworks required to achieve an ecological, amenity or recreation function. This must also be prior to any planting into those completed areas to check ground conditions are suitable for the proposed planting	8.11.4 Monitoring and Inspection Plan
ii.	In accordance with any additional monitoring and inspection requirements identified in LC. 93(b){i), including an annual inspection of completed planting areas.	8.11.4 Monitoring and Inspection Plan
LC.94	**Final Site Inspections**	
	Wellington Water must arrange a schedule of final site inspections following the completion of construction and site remediation, to be agreed in writing by the Manager Open Space and Recreation Planning, as the site is progressively vacated by the project work and associated contractors. The inspection schedule shall provide:	8.11.5 Final Site Inspections 6.3 Post – Construction Notification Requirements
(a)	Sufficient opportunity for identified issues to be resolved by Wellington Water or its contractor to the satisfaction of the Manager Open Space and Recreation Planning, prior to final site vacation.	6.3 Post – Construction Notification Requirements 8.11.5 Final Site Inspections
(b)	For final site inspection by the Manager Parks Sports and Recreation Operations and Manager Open Space and Recreation Planning and the Project Landscape Architect.	6.3 Post – Construction Notification Requirements 8.11.5 Final Site Inspections
LC.95	**Defects and liability period - Playing Fields**	
	There will be a two seasons defects period on the playing field reinstatement. This means that from the date that the CMO, in consultation with the Manager, Open Space and Recreation Planning, confirms in writing that the reinstated field or fields, and related tracks, retaining walls, fencing and drainage are suitable for organised sports use and public activities to commence, two seasons of sport (i.e. a winter and summer season) will be played on the field/fields to confirm that the fields are performing as anticipated. This may extend beyond the one-year timeframe of the Designation condition 42 however it is a more accurate test of the performance of the field/s.	9.3.1 Defects and Liability Period – Playing Fields
LC.96	**Defects and liability period- New Tracks**	
	There will be a defects period of nine months on new track builds and track reinstatement (including the track, surface materials, drainage and any steps, retaining, handrails, boardwalks or bridges) from the date of completion and final sign off by the Manager, Open Space and Recreation Planning. Any defects must be addressed and repaired to the satisfaction of the Manager, Open Space and Recreation Planning within one month of identification of any issue.	8.11.6 Defects and Liability Period – New Tracks

LC.97	Defects and liability period - Planting and Landscaping: The planting and landscaping defects liability period is five years. While there may be areas that have achieved the success measures outlined in Designation condition 33, Wellington Water will still be liable until the end of the five year period so as to ensure the ground conditions are performing as intended.	8.11.7 Defects and Liability Period – Planting and Landscaping
Note:	There is the potential that planting in stabilised slopes, in shallow soils or steep and/or exposed slopes will flourish for a short period before failing. The five year period allows for appropriate monitoring of uncertainty around ground treatment and planting solutions.	8.11.7 Defects and Liability Period – Planting and Landscaping

4 Management Plan Framework

4.1 *Management Plan Consolidation Content*

The Omāroro Reservoir Project requires an overarching Construction Environmental Management Plan (CEMP) with four (4) environmental sub - management plans pursuant to the conditions issued by GWRC, WCC and the TBA. These plans will be administered in accordance with the requirements and constraints imposed by these regulatory permissions. The Construction Environmental Management Plan (CEMP) provides the overarching framework for the management of the environmental aspects of the project and is supported by these sub management plans focusing on the specialist environmental areas of erosion, sediment and dust control, noise and vibration, ecology and contaminated soils. To demonstrate how HEB Construction will comply with the conditions the suite of management plans below have been produced:

1. **Construction Environmental Management Plan** (CEMP) – consolidates:
    a. Construction Management Plan
2. **Erosion & Sediment Control Plan** (ESCP) – consolidates:
    a. Flocculation Management Plan (FMP)
    b. Earthworks Management Plan (EMP) – via GWRC
    c. Earthworks Management Plan (EMP) – via WCC
    d. Contaminated Soils Management Plan
3. **Construction Noise & Vibration Management Plan** (CNVMP)
4. **Landscape & Ecology Management Plan** (LEMP) – consolidates:
    a. Play Fields Management Plan (PFMP)
    b. Construction Site Area Fencing Plan
5. **Construction Traffic Management Plan** (CTMP) – consolidates:
    a. Site Specific Traffic Management Plan (SSTMP)
    b. Pedestrian Management Plan

4.2 *Management Plan Submission & Approval Process*

The LEMP is one of five (5) specialised Environmental Management Plans to be submitted to the Wellington City Council (WCC) Compliance Monitoring Officer (CMO) for certification. The LEMP includes more detailed information and specifications within the following Appendices:

- Appendix 4 – Landscape Detailed Design Drawings
- Appendix 5 – Technical Specification Landscape
- Appendix 6 - Construction Specification - Sport field drainage and turf establishment
- Appendix 7 – Sports Playing Field Drawings
- Appendix 8 - Playing Field Remediation Design Report

Consultation with the WCC Manager Open Space and Recreation Planning was carried out during the preparation of the Draft LEMP.

Under TBAC a draft LEMP (in consolidation with the Playing Fields Management Plan PFMP) , including any proposed variation to an approved LEMP, must be submitted to the WCC Manager Open Space and Recreation Planning for comment and feedback at least 20 working days prior to the final management plan being lodged with the CMO for certification.

Any Community Reference Group (CRG) feedback will also be considered, addressed and responded to within this LEMP.

Construction shall not commence until written certification of the LEMP (including the PFMP) from the CMO has been received.

The draft PFMP section of the LEMP was prepared with input from a suitably qualified sports turf specialist *(Turf Management Services Ltd & Sports Surface Design and Management*).

SSDM has been engaged by Beca Ltd to provide specialist turf input. Throughout the draft PFMP process SSDM liaised with representatives of the Manager Open Space and Recreation Planning in relation to specific sports field re instatement requirements.

The LEMP including the PFMP will demonstrate how the outcomes of the consultations with all parties have been incorporated.

The Manager in responding to any draft management plan must be satisfied that the outcome of the proposal on the Town Belt is as intended when approval was granted to the licence and easement.

5 Roles & Responsibility

The roles and responsibilities of key staff members within HEB Construction to implement the CEMP and its sub-management plans, including this LEMP, are set out in Table 5.

Table 5: Roles and Responsibility for Implementing the CEMP and the Sub – Management Plans

Position	Contact	Key CEMP Responsibilities
Consent Holder	Wellington Water (Contact details TBC)	Overall responsibility to ensure resource consent conditions and CTMP requirements met. Overall responsibility for reporting to WCC
HEB Project Manager	James Lake HEB Construction Ltd E: James Lake@heb.co.nz M: 027 476 4098	Submit the Construction Environmental Management Plan (CEMP) and associated sub management plans including this LEMP for review and certification prior to implementation The Manager shall be given a minimum of two working days (48 hours) notice prior to the works commencing. Note: to include the consent reference WGN180065 and the name and phone number of a contact person responsible for the proposed works. Arrange and conduct a pre-construction site meeting prior to any work authorised by the resource consent WGN180065 commencing on site and invite, with a minimum of 10 working days' notice, the Greater Wellington Regional Council and all contractor(s) undertaking the works. Ensure that the site is available to the Compliance Manager or other Council representatives for inspections if required subject to receiving the appropriate site induction and health and safety briefings. Responsible for all day to day construction operations on the project. Responsible for routine communication and notifications to Regulatory Agencies. Overall responsibility for ensuring environmental compliance is maintained onsite and all actions identified by onsite inspections are completed. Implementation of the CEMP and sub management and mitigation plans onsite.
HEB Project Engineer	Mark O'Hare HEB Construction E: Mark.O'Hare@heb.co.nz M: +64 27 306 6341	Responsible for all day to day construction works. To ensure the Site is operated in accordance with the LEMP, Design Drawings and Technical Specifications.
Landscape Architect	Haden Sefonte HEB Construction E: Hayden.Sefonte@heb.co.nz M: 027 379 0995	Confirmation of the maximum extent of vegetation clearance with the Project Ecologist and Project Manager and confirmation of the methods of protection of vegetation in buffer zones/'no-go' areas and other protection of other vegetation on site.

		Responsible for input into Construction Environmental Management Plan (CEMP) and LEMP Undertake a planting review within 3 years of completion of construction of the reservoir Confirming landscaping works are being undertaken in accordance with the Contract, Technical Specifications & approved LEMP.
Project Ecologist	Stephen Fuller Boffa Miskell E:Stephen.Fuller@boffamiskell.co.nz M: 027 222 5741	Undertake a lizard survey (with a suitably qualified herpetologist) prior to vegetation clearance Confirmation of the maximum extent of vegetation clearance with the Project Landscape Architect and Project Manager and confirmation of the methods of protection of vegetation in buffer zones/'no-go' areas and other protection of other vegetation on site. Provide input and advice where required with the LEMP, ESCP and CEMP management plans ***Ornithologist:*** Pre-clearance check for breeding birds Provide recommendations if required
Arborist	TBC	Removal of large trees Limb identification for protection and or removal (refer tree protection and removal plan in Landscape drawings)
HEB Environmental Adviser	Elisa Chillingworth HEB Construction Ltd E: Elisa.Chillingworth@heb.co.nz M: 027 488 8151	Completion of routine environmental site inspections, development of actions for remediation of any issues identified. Provision of Environmental Training (Erosion and Sediment Control, Management of Hazardous Substances, Archaeological site Management, Emergency Spill Response). Provide environmental guidance and advice to the site staff. Onsite environmental compliance manager. Completion of routine monthly environmental audits.
Community Reference Group (CRG)	Various – includes submitters to consent, parties who have requested ongoing involvement, community group representatives and others.	To provide feedback for the draft LEMP and to be kept informed of site developments.
Health and Safety Adviser	Nichola Henderson HEB Construction Ltd E: Nichola.Henderson@heb.co.nz M: 027 590 9841	Completion of routine monthly safety site inspections, development of actions for remediation of any issues identified.

6 Implementation and Operation

Tables 1, 2 and 3 have previously identified the various regulatory permissions in the form of Resource Consents, Designation, and a Licence. The following sections of the LEMP outline how these conditions relating to the LEMP (including the PFMP) will be met and managed by the Omāroro reservoir Project delivery team.

6.1 *Pre-Construction Notification Requirements*

Prior to construction commencing on site the following notifications from the Resource Consents and designation conditions and are required:

Table 6: Pre – Construction Notification Requirements identified within GWRC Conditions

Pre-construction requirements		LEMP Section Reference or Relevant Management Plan
3	The Manager shall be given a minimum of two working days (48 hours) notice prior to the works commencing. Note: Notifications can be emailed to notifications@gw.govt.nz. Please include the consent reference WGN180065 and the name and phone number of a contact person responsible for the proposed works.	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 6.1 Pre-construction Notification Requirements
4	The consent holder shall provide a copy of this consent and any documents and plans referred to in this consent to each operator or contractor undertaking the works authorised by this consent, prior to the works commencing. Note: It is recommended that the contractor(s) be verbally briefed on the requirements of the conditions of this consent prior to works commencing.	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 6.1 Pre-construction Notification Requirements

Table 7: Pre – Construction Notification Requirements WCC Designation Conditions

Pre-construction requirements		LEMP Section Reference or Relevant Management Plan
DC.5		
	Prior to commencing any construction works, the Requiring Authority shall arrange and conduct a pre-construction site meeting with the contractor (at a minimum the Project Manager and Site Manager) undertaking the works and invite, with a minimum of 10 working days' notice, WCC's CMO and any other key WCC representatives determined by the CMO.	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 6.1 Pre-construction Notification Requirements
Note:	In the case that any of the invited parties, other than the representative of the Requiring Authority and the contractor, do not attend this meeting, the Requiring Authority will have complied with this condition, provided the invitation requirement is met.	
DC.32(a)	At least 15 Working Days prior to Commencement of Construction or vegetation removal, the Requiring Authority shall submit a LEMP to the CMO for certification	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 6.1 Pre-construction Notification Requirements
DC.32(b)	The LEMP shall be in general accordance with the Landscape Strategy and Ecological Impact Assessment provided in the AEE and address the matters in condition DC. 33	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements

		LEMP 6.1 Pre-construction Notification Requirements
DC.36	Prior to commencing construction, the Requiring Authority shall remove and store the existing bench seat and plaque located on the reservoir site. Within six months of the completion of construction the bench seat and plaque shall be re-instated.	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 6.1 Pre-Construction Notification Requirements 6.2 Post Construction Notification Requirements
DC.38 a)	At least 15 Working Days prior to Commencement of Construction the Requiring Authority shall submit a Playing Field Management Plan (PFMP) to the CMO for certification.	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 4.2 Management Plan Submission & Approval Process

Table 8: Pre – Construction Notification Requirements TBA Licence Conditions

Pre-construction requirements		LEMP Section Reference or Relevant Management Plan
LC. 63	**Draft LEMP and PFMP feedback:** A draft LEMP and PFMP, including any proposed variation to an approved LEMP or PFMP, must be submitted to the WCC Manager Open Space and Recreation Planning for comment and feedback at least 20 working days prior to the final management plan/s being lodged with the CMO for certification.	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 6.1 Pre-construction Notification Requirements
LC.74	**Preconstruction condition survey: access way and car parking area:** At least 20 working days prior to construction commencing Wellington Water, or its contractor, shall carry out a preconstruction condition survey of the lower field public access way and the public car parking area to the south of the lower field, using an appropriately qualified engineer. A report of this survey will be supplied to the Manager Open Space and Recreation Planning.	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 6.1 Pre-construction Notification Requirements
LC.83	**Preconstruction inspection: parks infrastructure:** At least 40 working days prior to commencing any work on site the site manager or CLP must, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, arrange a site walkover with the project landscape architect and the Manager Open Space and Recreation Planning to identify and inventory all existing park infrastructure (e.g. gates, barriers, seats, signs, fences, retaining walls, goal posts etc) that must be removed, stored, relocated or disposed of by Wellington Water or its contractor. Any items scheduled for relocation or disposal that will need to be replaced in conjunction with site remediation will be identified.	Construction Environmental Management Plan (CEMP) 7.1.1 Pre-construction Notification Requirements LEMP 6.1 Pre-construction Notification Requirements
LC.84	**Draft parks infrastructure inspection and inventory management report:** A draft report of the parks infrastructure inspection, including an inventory management schedule and plan must be produced by Wellington Water or its contractor, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, and supplied to the Manager Open Space and Recreation Planning for review at least 20 working days prior to commencing any work on site. This draft report shall include:	8.10.1 Infrastructure Inventory and Inspection & 6.1 Pre-construction Notification Requirements

(a)	***Site map:*** a map of the licence area,	8.10.1 Infrastructure Inventory and Inspection
(b)	***Asset schedule:*** the location and schedule of all identified park assets,	8.10.1 Infrastructure Inventory and Inspection
(c)	***images:*** photographic images of all identified inventoried items, to assist with identification, tracking and management	8.10.1 Infrastructure Inventory and Inspection
(d)	***Management plan:*** a management plan or schedule for each inventoried item, clearly identifying for each asset/s whether it will be:	8.10.1 Infrastructure Inventory and Inspection
i.	Removed and relocated, and not replaced as part of future site reinstatement	8.10.1 Infrastructure Inventory and Inspection
ii.	Removed and relocated, and scheduled for replacement as part of future site reinstatement	8.10.1 Infrastructure Inventory and Inspection
iii.	Removed and stored by Wellington Water for future reinstatement	8.10.1 Infrastructure Inventory and Inspection
iv.	Removed and disposed of, and scheduled for replacement as part of future site reinstatement	8.10.1 Infrastructure Inventory and Inspection
v.	Removed and stored by Wellington Water, with a decision to be made by the Manager Open Space and Recreation Planning, prior to commencing site remediation, regarding asset relocation, disposal, reinstatement and/or replacement	8.10.1 Infrastructure Inventory and Inspection
vi.	Retained and managed in situation, including any management plan for the monitoring, protection and maintenance of the asset.	8.10.1 Infrastructure Inventory and Inspection

Greater Wellington Regional Council:

I. The Manager at GWRC will be given a minimum of two working days (48 hours) notice prior to the works commencing via email to notifications@gw.govt.nz.
II. The Consent Holder (WWL) will provide a copy of this consent and any documents and plans referred to in this consent to HEB Construction and other contractors employed undertaking the works authorised by this consent, prior to the works commencing.

Wellington City Council:

I. HEB Construction will arrange and conduct a pre-construction site meeting with the Project Manager and Site Manager, undertaking the works and invite, with a minimum of 10 working days' notice, WCC's CMO and any other key WCC representatives determined by the CMO.
II. Prior to commencement of construction or vegetation removal, the Omāroro project will submit a LEMP to the CMO for certification and construction must not commence until WCC has received a written certification of the LEMP by the CMO.
III. Prior to commencing construction, the Requiring Authority shall remove and store the existing bench seat and plaque located on the reservoir site.
IV. At least 15 days prior to commencement of construction a PFMP will be submitted to the CMO for certification.

Town Belt Act Licence:

I. A draft LEMP, including any proposed variation to an approved LEMP, will be submitted to the WCC Manager Open Space and Recreation Planning for comment and feedback at least 20 working days prior to the final management plan/s being lodged with the CMO for certification.
II. At least 20 working days prior to construction commencing HEB Construction will carry out a preconstruction condition survey of the lower field public access way and the public car parking area to the south of the lower field, using an appropriately qualified engineer. A report of this survey will be supplied to the Manager Open Space and Recreation Planning.

III. At least 40 working days prior to commencing any work on site the site manager will arrange a site walkover with the project landscape architect and the Manager Open Space and Recreation Planning to identify and inventory all existing park infrastructure (e.g. gates, barriers, seats, signs, fences, retaining walls, goal posts etc) that must be removed, stored, relocated or disposed of by HEB Construction.

IV. A draft report of the parks infrastructure inventory must be produced to the Manager Open Space and Recreation Planning at least 20 days prior to construction commencing.

6.2 *During Construction Notification Requirements*

Table 9: During Construction Notification Requirements WCC Conditions

Post-construction requirements		LEMP Section Reference or Relevant Management Plan
DC.33b	Confirmation of an appropriate buffer between the earthworks and waterways including confirmation of waterway location by longitudinal and cross-section survey. In the case of the Papawai Stream the buffer shall be no less than 10m on the stream's west bank (hillside). In the case of the Waitangi Stream Tributary, to the west of the project site, no buffer shall be less than 5m.	8.1 Buffer Zones 6.2 During Construction Notification Requirements
DC.34(d)	If vegetation clearance must occur during the period identified in condition DC.34 c), a survey shall be undertaken prior to clearance by a suitably qualified and experienced ornithologist to determine if a nest or nests are present. If a nest of any of the species identified in DC. 34c) is located on a tree to be felled, that tree must not be felled until the chick(s) has left the nest	7.1 Nesting Bird Survey 6.2 During Construction Notification Requirements

Table 10: During Construction Notification Requirements TBA Licence Conditions

Post-construction requirements		LEMP Section Reference or Relevant Management Plan
LC.17	**Reinstatement and offset works plan consultation:** If required by the Manager Open Space and Recreation Planning the planning and implementation of works required under LC. 15 shall occur in consultation with any landscape architect and/or ecologist appointed by the Manager Open Space and Recreation Planning.	Construction Environmental Management Plan (CEMP) 7.1.1 during construction Notification Requirements LEMP 6.2 During construction Notification Requirements
LC.20	**Reinstatement and offset works plan approval:** The reinstatement and offset plan shall be provided to the Manager Open Space and Recreation Planning for approval 20 working days prior to commencement. Works shall not commence prior to receipt of written approval.	Construction Environmental Management Plan (CEMP) 7.1.1 during construction Notification Requirements LEMP 6.2 During construction Notification Requirements
LC.30	**Reinstatement and offset planting plan consultation:** If required by the Manager Open Space and Recreation Planning the preparation of the plan and any planning and implementation of works required under LC.27 shall occur in consultation with any landscape architect and/or ecologist appointed by the Manager Open Space and Recreation Planning.	Construction Environmental Management Plan (CEMP) 7.1.1 during construction Notification Requirements LEMP 6.2 During construction Notification Requirements

LC. 31	**Review of draft reinstatement and offset planting plan:** Any draft reinstatement and offset planting plan required under LC. 29 must be provided to the Manager Open Space and Recreation Planning for review and feedback at least 20 working days prior to the commencement of any reinstatement works, unless otherwise agreed by the Manager.	Construction Environmental Management Plan (CEMP) 7.1.1 during construction Notification Requirements LEMP 6.2 During construction Notification Requirements
LC.76	**Access way and car parking area inspection following lower playing field remediation** Unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, within 20 working days of the completion of the remediation of the lower playing field, Wellington Water or its contractor shall organise with the Manager a joint inspection of lower field public access way and public car parking area to determine and agree whether remedial/repaving work, if any, are required, as a result of the project, to reinstate the access way and/or car parking surface.	Construction Environmental Management Plan (CEMP) 7.1.2 During Construction Notification Requirements LEMP 6.2 During construction Notification Requirements
LC. 92	**Certification of vegetation clearance:** Following the completion of programmed vegetation clearance from the licence area, described in the CMP, Wellington Water, or its contractor, shall provide certification to the Manager Open Space and Recreation Planning that vegetation clearance has been carried out in accordance with any approved LEMP, CMP and in accordance with any required designation and/or resource consent conditions.	Construction Environmental Management Plan (CEMP) 7.1.2 During Construction Notification Requirements LEMP 6.2 During construction Notification Requirements

Wellington City Council:

I. An appropriate buffer between the earthworks and waterways including confirmation of waterway location by longitudinal and cross-section survey is to be confirmed.
II. If vegetation clearance must occur during the breeding period of kaka, falcon, kakariki, and morepork (1 September to 30 March), then a survey shall be undertaken by a suitably qualified and experienced ornithologist to determine if a nest/nests are present prior to clearance.
III. If no nests are present, a statement will be sent to The Manager - Open Space and Recreation Planning, confirming the site is safe to commence vegetation clearance.
IV. If a nest/nests are present, once the chick has fledged, a statement will be sent to The Manager - Open Space and Recreation Planning, confirming the site is free of nests and vegetation clearance can commence.

Town Belt Act Licence:

I. If any damage to the Papawai Stream or Waitangi Stream tributary bed or margins within the Town Belt, not otherwise provided for within the application documents, a draft reinstatement and offset works plan will be provided to the Manager Open Space and Recreation Planning for review and feedback at least 20 working days prior to the commencement of any reinstatement works.
II. Any damage to any land or vegetation outside of the project footprint will be subject to reinstatement and the provision of offset planting by the project and a draft reinstatement and offset works plan will be provided to the Manager Open Space and Recreation Planning for review and feedback at least 20 working days prior to the commencement of any reinstatement works.
III. Any reinstatement works, offset stream works, or offset planting works required on the project will involve the planning and implementation in consultation with the landscape architect and Project Ecologist appointed by the Manager Open Space and Recreation Planning.

IV. Within 20 working days of the completion of the remediation of the lower playing field, HEB Construction will organise with the Manager a joint inspection of lower field public access way and public car parking area to determine and agree whether remedial works, if any, are required, as a result of the project, to reinstate the access way and/or car parking surface.

V. Following the completion of required vegetation clearance, HEB Construction shall provide certification to the Manager Open Space and Recreation Planning that vegetation clearance has been carried out in accordance with the approved LEMP and regulatory permissions.

6.3 *Post - Construction Notification Requirements*

Table 11: Post – Construction Notification Requirements WCC Conditions

Post-construction requirements		LEMP Section Reference or Relevant Management Plan
DC.33n	Subject to achieving the success standards in paragraphs i), ii) and iii) below, there shall be a five-year defects liability and maintenance period for all terrestrial planting, but the maintenance period may be shorter if the success measures have been achieved earlier. At the end of that period, the Requiring Authority shall provide information to the CMO to demonstrate that the planting has been successful, with success defined as follows:	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-construction Notification Requirements
DC.33n(i)	In relation to mass planting, successful planting shall be defined as 80% canopy closure whereby a sustainable plant community has been established and where plants have grown to create a canopy that shades the ground and suppresses weed growth	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-construction Notification Requirements
DC.33n(ii)	In relation to the planting of specimen trees, successful planting shall be defined as 100% plant survival, with 100% of trees in full leaf(if the relevant species is typically in leaf at that time of year) with the trees to have a habit of growth that is normal to the species and are to be sound, healthy and vigorous with normal and well-developed branch systems	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-construction Notification Requirements
DC.33n(iii)	Success in relation to wetland and riparian planting shall be defined as nearly as practicable to the criteria in i), or ii) and in any event as agreed by expert ecologists.	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-construction Notification Requirements
DC.36	Prior to commencing construction, the Requiring Authority shall remove and store the existing bench seat and plaque located on the reservoir site. Within six months of the completion of construction the bench seat and plaque shall be re-instated.	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-construction Notification Requirements
DC.37	A planting review must be undertaken by a suitably qualified and experienced landscape architect within 3 years of completion of construction of the reservoir. The review will focus on the revegetation and assess the effectiveness of plant growth, particularly on mechanically stabilised slopes. Where required, remedial works shall be undertaken to ensure that planting treatments are successful and have the potential to improve the landscape values of the site. Evidence of this review must be provided to the CMO.	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-Construction Notification Requirements

DC.42(a)	There shall be a 1-year defects liability period for works associated with the reinstatement of each of the upper and lower playing fields, including access tracks, retaining walls (where required), fencing and drainage. This 1 year period will commence from the date that the CMO (in consultation with the Manager, Open Space and Recreation Planning and the Manager, Sports and Recreation Operations and Contracts), confirms in writing that the reinstated field or fields, and related tracks, retaining walls, fencing and drainage are suitable for organised sports use and public activities to commence.	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-construction Notification Requirements

Table 12: Post – Construction Notification Requirements TBA Licence Conditions

Post-construction requirements		LEMP Section Reference or Relevant Management Plan
LC.76	**Access way and car parking area inspection following lower playing field remediation:** Unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, within 20 working days of the completion of the remediation of the lower playing field, Wellington Water or its contractor shall organise with the Manager a joint inspection of lower field public access way and public car parking area to determine and agree whether remedial/repaving work, if any, are required, as a result of the project, to reinstate the access way and/or car parking surface.	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-construction Notification Requirements
LC.94	**Final Site Inspections:** Wellington Water must arrange a schedule of final site inspections following the completion of construction and site remediation, to be agreed in writing by the Manager Open Space and Recreation Planning, as the site is progressively vacated by the project work and associated contractors. The inspection schedule shall provide:	8.11.5 Final Site Inspections 6.3 Post – Construction Notification Requirements
(a)	Sufficient opportunity for identified issues to be resolved by Wellington Water or its contractor to the satisfaction of the Manager Open Space and Recreation Planning, prior to final site vacation.	6.3 Post – Construction Notification Requirements 8.11.5 Final Site Inspections
(b)	For final site inspection by the Manager Parks Sports and Recreation Operations and Manager Open Space and Recreation Planning and the Project Landscape Architect.	6.3 Post – Construction Notification Requirements 8.11.5 Final Site Inspections
LC.96	**Defects and liability period- New Tracks:** There will be a defects period of nine months on new track builds and track reinstatement (including the track, surface materials, drainage and any steps, retaining, handrails, boardwalks or bridges) from the date of completion and final sign off by the Manager, Open Space and Recreation Planning. Any defects must be addressed and repaired to the satisfaction of the Manager, Open Space and Recreation Planning within one month of identification of any issue.	Construction Environmental Management Plan (CEMP) 7.1.3 Post-construction Notification Requirements LEMP 6.3 Post-construction Notification Requirements

Wellington City Council:

I. Information will be provided to the CMO to demonstrate that planting has been successful as measured by conditions DC.33n(i) to DC.33n(iii) after the five-year defects liability and maintenance period.

II. Within six months of the completion of construction the bench seat and plaque located on the reservoir site shall be reinstated.

III. A planting review will be undertaken by a suitably qualified and experienced Landscape Architect within 3 years of completion of construction of the reservoir and provided to the CMO.

IV. It is understood that there is an agreed defects liability period for works associated with the reinstatement of each of the upper and lower playing fields. This defects liability period will commence from the date that the CMO confirms in writing that the fields are suitable for organised sports use and public activities to commence.

Town Belt Act Licence:

I. Within 20 working days of the completion of the remediation of the lower playing field, HEB Construction will organise with the Manager a joint inspection of lower field public access way and public car parking area to determine and agree whether remedial work is required as a result of the project, to reinstate the access way and/or car parking surface.

II. HEB Construction will arrange final inspections following the completion of construction and remediation works. This is to ensure enough time is allowed for issues to be resolved. The final site inspection is between the Manager Parks Sports and Recreation Operations and Manager Open Space and Recreation Planning and the Project Landscape Architect.

III. There will be a defects period of nine months on new track builds and track reinstatement from the date of completion. Any defects will be addressed and repaired within one month of identification.

7 Key Ecological Issues

One of the purposes of the LEMP is to outline the methods and measures to be implemented prior to the Works, during the construction phase, and for a defined period thereafter to avoid, minimise, and mitigate adverse effects of the construction on ecological values and function. Requirements have been identified in GRWC WCC and TBA conditions below.

7.1 *Nesting Bird Survey*

There is a risk that nesting birds, mainly kaka, falcon, kakariki, and morepork, may be adversely affected by the vegetation clearance activity on the project. As such requirements have been identified within the WCC designation conditions below.

Table 13: Nesting Bird Survey and Nest Box Requirements Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33i	A methodology for the monitoring of the nest boxes required by condition DC. 34 during construction, to be prepared by a suitably qualified and experienced ornithologist	7.1.1 Nesting Boxes
DC.34(c)	As far as practicable, vegetation clearance will occur outside the breeding season of kaka, falcon, kakariki, and morepork (1 September to 30 March)	7.1 Nesting Birds Survey
DC.34(d)	If vegetation clearance must occur during the period identified in condition DC.34 c), a survey shall be undertaken prior to clearance by a suitably qualified and experienced ornithologist to determine if a nest or nests are present. If a nest of any of the species identified in DC. 34c) is located on a tree to be felled, that tree must not be felled until the chick(s) has left the nest	7.1 Nesting Birds Survey

DC.34(e)	The Requiring Authority shall engage a suitably qualified and experienced ornithologist to provide a recommendation on the type, location and number of nest boxes that must be installed in adjacent areas of vegetation specifically for resident kaka and morepork.	7.1.1 Nesting boxes
DC.34(f)	Nesting boxes required under DC.34 e) shall be installed under the supervision of the ornithologist prior to the commencement of any tree removal.	7.1.1 Nesting Boxes

Nesting Bird limitations:

I. Wherever possible vegetation clearance will occur **outside the breeding season** for kaka, falcon, kakariki and/or morepork (i.e. late autumn and winter - 1 April to 30 August). Where this occurs, no nest surveys are required.

II. If for any reason vegetation clearance needs to occur **during the breeding season** for kaka, falcon, kakariki and/or morepork (i.e. spring and summer - 1 September to 30 March), a nest survey shall be undertaken within any vegetation to be cleared to determine if a nest or nests are present.

III. This survey will occur a week prior to clearance and be carried out by a suitably qualified and experienced ornithologist.

IV. If no nests are present, a statement will be sent to The Manager - Open Space and Recreation Planning, confirming the site is safe to commence vegetation clearance.

V. If a nest is located on a tree to be felled, the following process will be followed as advised by a suitably qualified Ecologist:

1. The ornithologist will confirm nest location and then determine the extent of a buffer zone to be established around the nest site. The buffer zone will vary according to location of nest, terrain and time of breeding season (i.e. egg, chick, fledgling).
2. Vegetation clearance within the buffer zone will cease until after the chick has fledged, upon which operations can continue.
3. A statement will be sent to The Manager - Open Space and Recreation Planning, confirming the nest find, confirming clearance has ceased and describing the measures being taken to protect the next site.
4. The effectiveness of this buffer will be monitored by ornithologist.
5. If monitoring determines the buffer is insufficient to prevent disruption to nesting the Project shall extend the buffer zone as necessary on the specialist Project Ecologist advice and advise The Manager - Open Space and Recreation Planning, accordingly.
6. Once the chick has fledged a statement will be sent to The Manager - Open Space and Recreation Planning, confirming the site is free of nests and vegetation clearance can commence.

7.1.1 *Nest Boxes*

A methodology and recommendation by a qualified ornithologist of the installation of nest boxes for kaka and morepork was required. The original ecological assessment was carried out early 2017 and since this there has been documented increase in kaka activity. WCC, the Department of Conservation (DOC) and Zealandia discussed increasing interaction between kaka and residential properties and the impact of increased breeding on Council reserve management.

Kaka are expanding in more of the Town Belt and Outer Green Belt and appear to be having no trouble finding nest sites, therefore it has been decided that the effect of tree felling on the project is likely to have a negligible effect on kaka nesting and breeding. Feedback from the Department of Conservation (DoC) and Zealandia had also been sought suggesting that morepork nest boxes are likely to be of very little benefit, that morepork tend to be very flexible and use a variety of sites for nesting and that there is little value adding nest boxes.

Based on this it has been recommended that no nest boxes are installed for kaka or for morepork for the Omāroro reservoir project (*Reference Boffa Miskell Draft LEMP Document and email correspondence with Stephen Fuller)*.

An appendix will be inserted containing detailed documentation confirming this decision between the relevant parties and WCC (Appendix 15).

7.2 *Lizard Survey*

There is a risk that lizards may be adversely affected by the vegetation clearance activity on the project. There are two primary habitat types within the construction footprint that may contain lizards – regenerating native forest and rank grass. As such requirements have been identified within the WCC designation conditions below.

Table 14: Lizard Survey and Salvage Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33j	A methodology for surveying lizard presence prior to vegetation clearance, and minimising effects on lizard populations as required by condition DC.35.	7.2 Lizard Survey
DC.35(a)	Prior to any vegetation clearance occurring, a lizard survey is to be undertaken of the project site and surrounding area by a herpetologist.	7.2 Lizard Survey

Lizard limitations:

I. Within a suitable timeframe prior to vegetation clearance, lizard survey and salvage will be conducted in suitable habitat and 50m or more neighbouring the required footprint clearance.

II. Surveys and salvage will be carried out by a suitably experienced herpetologist.

III. A DoC wildlife permit is required to conduct these surveys and has been applied for at the time this management plan has been written. Once received the requirements as stated on

these permits will be confirmed and incorporated into this LEMP (Appendix 14). The methodologies stated within this LEMP may change to accommodate the conditions of the wildlife permit.

IV. If any lizards are found or there is a sign of presence, lizard relocation surveys and rescue will be conducted immediately following the steps (or a similar methodology) below:

a) ***Pitfall trapping:*** Baited pitfall traps will be set throughout the rank grass and regenerating forest for terrestrial lizard species i.e. the northern grass skink. Pitfall trapping will continue until no lizards are caught for three consecutive fine weather days, or otherwise to the satisfaction of the Project Herpetologist.
b) ***Spotlighting:*** Prior to clearance of the native forest, two nights of spotlighting will be undertaken within the clearance site to survey / salvage for arboreal lizards.
c) ***Hand searching:*** At the time of clearance, two suitably qualified ecologists will hand search felled vegetation for lizards.

V. If lizards are found during salvage, they will be immediately relocated into suitable habitat in the surrounding area, but no closer than 50 metres from the Project footprint.

VI. Upon completion of this survey and/or salvage a report will be sent to The Manager - Open Space and Recreation Planning, confirming the works carried out, any lizards found, their species and location, and the general location of any transfers.

7.2.1 *Lizard Habitat Construction*

Table 15: Lizard Habitat Re-Creation Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.35(b)	If any lizards are found or their presence is suspected measures must be developed to minimise the effect of the project on the lizard population, this may include lizard relocation prior to vegetation clearance, and habitat re-creation associated with post construction site remediation and landscaping. These measures must be included in Landscape and Ecology Management Plan required under conditions DC.32 and DC.33.	7.2.1 Lizard Habitat Construction

Lizard habitat recreation requirements:

I. If any lizards should be found, lizard habitat construction will occur in areas of retained vegetation immediately adjacent to the site.

II. The habitat recreation will be designed by the project herpetologist based on the species and using materials from tree felling. Habitat enhancement may include:
   a. Debris piles: Trees felled will be used to create woody debris piles throughout the site for terrestrial lizard species (example photos below).
   b. Pest control: The site and surrounding areas will have mammalian predator control for the five years following the completion of works. A pest control plan will be

provided by a suitably qualified contractor.

III. Habitat recreation will be confirmed upon the completion of salvage and a report outlining the design will be provided to The Manager - Open Space and Recreation Planning.


Figures 2 and 3: Debris piles for terrestrial lizard species (Reference: Boffa Miskell).

7.3 *Vegetation Removal & Retention*

Vegetation clearance is required on the Omāroro project to enable the construction of the reservoir, placement of fill, construction of the pipe work tunnel and tunnel access road. The general approach is to avoid, minimise and contain effects to low value areas such as lawns, exotic vegetation and planted native vegetation as much as possible. Requirements have been identified in WCC and TBA conditions below.

Table 16: Vegetation Removal and Retention Identified Within Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33f	Identification of vegetation to be retained, including retention of as many as practicable significant trees and areas of regenerating indigenous vegetation	7.3 Vegetation Removal & Retention
DC.33g	Protection measures for vegetation to be retained and vegetation clearance methodology as outlined in condition DC.34, including specifying a requirement that the removal of large trees shall be undertaken by an arborist to minimise damage to adjacent vegetation.	7.3 Vegetation Removal & Retention 7.3.1 Vegetation Protection Measures & Edge Effects
DC.33h	Under conditions DC.33 f) and (g) above, particular attention shall be given to minimisation of the loss of trees in the Seral Forest B and to the protection of trees in the Seral Forest B that do not need to be removed. Where any vegetation is required to be removed from Seral Forest B, the Requiring Authority shall provide the CMO with a written explanation for why the removal is needed.	7.3.3 Seral Forest
DC.33i	A methodology for the monitoring of the nest boxes required by condition DC. 34 during construction, to be prepared by a suitably qualified and experienced ornithologist	7.1.1 Nesting Boxes

DC.34	Prior to any vegetation clearance occurring:	7.3 Vegetation Removal & Retention
DC.34(a)	The maximum extent of clearance is to be clearly identified and confirmed by the Project Ecologist in consultation with the Project Landscape Architect and Project Construction Manager	7.3 Vegetation Removal & Retention 7.3.1 Vegetation Protection Measures & Edge Effects
DC.34(b)	Vegetation to be retained will be clearly marked on site, with special attention given to large trees and Seral Forest B	7.3.1 Vegetation Protection Measures & Edge Effects
DC.34(c)	As far as practicable, vegetation clearance will occur outside the breeding season of kaka, falcon, kakariki, and morepork (1 September to 30 March)	7.1 Nesting Birds Survey
DC.34(d)	If vegetation clearance must occur during the period identified in condition DC.34 c), a survey shall be undertaken prior to clearance by a suitably qualified and experienced ornithologist to determine if a nest or nests are present. If a nest of any of the species identified in DC. 34c) is located on a tree to be felled, that tree must not be felled until the chick(s) has left the nest	7.1 Nesting Birds Survey
DC.34(e)	The Requiring Authority shall engage a suitably qualified and experienced ornithologist to provide a recommendation on the type, location and number of nest boxes that must be installed in adjacent areas of vegetation specifically for resident kaka and morepork.	7.1.1 Nesting boxes
DC.34(f)	Nesting boxes required under DC.34 e) shall be installed under the supervision of the ornithologist prior to the commencement of any tree removal.	7.1.1 Nesting Boxes
Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Vegetation Clearance		
LC.92	Certification of vegetation clearance: Following the completion of programmed vegetation clearance from the licence area, described in the CMP, Wellington Water, or its contractor, shall provide certification to the Manager Open Space and Recreation Planning that vegetation clearance has been carried out in accordance with any approved LEMP, CMP and in accordance with any required designation and/or resource consent conditions.	7.3 Vegetation Removal & Retention

7.3.1 *Vegetation Protection Measures & Edge Effects*

I. Both native and exotic vegetation were identified as part of the AEE. This vegetation includes 10 vegetation types and identified in Appendix 1 along with a mark-up of the areas of removal (*map prepared by Boffa Miskell*).

I. Identification of vegetation to be retained, including significant trees and areas of regenerating indigenous vegetation, will be fenced off to at least the dripline and marked by flagging tape after inspection by the Project Ecologist. This will occur in consultation with the Project Landscape Architect and Project Manager.

II. Once retained vegetation has been confirmed a report will be sent to The Manager - Open Space and Recreation Planning, providing a map of the extent of retained vegetation.

Vegetation protection measures are to be carried out in accordance with the following:

I. Any removal of large trees will be carried out by an arborist to minimise damage to adjacent vegetation;

II. Vegetation clearance maximum boundaries and established trees will be clearly defined with marker tape and fenced to avoid and prevent unnecessary disturbance or damage. Large trees and Seral Forest B will require particular attention and the trees which do not need to be removed require robust protection;

III. Careful selection of appropriate machinery is to be considered to minimise disturbance;

IV. No land disturbance within the dripline of retained trees or vegetation during construction works;

V. Machinery will be kept well clear of the vegetation canopy and any excavations will not undermine the vegetation stability or endanger its health;

VI. Where there is a deviation from any approved route or outside the construction zone, any vegetation in the new construction area will be checked first by the Project Landscape Architect and Project Ecologist. Approval for removal will be required and areas to be retained are to be marked out on site by the Project Landscape Architect and Project Ecologist before proceeding further.

7.3.1.1 Arborist:

I. Prior to commencing on the site, a Council-approved arborist (Project-Arborist) will be engaged by HEB Construction. The Project Arborist shall prepare an arboricultural impact assessment in accordance with AS 4970 – 2009 Protection of Trees on Development Sites. This assessment is to be provided to Councils Arboricultural Officer for review and acceptance.

II. Large trees will be felled by the qualified arborist to ensure minimal effects on adjacent vegetation that is to be retained.

III. Any branches to be pruned where the Work Zone Boundary meets the existing tree line, will be carried out by the qualified arborist with the advice from the Project Ecologist.

IV. Any vegetation to be retained requiring remedial work such as pruning or crown lifting will also be carried out by the qualified arborist to ensure the work is in accordance to best practice.

V. The Tree protection zone (TPZ) shall be fenced as indicated in the arboricultural impact assessment to ensure both the vegetation and the natural ground around it are not damaged. A permanent fence shall be erected at edge of the TPZ. The protective fence shall be installed before construction and remain there until the work is finished. The fence should be clearly visible and strong enough to protect the tree trunk, branches and tree roots from any accidental damage and machinery impact.

VI. All vehicles, structures, building materials and debris associated with construction will not be stored within the Tree Protection Zone (TPZ) of any tree, unless prior approval from the Project Arborist.

VII. On completion of work the Project Arborist will, at their discretion, sign off the work and provide an account of the project to the Council arborist and compliance monitoring officer (CMO) that documents:

a. Photographs showing stages of any work within the root protection area;
b. Effects of work on the trees;
c. Remedial works required.

7.3.2 *Vegetation Clearance*

HEB Construction will identify areas of required vegetation clearance shown on the relevant construction drawings; this includes exotic trees, shrubs or grass, and the methods of removal dependant on height as tabled below. Where identified all native trees will remain undisturbed.

Table 17: Clearing Schedule

Material	Location	Height	Clearing Details
Grass and weeds	All areas to be planted or grassed	AL	Blanket spray with herbicide, up to two applications, dependant upon the situation and weed type.
Blackberry	All areas to be planted or grassed	All	Blanket spray with herbicide, up to two applications dependant on the situation. Cut, mulch and respray growth.
Gorse	All areas to be planted or grassed	All	Cut and mulch and spray regrowth with 2 applications and spray regrowth with approved herbicide specific for gorse
Exotic trees and shrubs	Massed planting not on fill site	All	Fell, remove and mulch (See Notes 1 & 2)
Convolvulus	All areas to be planted or grassed	All	Spray active growth with approved herbicide with marker dye added; monitor closely and re-spray any regrowth.

All plant and equipment will only be operated by licensed, experienced operators. Only certified applicators will be responsible for the application of herbicides and chemical sprays will be Wellington City Council approved spray/chemical list, with an approved Wellington City Council contractor. All chemical used will be recorded in a spreadsheet, with operators name, product name, quantity used, and date sprayed.

Where vegetation clearance cannot be avoided, HEB Construction will ensure the clearance process will involve the following:

I. Notification provided to the Project Ecologist, within a sufficient timeframe to

ensure all wildlife salvage regulation requirements including nesting birds and lizards, have been adhered to.

II. Identification of the extent of vegetation clearance by the Project Landscape Architect and Project Ecologist in collaboration with the Construction Manager.

III. Space will be provided for construction machinery to operate without causing unnecessary damage. To avoid damage to surrounding vegetation, clearance will involve the following;

a. Machinery will be selected to minimise ground and root disturbance;

b. Where an area of vegetation is being partially cleared (such as Seral Forest B), trees will be felled away from areas to be retained and back into the construction footprint;

c. Felled vegetation will not enter any waterway and will not be stockpiled within 10m of any waterway.

IV. The Project Ecologist and Landscape Architect will confirm the process for clearanceor modification prior to works commencing.

V. The felling of trees will be carried out by a suitably qualified Wellington City Council approved arborist. Trees will not be cleared by excavator, scraper or other, non-specialist equipment.

VI. Plant matter considered to be ecologically valuable shall be stockpiled for uses such as lizard habitat reconstruction and mulching.

VII. The potential for spreading of pest plant species will be minimised by:

a. Ensuring machinery entering site has been thoroughly cleaned;

b. Use of appropriate machinery to clear vegetation, minimising soil disturbance;

c. Separating weeds from vegetation to be mulched and ensuring pest plant matter is removed from site and disposed appropriately.

VIII. Following the completion of programmed vegetation clearance, certification will be provided to the Manager Open Space and Recreation Planning that the vegetation clearance has been carried out in accordance with this LEMP, the WCC and TBA condition requirements.

Manuka Trees

During vegetation clearance activities, HEB will keep manuka trees separate from other vegetation for delivery by others to Taranaki Whānui ki te Upoko o te Ika. Pekaira Rei will be contacted to confirm delivery requirements.

7.3.3 *Seral Forest*

There is a requirement to bury the reservoir and therefore a large fill is proposed to the south of the reservoir which will fill the valley containing Seral Forest B (Appendix 2).

HEB Construction will ensure all practicable efforts to minimise the extent of the loss of trees in Seral Forest B and to ensure the protection of those trees that do not need to be removed.

A very small area of Seral forest A will be disturbed by construction works and is to be replanted. Seral forest C sits within the riparian planting zone for the Papawai Stream, which is to be strengthened through further planting.

7.3.4 *Edge Effects*

For areas of valued vegetation that are being partially cleared (such as Seral Forest A, B and C) there is a risk that the cut edge will expose the retained vegetation to windthrow, desiccation and weed invasion. Immediately following vegetation clearance, HEB Construction will ensure following steps will be performed:

I. The cut edge of retained vegetation will be checked by a suitably experienced ecologist.

II. Where an area of clearance is considered to open the forest to risk from edge effects, recommendations for remedials will be considered. These may include:
   a. Installation of shade cloth;
   b. 'Buffer' planting;
   c. Weed management.

III. Where remedial works are carried out a statement will be sent to The Manager - Open Space and Recreation Planning, confirming the types of works, their location and duration.

7.4 *Stream Discharges*

During the construction phase of the programme there is a potential for discharges to either Papawai Stream or the Waitangi Stream tributary, especially under high rainfall/flow conditions. No current and approved works are proposed to occur within either Papawai Stream or the Waitangi Stream tributary At the time of the drafting of this document a consent application had been lodged with GWRC by WWL in relation to a proposed stormwater upgrade that would require some physical works in and around the Waitangi Stream. When, and if, consent is granted this LEMP, and aspects of the ESCP, and CEMP will be updated to address consent conditions and any mitigation measures regarded. Requirements have been identified in the GWRC conditions below.

Table 18: Water Quality Monitoring & Discharges Identified Within GWRC Regulatory Permissions

GWRC Resource Consent Conditions		
Pre-Construction Requirements		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
7d(i)	Methodology and proposed trigger limits for water quality monitoring and discharges	7.4 Stream Discharges

8(h)	Rainfall response and contingency measures including procedures to minimise adverse effects in the event of extreme rainfall events and/or the failure of any key erosion and sediment control measures or devices	7.4.1 Rainfall Event Monitoring 7.4.2 Actions Resulting from a Discharge
21(e)	Notwithstanding the requirements of any other conditions of this consent, the consent holder shall ensure that, after a reasonable mixing zone, discharges from the site shall not give rise to any of the following effects in any receiving waterbody: Any significant adverse effects on aquatic life. *Note: For the purposes of this condition, the end zone of reasonable mixing is defined as a point 50 metres downstream from any point of discharge to a waterbody.*	7.4.1 Rainfall Event Monitoring 7.4.2 Actions Resulting from a Discharge

7.4.1 *Rainfall Event Monitoring*

HEB Construction will follow the site auditing requirements below in the event of a heavy rainfall event and where there has been a discharge which directly or indirectly causes, or is likely to cause, adverse ecological effects in the receiving environment.

I. During any heavy rainfall event, defined as 20 mm/24 hrs or 7 mm/hr, a suitably experienced person will visit the site, walking each stream from 50 m below open earthworks to a minimum of 50 m upstream of works.

II. During this visit, turbidity monitoring will be carried out at fixed sampling sites (to be confirmed in the ESCP and reviewed by the project ecologist) and at any other location where there is a visible increase in turbidity or visible surface flow of discoloured water into the stream.
    a. Turbidity monitoring (NTU) will be undertaken with an approved and calibrated handheld turbidity meter.

III. At any location where there is a visible or measured increase in turbidity/surface flows within the stream, the qualified person shall investigate and determine the source of the sediment.

IV. If an excessive sediment discharge is being generated from the Project, immediate action will be taken to remedy that discharge. The trigger for a determination of “excessive” will be:
    a. An NTU measure 25 % greater than is recorded at the control site (site immediately above works) if NTU exceeds 100, or
    b. An NTU measure that is 20 NTU greater than is recorded at the control site (immediately above works) if NTU is less than 100.

V. If an excessive discharge has been generated a review will be carried out the following day, any necessary improvements of Erosion and Sediment Control devices will be completed, and those measures will be carried out within 3 working days (TBC).

The CMO will be informed within 3 working days (TBC) of both the event and the response.

7.4.2 *Actions Resulting from a Discharge*

If the rainfall event monitoring confirms there has been an excessive sediment discharge generated from the Project, or a non-rainfall related discharge occurs, the following sampling will be carried out by a suitably qualified ecologist to determine whether that discharge has had an adverse ecological effect.

Deposited sediment sampling:

A modified SAM-1 (bankside visual estimate of percentage sediment cover) assessment will be carried out as follows:

I. Fixed sampling sites will be located (These sites to be confirmed in the ESCP and reviewed by the project ecologist).

II. As soon as the stream is running clear, a visual assessment of the percent of streambed covered in newly deposited fine sediment (<2 mm) will be carried out by a suitably experienced person as early as practicable.

III. At each sample site a visual inspection of the streambed, banks, shoulders, and adjacent floodplain (where present) will occur. As a minimum, the following is to be recorded inspection:
    a. Flattened vegetation,
    b. New / increased bed or bank erosion, and
    c. Obvious fresh depositions of gravels, silts and muds (yellow-brown mineral deposits as opposed to brown-black organic deposits).

IV. Where possible the depth of new sediments will be recorded.

V. If there are notable differences between deposition upstream, within the site, and downstream, which can be confidently attributed to a discharge from the Project, it will be determined that the discharge has had a physical effect, and further macro-invertebrate sampling will be carried out.

Macroinvertebrate sampling:

A modified macroinvertebrate assessment will be carried out as follows:

I. Fixed sampling sites will be located (These sites to be confirmed in the ESCP and reviewed by the project ecologist).

II. Macroinvertebrate sampling will, as far as practicable, be avoided within two weeks of a high- rainfall event. Where multiple high-rainfall events occur within a shorter duration sampling will wait until two weeks after the final event.

III. Sampling will be carried out by a suitably experienced ecologist. A surber sampler will be used to collect the macro-invertebrate samples and will be taken at each of the sampling sites. Macroinvertebrate sampling will not be carried out at a frequency of greater than once every 12 weeks.

IV. If macroinvertebrate sampling occurs in response to a known point-source discharge event then sampling should also occur at the point of discharge and 50 m downstream, beyond the zone of reasonable mixing.

V. Five biological indices will be calculated from the macroinvertebrate data obtained from each survey, including:
   a. taxonomic richness,
   b. EPT taxa richness,
   c. proportion of EPT taxa,
   d. macroinvertebrate community index (MCI), and
   e. quantitative MCI (QMCI).

VI. These results will provide an indication of the general health of the macroinvertebrate community at each site at the time of sampling.

VII. A comparison of the results with previous surveys and between sites can assist with determining whether there has been a marked change in a community.

VIII. Data recorded at each site during the survey can also assist with identifying any changes in environmental conditions that could contribute to changes in the state of the macroinvertebrate community.

IX. Recommendations will be made by the project ecologist which may include additional sampling and/or mitigation.

X. If additional sampling is recommended, consideration should be made to the frequency of the monitoring to not adversely deplete macroinvertebrate abundances through over-extraction. Further monitoring will be determined by the qualified ecologist.

Baseline macroinvertebrate monitoring:
For a significant adverse effect on aquatic life to be measurable, baseline macroinvertebrate samples will be collected from each monitoring location and processed as per the above method to determine:

I. The pre-existing community assemblage at each site and the variation between sites, and
II. The pre-existing index measures.

A baseline summary will be produced in writing prior to the commencement of any earthworks. The summary will confirm the above process is suitable or recommend any alterations. Any recommended changes will be confirmed in writing with The Manager, Environmental Regulation, GWRC, prior to enacting and this plan will be revised and updated accordingly.

HEB Construction will ensure the Community Reference Group (CRG) will be notified of any contamination of watercourses and issued baseline macroinvertebrate sample results.

7.5 *Protection of Streams*

Any damage to the Papawai Stream or Waitangi Stream tributary bed or margins within the Town Belt, not otherwise provided for within the application documents or any consents obtained from

Greater Wellington, will be reinstated and offset by the project. Requirements have been identified in the TBA conditions below.

Table 19: Protection of Streams, Reinstatement & Offset Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of Streams		
LC.14	Stream damage to be reinstated and offset:	
	Any damage to the Papawai Stream or Waitangi Stream tributary bed or margins within the Town Belt, not otherwise provided for within the application documents or any consents obtained from Greater Wellington, will be subject to a requirement for reinstatement and offsetting by Wellington Water, in accordance with LC15-LC24. *Note: The intention of this condition is to set a high bar for avoidance of ANY stream disturbance or damage. While a high bar is set, if damage does occur, the remediation will be commensurate with the damage as determined by professionals (refer condition 16). For example, damage ta vegetation at the bank will require replanting of that area and an offset area but will not mean that the offset area needs to be completely redeveloped as a comprehensive stream restoration project.*	7.5 Protection of Streams

7.5.1 *Stream Reinstatement and Offset Works*

Table 20: Protection of Streams, Reinstatement & Offset Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of Streams		
LC.15	Stream reinstatement and offset works: Any reinstatement and offset works required by LC.14 shall, unless otherwise agreed by the Manager Open Space and Recreation Planning, be three times the length of the stream bed or margin that is damaged.	7.5.1 Stream Reinstatement and Offset Works
LC.16	Reinstatement and offset works plan to be produced by landscape architect and/ or ecologist: Wellington Water must employ a suitably qualified landscape architect and/or ecologist, to produce a reinstatement and offset works plan, and supervise implementation of any reinstatement works under LC.15.	7.5.1 Stream Reinstatement and Offset Works
LC.17	Reinstatement and offset works plan consultation: If required by the Manager Open Space and Recreation Planning the planning and implementation of works required under LC. 15 shall occur in consultation with any landscape architect and/or ecologist appointed by the Manager Open Space and Recreation Planning.	7.5.1 Stream Reinstatement and Offset Works – during construction add in requirements
LC.20	Reinstatement and offset works plan approval: The reinstatement and offset plan shall be provided to the Manager Open Space and Recreation Planning for approval 20 working days prior to commencement. Works shall not commence prior to receipt	7.5.1 Stream Reinstatement and Offset Works

	of written approval.	
LC.21	Reinstatement and offset works completion: Any reinstatement and offset works required under LC. 15 must be completed within three months of the damage, or within an appropriately suitable reinstatement period set out in the reinstatement and offset plan.	7.5.1 Stream Reinstatement and Offset Works
LC.22	Reinstatement and offset works certification: Any agreed reinstatement and offset works under LC. 20 must be inspected by the Manager Open Space and Recreation Planning, or by any appointee of the Manager, and certified in writing as being completed.	7.5.1 Stream Reinstatement and Offset Works

Any reinstatement and offset works shall be three times the length of the stream bed/margin in question.

A reinstatement and offset plan will be produced by a landscape architect and or ecologist in consultation with the Manager Open Space and Recreation Planning, if any damage to the Papawai Stream or Waitangi Stream tributary occurs that is not provided for as authorised by the consents, designation and/or licence agreement granted for this project

A suitably qualified landscape architect and ecologist, to produce a reinstatement and offset works plan and must supervise implementation of any reinstatement works in this plan.

Any reinstatement and offset works will be completed within three months of the damage and will be inspected by the Manager Open Space and Recreation Planning to be certified in writing as complete.

7.5.2 *Damage Documentation and Reporting*

Table 21: Damage Documentation and Reporting Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of Streams		
LC.18	Damage documentation and reporting: Wellington Water must also formally document any damage incident under LC.14 and include details of this incident on a breach register and provide an update of this breach and its response to this in a report to the next available CRG, or CLG, meeting.	7.5.2 Damage Documentation and Reporting

The project will also formally document any damage to either the Papawai Stream or Waitangi Stream tributary including details onto a breach register. This breach and the response will be provided to the CRG.

7.5.3 *Consenting and Cost Responsibilities*

Table 22: Consenting and Cost Responsibilities Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of Streams		
LC.24	Reinstatement and offset works consenting responsibilities: Wellington Water or its contractor will have responsibility for obtaining any consents required from Greater Wellington Regional Council for any stream damage or stream reinstatement and offset works.	7.5.3 Consenting and Cost Responsibilities
LC.25	Reinstatement and offset costs: Any costs associated with LC. 14- LC. 24 will be met by Wellington Water or its contractor, unless otherwise agreed with the Manager Open Space and Recreation Planning.	7.5.3 Consenting and Cost Responsibilities

The project will obtain any consents required from GWRC for any stream damage or stream reinstatement / offset works and any costs associated will be met unless otherwise agreed with the Manager Open Space and Recreation Planning.

7.5.4 *Reinstatement and Offset Maintenance*

Table 23: Reinstatement and Offset Maintenance Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of Streams		
LC.23	Reinstatement and offset maintenance : Any reinstatement and offset works must be maintained by Wellington Water or its contractor to establish as intended. Any reinstatement and offset works plan and reinstated or offset works stream area/s must be added to any draft or final Landscape and Ecology Management Plan (LEMP) required under the designation conditions to ensure the area is subject to ongoing management and maintenance under the LEMP.	7.5.4 Reinstatement and Offset Maintenance

Any reinstatement and offset works must be maintained by the project to establish as intended. Any reinstatement and offset works plan and stream area/s will be added to the LEMP to ensure the area is subject to ongoing management and maintenance under the LEMP.

7.6 *Protection of land or Vegetation Outside of the licence Area*

Any damage to any land or vegetation outside of the project footprint will be subject to reinstatement of the damage and the provision of offset planting by the project. Requirements have been identified in the TBA conditions below.

Table 24: Offset Planting Works Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of land or Vegetation Outside of the licence Area		
LC.26	Land and vegetation damage to be reinstated and offset	
	Any damage to any land or vegetation outside of the licence area will be subject to a requirement for both the reinstatement of the damage and the provision of offset planting by Wellington Water, in accordance with LC. 27- LC. 37.	7.6 Protection of land or Vegetation Outside of the licence Area
LC.27	Offset planting area	7.6.1 Offset Planting Works
	Any offset planting area required by LC. 26 shall, unless otherwise agreed by the Manager Open Space and Recreation Planning, be:	7.6.1 Offset Planting Works
(a)	Three times the size of the area of land disturbed, or	7.6.1 Offset Planting Works
(b)	In the case of the disturbance of vegetation three times the area of land contained within the drip line of any damaged or removed vegetation, or	7.6.1 Offset Planting Works
(c)	Whichever is the greater of (a) or (b).	7.6.1 Offset Planting Works
LC.29	**Reinstatement and offset planting plan to be produced by landscape architect and ecologist**: Wellington Water must employ a suitably qualified landscape architect and ecologist, agreed to by the Manager Open Space and Recreation Planning to produce a draft reinstatement and offset planting plan, and to plan and implement any reinstatement and offset planting works required under LC.27.	7.6.1 Offset Planting Works
LC.30	Reinstatement and offset planting plan consultation: If required by the Manager Open Space and Recreation Planning the preparation of the plan and any planning and implementation of works required under LC.27 shall occur in consultation with any landscape architect and/or ecologist appointed by the Manager Open Space and Recreation Planning.	7.6.1 Offset Planting Works – 6.2 During Construction Notification Requirements

7.6.1 *Offset Planting Works*

Any offset planting area required by the project will be:

I. Three times the size of the area of land disturbed;
II. Three times the area of land contained within the drip line of any damaged/removed vegetation or;
III. Whichever is greater.

The landscape architect and ecologist will produce a draft reinstatement and offset planting plan as agreed to by the Manager Open Space and Recreation Planning.

The preparation of the plan and implementation of the works required will occur in consultation with any landscape architect and/or ecologist appointed by the Manager Open Space and Recreation Planning.

7.6.2 *Damage Documentation and Reporting*

Table 25: Damage Documentation and Reporting Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference

Protection of land or Vegetation Outside of the licence Area		
LC.28	Damage documentation and reporting	7.6.2 Damage Documentation and Reporting
	Wellington Water must also formally document any damage incident under LC.26 and include details of this incident on a breach register and provide an update of this breach and its response to this in a report to the next available CRG, or CLG, meeting.	7.6.2 Damage Documentation and Reporting

The project will also formally document any damage and incident details onto a breach register. This breach and the response will be provided to the CRG.

7.6.3 *Approvals and Certification*

Table 26: Approvals and Certification Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of land or Vegetation Outside of the licence Area		
LC. 32	Reinstatement and offset plan approval	
	Reinstatement works required under LC. 27 shall not commence until a final reinstatement plan is approved by the Manager Open Space and Recreation Planning.	7.6.3 Approvals and Certification
LC. 33	Reinstatement and offset planting works completion	
	Any reinstatement and offset planting works required under LC. 27 must be completed within three months of the damage, or within an appropriately suitable period agreed with the Manager Open Space and Recreation Planning.	7.6.3 Approvals and Certification
LC. 34	Reinstatement and offset works certification	
	Any agreed reinstatement and/or offset works under LC. 32 must be inspected by the Manager Open Space and Recreation Planning, or by any appointee of the Manager, and certified in writing as being completed.	7.6.3 Approvals and Certification

Reinstatement works will not commence until a final reinstatement plan is approved by the Manager Open Space and Recreation Planning.

Any reinstatement and offset planting works required will be completed within three months of the damage, or within a suitable period agreed with the Manager Open Space and Recreation Planning. The works will then be inspected by the Manager Open Space and Recreation Planning to be certified in writing as complete.

7.6.4 *Reinstatement and Offset Maintenance*

Table 27: Reinstatement and Offset Maintenance Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of land or Vegetation Outside of the licence Area		
LC. 35	Reinstatement and offset planting maintenance	

	Any reinstatement and offset planting works must be maintained by Wellington Water or its contractor to establish as intended. Any reinstated or offset planting area/s must be added to any draft or final Landscape and Ecology Management Plan (LEMP) to ensure the area is subject to ongoing management and maintenance under the LEMP.	7.6.4 Reinstatement and Offset Maintenance

Any reinstatement and offset planting must be maintained by the project to establish as intended. Any reinstatement and offset works plan and stream area/s will be added to this LEMP to ensure the area is subject to ongoing management and maintenance under the LEMP.

7.6.5 *Consenting and Cost Responsibilities*

Table 28: Consenting and Cost Responsibilities Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Protection of land or Vegetation Outside of the licence Area		
LC. 36	Reinstatement and offset planting works consenting responsibilities	
	Wellington Water or its contractor will have responsibility for obtaining any consents required from Greater Wellington Regional Council and/or Wellington City Council for any land or vegetation damage or reinstatement or offset planting works required outside of either the licence or designation area.	7.6.5 Consenting and Cost Responsibilities
LC. 37	Reinstatement and offset planting costs	
	Any costs associated with LC. 26- LC. 36 will be met by Wellington Water or its contractor, unless otherwise agreed with the Manager Open Space and Recreation Planning.	7.6.5 Consenting and Cost Responsibilities

The project will obtain any consents required from GWRC for land or vegetation damage or reinstatement or offset planting works. Any costs associated will be met unless otherwise agreed with the Manager Open Space and Recreation Planning.

7.7 *Weed Surveys*

A baseline survey of pest plant species on site will be carried out by a suitably qualified ecologist prior to the commencement of construction. This will assist in tracking the potential spread of weeds throughout site.

I. Biannual weed surveys will occur every spring and autumn, and are required so that:
   a. There is a measure of existing weeds and newly introduced ecological weeds to the site.
   b. Any existing weeds requiring immediate control under the Regional Pest Management Survey (RPMS) are managed.
   c. Opportunities to control existing ecological weeds that can be readily removed.

II. Biannual surveys will include riparian zones, road verges, shelterbelts, open areas of recently disturbed soils, cut faces, and recently / partially cleared areas of vegetation. Plants not outlined in the Regional Pest Management Strategy (RPMS) which are considered an ecological threat may still be recommended for control.

III. Species-specific recommendations for control will be formed.

7.8 *Pest Management.*

7.8.1 *Pest Management Methodology and Programme*

An assessment of plant and animal pests will be undertaken prior to any works commencing. This assessment shall outline the baseline pest populations to be controlled throughout the contract works and include a list of pest species (including animal pests (if required) and plant pests including priority pests from the GWRC Regional Pest Management Strategy (RPMS). A detailed plant and animal pest control methodology and programme will be prepared prior to site preparation and planting associated with landscaping scheduled for 2023. The methodology and programme shall address pests identified in the pest assessment. Including the following:

(a) A plan or map detailing the extent of the site preparation/clearance areas to be managed, and the location of any sensitive areas;
(b) Types of chemicals (herbicide, fungicide, baits) that are likely to be used and the times of year that any control operations are likely to occur;
(c) Strategies used to avoid contamination of sensitive areas. This could include specific application techniques, no-spray buffer zones, a list of people who need to be informed of spraying operations.
(d) The identity of the person likely to be undertaking the work and confirmation of their current qualifications/certifications.
(e) Particular weather conditions which may increase potential drift hazard; and
(f) Indication of agrichemicals to be used that may present a specific hazard
(g) A critical path timeline capable of showing progress through the contract period up to the end of the defects liability and maintenance period.

7.8.2 *Plant Pest Contractors*

All plant pest control works shall be in accordance with the accepted horticultural practices, and shall be carried out by suitably qualified and experience contractors in relation to use of herbicides Growsafe certified or an equivalent shall be required.

7.8.3 *Animal Pest Contractors*

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

HEB Construction will ensure that the contractor shall take all prescribed steps contained in the Health and Safety in Employment Act 1992 (HSEA) and the Resource Management Act 1991 (RMA) to ensure that no act or omission is in breach of any duty or obligation of the Contractor under the said legislation.

7.8.4 *Pest Plant Removal and Disposal*

Plant Pest control shall be undertaken during site preparation and prior to planting associated with landscaping scheduled for 2023, with all landscape areas being cleared of pest plants prior to planting. HEB Construction will ensure that the Contractor disposals of the pest plants off site in a safe and legal manner in accordance with local authorities' guidance.

7.8.5 *Preparation for Animal Pest Control*

Any of the following animal control measures may be implemented depending on the outcome of the initial pest assessment and subsequent site evaluations, some of the measures may require consents or permits:

(a) Capture and relocation of birds (may require a Wildlife Permit for DoC);
(b) Rabbit/Possum trapping

7.8.6 *Notification, Hoardings and Signs.*

HEB Construction will supply, install, manage and maintain all Health and Safety Warning signs as required, for the duration of the Project and in accordance with the Application for Medical Officer of Health Permission to lay Controlled Pesticides. All necessary warning notices and other signage shall be erected for the duration of the pest control and the pesticide caution period, in accordance with the consent(s). HEB Construction will inform neighbouring landowners of the proposed pest control programme at least 7 days prior to pesticide applications and again on completion of the programme. Notification shall be in the form of a letter delivered to the property occupier, providing the following details:

(a) Pests to be controlled
(b) Poisons to be used Drop
(c) locations Application dates
(d) Name of Contractor's representative with 24-hour contact phone number.

Notification, Hoardings and Signs:

(a) Pests to be controlled
(b) Name of Contractor's representative with 24-hour contact phone number
(c) Poisons to be used Drop locations
(d) Application dates

All pest control activities will be discussed prior to starting with the WCC.

7.8.7 *Carcass Removal*

HEB Construction will ensure that the Contractor shall collect carcases, especially during all professional hunting operations, and throughout the Project, and dispose of carcasses at licensed landfills.

8 Key Landscape Issues and Strategy

This landscaping section of the LEMP shall outline the permanent mitigation measures, as well as the necessary monitoring and management required for landscape amenity, use and function during the operational phase of the Project. Requirements have been identified in GRWC WCC and TBA conditions below.

Table 29: Final Landscape Strategy Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33(a)	Final landscape strategy	8. Key Landscape Issues and Strategy

A landscape strategy has been developed to assist integrating the completed reservoir within the existing vegetated open space context characteristic of Prince of Wales Park. The resultant landscape treatment will be addressed as an integral part of the project in accordance with the following objectives:

I. Create a final landform that supports a smooth integration with adjacent areas of topography and optimises effective revegetation conditions;
II. Establish native vegetation, amenity trees and areas of open grass which assist the final landform becoming assimilated within its surrounding open space setting and maintains a wider green backdrop; and
III. Maintain and enhance recreation opportunities, including recreation tracks, lookout opportunities and playing fields.

The landscaping works require the rehabilitation of the landform to incorporate the reservoir within the Prince of Wales, to re-establish / reinstate modified playing fields and the rehabilitation of the vegetation.

A landscape concept (Appendix 3) and landscape detailed drawings (Appendix 4) are attached in this LEMP document. The Landscape and Visual Assessment also provides further detail on the landscape strategy used for this project.

All Materials and workmanship shall comply with the relevant requirements and following standards listed in the Landscape Technical Specification (Appendix 5), as appropriate.

8.1 *Buffer (No go) Zones*

Table 30: Buffer Zones Identified Within GRWC & WCC Regulatory Permissions

GWRC Resource Consent Conditions		
Pre-Construction Requirements		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
8e(v)	Any "no go" and/or buffer areas to be maintained undisturbed, including minimum buffer strips of riparian vegetation to be retained	8.1 Buffer Zones
Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		

DC.33b	Confirmation of an appropriate buffer between the earthworks and waterways including confirmation of waterway location by longitudinal and cross-section survey. In the case of the Papawai Stream the buffer shall be no less than 10m on the stream's west bank (hillside). In the case of the Waitangi Stream Tributary, to the west of the project site, no buffer shall be less than 5m.	8.1 Buffer Zones

HEB Construction will ensure that the two buffer areas identified are to be maintained and undisturbed, including the 'no go' areas marked in Appendix 4 Landscape Drawings. As previously mentioned, the project will minimise the vegetation clearance to what is required, and vegetation will be retained as much as practicable.

The vegetation buffer required for Papawai Stream will be no less than 10m on the stream's west bank.

The vegetation buffer required for Waitangi Stream Tributary will be no less than 5m (Figure 5).

Confirmation of the required buffers between the earthworks site and the Waitangi Stream Tributary and the Papawai Stream will be provided, including a location by longitudinal and cross-section survey as soon as practicable.

Construction works are not to encroach on or go through into the buffer zone (no go) areas show in Appendix 4 Landscape Drawings. The buffer (no go) zones will be marked on site by signs and flag-lines.

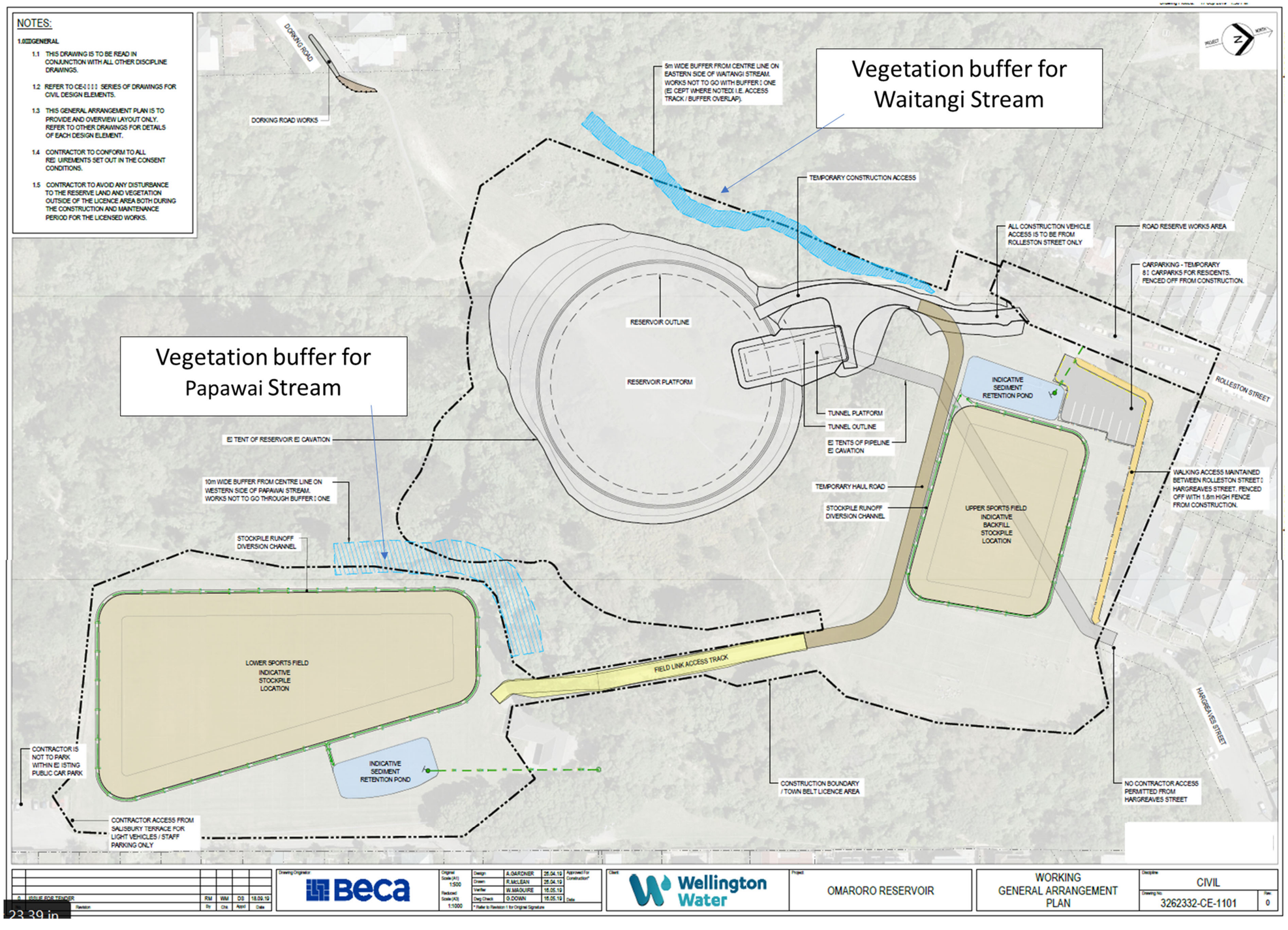

Figure 5: Buffer Zones for Papawai Stream and Waitangi Stream

8.2 *Riparian Planting*

Table 31: Riparian Planting Identified Within GRWC Regulatory Permissions

GWRC Resource Consent Conditions		
Pre-Construction Requirements		
Condition number	Condition requirement	LEMP Section Reference
7b(iii)	Details of enhancement of riparian vegetation along all waterways within the site area	8.2 Riparian Planting

HEB Construction will carry out revegetation, riparian planting along areas specified of the Waitangi (Figure 6) and Papawai (Figure 7) Streams. As previously mentioned, Seral forest C sits within the riparian planting zone for the Papawai Stream, which is to be strengthened through further planting.

HEB Construction will complete Riparian planting (Figure 8), see Landscape Design Drawings (Appendix 4), in Spring (May through to Late October) when the water temperature is starting to rise.

It is expected that there will be some weeds present in the riparian areas. HEB Construction will use a manual release technique in these areas as the use of herbicides in water zones is restricted. Weeds species may be present post weeding providing these do not inhibit or compromise the growth of riparian species. No fertiliser will be used for riparian planting and only biodegradable weed mat will be used.

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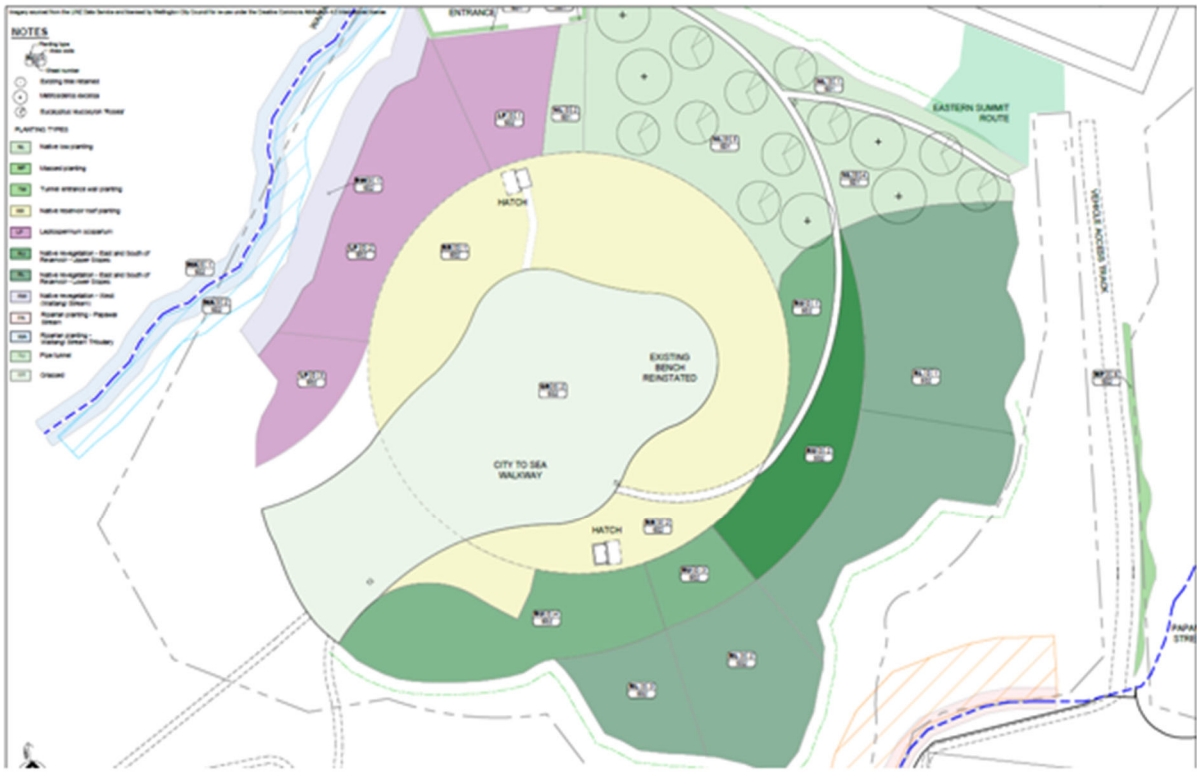


Figure 6: Design drawing showing area for riparian planting along Waitangi Stream

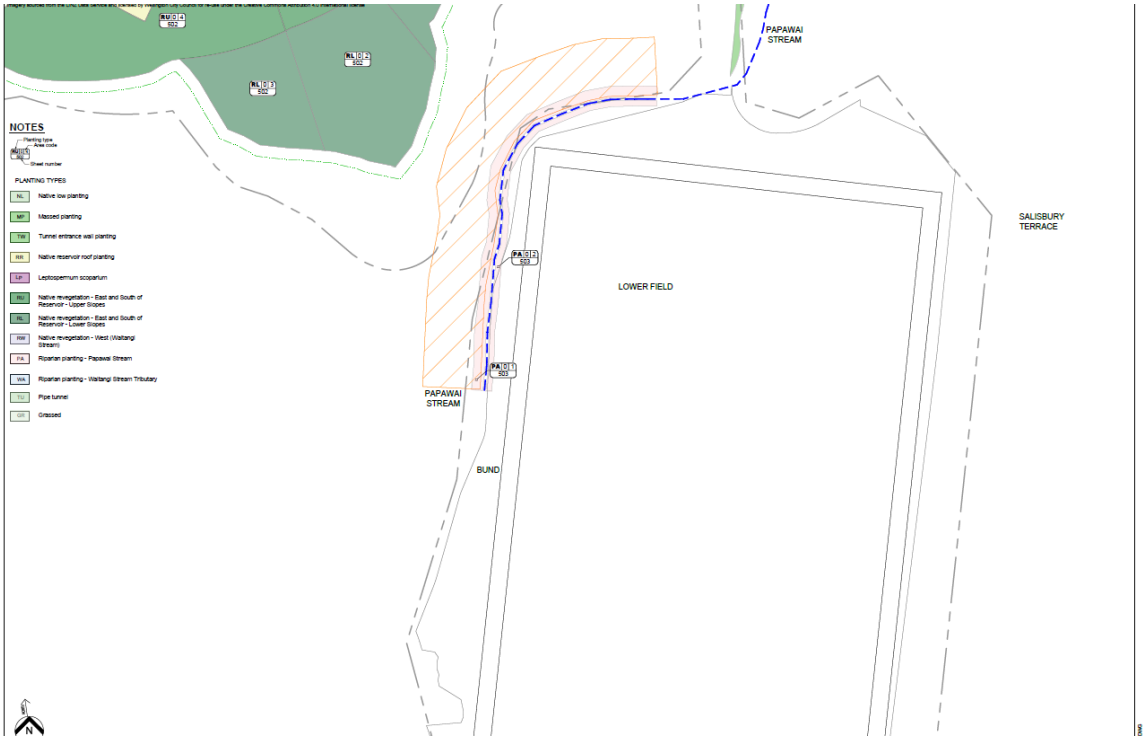


Figure 7: Design drawing showing area for riparian planting along Papawai Stream

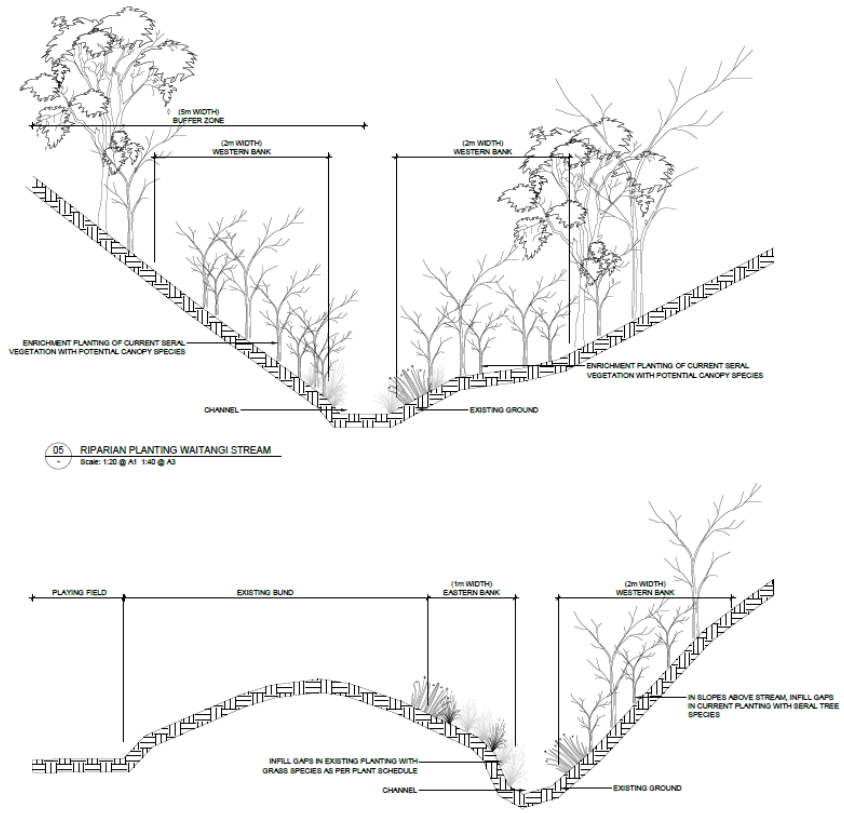


Figure 8: Design drawing showing area for riparian planting along Papawai and Waitangi Streams

For further details and the extent of riparian planting on the Omāroro project refer Landscape Detailed Design Drawings in Attachment 4 and Technical Specification Landscape in Appendix 5.

8.3 *Site Preparation for Landscaping*

8.3.1 *Weed Control*

Table 32: Weed Control and Clearance Identified in WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33m(i)	**Detailed specifications relating to (but not limited to) the following:** Weed control and clearance	8.3.1 Weed Control

There is a requirement for vegetation management and for plant pests to be controlled. Before any work commences an assessment of pests shall be undertaken and control methods established. Plant pests shall be controlled across the project during the contract works and during the Defects Liability and Maintenance Period.

Plant Pest Control Methodology and Programme:

Plant Pest control will be undertaken during site preparation with all landscape areas being cleared of pest plants prior to planting.

A detailed methodology and programme report shall be written by HEB Construction prior to site preparation and planting. The methodology and programme shall address pests identified in the pest assessment and includes the following:

I. A plan or map detailing the extent of the site preparation/clearance areas to be managed, and the location of any sensitive areas;
II. Types of chemicals (herbicide, fungicide, baits) that are likely to be used and the times of year that any control operations are likely to occur;
III. Strategies used to avoid contamination of sensitive areas. This could include specific application techniques, no spray buffer zones, a list of people who need to be informed of spraying operations.
IV. The identity of the person likely to be undertaking the work and confirmation of their current qualifications/certifications.
V. Particular weather conditions which may increase potential drift hazard; and
VI. Indication of agrichemicals to be used that may present a specific hazard
VII. A critical path timeline capable of showing progress through the contract period up to the end of the defects liability and maintenance period.

HEB Construction will then undertake the pest control works in general accordance with the approved methodology and programme.

Hydro-seeding Grassed (and Specialist) Surfaces:

Prior to placement of cut material on fill sites, HEB Construction will ensure existing pest species or vegetation will be removed or sprayed as specified in the Appendix 5 Technical Specification Landscape; at least 14 days prior earthworks.

During the grassed surface establishment period, HEB Construction will control weeds which effect the establishment of the grassed surface or native species mix.

Weeds shall be sprayed with a selective herbicide for the weed to be controlled, approved for use by the local authority and applied at the manufacturer's rates.

8.3.2 *Ground Preparation*

Table 33: Ground Preparation Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33m(ii)	Ground preparation	8.3.2 Ground Preparation

HEB Construction will provide detailed specification in ground preparation. This includes the clearing and disposal of required vegetation, removal and disposal of existing hardstand surfaces, inorganic debris, site preparation spraying, pruning and minor landscape earthworks, topsoil spreading and the removal and storage of the existing bench seat and plaque.

All measures to protect existing vegetation (e.g. mature trees, native bush) shall be in place prior to any site preparation commencing.

For all areas of earthworks, the project will ensure that erosion and sediment control measures are installed in accordance with GWRC requirements and following the approved ESCP.

The Working Area shown on the Drawings (Appendix 4) shall be cleared of all vegetation and structures except those specifically required to remain as noted and marked out by the Project Ecologist and Landscape Architect.

HEB Construction will ensure vegetation clearance is carried out as stated in the methodology in Section 7.3 ensuring all the conditions stated are met.

Earth worked areas ready for landscape work must include:

I. Have sufficient drainage and fall to shed water in a controlled manner and prevent ponding and erosion;
II. Are free of contaminants, stumps, branches and construction debris;
III. Have been placed in layers no greater than 150mm thick and compacted by track rolling as appropriate to prevent undue settlement.

8.3.3 *Substrate – Mulching*

Table 33: Mulching Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33m(iii)	**Detailed specifications relating to (but not limited to) the following**: Mulching	8.3.3 Substrate

HEB Construction will provide detailed specification on mulching. The tree species identified to be mulched will be re-used on site prior to the vegetation clearance works. The clearing schedule table below shows potential species for mulching.

Material	Location	Height	Clearing Details
Grass and weeds	All areas to be planted or grassed	AL	Blanket spray with herbicide, up to two applications, dependant upon the situation and weed type.
Blackberry	All areas to be planted or grassed	All	Blanket spray with herbicide, up to two applications dependant on the situation. Cut, mulch and respray growth.
Gorse	All areas to be planted or grassed	All	Cut and mulch and spray regrowth with 2 applications and spray regrowth with approved herbicide specific for gorse
Exotic trees and shrubs	Massed planting not on fill site	All	Fell, remove and mulch (See Notes 1 & 2)
Convolvulus	All areas to be planted or grassed	All	Spray active growth with approved herbicide with marker dye added; monitor closely and re-spray any regrowth.

Note 1, Mulch all areas where accessible by mulching machine (excluding areas of invasive weeds which would be spread by mulching or that may re-sprout when mulched), HEB Construction will confirm which tree species can be mulched for re-use on site prior to the clearance works)

All material to be retained on site shall be stockpiled near to the clearance areas, unless otherwise specified. No pest plant material that could re-sprout and take root will be mulched or incorporated within mulching of onsite material (e.g. crack willow).

Mulch will be applied to prior to planting for all planting areas, apart from riparian areas.

HEB Construction will ensure all mulch areas have a depth of 100mm minimum with depth no less than 75mm remaining after settling.

Individual specimen trees located outside of the fill zone shall include a 1.0m (diameter) mulched area surrounding the base of each tree.

In all instances mulch will be kept clear of stems to avoid stem rot.

Mulch shall be sufficiently aged (i.e. 6 months minimum) to avoid depleting nutrients from the soil. Any soil depletion shall be addressed immediately with applications of fertiliser to avoid plant losses. Mulch shall not contain any contaminants.

Mulch to be applied to areas below:

I. Fill slopes above 2h:1v – Biocoir 450
II. Planting on slope above Papawai Stream - Biocoir 450
III. Fill slopes 2H:1v or below – Coarse graded, long fibred organic mulch partly composted to a minimum of 6 months
IV. All other garden beds – Coarse graded, long fibred organic mulch partly composted to a minimum of 6 months

8.3.4 *Topsoil Management*

Table 34: Topsoil Management Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC55 (e)	*Topsoil management:* Methods for ensuring that topsoil used for reinstating areas will be weed free	8.3.4 Topsoil Management

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

Imported topsoil:

HEB Construction will ensure the volumes of topsoil required for planting and the specifications for the imported topsoil meet the Technical Specification Landscape and design drawings (Appendices 4 and 5).

Imported topsoil is to be used as per the Appendix 5 Technical Specification Landscape. Imported topsoil shall be carefully managed to avoid any contamination, seeds or undesirable material being brought to site. Examples of species which are a risk are Brush wattle, gorse, Darwin's barberry and old mans beard.

The primary method of mitigating against weed-infested topsoil material being brought on to the site will be to ensure that any material being delivered to site is sourced from a reputable supplier. If this is from an existing stockpile, then HEB Construction will arrange for stockpiles to be sprayed out for weeds at least 1 week prior to delivery to the reservoir site.

Unsuitable Materials

HEB Construction will ensure that all planting is undertaken on suitable material which will sustain the proposed plant species. Unsuitable materials include:

1. Soil that is too weak to provide support for new planting
2. Soil containing rubbish or
3. Contaminated soil containing pest plant material.

Should dormant seed or plant pest seed be present or identified onsite HEB Construction will supply a methodology and a timeline for removal of any pest plant species and or to control any infestation, i.e. removed within 2 months before reseeding.

HEB Construction will supply a methodology to remediate unsuitable materials. Should sub-surfaces include unsuitable materials and are not to the required standard, topsoiling shall not proceed until rectified.

8.3.5 *Compaction*

Table 35: Compaction Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC55 (f)	**Detailed specifications relating to (but not limited to) the following: *Compaction areas:*** Methods to be employed to repair compacted ground and ensure new ground material build up is suitable for the intended end use and long-term sustainability and maintenance of that use. Methods must ensure that areas subject to compaction or backfilling do not create areas that will not drain and/or will not allow new planting to successfully establish and grow in the long term or ground conditions that result in sports fields or walking tracks that do not drain or function properly	8.3.5 Compaction

HEB Construction will ensure methods to be employed to repair compacted ground and ensure new ground material build up are suitable for the intended end use and long-term sustainability and maintenance of that use. These methods will include a combination of:

- Pre-construction and post-construction soil testing (scala testing or similar) to assess mechanical strength of the soil;
- Avoid working wet soil;
- Using appropriately sized plant and machinery, avoiding using unnecessarily large machinery;
- Ensuring machinery is restricted to designated transportation “lanes” within the site and not permitted to move randomly;
- Where post construction testing indicates undesirable compaction, this will be alleviated with deep tillage.

Methods will ensure that areas subject to compaction or backfilling do not create areas that will not drain and/or will not allow new planting to successfully establish and grow in the long term or ground conditions that result in sports fields or walking tracks that do not drain or function properly.

Refer to section 8.3.7 Ground and Land Drainage in this LEMP for further detail.

8.3.6 *Reservoir Backfill Design*

Table 36: Backfill Design and Landscaping of Backfill Areas Identified Within WCC and TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33c	How the final reservoir backfill design will support a smooth integration with adjacent topography and optimise effective revegetation conditions	8.3.6 Reservoir Backfill Design
Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC55 (g)	*Backfill inspection and monitoring:* An inspection and monitoring programme for backfilled areas to be undertaken by the project landscape architect to ensure that suitable material is being used for the intended end result.	8.3.6 Reservoir Backfill Design
LC56 (b)	*Landscaping of backfill areas:* Plans and details that show earthworks backfilling methods and materials have been tested and approved by a suitably qualified landscape architect who can confirm that the landscaping and vegetation proposed will be able to grow in the materials proposed	8.6.6 Reservoir Backfill Design

To ensure a smooth integration of backfilled areas with adjacent topography. A 2-metre-wide 'Work Zone Boundary' sits outside the fill boundary. This exists to complete construction works on the edge of the fill site and has been included in all planting plans to ensure a smooth integration between existing vegetation. Refer Figures 9B and 9C below.

Landscaping of backfill areas:
HEB Construction will ensure an inspection and monitoring programme for backfilled areas is undertaken by the landscape architect.

The Landscape Architect and the Construction team will meet and agree on the backfilling methods. At this meeting a 'hold point' will be identified and agreed to, in order for timely site visits by the Project Landscape Architect to inspect the backfill before the next phase of activity commences.

A draft backfill inspection and monitoring programme is demonstrated below:

	KEY STAGES	Intention of inspection
Tracks		
City to sea walkway	*Completion of the subgrade*	Inspect subgrade for correct material, thickness and falls
	Completion of the topcourse	Inspect topcourse for correct material, thickness and falls
Eastern walkway	*Completion of the subgrade*	Inspect subgrade for correct material, thickness and falls
	Completion of the topcourse	Inspect topcourse for correct material, thickness and falls
Fill slopes		
	Completion of reinforced geogrid and commencment of laying geocell	Inspect geocell product, discuss laying methodology with contractor onsite
	Part way through laying geocell (TBC dates and timeframe during construction)	Meet contractor to check laying correctly and discuss any changes, issues arrising
	Completion of geocell	Inspect to check completeness prior to laying topsoil
Natural slopes		
	Completion of base layer prior to laying topsoil	Inspect to check completeness and location of walking tracks
	Several visits way through laying topsoil (TBC dates and timeframe during construction)	Inspect to check method for laying and that laid topsoil is not becoming compacted
	Completion of laying topsoil	Inspect to check thickness, compaction and completion to specification

Figure 9B: Reservoir Slope Stabilisation

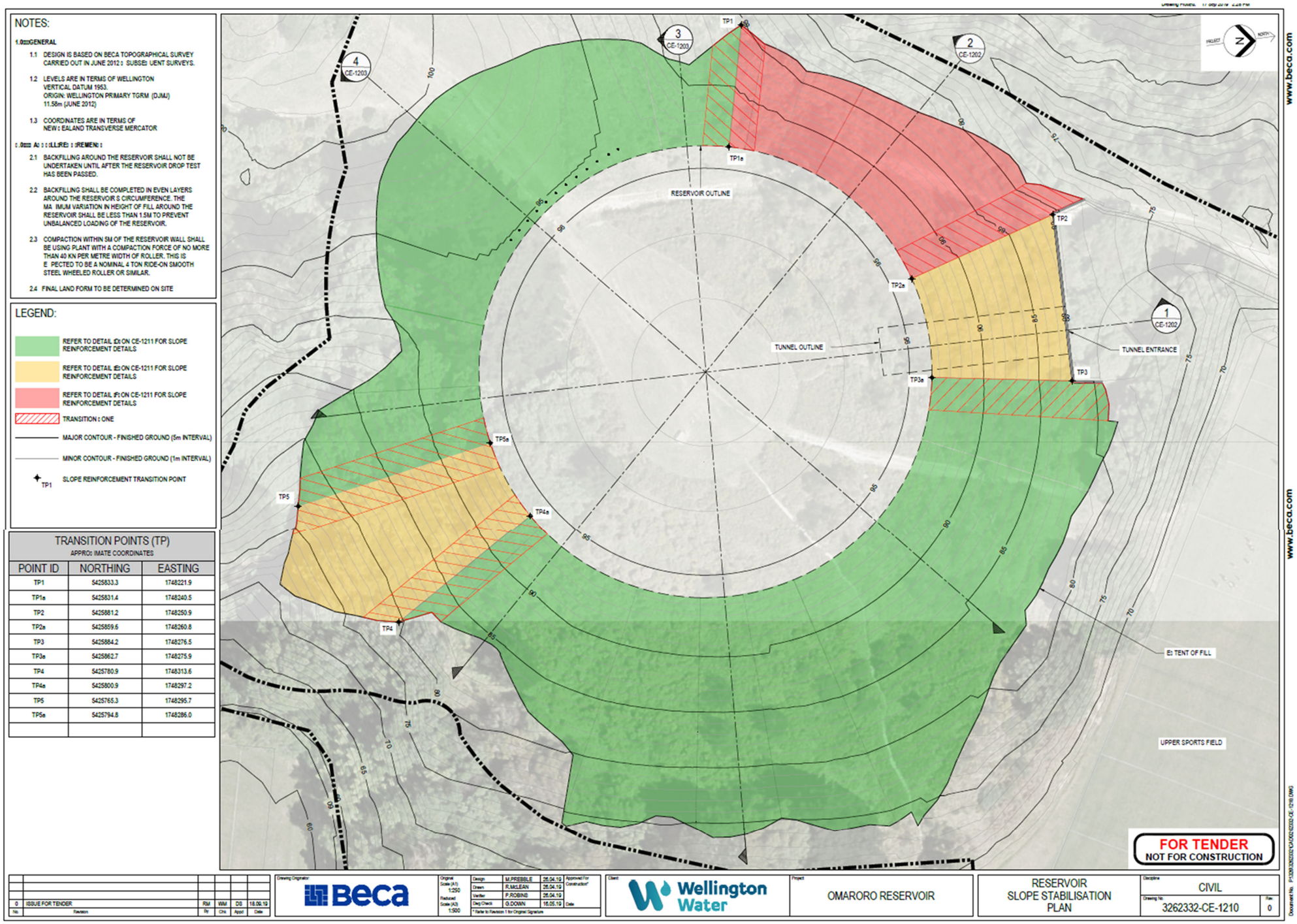
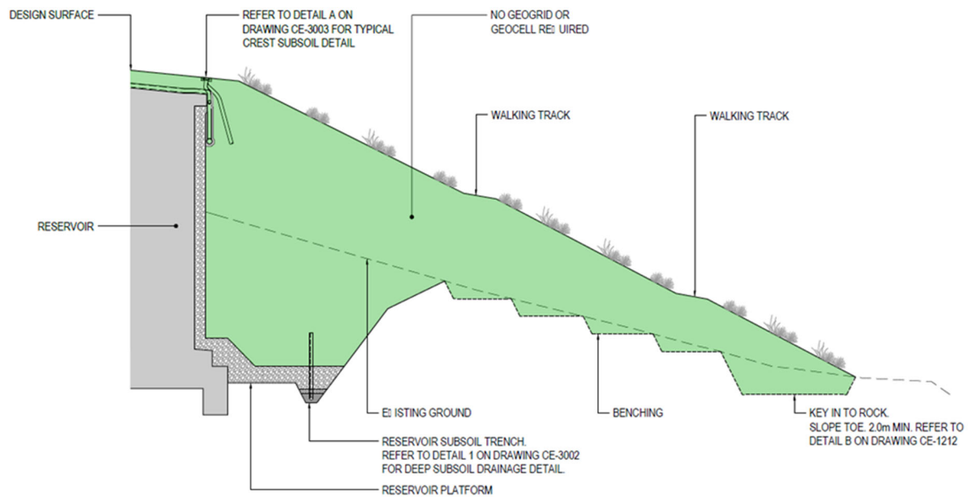


Figure 9C: Reservoir Slope Stabilisation



D CE-1210 SLOPE DETAILS - NO REINFORCEMENT - SLOPE 1H : 0.59V
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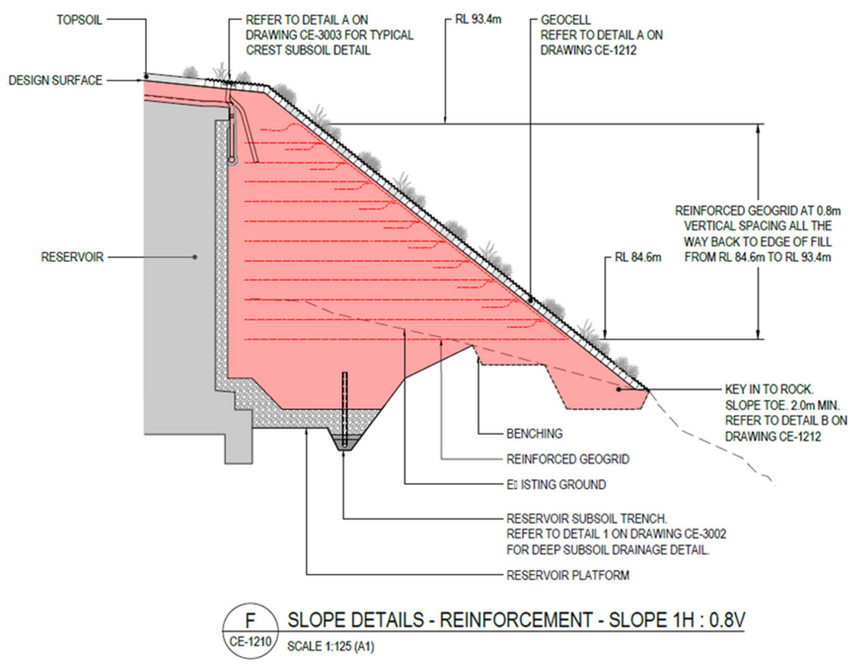
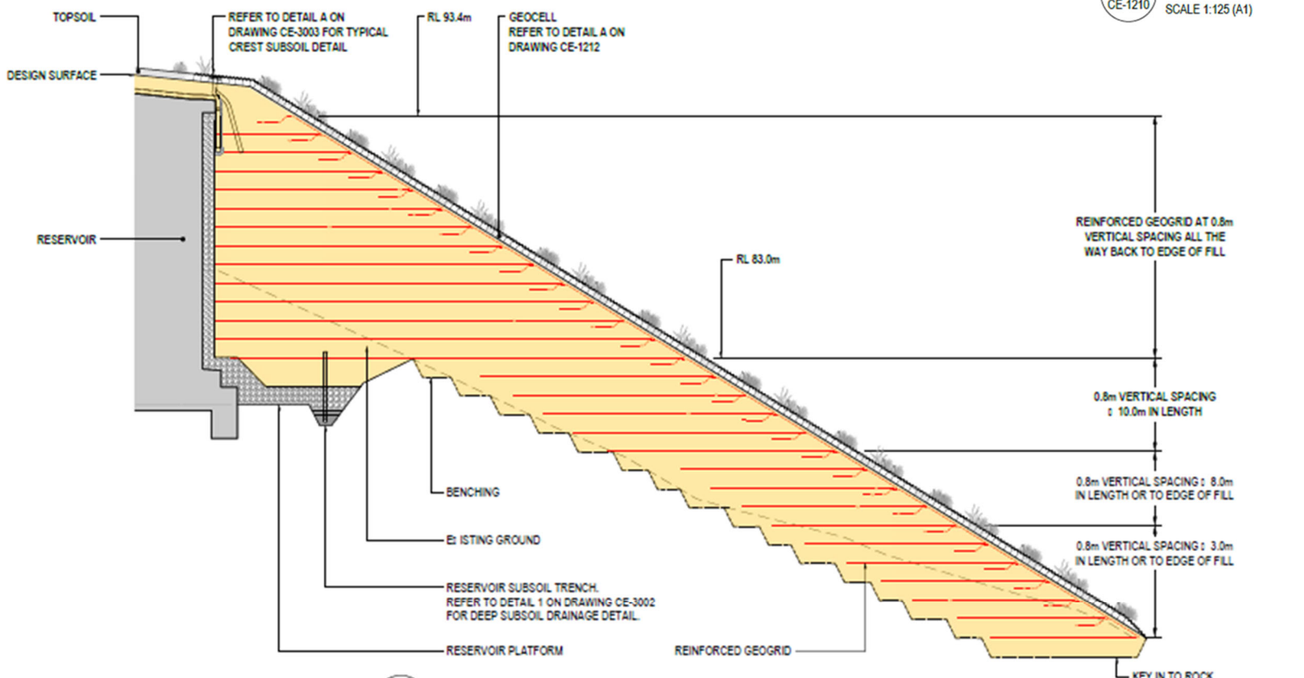


F CE-1210 SLOPE DETAILS - REINFORCEMENT - SLOPE 1H : 0.8V
SCALE 1:125 (A1)



E CE-1210 SLOPE DETAILS - REINFORCEMENT - SLOPE 1H : 0.63V
SCALE 1:125 (A1)

8.3.7 *Ground and Land Drainage*

Table 37: Ground and Land Drainage Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC55 (c)	*Proposed finished ground and land drainage:* Anticipated final overland flow paths for stormwater including details of how final ground levels and slope treatment will manage site run-off into the stream environments and not exacerbate sediment discharge to streams or result in erosion.	8.3.7 Ground and Land Drainage

Proposed finished ground and land drainage details, reservoir subsoil drainage and slope stabilisation details are set out in construction drawings included in Appendix 7: Sports Playing Field Drawings and in Appendix 9: Civil Construction Design Drawings.

All overland flow paths for stormwater, including final ground levels and stormwater, will manage site run off into the stream environments and not exacerbate sediment discharges.

Earthworks:

I. Surfaces must have sufficient drainage and fall to shed water in a controlled manner and prevent ponding and erosion;
II. Are free of contaminants, stumps, branches and construction debris;
III. Have been placed in layers no greater than 150mm thick and compacted by track rolling as appropriate to prevent undue settlement.

Topsoil care:

Topsoil compaction should be avoided, measures include:

I. The use of the lightest possible vehicles and machinery when spreading topsoil and/or trafficking planting areas which have been topsoiled;
II. Ensure all machinery used is fit for purpose;
III. Avoid trafficking completed topsoil areas, and limit passes.

Final Grading:

HEB Construction will ensure that:

I. All earthworks shall have been shaped to integrate the works with the surrounding landform;
II. All areas to be planted / grassed shall have been contoured when the topsoil is reasonably dry and workable to;
III. Smooth flowing contours with falls for adequate drainage and, removing all minor hollows and ridges;
IV. Final ground levels and slope treatment will manage site run-off into the stream environments and not exacerbate sediment discharge to streams or result in erosion.

Playing field surfaces and perimeter drainage:

I. HEB Construction will ensure both playing field surfaces are laser graded to ensure consistent cross falls in accordance with general existing levels.

II. Playing fields include the installation of primary sub soil drainage systems designed in accordance with recognised industry standards.
III. Perimeter swale drains designed in order to manage overland flow.

Planting protects and strengthens the finished ground and provides slope treatment, ensuring stabilisation to avoid erosion and sedimentation impact on the stream environments.

8.3.8 *Reinstatement Areas*

Table 38: Reinstatement Areas Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC55 (d)	*Reinstatement Areas:* Details illustrating how areas disturbed or impacted by the construction project will be reinstated to be fit for purpose, and will be designed to be able to be practically and cost effectively maintained and managed	8.3.8 Reinstatement Areas

All areas disturbed or impacted by the construction project will be reinstated to be fit for purpose and are designed to be able to be practically and cost effectively managed.

On completion of the work, HEB Construction will ensure all surfaces affected by the works are reinstated to pre-construction condition unless specified otherwise.

It is envisaged that all areas identified for re-use i.e. the two playing fields, walking tracks, Rolleston street and Dorking street etc shall be returned to practical reuse quickly following completion of the works.

Following completion of the reservoir installation, the upper and lower playing fields are to be reinstated to at least the same standard as prior to the works. The aim of is to enhance the performance of the existing sports fields upon handing back to the Council. This will be achieved through the improvement of the existing (poor) surface levels and the installation of a primary sports field drainage system on both fields.

The proposed reinstatement methodology will address these surface levels and result in an enhanced playing surface for community users of the Park. The improved surface levels as a result of the proposed methodology will also facilitate easier maintenance of the sports field platforms.

8.4 *Planting Programme*

Table 39: Planting Programme and Rehabilitation Identified Within GWRC Regulatory Permissions

GWRC Resource Consent Conditions		
Pre-Construction Requirements		
Condition number	Condition requirement	LEMP Section Reference

8(f)	Timetable and nature of progressive site rehabilitation and re-vegetation proposed.	Erosion and Sediment Control Plan 8.4 Planting Programme
Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33I	Planting programme – the staging of planting in relation to the construction programme which shall, as far as practicable, include provision for planting within the first planting season following completion of the Project	8.4 Planting Programme

HEB Construction will ensure all planting will be carried out during a four-month period from the beginning of May until the end of August. Planting is not to occur outside of these months. This means that while construction maybe completed, planting may not immediately occur and instead will not happen until the following planting season. All works upon completion will be hydroseeded or protected by some other means to stabilise the surface and reduce runoff, erosion and dust. Areas to be planted will be spot sprayed with herbicide to kill grass and any weeds well in advance of planting.

At the earliest opportunity a comprehensive planting programme will be produced and updated within this LEMP for implementation of the landscape works.

The construction programme will, as much as practicable, include provision for planting within the first planting season following completion of the project. This programme shall be prepared using critical path techniques and shall be capable of showing actual progress through the project.

Task Name	Start	Finish	Duration
Planting to Reservoir Site	**Thu 24/11/22**	**Mon 20/02/23**	**51 days**
Pipe tunnel entrance planting	Fri 20/01/23	Tue 24/01/23	2 days
Leptospermum Scorparium	Wed 25/01/23	Thu 26/01/23	2 days
Massed planting	Fri 27/01/23	Mon 30/01/23	2 days
Native low planting	Tue 31/01/23	Wed 1/02/23	2 days
Native regenration planting	Thu 2/02/23	Fri 3/02/23	2 days
Native reserve roof planting	Tue 7/02/23	Wed 8/02/23	2 days
Upper field northern edge planting	Thu 9/02/23	Tue 14/02/23	4 days
New grass	Wed 15/02/2:	Mon 20/02/23	4 days
New path	Thu 24/11/22	Wed 14/12/22	15 days
Specimen trees	Wed 15/02/2:	Mon 20/02/23	4 days
Playing Fields	**Mon 12/09/2:**	**Tue 20/12/22**	**71 days**
Profiling (leveling) of lower fields	Mon 12/09/2:	Fri 7/10/22	20 days
Profiling (leveling) of upper fields	Fri 28/10/22	Thu 24/11/22	20 days
Re-surface upper & lower playing fields - refer to separate schedule of prices to be supplied to subcontractor	Wed 23/11/22	Tue 20/12/22	20 days
Allowance for irrigation water supply, assume 40mm HDPE from Rolleston St main including 2 no. hose taps and backflow preventer	Mon 10/10/22	Thu 13/10/22	4 days
Irrigation on lower field	Fri 14/10/22	Wed 26/10/22	8 days
Irrigation on upper field	Fri 25/11/22	Tue 6/12/22	8 days
Other Small Items - Gates, Fences etc.	**Fri 25/11/22**	**Tue 20/12/22**	**18 days**
375mm dia. SED H5 treated timber pole retaining wall, 950mm max. retained height (Dorking Rd)	Mon 28/11/22	Wed 30/11/22	3 days
Standard vehicle gate	Fri 25/11/22	Fri 25/11/22	1 day
Reinstate existing two rail parks fences	Mon 28/11/2:	Tue 29/11/22	2 days
New two rail parks fences	Wed 30/11/22	Tue 13/12/22	10 days
Vanguard removable bollards at top of Asquith - quantity assumed	Wed 14/12/22	Fri 16/12/22	3 days
Allowance for signs	Mon 19/12/2:	Tue 20/12/22	2 days

Figure 8: Construction Programme information Regarding the Planting of Reservoir Site and Two Playing Fields

8.4.1 *Planting Species and Planting Specifications*

Table 40: Planting Specifications and Planting Strategies Identified Within WCC and TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33k	Details of proposed mass planting and specimen tree planting including plant species, plant/grass mixes, spacing/densities, sizes (at the time of planting) and layout and planting methods. The intention is to achieve a dense canopy of complementary plant communities which will achieve a variation in plant height.	8.4.1 Planting Species and Planting Specifications
DC.33m(iv)	Plant supply and planting, including hydro-seeding and grassing.	8.4.1 Planting Species and Planting Specifications
Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan

Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 56	**Landscape design and management**	
(a)	***Landscape and planting strategies:*** A landscape and planting strategy for the site, including:	8.4.1 Planting Species and Planting Specifications
i.	Use of planting that is varied in height and scale to disguise any uniform slope areas	8.4.1 Planting Species and Planting Specifications
ii.	The identification and intention of area specific planting strategies and landscape design treatments, including species selection and maintenance requirements, for reference in monitoring the success of planting and landscape works	8.4.1 Planting Species and Planting Specifications
iii.	Any planting or planting areas to be planted outside the standard planting seasons that will require maintenance to address potential plant stress (for example irrigation)	8.4.1 Planting Species and Planting Specifications
iv.	Any areas where planting may need to be delayed until a suitable planting period (to maximise planting success), and that may need to be suitably maintained and stabilised in the interim period.	8.4.1 Planting Species and Planting Specifications

Planting specifications and strategies have been identified in the regulatory permissions. The identification and intention of area specific planting strategies and landscape design treatments, including species selection and maintenance requirements has been considered during the design phase of the project.

Plant species have been chosen that vary in height and appearance to disguise the uniform shape of earthworks areas. This includes groundcovers, shrubs and trees in random placement to reduce the risk of appearance of uniformity or in row formation. The intention is to achieve a dense canopy of complementary plant communities, achieving a variation in plant height. Refer to planting details in Appendix 4 – Landscape Detailed Design Drawings.

Open space areas on the reservoir ‘top’ have been limited as far as practical to achieve a character similar to that which existed pre-construction and reduce the extent of mowing areas. The irregular shape to planting on the reservoir ‘top’ helps to create an informal lookout space which existed pre-construction.

A master species list was prepared and is shown on the Landscape Concept drawing (refer Attachment 3) which has now been used to create a more refined plant schedule. The finalised plant list includes areas such as riparian planting to streams and edge treatment planting to tie the reinstated licence area into new ground levels to minimise visual effects (Figures 9 - 12).

Planting is also included in places to reduce weed infestations and help stabilise existing banks. Plant/grass mixes, spacing/densities, sizes and layout and planting methods are demonstrated in the Landscape design drawings (excerpts below) and the Landscape Technical Specification (Appendix 5).

Plants shall be watered to the level required for the programme planting season. Any planting or planting areas to be planted outside the standard planting seasons will undergo maintenance to address potential plant stress.

Irrigation is included as part of this maintenance and HEB Construction is responsible for providing a suitable water supply for plants in the event of unseasonal dry conditions that could comprise plant survival and establishment.

Any areas where planting needs to be delayed until a suitable planting period (to maximise planting success), the surfaces will be hydroseeded and or stabilised using a form of erosion control to stabilise the surface and reduce runoff, erosion and dust.

A meeting is to be held between the Project Landscape Architect and HEB Construction to discuss planting details and implementation of the 'hold points' identified in the Appendix 5 Technical Specification Landscape (Appendix 5), site visits and monitoring and reporting. Reporting will comprise of documentation detailing progress against anticipated outcomes and will include photographs to illustrate these outcomes. More information on the inspection test plans and monitoring can be found in section 8.11.4 Monitoring and Inspection Plan of this LEMP.

Monitoring reports to include:

I. Dates of visits;
II. Condition of vegetation;
III. Condition of protective fencing;
IV. Works undertaken in the vicinity since the previous visit; and
V. Any actions required.

In addition to this monitoring process, HEB Construction will ensure that the health of the retained and newly planted vegetation is not compromised and that the retained vegetation does not pose a safety risk.

Botanical Name	Common Name	Grade	Spacing	% MIX
Specimen trees				
Eucalyptus leucoxylon 'Rosea'	Red flowering gum	PB8	As shown	
Metrosideros excelsa	Pohutukawa	PB18	As shown	
Access road between fields road bank stabilisation				
Phormium cookianum	Mountain flax	1 L	1m	100%
Grass - Low				
TBC species				100%
Stilling well				
Austroderia fulvida	Toetoe	1 L	1m	40%
Coprosma propinqua	Mingimingi	1 L	1m	30%
Phormium cookianum	Mountain flax	1 L	1m	30%
Pipe tunnel entrance planting				
Coprosma propinqua	Mingimingi	1 L	1m	30%
Muehlenbeckia axillaris	Pohuehue	1 L	1m	30%
Phormium cookianum	Mountain flax	1 L	1m	20%
Poa cita	Silver tussock	1 L/RT	0.6m	20%
Upper field northern edge planting				
Cordyline australis	Ti kouka	1 L	1m	5%
Hebe stricta	Koromiko	1 L	1m	30%
Phormium cookianum	Mountain flax	1 L	1m	40%
Poa anceps	Meadow grass	1 L	1m	25%
Pipe tunnel wall planting				
Metrosideros perforata	White rata vine	1 L	0.5	
Muehlenbeckia astonii	Shrubby tororaro	1L	2m	30%
Muehlenbeckia complexa	Pohuehue	1 L	1m	
Muehlenbeckia axillaris	Creeping wire vine	1 L	0.6m	30%
Poa cita	Silver tussock	1 L/RT	0.6m	40%
Native reservoir roof planting				
Coprosma acerosa	Sand coprosma	1.5 L	1m	30%
Melicytus alpinus	Porcupine shrub	1.5 L	1m	30%
Muehlenbeckia complexa	Pohuehue	1 L	1m	15%
Phormium cookianum	Mountain flax	1 L	1m	15%
Poa anceps	Meadow grass	1 L	1m	10%
Native Low Planting				
Coprosma propinqua	Mingimingi	1 L	1m	15%
Muehlenbeckia complexa	Pohuehue	1 L	1m	15%
Olearia solandri	Coastal shrub daisy	1 L	1m	15%
Phormium cookianum	Mountain flax	1 L	1m	40%
Poa anceps	Meadow grass	1 L	0.6m	15%
Manuka planting				
Leptospermum scoparium	Manuka	1 L /RTT	1m	100%
Native Revegetation - East and South of Reservoir - Dry Upper Slopes - predominantly constructed batte				
Key seral trees (ngaio, weeping kowhai, akiraho) key bulking plants (karamu, manuka)				
Year 1 Establish				
Austroderia fulvida	Toetoe	1 L	1m	10%
Brachyglottis repanda	Rangiora	1 L	1m	10%
Coprosma robusta	Karamu	1 L	1m	20%
Hebe stricta	Koromiko	1 L	1m	10%
Leptospermum scoparium	Manuka	1.0 L	1m	20%
Olearia paniculata	Akiraho	1.5 L	1m	5%
Myoporum laetum	Ngaio	1.5 L	1m	10%
Pennantia corymbosa	Kaikomako	1.5 L	1m	5%
Sophora microphylla	Weeping Kowhai	1.5 L	1m	10%
Year 2 Enrichment (5m centres)				
Dysoxylum spectabile	Kohekohe	5 L	5m	20%
Elaeocarpus dentatus	Hinau	5 L	5m	20%
Knightia excelsa	Rewarewa	5 L	5m	40%
Metrosideros robusta	Northern rata	5 L	5m	20%

Figure 9: Planting Schedule – Sheet 1

Botanical Name	Common Name	Grade	Spacing	% MIX
Native Revegetation - East and South of Reservoir - Lower Slopes, both constructed batters slopes & nat				
Key seral trees (pigeonwood, lemonwood, fivefinger) Key bulking plants (karamu, kanuka)				
Year 1 Establish				
Carpodetus serratus	Putaputaweta	1.5 L	1m	5%
Coprosma robusta	Karamu	1 L	1m	20%
Griselinia littoralis	Broadleaf	1.5 L	1m	5%
Hebe stricta	Koromiko	1 L	1m	5%
Hedycarya arborea	Pigeonwood	1.5 L	1m	10%
Kunzea ericoides	Kanuka	1.0 L	1m	20%
Myoporum laetum	Ngaio	1.5 L	1m	10%
Pennantia corymbosa	Kaikomako	1.5 L	1m	5%
Pittosporum eugenioides	Lemonwood	1.5 L	1m	10%
Pseudopanax arboreus	Five Finger	1.5 L	1m	10%
Year 2 Enrichment (5m centres)				
Beilschmiedia tawa	Tawa	5 L	5 m	20%
Dysoxylum spectabile	Kohekohe	5 L	5m	25%
Elaeocarpus dentatus	Hinau	5 L	5m	20%
Knightia excelsa	Rewarewa	5 L	5m	20%
Metrosideros robusta	Northern rata	5 L	5m	5%
Podocarpus totara	Totara	5 L	5m	5%
Prumnopitys taxifolia	Matai	5 L	5m	5%
Native Revegetation - West Slopes above Waitangi Stream				
Key seral trees (wineberry, tree fuchsia, five finger, kowhai) Key bulking plants (karamu, koromiko)				
Year 1 Establish				
Aristotelia serrata	Wineberry	1.5 L	1m	10%
Carpodetus serratus	Putaputaweta	1.5 L	1m	10%
Coprosma robusta	Karamu	1 L	1m	20%
Fuchsia excorticata	Kotukutuku	1.5 L	1m	10%
Hebe stricta	Koromiko	1.5 L	1m	20%
Pennantia corymbosa	Kaikomako	1.5 L	1m	5%
Pittosporum eugenioides	Lemonwood	1.5 L	1m	5%
Pseudopanax arboreus	Five Finger	1.5 L	1m	10%
Sophora tetraptera	Kowhai	1.5 L	1m	10%
Year 2 Enrichment (5m centres)				
Beilschmiedia tawa	Tawa	5 L	5 m	40%
Dacrycarpus dacrydioides	Kahikatea	5 L	5m	10%
Laurelia novae-zelandia	Pukatea	5 L	5m	10%
Rhopalostylis sapida	Nikau	5 L	5m	40%
Papawai Stream - Riparian planting				
Playing Field Berm (Infill gaps in current planting)				
Carex secta	Purei	1.5 L	2m	50%
Carex virgata	Pukio	1.5 L	2m	50%
Slopes above stream (infill gaps in current scrub with seral tree species)				
Aristotelia serrata	Wineberry	1.5 L	2m	20%
Carpodetus serratus	Putaputaweta	1.5 L	2m	10%
Coprosma robusta	Karamu	1 L	2m	10%
Fuchsia excorticata	Kotukutuku	1.5 L	2m	10%
Pennantia corymbosa	Kaikomako	1.5 L	2m	10%
Pittosporum eugenioides	Lemonwood	1.5 L	2m	10%
Pseudopanax arboreus	Five Finger	1.5 L	2m	20%
Sophora tetraptera	Kowhai	1.5 L	2m	10%
Waitangi Stream - Riparian planting				
Enrichment Planting of current seral vegetation with potential canopy species.				
Beilschmiedia tawa	Tawa	5 L	5m	25%
Dacrycarpus dacrydioides	Kahikatea	5 L	5m	25%
Laurelia novae-zelandia	Pukatea	5 L	5m	25%
Rhopalostylis sapida	Nikau	5 L	5m	25%
Pipe to upper field planting				
Within Flex MSE system	Refer TU-1-501 for area			
Agrostis capilaris	Browntop			10%
Lolium perenne	Perennial Ryegrass			60%
Festuca rubra	Chewings' Fescue			30%
Hydro-seeded lawn				
TBC by hydro-seed specialist	Refer GR-1 and 3-501 for areas			
Agrostis capilaris	Browntop			10%
Lolium perenne	Perennial Ryegrass			60%
Festuca rubra	Chewings' Fescue			30%
Seeded lawn				
Low growing grass mix	Refer GR-2-501 for area			
Agrostis capilaris	Browntop			15%
Lolium perenne	Perennial Ryegrass			60%
Trifolium repens	Huia white clover			25%
Valve chambers (low growing)				
Coprosma acerosa	Sand coprosma	1 L	1m	25%
Hebe stricta	Koromiko	1.5 L	1m	20%
Muehlenbeckia complexa	Pohuehue	1 L	1m	25%
Phormium cookianum	Mountain flax	1 L	1m	30%

Figure 10: Planting Schedule – Sheet 2

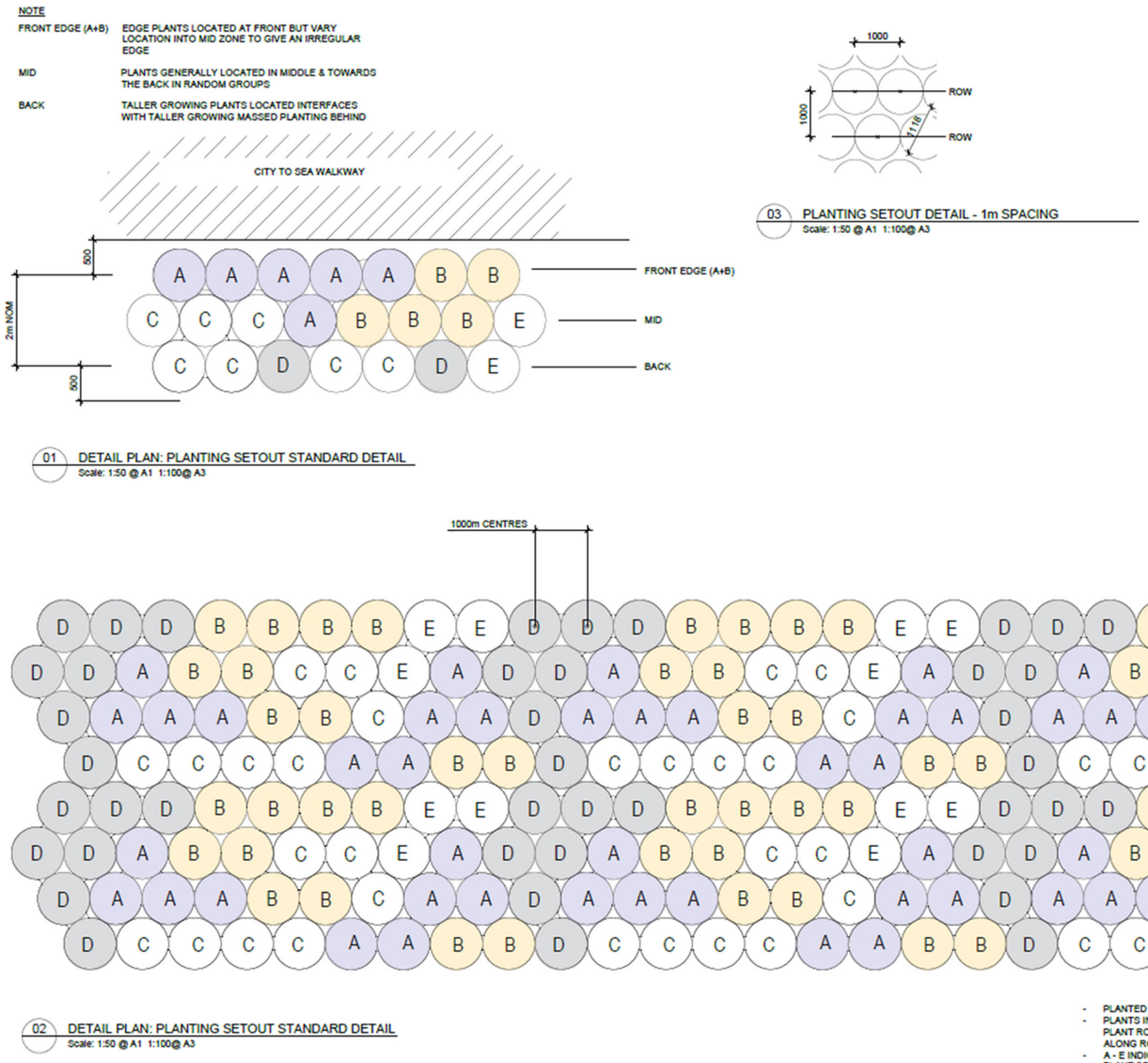


Figure 11: Planting Details

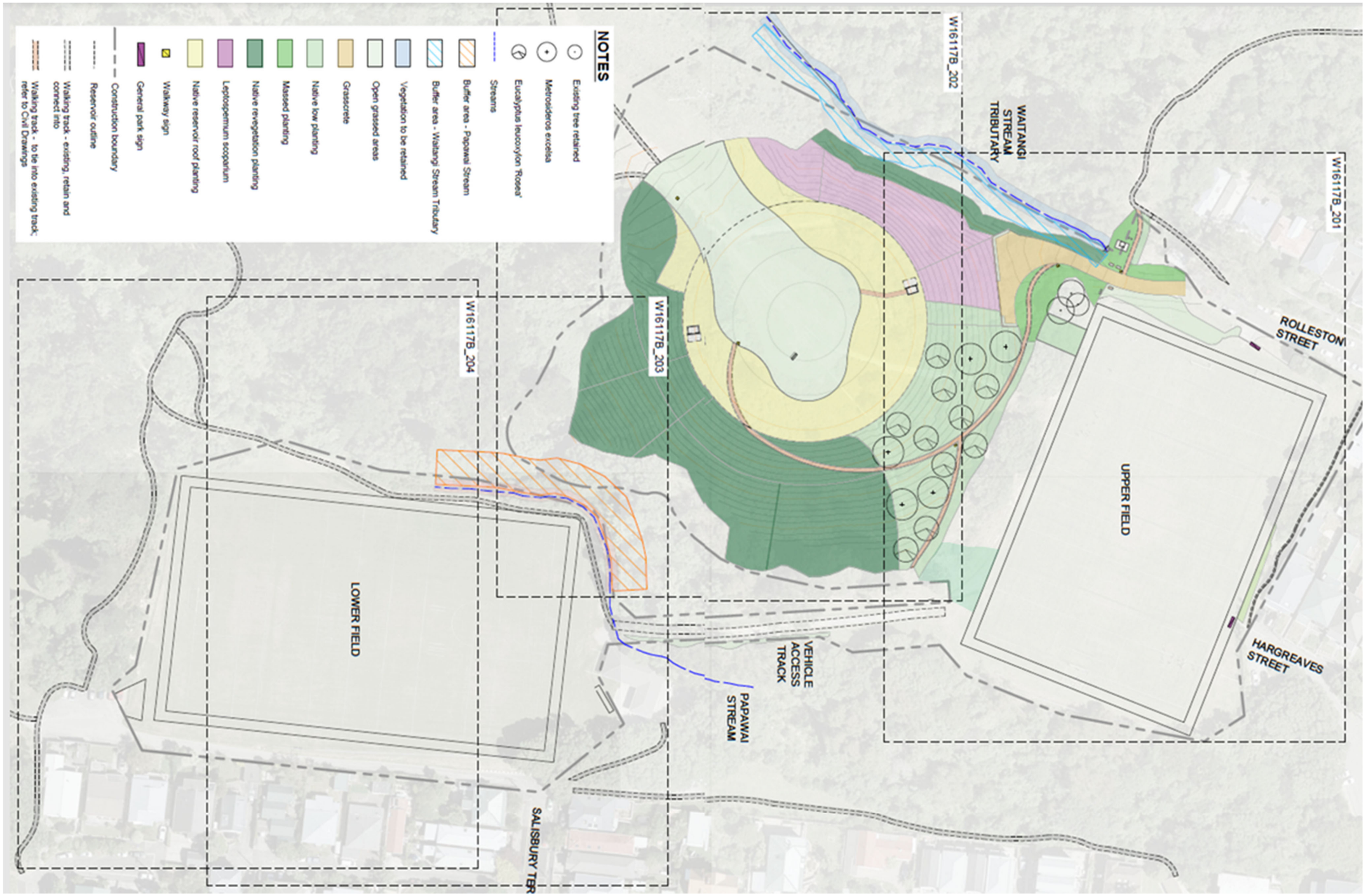


Figure 12: Overview of the Different Planting Types and Areas on the project

8.4.2 *Eco-Sourcing*

Table 41: Eco Sourced Native Plants Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 56a (v)	Eco-sourced native plants and providing sufficient lead times to supply and where necessary harden plants, to achieve the quantities needed.	8.4.2 Eco-Sourcing

HEB Construction will ensure indigenous plant species shall be sourced as far as practicable from the Wellington Ecological District. In cases where this is not possible due to lack of available seed, seed can be sourced from adjacent ecological districts within the wider Sounds-Wellington Ecological Region.

Seed collection should ensure that source trees come from a similar environment or habitat to that in which they will be planted at the reservoir, to ensure propagated individuals are adapted to the environmental conditions found there. Seed collection must be from natural vegetation and avoid collection from propagated plants with unknown origins.

Where necessary plants will be hardened to achieve the quantities required for the project. These plants are to be grown in a nursery environment for a sustained period under a range of conditions like those in the area they are to be planted. Once installed, hardened plants should generally be able to withstand the prevailing environment.

8.4.3 *Landscaping of Reservoir Top*

Table 42: Landscaping of Reservoir Top Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC.56 (c)	*Landscaping of reservoir 'top' and identified areas to be kept clear of trees:* Final design of the top of the reservoir and any areas identified by Wellington Water that must be kept clear of trees must:	8.4.3 Landscaping of Reservoir Top
i.	Clearly define areas that must be kept clear of vegetation in perpetuity	8.4.3 Landscaping of Reservoir Top
ii.	Limit open grass area as far as possible to try and achieve a character similar to that which existed pre-construction	8.4.3 Landscaping of Reservoir Top
iii.	Within any open space area on the top of the reservoir, create an informal lookout space	8.4.3 Landscaping of Reservoir Top

The final design of the landscaping for top of the reservoir is demonstrated in Figure 13. The landscaping specifications and landscaping design drawings provide further detail. The drawing

below shows open grassed areas on the top of the reservoir and an outline of the area to be kept free from trees.
Open space areas on the reservoir 'top' have been limited as far as practical to achieve a character similar to pre-construction and reduce the extent of mowing areas. The irregular shape to planting on the reservoir 'top' helps to create an informal lookout space which existed pre-construction.

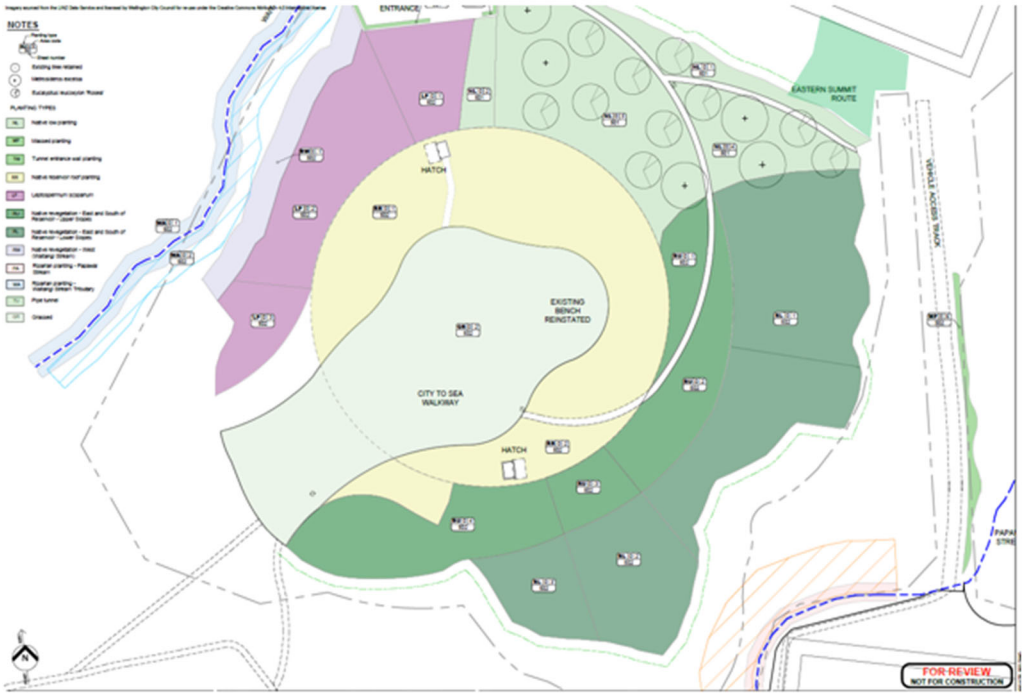


Figure 13: Except from landscape design drawings of plants for reservoir top

8.5 *Tracks*

8.5.1 *Final Track Network*

Table 43: Track Network Planning and Short Walk Standard Identified Within WCC and TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33d	Details of replaced pathways through the site, which shall be designed with reference to the WCC "Short Walk Standard"	8.5.1 Final Track Network
Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 56 (d)	Track network planning: Plans and details that show the location and design specification for the final track network, including reinstatement of closed tracks. This shall be integrated with temporary track planning and design requirements (LC 72 (b))	8.5.1 Final Track Network

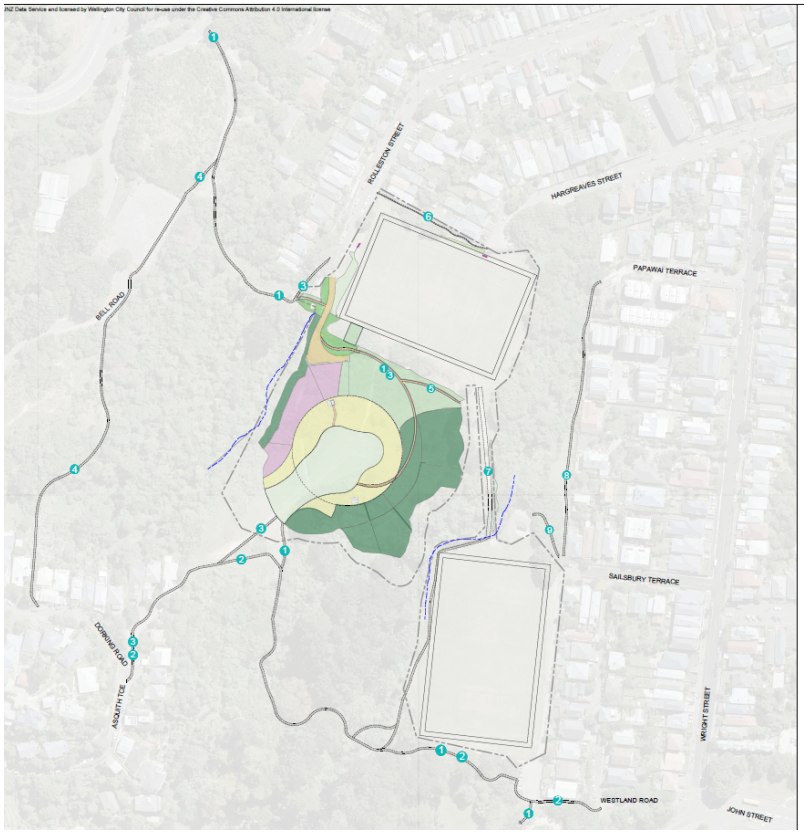
Details in the design drawings show the location and design specification for the final track network. These include reinstatement of closed tracks such as a portion of the City to Sea Walkway.

New or replaced pathways are designed to the 'Short Walk Standard" as defined in the Wellington City Council Open Space Access Plan (September 2016) - refer to Appendix 10.

The Walkway Network Plan (WNP) (Figure 14) in the Landscape Design Drawings identifies the final track network. It shows the location of tracks which can be used as re-route tracks during the construction phase when a portion of the City to Sea Walkway, the access track between fields, the eastern and western summit routes and the informal track along the Papawai Stream bund will be closed.

The access track between Upper and Lower fields will be closed during construction. Post construction, this track will be reinstated. Refer to Section 9.2.6 Access Track between Upper and Lower Playing Fields of this LEMP.

Refer to the Construction Traffic Management Plan (CTMP) for temporary track closures and pedestrian management.



NO.	DESCRIPTION	CLASSIFICATION	SURFACE FINISH
1	City to Sea Walkway	Walking track	50mm (after compaction) lime infused domestic top-coarse. Sourced from Horokiwi quarry
2	Dorking Road to Westland Road	Walking track	Remain unchanged.
3	Dorking Road to Rolleston Street	Walking track	Grassed surface in keeping with reservoir top. Section of asphalt to remain unchanged.
4	20 Dorking Road to Bell Road commuter route	Walking track	Remain unchanged. used as the Re-route walkway for Dorking to Rolleston during construction.
5	Eastern summit route	Walking track	50mm (after compaction) lime infused domestic top-coarse. Sourced from Horokiwi quarry
6	Rolleston Street to Hargreaves Street	Informal grassed and paved surface (in parts). To remain open where practical	Unchainged
7	Upper to Lower field access track	WCC maintenance access track	Re-instate grassed swale to west and grassed margin to east. Track left as compacted aggregate
8	Salisbury Terrace to Papawai Terrace	To remain open and unchanged from existing	
9	Sports pavilion to Salisbury Terrace	To remain open and unchanged from existing	

NOTE: Location of walkways outside project works boundary are approximate

FOR REVIEW

Figure 14: Walkway Network Plan

8.5.2 *Reservoir Service Tunnel Access Way Track*

Table 44: Reservoir Service Tunnel Access Way Track Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 59	**Reservoir Service Tunnel Access Way Track** Landscape design and management of the service access way to the reservoir service tunnel must provide for the following:	
(a)	Service tunnel access track design: The tunnel access way track must be as narrow as practicable and comprise a permeable surface that blends into the natural park landscape and functions primarily as a walking track	8.5.2 Reservoir Service Tunnel Access Way Track
(b)	Service tunnel access track use: Alignment, design and materials used on the service tunnel access way track will ensure the track can only be accessed by WCC, Wellington Water or approved contractor vehicles for normal reservoir and park maintenance, servicing and management activities	8.5.2 Reservoir Service Tunnel Access Way Track

The service tunnel access track is to be finished with a 155mm deep grasscrete surface. This to ensure the grassed finish blends into the natural park landscape (see Landscape Design Drawings Appendix 4). The track has been designed to be as narrow as practicable.

The grasscrete surface provides a hardwearing surface to be used as a walking track as part of the City to Sea Walkway and service access for the pipe tunnel. Refer Appendix 9: Civil Construction Design Drawings for further details regarding the construction.

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At the termination of Rolleston Street, the vehicle entrance to the pipe tunnel includes a park gate ensuring maintenance vehicle, WCC or WWL use only. Vehicle manoeuvring space is provided at the tunnel entrance to ensure vehicles can exit safely facing forward.

Figure 15: Design and key demonstrating grasscrete surface use at tunnel entrance

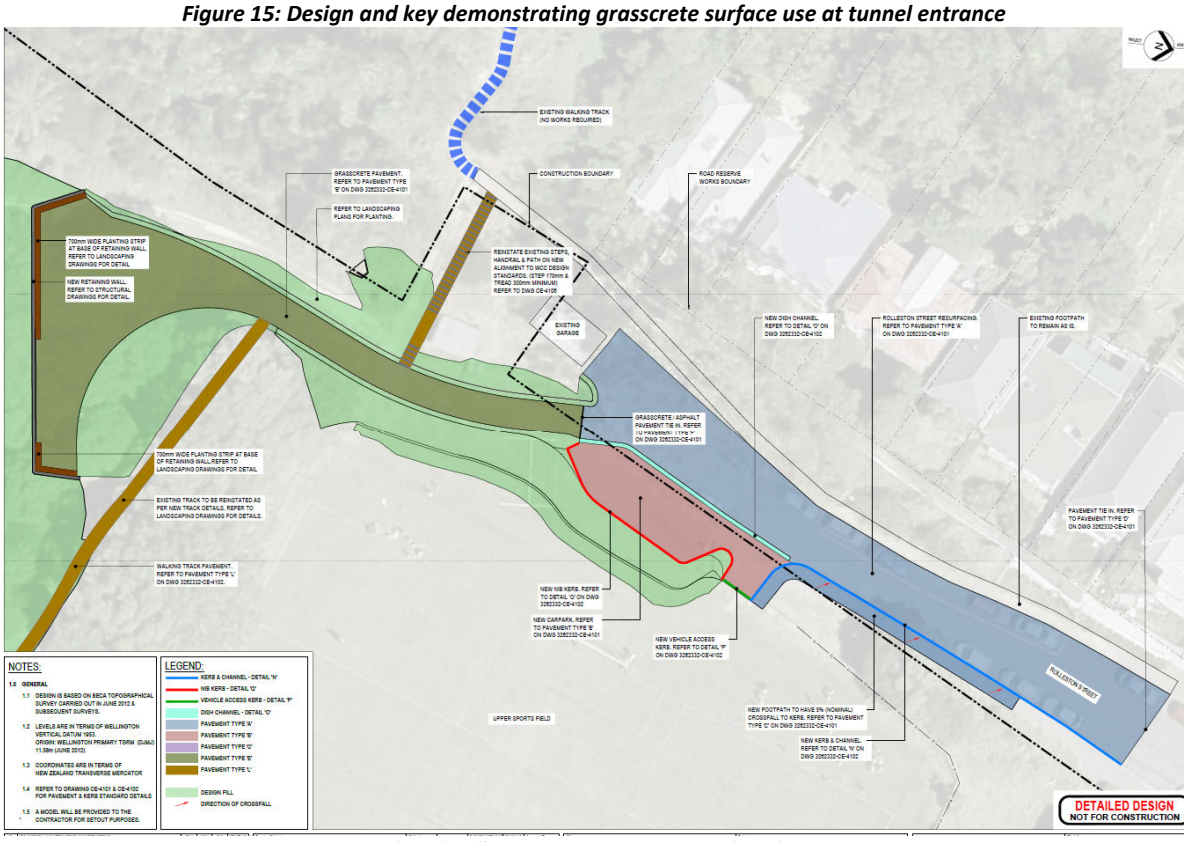

Figure 16: Access road and Rolleston street pavement plan showing grasscrete area

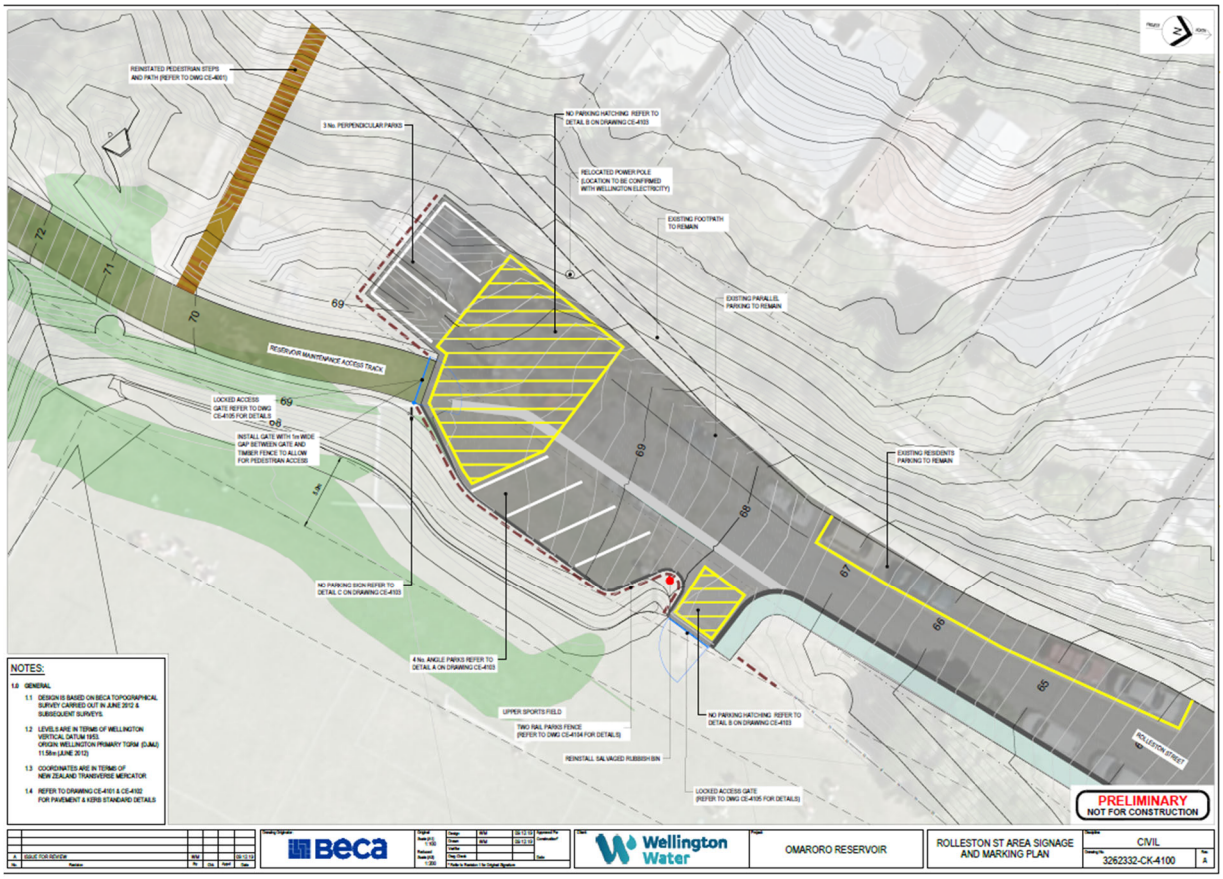

Figure 17: design showing location of locked access gate – access for maintenance, WWL and WCC only

8.5.3 *Culvert for Waitangi Stream*

Table 45: Culvert for Waitangi Stream Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 59 (c)	Culvert for Waitangi Stream: Provision for the safety of track users in the final design of the Waitangi Stream tributary stream culvert that goes underground into the stormwater network.	8.5.3 Culvert for Waitangi Stream

HEB Construction will install a new headwall and fence in the Waitangi tributary stream culvert to ensure the provision for the safety of track users. Fence is to be 900mm high with vertical uprights which prevents climbing or moving through into the stream environment. At the time of the drafting of this document a consent application had been lodged with GWRC by WWL in relation to a proposed stormwater upgrade that would require some physical works in and around the Waitangi Stream. When, and if, consent is granted this LEMP, and aspects of the ESCP, and CEMP will be updated to address consent conditions and any mitigation measures regarded.

8.6 *Exposed Reservoir Infrastructure*

Table 46: Exposed Reservoir Infrastructure Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 58	**Exposed Reservoir Infrastructure**	
	The design and look of any exposed above ground infrastructure associated with the reservoir and associated pipe work must provide for the following:	8.6 Exposed Reservoir Infrastructure
(a)	Integration with landscape: Design, materials and colours must be selected to integrate the infrastructure into the park and the natural landscape as far as practical. Opportunities to create bespoke solutions that can also serve a recreation or amenity purpose must be considered in design.	8.6 Exposed Reservoir Infrastructure

All exposed reservoir infrastructure has been designed to ensure colours and materials integrate with the natural landscape as much as practicable. Opportunities to create bespoke solutions that can also serve a recreation or amenity purpose were considered in design. See attached landscape design drawings for detail.

8.6.1 *Pipe Tunnel Access Door*

Table 47: Pipe Tunnel Access Door Requirements Identified Within WCC TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33e	Consideration of CPTED principles in relation to the pipe tunnel access door	8.6.1 Pipe tunnel access door
Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 58	Exposed Reservoir Infrastructure:	
(b)	Reservoir service tunnel access door area: In preparing a draft landscape design for the reservoir service tunnel access door area attention shall be given to preparing a reasonable selection of design alternatives for this area, prior to final design selection.	8.6.1 Pipe Tunnel Access Door

Over the design phase of the project the pipe tunnel access door was discussed with WCC. Two sketches were tabled with the tunnel door facing either west or north. Due to the Crime Prevention Through Environmental Design (CPTED) safety issues (passive surveillance) with the west facing door option, the north facing door was selected by WCC to be progressed further.

The north facing door option was refined to include a handrail and a sloping wall which addressed CPTED concerns raised.

One of the seven qualities that characterise well designed, safer places from the Ministry of Justice National Guidelines for Crime Prevention through Environmental Design in New Zealand, is;

I. "A Sense of Ownership, respect, territorial responsibility and community".

For the reservoir service tunnel access door area, 7 options to treat the wall were produced with different examples given for seating and signage.
Options included:

I. A climbing wall;
II. A mural;
III. Reservoir data graphics;
IV. Surrounding area maps supporting way-finding;
V. Pipe network and instrumentation graphics;
VI. Climbing or trailing plants;
VII. Concrete surface finish effects.

This was discussed with WCC in January and February 2019 and shown at a residents meeting on 14/03/19. A design is to be decided by WCC, in consultation with CRG and HEB Project Manager.

8.6.2 *Reserve Maintenance*

Table 48: Reserve Maintenance Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 58	**Landscape design and management**	
(c)	Reserve maintenance: Design and infrastructure installation must enable easy and practical access for ongoing maintenance of the area/s around any structure/s.	8.6.2 Reserve Maintenance

HEB Construction will ensure the design and infrastructure installation must enable easy and practical access for ongoing maintenance of the reservoir and the two playing fields. This includes maintenance access ways, reinstated or new walking tracks, Rolleston Street, Hargreaves Street and Dorking Road as examples of this (Civil Construction Drawings).

The landscape design drawings illustrate areas of access for the ongoing maintenance of the structures.

Refer to Section 9.2.6 Access Track between Upper and Lower Playing Fields of this LEMP for details regarding the access track between the two playing fields.

The Walkway Network Plan (WNP) (figure 32) in the Landscape Design Drawings identifies the final walking track network.

8.6.3 *Landscape Treatment Integration*

Table 49: Landscape Treatment Integration Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 56	**Landscape design and management**	
(e)	Landscape treatment integration: Specific landscape treatments that will be applied at the edge of the reinstated licence area to integrate new ground levels and associated landscape treatments within the licence area into the undisturbed landform and vegetation patterns outside of the licence area in a way that provides for the intended use and management of that land and minimises visual effect	8.6.3 Landscape Treatment Integration

The Planting Schedule and Landscape Design Drawings indicate where edge treatment planting will tie reinstated licence area into new ground levels to minimise visual effects.

Plant species have been chosen that vary in height and appearance to disguise the uniform shape of earthworks areas. This includes groundcovers, shrubs and trees in random placement so as not to appear in rows or have the appearance of uniformity (see Landscape Design Drawings – planting detail sheet 1).

Open space areas on the reservoir 'top' have been limited as far as practical to achieve a character similar to that which existed pre- construction.

As previously mentioned, to ensure a smooth integration of backfilled areas with adjacent topography, a 2-metre-wide 'Work Zone Boundary' sits outside the fill boundary. This exists to complete construction works on the edge of the fill site and has been included in all planting plans to ensure a smooth integration between existing vegetation.

The Landscape Design Drawings (Appendix 4) illustrate how these effects will be implemented.

8.7 *Park Entrances and Edge Design*

8.7.1 *Rolleston Street*

Table 50: Rolleston Street Park Entrance Design Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 61	**Licence Area Park Entrances and Edge Design**	
	Landscape design and management of the licence area's park entrance areas and edges (both with adjacent Town Belt land and residential areas) must provide for the following:	
(a)	*Rolleston Street park entrance design:* Design of the Rolleston Street road entrance and western upper field edge that provides for access to the pipe tunnel entrance, walking access to the track network and	8.7.1 Rolleston Street

	improved sports field parking and vehicle manoeuvring space while not impacting sports field and side-line activity, function and maintenance.	

The design of Rolleston Street park entrance improves the area from its current layout. Space for carparking will be formalised with space for turn around if the carpark is full via the field entry point. The existing City to Sea walkway connects with the vehicle entrance to the pipe tunnel via the existing western steps. Walkway users can use a section of the vehicle entrance track before way-finding signage points the direction of the City to Sea Walkway east away from the vehicle track. Carpark users can use the tunnel entrance vehicle track to access the City to Sea Walkway in either direction.

Civil Design Drawings illustrate the Rolleston Street Road entrance and access (Figure 18).

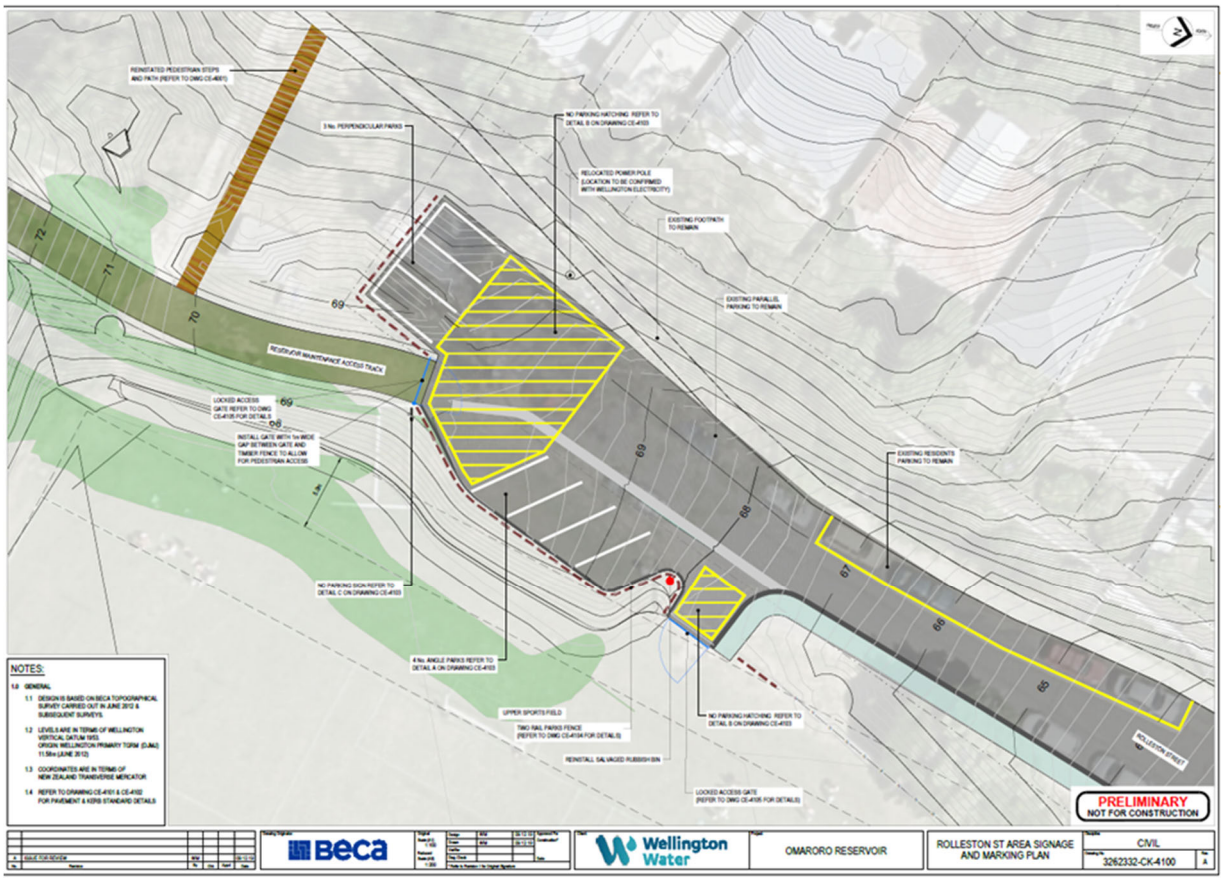

Figure 18: Rolleston Street area

8.7.2 *Upper Field Edges*

Table 51: Upper Field Northern and Southern Edges Design Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		

LC. 61	**Licence Area Park Entrances and Edge Design**	
	Landscape design and management of the licence area's park entrance areas and edges (both with adjacent Town Belt land and residential areas) must provide for the following:	
(b)	*Upper field northern and southern edges:* The northern and southern edges of the upper field may require ground level changes and new planting to successfully integrate the uncompacted and resurfaced field into the undisturbed field edges and incorporate any new drainage and side-line areas for spectators.	8.7.2 Upper Field Edges

Planting to the northern edge of the upper field allows for the area to be restored after the field is reinstated. Small growing species have been selected on the northern side of the playing field fence ensuring maximum space for spectators and maintains views into and from the park.

The finish to the southern edge to the upper field includes a grass swale in keeping with the existing condition. At the pipe interface with the upper field, drought resistant grasses are proposed within FLEX MSE for this steep north facing slope. This is in keeping with the current vegetated face to provide continuity with vegetation that is to be retained.

Further detail can be found in the Landscape Design Drawings (Appendix 4) as to how these edge finishes integrate.

8.7.3 *Hargreaves Street*

Table 52: Hargreaves Street Reinstatement Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 61	**Licence Area Park Entrances and Edge Design**	
	Landscape design and management of the licence area's park entrance areas and edges (both with adjacent Town Belt land and residential areas) must provide for the following:	
(c)	Reinstatement of the Hargreaves Street entrance	8.7.3 Hargreaves Street

HEB Construction will ensure the Hargreaves Street entrance will be reinstated to pre-construction conditions. This includes the removal, storage and reinstatement of the General Park Sign and any park signs in their original location or as instructed under the advice from WCC (Figure 19).

Existing General Parks signs x3. WCC to remove, store and reinstate at end of contract works. Allow one weeks notice to WCC prior to removal.

Figure 19: General Park Sign

8.7.4 *Lower Playing Field Access from Southern Car Park Area*

Table 53: Lower Playing Access from Southern Car Park Area Reinstatement Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 61	**Licence Area Park Entrances and Edge Design**	
	Landscape design and management of the licence area's park entrance areas and edges (both with adjacent Town Belt land and residential areas) must provide for the following:	
(d)	Lower playing access from southern car park area: Reinstatement of the driveway and entrance to the lower playing field at the south eastern corner. Access for maintenance is required while stopping public vehicle access onto the field. Parking and manoeuvring space will be designed to maximise public parking for visitors to the park	8.7.4 Lower Playing Field Access from Southern Car Park Area

No change is proposed for the access to the lower field from the driveway in the south east corner. If during construction the two rail parks fence, gate and park signage are required to be removed, they will be stored by WWL and reinstated post construction in the condition as photographed. Any items will be included and recorded correctly in the infrastructure inspection and inventory management.

8.7.5 *Fencing Plan and Reinstatement*

Table 54: Fencing Plan and Reinstatement Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 61	**Licence Area Park Entrances and Edge Design**	
	Landscape design and management of the licence area's park entrance areas and edges (both with adjacent Town Belt land and residential areas) must provide for the following:	
(e)	Fencing plan and reinstatement: A fencing plan and list of all fencing to be reinstated and/or newly installed across the site that is fit for purpose and meets WCC parks infrastructure specifications. The fencing will be located, specified and installed in such a way that the maintenance of the fences and the land around them has been considered and is practical.	8.7.5 Fencing Plan and Reinstatement

A fencing Plan is included in the Landscape detailed design drawings (Figures 20 -22). This includes a list of fencing to be reinstated and newly installed that are fit for purpose and meet WCC parks infrastructure specifications. Fencing is to be located and installed in such a way that the maintenance of the fences and the land around them has been considered and is practical. This shows the location of all existing fencing, which is to be retained and removed. Refer to Landscape Drawings for Fencing Plan and civil engineering drawings for location and details

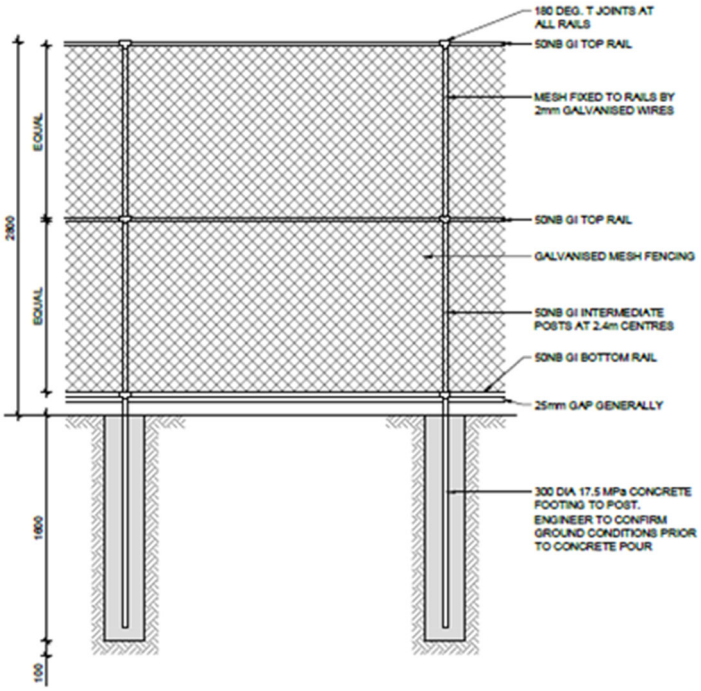

Figure 20: The Sports field Replacement Fence

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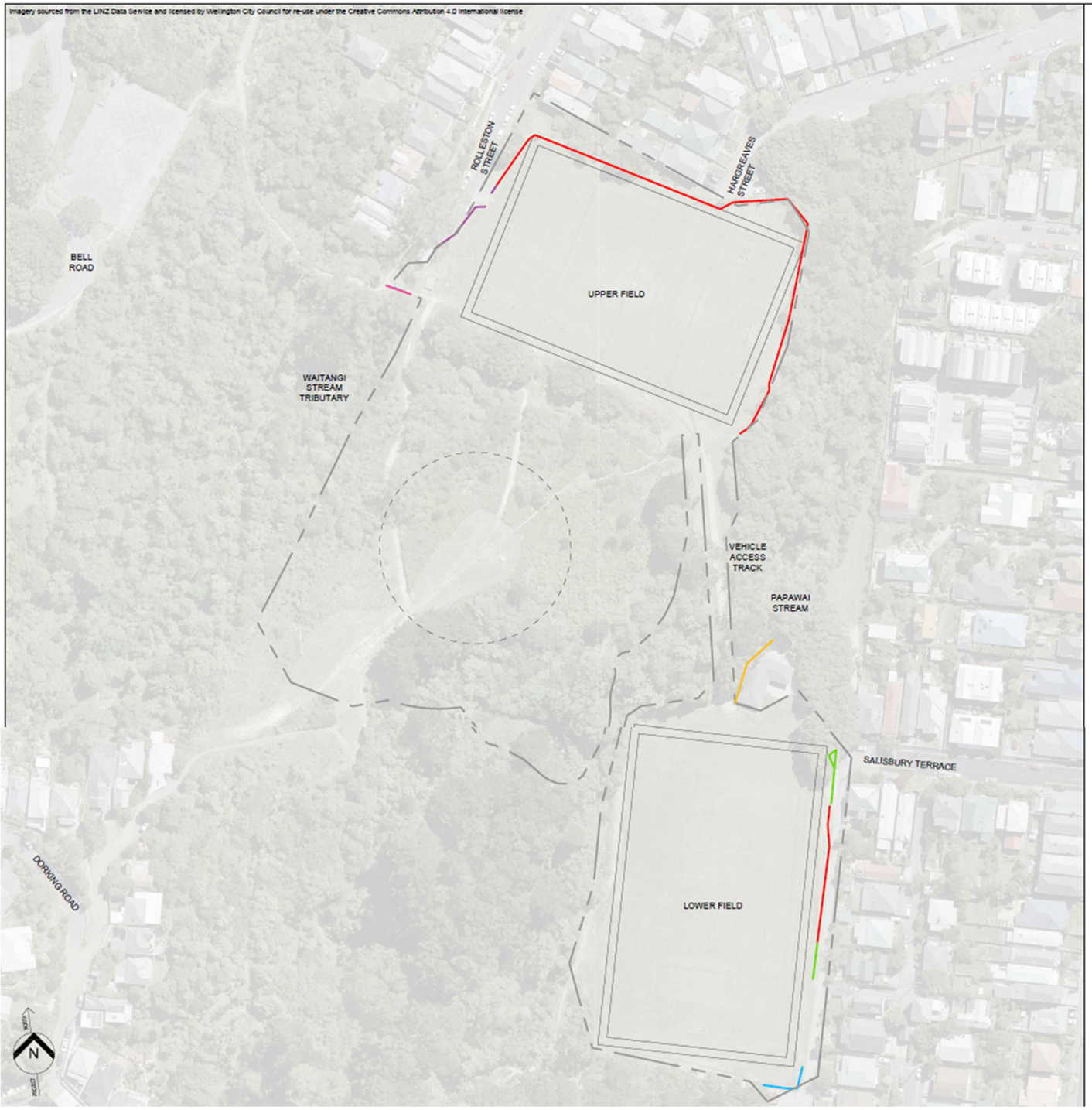


KEY	FENCE TYPE	RETAINED / REMOVED	EXISTING IMAGE
	Upper field / lower field high chain link fence	Retained	
	Sports Pavillion timber and mesh fence	Retained	
	Low chain link fence	Retained	
	Low timber fence with gate	Retained	
	Low timber fence	Removed and replaced with a new one on a new alignment	
	Timber handrail	Removed and replaced in new alignment. Refer civil drawings.	

Figure 21: Fencing Plan

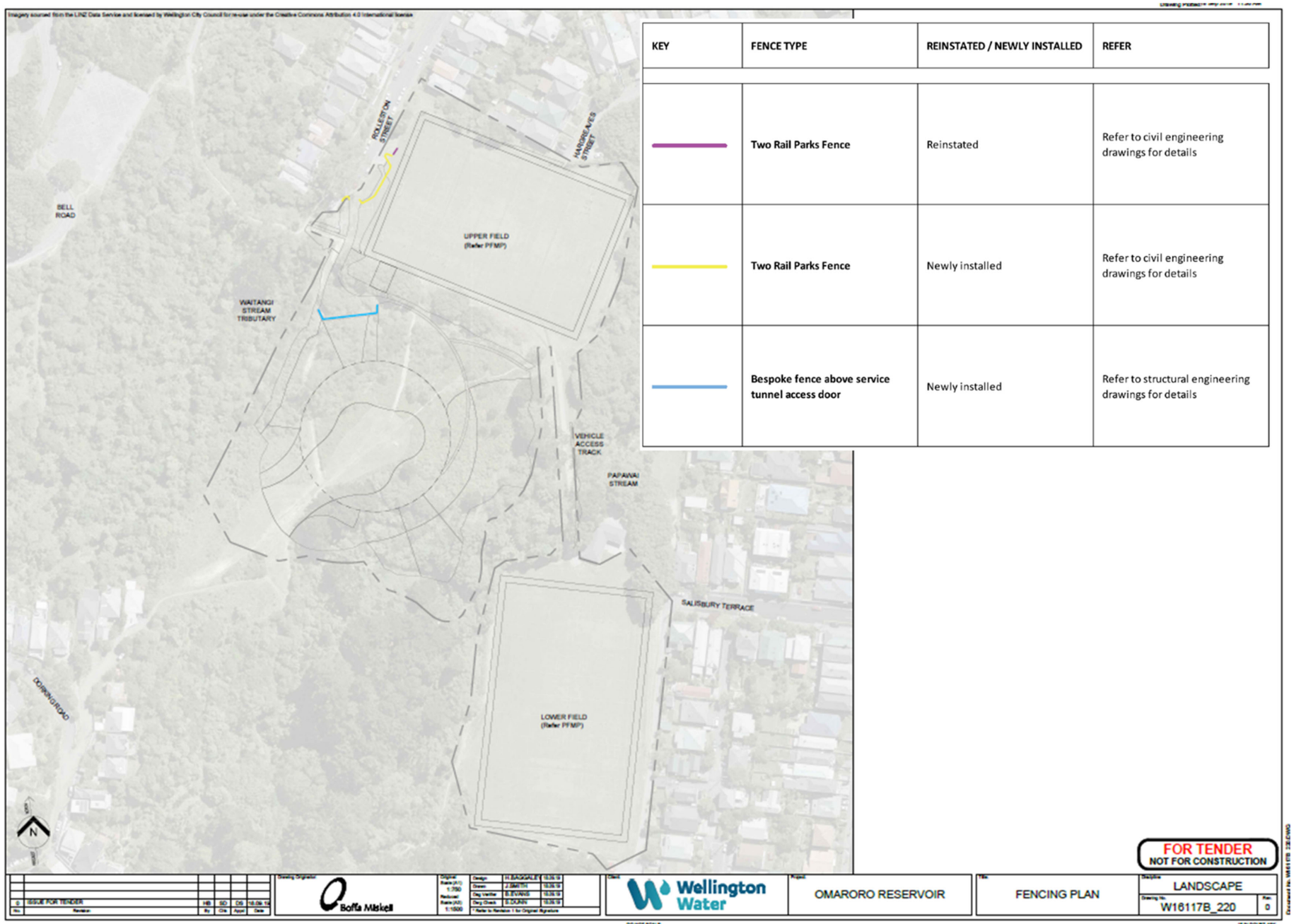


Figure 22: Fencing Plan

8.7.6 *Construction Temporary Fencing*

Table 55: Construction Site Temporary Fencing Plan Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Temporary Construction Site Area: Site Fencing		
LC. 66	**Fencing plan:** In conjunction with preparing a draft Construction Management Plan (CMP), as required under designation conditions DCll, 12, 16 and 17, Wellington Water must include in its draft CMP for CMO feedback a plan of all perimeter fencing that will mark or enclose the total extent of site used, or licenced for use, during the construction period. This plan shall include the following information:	8.7.6 Construction Temporary Fencing
(a)	Location and Type: Fence location, and fencing typology and form (i.e. security fencing, acoustic screening, silt fencing etc)	8.7.6 Construction Temporary Fencing
(b)	***Staging:*** Fencing staging, where it is anticipated that fencing may be shifted or altered or amended over the course of the reservoir excavation1 construction, backfill, remediation and site landscape and sport field remediation phases,	8.7.6 Construction Temporary Fencing
(c)	***installation and removal method:*** Installation and removal methodology for fencing, intended to minimise damage to vegetation, tree roots and land outside of the licence area licence area.	8.7.6 Construction Temporary Fencing
(d)	***Inspection and maintenance:*** An inspection and maintenance regime to ensure that fencing is maintained in good order and functioning at all times as intended.	8.7.6 Construction Temporary Fencing
(e)	***Final removal:*** A requirement for all fencing to be removed within 20 working days of the completion of construction.	8.7.6 Construction Temporary Fencing
(f)	*Fencing retention approval:* Any fencing proposed to be retained within the licence area beyond this period must be approved in writing by the Manager Open Space and Recreation Planning.	8.7.6 Construction Temporary Fencing

Temporary Construction fencing is required on the project. The Construction Fencing Plan (Appendix 11) gives an approximate indication of the location of the construction fencing to be erected as a perimeter fence and to remain throughout the construction programme.

A 1.8m high, mesh fence will be installed in accordance with manufacturers guidelines taking upmost care to minimise damage to vegetation, tree roots and land outside of the licence area licence area.

Refer to the construction traffic management plan for the temporary pedestrian fencing requirements proposed at junctions to temporarily closed tracks and any temporary walkway diversions (CTMP – Section 6.3).

Regular Inspection and Maintenance checks (at the minimum monthly- TBC) will be carried out along all temporary fences to ensure all fencing remains compliant and functional. Inspection checks will include if there is any evidence of people climbing up and over and if they are clear to path users.

HEB Construction will take all necessary measures to protect existing vegetation from damage. Trees to be retained within the project area, as identified on the drawings and required by the conditions of the regulatory permissions, shall be fenced as per the Tree Protection Zone. The TPZ shall be fenced as indicated in the arboricultural impact assessment.

The fence shall be installed before construction and remain there until the work is finished. The fence should be clearly visible and strong enough to protect the tree trunk, branches and tree roots from any accidental damage and machinery impact.

All vehicles, structures, building materials and debris associated with construction must not be stored within the Tree Protection Zone of any tree, unless prior approval from the Project Arborist.

Silt fencing will also be installed (to specification) as per guidance under Section 8.4.7 of the Erosion and Sediment Control Plan (ESCP).

Protective Fencing: HEB Construction will install “Pigs Tail” fence standards and rope/warning tape fencing (or similar stakes, to be approved) around the perimeter of any sown areas to prevent damage to the newly prepared surface from unauthorised access.

Any other temporary fences to be installed will be updated within this LEMP.

All temporary fencing will be removed within 20 working days of the completion of construction. Any fencing proposed to be retained within the licence area beyond this period must be approved in writing by the Manager Open Space and Recreation Planning.

8.8 *Lower Playing Field Design*

8.8.1 *Lower Playing Field Flood Management*

Table 56: Lower Playing Field Flood Management Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 62	**Lower playing field flood management, final field design and Papawai Stream edge**	
(a)	*Flood management:* Any feasible options may exist to improve the management of flood events in the Papawai Stream that could avoid or reduce the flow of stormwater over the stream's bund edge onto the field and general seepage through the bund into the field	8.8.1 Lower Playing Field Flood Management

Opportunities for improving the flood management of Papawai Stream and the lower playing field edge are being taken into consideration for design in conjunction with the Open Space and Recreation Planning Manager.

Wellington Water (WWL) were completing a study specifically referring to the requirements in LC.62 (a, b & c). Depending on the outcomes of this study this LEMP will be updated to accommodate any alterations.

8.8.2 *Papawai Stream Ecological Enhancement*

Table 57: Papawai Stream Ecological Enhancement Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 62	**Lower playing field flood management, final field design and Papawai Stream edge**	
(b)	*Papawai Stream ecological enhancement:* Any feasible options may exist to enhance the ecological function of the stream in conjunction with any flood management enhancements.	8.8.2 Papawai Stream Ecological Enhancement
(c)	*Stream enhancement incorporation in lower playing field reinstatement:* Any design solutions arising from (a) and/or (b) could be practically incorporated into works associated with reinstating the lower playing field following the completion of reservoir backfilling.	8.8.2 Papawai Stream Ecological Enhancement

Opportunities for Papawai Stream in enhancing the ecological function of the stream in conjunction with any flood management enhancements are considerations for a design specific to this area. Any decisions will be made with the Open Space and Recreation Planning Manager.

Wellington Water (WWL) were executing a study specifically referring to the requirements in LC.62 (a, b & c). Depending on the outcomes of this study this LEMP and PFMP will be updated to accommodate.

Any design solutions arising from (a) and/or (b) could be practically incorporated into works associated with reinstating the lower playing field following the completion of reservoir backfilling.

8.9 *Maintenance and Reinstatement of Access Way*

Table 58: Maintenance of Access Way to Lower Playing Field Reinstatement Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Maintenance and reinstatement of access way between Salisbury Terrace and Harriers Club Building		
LC.73	**Maintenance of access way to lower playing field.**	

	Wellington Water, or its contractor, will be entirely responsible over the duration of the project for the maintenance of the public vehicle access from Salisbury Terrace to the Harriers Club building located on the east side of the Prince of Wales Park lower playing field (the lower field public access way). This will include a responsibility for ensuring that any potholes and other damage resulting from construction of the works are identified and fixed.	8.9 Maintenance and Reinstatement of Access Way

HEB Construction will be entirely responsible over the duration of the project for the maintenance of the public vehicle access and car parking area from Salisbury Terrace to the Harriers Club building located on the east side of the Prince of Wales Park lower playing field (the lower field public access way).

This includes a responsibility for ensuring that any potholes and other damage resulting from construction of the works are identified and fixed.

8.9.1 *Preconstruction Condition Survey*

Table 59: Preconstruction Condition Survey Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Maintenance and reinstatement of access way between Salisbury Terrace and Harriers Club Building		
LC.74	**Preconstruction condition survey: access way and car parking area**	
	At least 20 working days prior to construction commencing Wellington Water, or its contractor, shall carry out a preconstruction condition survey of the lower field public access way and the public car parking area to the south of the lower field, using an appropriately qualified engineer. A report of this survey will be supplied to the Manager Open Space and Recreation Planning.	8.9.1 Preconstruction Condition Survey

There is a requirement to conduct preconstruction condition surveys of the lower field public access way, between Salisbury Terrace and Harrier Club building, and the public car parking area to the south of the lower field.

Preconstruction condition surveys will be undertaken by an appropriately qualified engineer at least 20 working days prior to construction.

HEB Construction will repair any damage including potholes, to the road to the documented standard within the road condition survey report following completion of the respective construction phases of the project.

A report of this survey will be sent to the Manager Open Space and Recreation Planning.

8.9.2 *Access Way and Car Parking Inspection*

Table 60: Access way and Car Parking Area Inspection Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Maintenance and reinstatement of access way between Salisbury Terrace and Harriers Club Building		
LC.75	**Timeframes for repairing project damage to access way and/or car parking area**	
	Wellington Water or its contractor shall repair pot holes or other damage resulting from the project to the lower field public access way and/or car parking area either within 10 working days of being notified to the CLP, the CMO or the Manager Open Space and Recreation Planning, or within any other timeframe otherwise agreed in writing with the Manager Open Space and Recreation Planning.	8.9.2 Access Way and Car Parking Inspection
LC.76	**Access way and car parking area inspection following lower playing field remediation**	
	Unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, within 20 working days of the completion of the remediation of the lower playing field, Wellington Water or its contractor shall organise with the Manager a joint inspection of lower field public access way and public car parking area to determine and agree whether remedial/repaving work, if any, are required, as a result of the project, to reinstate the access way and/or car parking surface.	8.9.2 Access Way and Car Parking Inspection & 6.2 During Construction Notification Requirements

HEB Construction will ensure the repair of pot holes or any other damage resulting from the project to the lower field public access way and the car parking area either within 10 working days of being notified to the CLP, the CMO or the Manager Open Space and Recreation Planning, or within any other timeframe otherwise agreed in writing with the Manager Open Space and Recreation Planning.

Unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, within 20 working days of the completion of the remediation of the lower playing field, HEB Construction will organise with the Manager a joint inspection of lower field public access way and public car parking area to determine and agree whether remedial works, if any, are required, as a result of the project, to reinstate the access way and/or car parking surface.

8.9.3 *Remedial Works and Costs*

Table 61: Access way and Car Parking Area Remedial Works and Costs Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan

Maintenance and reinstatement of access way between Salisbury Terrace and Harriers Club Building		
LC.77	**Access way and car parking area remedial works**	
	Any agreed remedial or reinstatement works, including repaving, shall be completed and certified by the CMO, prior to the Manager, Open Space and Recreation Planning and the Manager, Sports and Recreation Operations and Contracts, confirming in writing, under designation condition DC42 that the reinstated lower field, and related tracks, retaining walls, fencing and drainage are suitable for organised sports use and public activities to commence.	8.9.3 Remedial Works and Costs
LC.78	**Access way and car parking area remedial works costs**: Wellington Water shall meet all fair and reasonable costs of undertaking any agreed remedial and/or reinstatement work/s.	8.9.3 Remedial Works and Costs

HEB Construction will ensure any agreed remedial works and costs, including repaving, shall be completed as defined in Appendix 5 Technical Specification Landscape.

These remedial works will be certified by the CMO, the Open Space and Recreation Planning Manager and the Sports and Recreation Operations and Contracts Manager.

This certification shall confirm in writing, that the reinstated lower field, and related tracks, retaining walls, fencing and drainage are suitable for organised sports use and public activities to commence.

8.10 *Existing Park Infrastructure*

8.10.1 *Infrastructure Inventory and Inspection*

Table 62: Infrastructure Inventory and Inspection Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Existing Park Infrastructure		
LC.84	**Draft parks infrastructure inspection and inventory management report:** A draft report of the parks infrastructure inspection, including an inventory management schedule and plan must be produced by Wellington Water or its contractor, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning, and supplied to the Manager Open Space and Recreation Planning for review at least 20 working days prior to commencing any work on site. This draft report shall include:	8.10.1 Infrastructure Inventory and Inspection
(a)	***Site map:*** a map of the licence area,	8.10.1 Infrastructure Inventory and Inspection
(b)	***Asset schedule:*** the location and schedule of all identified park assets,	8.10.1 Infrastructure Inventory and Inspection
(c)	***images:*** photographic images of all identified inventoried items, to assist with identification, tracking and management	8.10.1 Infrastructure Inventory and Inspection
(d)	***Management plan:*** a management plan or schedule for each inventoried item, clearly identifying for each asset/s whether it will be:	8.10.1 Infrastructure Inventory and Inspection
i.	Removed and relocated, and not replaced as part of future site reinstatement	8.10.1 Infrastructure Inventory and Inspection

ii.	Removed and relocated, and scheduled for replacement as part of future site reinstatement	8.10.1 Infrastructure Inventory and Inspection
iii.	Removed and stored by Wellington Water for future reinstatement	8.10.1 Infrastructure Inventory and Inspection
iv.	Removed and disposed of, and scheduled for replacement as part of future site reinstatement	8.10.1 Infrastructure Inventory and Inspection
v.	Removed and stored by Wellington Water, with a decision to be made by the Manager Open Space and Recreation Planning, prior to commencing site remediation, regarding asset relocation, disposal, reinstatement and/or replacement	8.10.1 Infrastructure Inventory and Inspection
vi.	Retained and managed in situation, including any management plan for the monitoring, protection and maintenance of the asset.	8.10.1 Infrastructure Inventory and Inspection
LC.86	Park asset removal, relocation, storage, reinstatement and replacement costs:	8.10.1 Infrastructure Inventory and Inspection
	Wellington Water shall meet all fair and reasonable costs for removing, relocating, storing, replacing and/or reinstating any park assets within the licence area.	8.10.1 Infrastructure Inventory and Inspection
Notes:	This condition set is required to ensure that parks assets within the licence area are jointly inspected by the Manager Open Space and Recreation Planning and Wellington Water, or its contractor, well in advance to the commencement of construction, and that an agreed management plan is developed for asset removal, relocation, storage, disposal, reinstatement and/or future replacement.	
	It is anticipated that some items will not be able to be removed in no way that would enable them to be appropriately and/or cost effectively reused or reinstated. In these cases, assets will need to be disposed of by Wellington Water.	
LC.87	**Confirmation whether lower playing field Sports Pavilion will be used:** Prior to commencing construction Wellington Water or its contractor shall confirm whether the sports pavilion building on the lower field will be needed in support of site operations.	8.10.1 Infrastructure Inventory and Inspection
LC.88	**Sports Pavilion not required for use -subject to monitoring and management:** Where the sports pavilion is not required for use, Wellington Water or its contractor shall suitably monitor and protect the building from any use or damage during the construction period. The monitoring and management of the sport pavilion shall be included in the parks infrastructure inspection and inventory management report detailed in LC 84.	8.10.1 Infrastructure Inventory and Inspection
LC.89	**Sports Pavilion potentially required for use-subject to monitoring and management:** Where the sports pavilion is identified is potentially being needed for use, but no timeline has been agreed for when this may occur, Wellington Water or its contractor shall suitably monitor and protect the building from any use or damage. The monitoring and management of the sport pavilion shall be included in the parks infrastructure inspection and inventory management report detailed in LC 84.	8.10.1 Infrastructure Inventory and Inspection
LC.90	**Sports Pavilion identified for use-Licence variation required:** Where the sports pavilion is identified for use, either prior to construction or at any stage throughout the project, Wellington Water or its contractor shall apply in writing to the Manager Open Space and Recreation Planning to vary the licence agreement area to include the pavilion.	8.10.1 Infrastructure Inventory and Inspection
LC.91	**Sports Pavilion identified for use-consenting approvals and costs:** Where the sports pavilion is identified for use, Wellington Water or its contractor shall meet all costs associated with varying this licence to include the use of this building, and shall be responsible for obtaining any other required statutory approvals to use the building and any associated costs.	8.10.1 Infrastructure Inventory and Inspection

Note:	The TBA application did not include use of the sports pavilion within the temporary construction area covered by this licence.	8.10.1 Infrastructure Inventory and Inspection
	Acknowledging that the building could be used by the project team during the construction, this condition sets out the terms that would apply to the use of this building.	
	Terms and conditions of use /building inspection, maintenance, repair and/or reinstatement) would farm part of any licence consideration and approval process.	

HEB Construction will produce a draft report of the parks infrastructure inspection, including an inventory management schedule and supplied to the Manager Open Space and Recreation Planning for review at least 20 working days prior to commencing any work on site.

This report must include:

I. Site map: a map of the licence area;
II. Asset schedule: the location and schedule of all identified park assets;
III. Images: photographic images of all identified inventoried items, to assist with identification, tracking and management;
IV. Management plan: a management plan or schedule for each inventoried item, clearly identifying for each asset/s whether it will be:
    a. Removed and relocated, and not replaced as part of future site reinstatement
    b. Removed and relocated, and scheduled for replacement as part of future site reinstatement
    c. Removed and stored by Wellington Water for future reinstatement
    d. Removed and disposed of, and scheduled for replacement as part of future site reinstatement
    e. Removed and stored by Wellington Water, with a decision to be made by the Manager Open Space and Recreation Planning, prior to commencing site remediation, regarding asset relocation, disposal, reinstatement and/or replacement
    f. Retained and managed in situation, including any management plan for the monitoring, protection and maintenance of the asset.

Park asset removal, relocation, storage, reinstatement and replacement costs:

HEB Construction will meet all fair and reasonable costs for removing, relocating, storing, replacing and/or reinstating any park assets within the licence area.

Parks assets within the licence area will be jointly inspected by the Manager Open Space and Recreation Planning and HEB Construction, well in advance to the commencement of construction, and that an agreed management plan is developed for asset removal, relocation, storage, disposal, reinstatement and/or future replacement.

Sports Pavilion Use:

Where the sports pavilion is or is not required for use, HEB Construction will suitably monitor and protect the building from any use or damage during the construction period. The monitoring and management of the sport pavilion shall be included in the parks infrastructure inspection and inventory management report.

Where the sports pavilion is identified for use, either prior to construction or at any stage throughout the project, HEB Construction will apply in writing to the Manager Open Space and Recreation Planning to vary the licence agreement area to include the sports pavilion.

If the sports pavilion is required for use HEB Construction will meet all costs associated with varying this licence to include the use of this building and shall be responsible for obtaining any other required statutory approvals to use the building and any associated costs.

A confirmation on the use of the sports pavilion, if required, will be included as an amendment to this LEMP.

8.10.2 *Existing Bench Seat and Plaque*

Table 63: Existing Bench Seat and Plaque Reinstatement Requirements Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.36	Prior to commencing construction, the Requiring Authority shall remove and store the existing bench seat and plaque located on the reservoir site. Within six months of the completion of construction the bench seat and plaque shall be re-instated.	8.10.2 Existing bench seat and plaque

HEB Construction will ensure the existing bench and plaque is removed and stored safely prior to commencing construction (Figure 23). Within 6 months of the completion of construction the bench is to be re-instated by HEB Construction. The exact position of the relocated bench will be agreed upon with the WCC. HEB Construction will inform the CRG of the location of the stored bench during construction. HEB recommends installing the seat safely outside the construction site fence and just uphill from its current position for public use during the construction period then installing in final position at completion of construction.

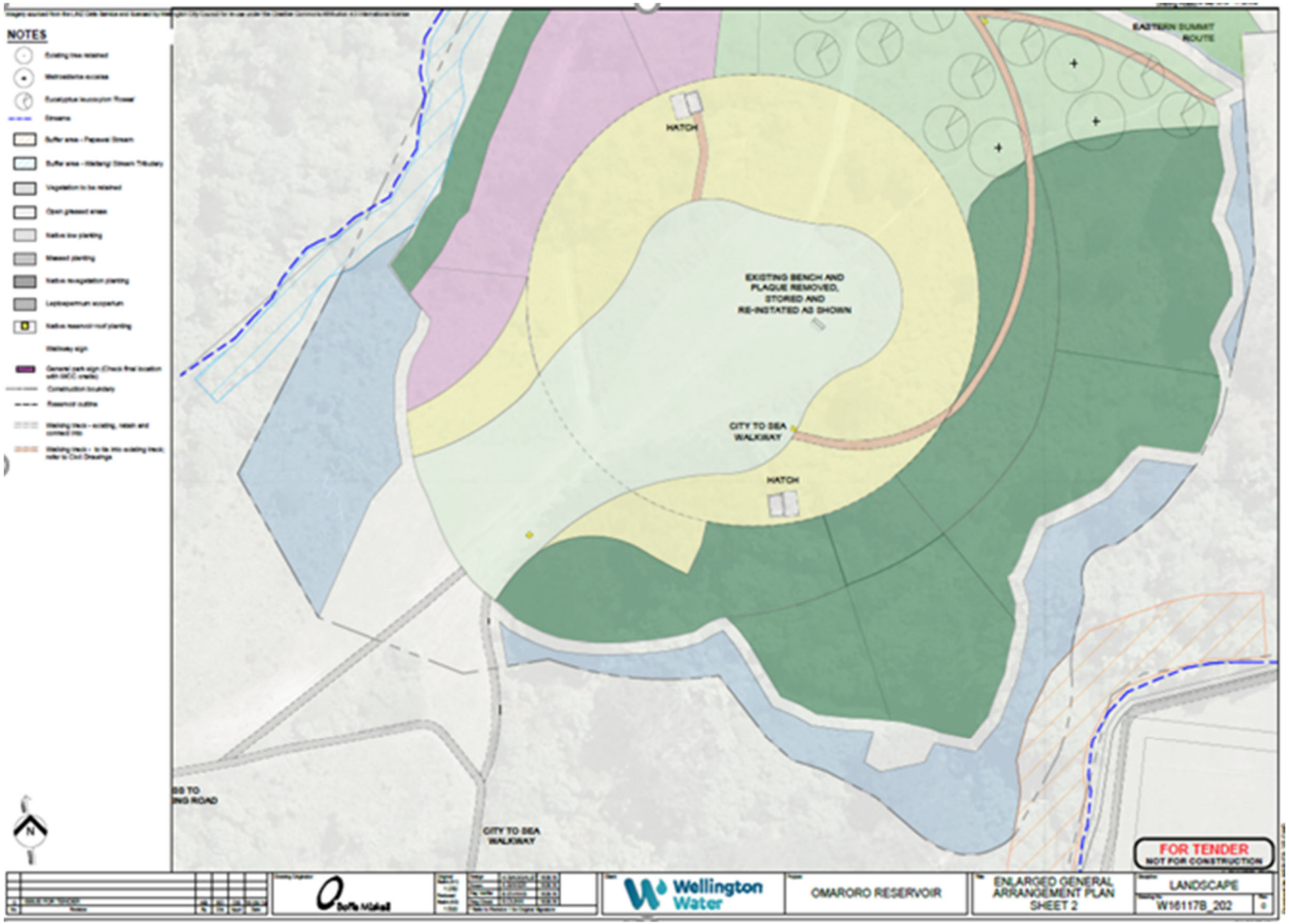


Figure 23: Existing bench seat and plaque location

8.11 *Monitoring, Inspection and Defects Period*

8.11.1 *Maintenance*

Table 64: Response Maintenance and Landscape Modification & Review Requirements Identified Within WCC and TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33m(v)	Proposed maintenance of plantings, including the replacement of unsuccessful plantings.	8.11.1 Maintenance
DC.33m(vi)	Response maintenance for existing vegetation affected by opening of the canopy during construction (this is required to address potential windfall effects that may arise as a result of peripheral tree removal).	8.11.1 Maintenance
Town Belt Act Licence Conditions		
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC.56 (f)	Landscape modification and review: If proposed landscaping fails or is compromised by either the methods and materials of backfilling, and must be changed, a landscape review and amendment process, involving a suitably qualified landscape architect and ecologist, for presenting changes to Manager Open Space and Recreation Planning that will achieve the same outcome anticipated for mitigating the effects of the reservoir project	8.11.1 Maintenance

Proposed maintenance, modifications and reviews have been identified within regulatory permissions. Maintenance relates to maintaining the planting during both the construction and the Defects Liability & Maintenance period of the project.

While maintenance will be the responsibility of the landscape contractor, regular monitoring and reporting will be carried out by both the Project Management Team or Project Landscape Architect or Project Ecologist.

HEB Construction will ensure maintenance involves key inspection points including:

I. Weekly checks for problem weeds, especially those that are aggressive and invasive, and to deal with these in the early stages of infestation when control should be relatively easy;
II. Observation to detect damage from pests and diseases, waterlogging, and vandalism;
III. Checks following heavy rainfall or severe weather events, or prolonged dry periods so remedial action can be taken (in particular with blocking of swales and drains);
IV. Modification of planting around streams to align with water levels;
V. Modification of planting around pedestrian walkways to ensure planting does not obscure visibility or access;
VI. Checking grass swales to ensure that areas are not 'scalped' during mowing and if so carrying out remedial work to avoid this occurring;
VII. Replacement of dead plants;
VIII. Reinstate mulch that has eroded or lost;
IX. Checking areas of scour to ensure plant success.

In addition to the routine maintenance of landscape treatments programmed above, responsive monitoring and repairs are required as necessary. These should be carried out:

I. Following a storm event,
II. Following prolonged dry or wet periods,
III. If damage from animal pests occurs.

In addition to the remedy of defects, HEB Construction will undertake maintenance of the area and of the landscape works regularly throughout the Defects Liability and Maintenance Period. The degree required and frequency is detailed in the Appendix 5 Technical Specification Landscape.

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

Watering, pest and disease control associated with defects liability of landscape treatments shall be at a frequency proposed by HEB Construction and agreed with the Engineer to Contract. HEB Construction shall submit a proposed maintenance regime, based on the schedule below to the Engineer for approval.

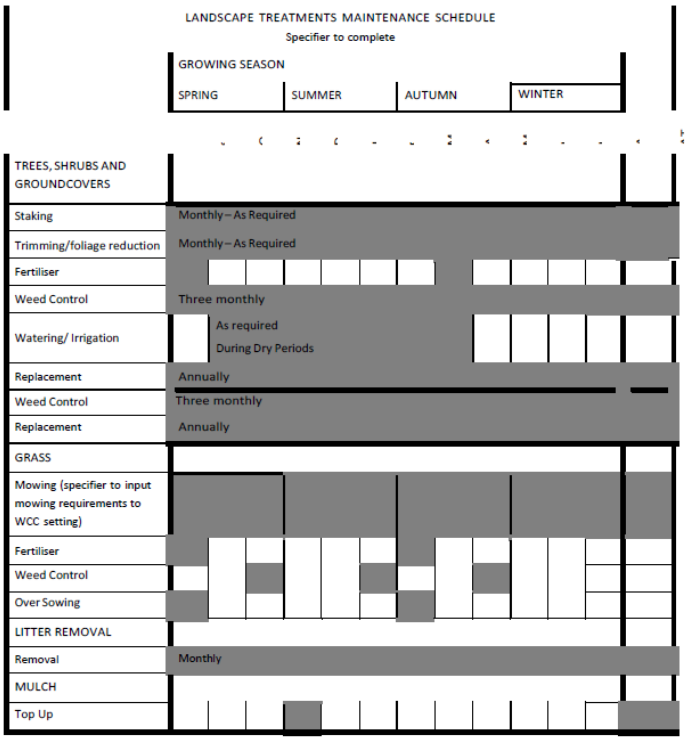


Figure 23: Landscape treatments maintenance schedule example from Appendix 5 Technical Specification Landscape

Response maintenance is required for existing vegetation affected by opening of the canopy during construction, to address potential windfall effects that may arise as a result of peripheral tree removal. A response maintenance for existing vegetation affected by opening of the canopy during construction may include:

I. Installation of shade cloth
II. 'Buffer' planting.
III. Weed management

Should the proposed landscaping fail or is compromised by either the methods or materials of backfilling, and must be changed, a landscape review must be carried out by the Project Landscape Architect and Project Ecologist. Suggested changes are to be presented to the Manager Open Space and Recreation Planning that will achieve the same outcome anticipated for mitigating the effects of the reservoir project. Refer to the Technical Specification for inspections.

8.11.2 *Maintenance and Management Schedule and Costs*

Table 65: Maintenance and Management Schedule and Cost Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 57	**Maintenance and management schedule and costs:**	
	The LEMP and PFMP must include a long-term maintenance and management plan and schedule for the licence area and surrounding landscape that has been disturbed or used by the project. The finished site must be maintained and managed for the primary purpose of Wellington Town Belt Reserve while allowing for the operation of the reservoir and associated infrastructure. The maintenance and management schedule must outline all changes in level of service from the preconstruction site state and clearly define costs associated with the change.	8.11.2 Maintenance and Management Schedule and Costs

An annual Playing Fields Maintenance and Management Schedule has been developed by SSDM which is appended to this document (Appendix 12). This plan details and schedules the maintenance and management requirements typical for a soil-based sports field with primary drainage and irrigation and covers the following items:

I. Mowing
II. Fertilising
III. Line marking;
IV. Physical treatment work
V. Renovation;
VI. Goal Posts
VII. Herbicide/Fungicide
VIII. Irrigation
IX. Reporting.

A maintenance and management schedule for the licence area and surrounding disturbed landscape is also included as an appendage to this LEMP document (Appendix 16). This schedule outlines all changes in the level of service from the preconstruction state.

8.11.3 *Planting Review*

Table 66: Planting Review Requirements Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.37	A planting review must be undertaken by a suitably qualified and experienced landscape architect within 3 years of completion of construction of the reservoir. The review will focus on the revegetation and assess the effectiveness of plant growth, particularly on mechanically stabilised slopes. Where required, remedial works shall be undertaken to ensure that planting treatments are successful and have the potential to improve the landscape values of the site. Evidence of this review must be provided to the CMO.	8.11.3 Planting review

A planting review will be undertaken by a suitably qualified and experienced Landscape Architect within 3 year of completion of construction of the reservoir. The review will focus on the revegetation and assessment of the effectiveness of plant growth, particularly on the mechanically stabilised slopes.

Where required, remedial works shall be undertaken to ensure that planting treatments are successful and have the potential to improve the landscape values of the site. Evidence of this review will be provided to the CMO.

Refer to the Landscape Technical Specification (Appendix 5) for further details.

8.11.4 *Monitoring and Inspection Plan*

Table 67: Monitoring and Inspection Plan Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Monitoring, inspection and defects period		
LC.93	Condition and site monitoring	
(b)	Monitoring and inspection plan: The LEMP and PFMP must include a monitoring and inspection plan prepared by the Wellington Water Project Landscape Architect with input from their specialists in maintenance of the various areas of the site {e.g. ecologists, sports turf specialist, landscapers, nursery managers, irrigation designers, engineers etc). The plan must outline:	8.11.4 Monitoring and Inspection Plan

i.	key stages of the project where monitoring and inspection is required	8.11.4 Monitoring and Inspection Plan
ii.	the intention of inspection and	8.11.4 Monitoring and Inspection Plan
iii.	success measures.	8.11.4 Monitoring and Inspection Plan
iv.	describe agreed processes for remedy of defects and failed planting including timeframes and re-inspections.	8.11.4 Monitoring and Inspection Plan
(c)	Monitoring and inspection parties: Monitoring and inspections required under LC.93{b) will include, the CMO, CLP, the Manager Open Space and Recreation Planning and any others required to properly consider the issues being monitored or inspected, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning.	8.11.4 Monitoring and Inspection Plan
(d)	Monitoring and inspection frequency: Monitoring and inspections will occur at a minimum:	8.11.4 Monitoring and Inspection Plan
i.	On completion of any area of ground works including tracks, sports fields or other earthworks required to achieve an ecological, amenity or recreation function. This must also be prior to any planting into those completed areas to check ground conditions are suitable for the proposed planting	8.11.4 Monitoring and Inspection Plan
ii.	In accordance with any additional monitoring and inspection requirements identified in LC. 93(b){i), including an annual inspection of completed planting areas.	8.11.4 Monitoring and Inspection Plan

A monitoring and inspection plan will be prepared by the Project Landscape Architect with input from their specialists in maintenance of the various areas of the project.

The plan must outline:

I. Key stages of the project where monitoring and inspection is required;
II. The intention of inspection;
III. Success measures;
IV. Describe agreed processes for remedy of defects and failed planting including timeframes and re-inspections.

Key Stages of the project are outlined in the draft Maintenance and Inspection Plan shown below:

Table 67a: Examples of Key Project Stages

OMARORO MAINTENANCE AND INSPECTION PLAN				
KEY STAGES	Intention of inspection	Success measures	Description of success measures	Process for remedy of defects
Completion of tracks				
Prior to planting fill areas				
Prior to planting areas on the upper field boundary				
Completion of riparian planting				
Annual inspection of completed areas				

Table 67b: Inspection Requirements

Site Preparation	• Set out for clearing • Installation of measures to protect existing vegetation (e.g. mature trees, seral forest a, b, c, native bush)

	• On completion of the clearance (including pest plant control) • Following earthworks and during site preparation, including depth of topsoil / soil mix • Completion of cultivation
Plant Pest and Animal Pest Control inspections	• Assessment to determine any Plant and Animal Pests problems • Methodology and programme • Review of pest plant areas to be cleared and managed • Following pest plant control, when signs of dieback are visible • Following any additional pest plant control operations • Following animal pest control operations • Inspections for pest control shall occur twice a year (generally spring then autumn)
Topsoil Quality	• On site review of existing topsoil areas to be planted into for any remediation • Inspection of topsoil proposed for importing • Receipt of topsoil testing results from laboratory testing with accompanying recommendations from a soil scientist for soil remediation measures (if any are required). • Completion of any topsoil remediation required
Plant Quality	• During production and prior to delivery of plants to site • Upon delivery of plants to site
Planting	• At setting out • During planting (Inspections may be staged as planting progresses with the availability of areas during the project). • Check all organic and stone mulch, biodegradable weed matting, plant ancillaries (e.g. tree stakes and ties) • Upon completion
Grassing	• Cultivation and preparatory work prior to seeding • Completion of topsoil/soil mix prior to final levelling and seeding • Completion of grass establishment prior to first mowing
Hydroseeding	• Preparatory work prior to seeding • At time of seeding for coverage review • Upon establishment • Note: The Contractor shall confirm that the specified seed is being used in the hydraulic spreading machine
Defects liability and Maintenance	• As agreed with the Engineer during the Defects Liability and Maintenance Period • Following the remedy of any defects, this is within 20 days of being notified of a defect, or for replacement of defective planting during the growing season. • End of Defects Liability and Maintenance Period (5 years for terrestrial and riparian planting) prior to the issue of Defects Liability Certificate

All materials and workmanship shall comply with the standards listed within the Landscape Technical Specification. Refer to each section within the Landscape Technical Specification for detail on the information to be supplied, the material testing, onsite testing, hold points and all inspections required for the project.

Monitoring and inspections required will include, the CMO, CLP, the Manager Open Space and Recreation Planning and any others required to properly consider the issues being monitored or inspected, unless otherwise agreed in writing by the Manager Open Space and Recreation Planning.

Frequency:

Monitoring and inspections will occur at a minimum:
On completion of any area of ground works including tracks, sports fields or other earthworks required to achieve an ecological, amenity or recreation function. This will also include prior to any planting into those completed areas to check ground conditions are suitable for the proposed planting.

Monitoring and inspections will occur in accordance with the monitoring and inspection requirements stated above, including an annual inspection of completed planting areas.

Throughout the duration of construction and the defects liability and maintenance period HEB Construction will monitor the progress and condition of the works and provide a 3 monthly (4 X per annum) report.

Upper and Lower Playing Fields:

The nominated playing fields contractor will have direct involvement in the monitoring of the sports field construction works by way of site inspections at key phases of the construction for both the upper and lower field areas.

These key hold points cover the following stages:

I. General set-out and materials approval
II. Subgrade shaping and levelling
III. Topsoil placement and levelling
IV. Primary drainage installation
V. Irrigation installation
VI. Basal fertiliser/compost application/decompaction and final level
VII. Seeding/turf establishment
VIII. Grow-in completion

Each of the above hold points have associated completion standards that need to be met and signed off prior to moving to the next phase which are detailed within the Sports Field Construction Works Specification.

In addition, HEB Construction will provide the WWL appointed Engineer to contract (or its representative) with a regular (i.e. minimum weekly) update of all grow-in activities that have occurred following sowing. The report may be verbal or written and is to be communicated to the Engineer (or its representative). The report shall cover the previous 7-day period.

8.11.5 *Final Site Inspections*

Table 68: Final Site Inspection Requirements Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Monitoring, inspection and defects period		
LC.94	**Final site inspections**	
	Wellington Water must arrange a schedule of final site inspections following the completion of construction and site remediation, to be agreed in writing by the Manager Open Space and Recreation Planning, as the site is progressively vacated by the project work and associated contractors. The inspection schedule shall provide:	8.11.5 Final Site Inspections
(a)	Sufficient opportunity for identified issues to be resolved by Wellington Water or its contractor to the satisfaction of the Manager Open Space and Recreation Planning, prior to final site vacation.	8.11.5 Final Site Inspections

(b)	For final site inspection by the Manager Parks Sports and Recreation Operations and Manager Open Space and Recreation Planning and the Project Landscape Architect.	8.11.5 Final Site Inspections

HEB Construction will arrange a schedule of final site inspections following the completion of construction and site remediation, to be agreed in writing by the Manager Open Space and Recreation Planning, as the site is progressively vacated by the project work and associated contractors.

The inspection schedule shall ensure:

I. Sufficient opportunity for identified issues to be resolved by HEB Construction to the satisfaction of the Manager Open Space and Recreation Planning, prior to final site vacation.
II. A final site inspection by the Manager Parks Sports and Recreation Operations, Manager Open Space and Recreation Planning and the Project Landscape Architect.

Upon completion of the relevant playing field remediation construction phases and sign off/approval of the key hold points both the upper and the lower playing fields will be assessed for turf cover quality and surface levels by the playing fields contractor.

The following grow-in completion standards are expected to have been achieved, checked and signed off prior to practical completion:

Handover requirement	Standard	Measurement procedure
Turfgrass height Presence of clippings	No greater than 40 mm Uniformly dispersed No individual clumps	Glass prism Visual Visual
Ground cover	90% ground cover with sown species 75 mm diameter patches of bare ground	Visual 0.5 m^2 frame
Micro-levels	15 mm over 3 m	3 m straight edge
Broadleaf weeds	5% ground cover	Visual

8.11.6 *Defects and Liability Period – New Tracks*

Table 69: Defects and Liability Period – New Tracks Identified Within TBA Regulatory Permissions

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Monitoring, inspection and defects period		
LC.96	**Defects and liability period- New Tracks**	
	There will be a defects period of nine months on new track builds and track reinstatement (including the track, surface materials, drainage and any steps, retaining, handrails, boardwalks or bridges) from the date of completion and final sign off by the Manager, Open Space and Recreation Planning. Any defects must be addressed and repaired to the satisfaction of the Manager, Open Space and Recreation Planning within one month of identification of any issue.	8.11.6 Defects and Liability Period – New Tracks

There will be a defects period of nine months on new track builds and track reinstatement (including the track, surface materials, drainage and any steps, retaining, handrails, boardwalks or bridges) from the date of completion and final sign off by the Manager, Open Space and Recreation Planning.

Any defects identified must be addressed and repaired to the satisfaction of the Manager, Open Space and Recreation Planning within one month of identification of any issue.

8.11.7 *Defects and Liability Period – Planting and Landscaping*

Table 70: Defects and Liability Period – Planting and Landscaping Identified Within WCC and TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Landscape & Ecology Management Plan		
DC.33n	Subject to achieving the success standards in paragraphs i), ii) and iii) below, there shall be a five-year defects liability and maintenance period for all terrestrial planting, but the maintenance period may be shorter if the success measures have been achieved earlier. At the end of that period, the Requiring Authority shall provide information to the CMO to demonstrate that the planting has been successful, with success defined as follows:	8.11.7 Defects and liability period – Planting and Landscaping
DC.33n(i)	In relation to mass planting, successful planting shall be defined as 80% canopy closure whereby a sustainable plant community has been established and where plants have grown to create a canopy that shades the ground and suppresses weed growth	8.11.7 Defects and liability period – Planting and Landscaping
DC.33n(ii)	In relation to the planting of specimen trees, successful planting shall be defined as 100% plant survival, with 100% of trees in full leaf(if the relevant species is typically in leaf at that time of year) with the trees to have a habit of growth that is normal to the species and are to be sound, healthy and vigorous with normal and well-developed branch systems	8.11.7 Defects and liability period – Planting and Landscaping
DC.33n(iii)	Success in relation to wetland and riparian planting shall be defined as nearly as practicable to the criteria in i), or ii) and in any event as agreed by expert ecologists.	8.11.7 Defects and liability period – Planting and Landscaping
Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Monitoring, inspection and defects period		
LC.97	Defects and liability period - Planting and Landscaping	
Note:	The planting and landscaping defects liability period is five years. While there may be areas that have achieved the success measures outlined in Designation condition 33, Wellington Water will still be liable until the end of the five year period so as to ensure the ground conditions are performing as intended.	8.11.7 Defects and liability period – Planting and Landscaping

A defects and liability period has been identified in the regulatory permissions. The Planting and landscaping defects liability period is five years. Depending on the achievement of the success measures, this period may be decreased.

At the end of that period, HEB Construction will provide information to the CMO to demonstrate that the planting has been successful, with success defined as follows:

Success is defined as follows:

I. In relation to mass planting, successful planting shall be defined as 80% canopy closure whereby a sustainable plant community has been established and where plants have grown to create a canopy that shades the ground and suppresses weed growth;
II. In relation to the planting of specimen trees, successful planting shall be defined as 100% plant survival, with 100% of trees in full leaf (if the relevant species is typically in leaf at that time of year) with the trees to have a habit of growth that is normal to the species and are to be sound, healthy and vigorous with normal and well-developed branch systems;
III. Success in relation to wetland and riparian planting shall be defined as nearly as practicable to the criteria in the above two (2) points and in any event as agreed by expert ecologists.

HEB Construction will remedy all defects relating to the landscape treatment works, each year during the defects and maintenance period, at the first available opportunity. All planting defects shall be addressed within the planting season (begins 1st May and ends 1st September). The aim of the defects liability is to achieve quality establishment of the projects landscape components.

To confirm this above statement, performance criteria for landscape establishment have been included in the Landscape Technical Specification.

9 Playing Fields Management Plan

This Playing Fields Management section (PFMP) of the LEMP is for the construction and turf reinstatement of the two: 'Upper and Lower' sports playing fields as part of the Omāroro Reservoir works. Requirements have been identified in GRWC, WCC and TBA conditions below.

9.1 *Purpose and Scope*

Table 71: Confirmation and Purpose of the PFMP Requirements Identified Within GWRC and WCC Regulatory Permissions

GWRC Resource Consent Conditions		
Pre-Construction Requirements		
Condition number	Condition requirement	LEMP Section Reference
7b(ii)	Confirmation of playing fields use and/or raising of levels i.e. a 'Playing Fields Management Plan'	9.1 Purpose and Scope
Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.39	The purpose of the PFMP is to outline the methods and measures to be implemented prior to the Works, during the construction phase, and for a defined period thereafter to avoid, remedy, and mitigate adverse effects of the construction and the Project on the Upper and Lower Prince of Wales Park playing fields.	9.1 Purpose and Scope

The PFMP provides the necessary methods and measures to be implemented prior to the works, during the construction phase, and for a defined period thereafter to avoid, remedy, and mitigate adverse effects of the Project on the Upper and Lower playing fields.

The Works involved for the reinstatement of the upper and lower playing fields includes:

I. Initial trimming of sub grade to form general level (including swales)
II. (Imported) topsoil placement
III. Installation of primary subsoil drainage system
IV. Final trim of top-soiled surface to correspond to design grades
V. Seeding
VI. Grow-in and turfgrass establishment.

Spoil and excavated material will be stockpiled on the both the upper and lower sports fields. Temporary erosion and sediment controls such as sediment retention ponds - SRPs will be installed and construction equipment will be operated and stored on the stockpiles.

Methods to avoid compaction will include a combination of:

- Pre-construction and post-construction soil testing (scala testing or similar) to assess mechanical strength of the soil;
- Avoid working wet soil;
- Using appropriately sized plant and machinery, avoiding using unnecessarily large machinery;
- Ensuring machinery is restricted to designated transportation “lanes” within the site and not permitted to move randomly;
- Where post construction testing indicates undesirable compaction, this will be alleviated with deep tillage.

Following completion of the reservoir installation, the two (2) sports fields are to be reinstated to at least the same standard as pre-construction. The aim is to enhance the performance of the existing sports fields upon handing back to the Council. This will be achieved through the improvement of the existing (poor) surface levels, the installation of a primary sports field drainage system and automated irrigation on both fields.

SSDM provided specialist turf input relating to the following:
- Feasibility;
- Design (concept & detailed): refer Appendix 8 Playing Field Remediation Design Report;
- Specification & Price Schedules,
- Construction overview (provision of a limited number of site visits)
- Production of a post construction Playing Fields Maintenance Plan.

Throughout the design process SSDM have liaised with representatives of the Manager Open Space and Recreation Planning in relation to specific sports field reinstatement requirements.

9.2 *Ground Preparation - Upper and Lower Playing Fields Reinstatement*

Table 72: Final Designs – Earthworks and Drainage Requirements Identified Within WCC and TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.39	The PFMP shall, as a minimum, address the following:	
a)	Final design of the fields including levels and improved drainage (where practicable)	9.2 Ground Preparation - Upper and Lower Playing Fields Reinstatement

Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 55	**Earthworks and ground preparation**	9.2 Ground Preparation - Upper and Lower Playing Fields Reinstatement
	Earthworks and ground preparation design and management must include the following:	
(a)	***Upper and Lower playing field reinstatement:*** The lower and upper fields will be reinstated to function for sports fields use	9.2 Ground Preparation - Upper and Lower Playing Fields Reinstatement
(b)	***Proposed finished ground levels:*** Proposed ground levels across the site that will result in all areas of the park, including any playing or sports fields, being fit for purpose.	9.2 Ground Preparation - Upper and Lower Playing Fields Reinstatement

Upper and lower sports field platform design and construction scope and requirements have been detailed in both the Playing Field Remediation Design Report and the Sports Field Construction Works Specification (Appendices 6 and 8).

The design provided by SSDM has focused upon reinstating the existing sports field platforms to the same dimensions and for the same purpose(s). The playability of the platforms shall be enhanced through the addition of a primary drainage system, surface laser levelling to create consistent falls and the installation of automated irrigation.

The design and construction scope are detailed in the following documents appended to this report:

Appendix 8 - Playing Field Remediation Design Report (September 2019)
Appendix 6 - Construction Specification - Sport field drainage and turf establishment
Appendix 7 - Sports Playing Field Drawings
Appendix 12- Proposed Annual Sports Field Maintenance Programme
Appendix 13 - Sports Field Irrigation Design Drawings (September 2019)

These documents cover off the following components:
1. Sports field sub grade formation.
2. (Imported) topsoil and compost quality, supply and placement.
3. Primary subsoil drainage system installation.
4. Irrigation system installation

5. Final trim of top-soiled surface to correspond to design grades. (including decompaction).
6. Seeding/sow down.
7. Turfgrass establishment and grow in.

In addition, post construction maintenance requirements and schedule are detailed in Proposed Annual Sports Field Maintenance Programme (Appendix 12).

9.2.1 *Raising of Upper and Lower Playing Fields*

Table 73: Raising of Upper and Lower Playing Fields Requirements Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.41	The Requiring Authority shall not permanently raise the upper and lower playing field as part of the Project for the expressed purpose of permanently storing surplus excavated material from the proposed reservoir site.	9.2.1 Raising of Upper and Lower Playing Fields
DC.41	This condition shall not affect or limit any reasonable works required as part of field reinstatement, involving field re-shaping or re-profiling, required to appropriately reinstate playing surfaces as agreed with the Manager Open Space and Recreation Planning and the Manager, Sports and Recreation Operations and Contracts.	9.2.1 Raising of Upper and Lower Playing Fields

HEB Construction will not permanently raise the upper and lower playing fields as part of the Project. Playing field platform design has focused on reinstatement to existing levels. Works will involve a relevelling and surface smoothing exercise in line with current levels to ensure the enhancement of the surfaces from what their current state by improving surface macro and micro levels.

Details on proposed finished surface grades compared to existing grades are detailed in the following drawings appended to this report (Sports Playing Field Drawings):

I. 3262232-CE-1402 Upper Sports Field Cross Sections
II. 3262332-CE-1502 Lower Sports Field Cross Sections

9.2.2 *Surface Specifications*

Table 74: Surface Specification Requirements Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.39	The PFMP shall, as a minimum, address the following:	
b)	Surface specifications	9.2.1 Surface Specifications

The Sports Field Construction Works Specification, Construction Design Drawings and the Remediation Design Report appended to this document detail the requirements necessary to produce sports surfaces in line with the community use requirement and to an appropriate standard.

Key surface related specifications are described in the sections outlined below:

I. Platform areas (Section 1 page 4 of the Playing Field Remediation Design Report);
II. Platform subgrade and surface shape and levels (Section 2 page 5 of the Playing Field Remediation Design Report) together with the following construction drawings:

   a. 3262332-CE-1401 Upper Sports Field Finished Level & Drainage Plan
   b. 3262232-CE-1402 Upper Sports Field Cross Sections
   c. 3262332-CE-1403 Upper Sports Field Surface Drainage Details
   d. 3262332-CE-1501 Lower Sports Field Finished Level & Drainage Plan
   e. 3262332-CE-1502 Lower Sports Field Cross Sections
   f. 3262332-CE-1403 Lower Sports Field Surface Drainage Details
   g. 2262332-CE-3303 Drainage Details Sheet 2 of 3.

I. Sub grade and topsoil treatment including quality, fertiliser amendments, finished level requirements and the specialist turf equipment necessary to deliver these requirements (Sections 2 and 4 of the Playing Field Remediation Design Report).
II. Sub soil drainage design (Section 3 pages 6 - 8 of the Playing Field Remediation Design Report).
III. Automated irrigation system installation (Section 6 of the Playing Field Remediation Design Report).
IV. Turf establishment and grow in specifications and methodologies. (Section 5 page 11 of the Playing Field Remediation Design Report).

9.2.3 *Retaining Works*

Table 75: Retaining Work Requirements Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.39	The PFMP shall, as a minimum, address the following:	
c)	Retaining works, including any retaining structure design, where necessary	9.2.3 Retaining Works

At the time of writing this management plan, there are no new retaining works proposed in relation to either the upper or the lower playing fields.

9.2.4 *Permanent Access for Maintenance*

Table 76: Permanent Access for Maintenance Vehicle Requirements Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.39	The PFMP shall, as a minimum, address the following:	
d)	Permanent access for maintenance vehicles to both fields	9.2.4 Permanent Access for Maintenance

The access track between Upper and Lower fields will be closed during construction. Post construction, this track will be reinstated to a 2.5m wide permeable gravel surface flanked by 1.25m wide grassed berms (refer Civil Design Drawings). The track will be made up of subbase and AP20 creating a robust route for maintenance vehicles. The final reinstatement design for the access way track ensures a link with the walking track network. Refer to Landscape Design Drawings (Appendix 4) for further detail and section 9.2.6 of this LEMP Document.

Section 8.6.2 Reserve Maintenance also describes information on the reinstatement of the disturbed areas in order to open access post construction for maintenance.

9.2.5 *Fencing*

Table 77: Fencing Requirements Identified Within WCC Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.39	The PFMP shall, as a minimum, address the following:	
e)	Fencing	9.2.5 Fencing

For details regarding temporary or permanent fencing to be installed / reinstated, refer to these three sections below in this LEMP document under section 8.7.5 Fencing Plan and Reinstatement and 8.7.6 Construction Fencing and Appendix 11 Construction Site Fencing Plan:

I. Fencing Plan and Reinstatement;
II. Construction Temporary Fencing;
III. Other temporary fencing types.

9.2.6 *Access Track between Upper and Lower Playing Fields*

Table 78: Access Track Between Upper and Lower Playing Fields Requirements Identified Within WCC and TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.39	The PFMP shall, as a minimum, address the following:	
f)	Design of the access track between the upper and lower playing fields.	9.2.6 Access Track between Upper and Lower Playing Fields
Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Landscape and Ecological Management Plan (LEMP) and Playing Fields Management Plan (PFMP)		
LC. 60	**Access Track between Upper and Lower Playing Fields**	
	Landscape design and management of the access track between the upper and lower playing fields must provide for the following:	9.2.6 Access Track between Upper and Lower Playing Fields
(a)	Access way use for walkway and maintenance vehicles: A final reinstatement design for the access way track between the upper and lower field that provides for the use of the access way as part of the park's walking track network and as a route for park maintenance vehicles.	9.2.6 Access Track between Upper and Lower Playing Fields
(b)	Stability and erosion control: An access way design and construction that avoids erosion of the access way surface and any erosion and sedimentation impact on the Papawai stream environment	9.2.6 Access Track between Upper and Lower Playing Fields
(c)	Access way stream edge planting: Planting along the access way stream side edge that protects and strengthens the top of the stream bank adjacent to the access way and the stream crossing at the bottom of the access way	9.2.6 Access Track between Upper and Lower Playing Fields

The access track between Upper and Lower fields will be closed during construction. Post construction, this track will be reinstated to a 2.5m wide permeable gravel surface flanked by 1.25m wide grassed berms (refer Civil Design Drawings). The track will be made up of subbase and AP20 creating a robust route for maintenance vehicles.

The final reinstatement design for the access way track ensures a link with the walking track network and as a route for park maintenance vehicles. Refer to Landscape Design Drawings (Appendix 4) for further detail.

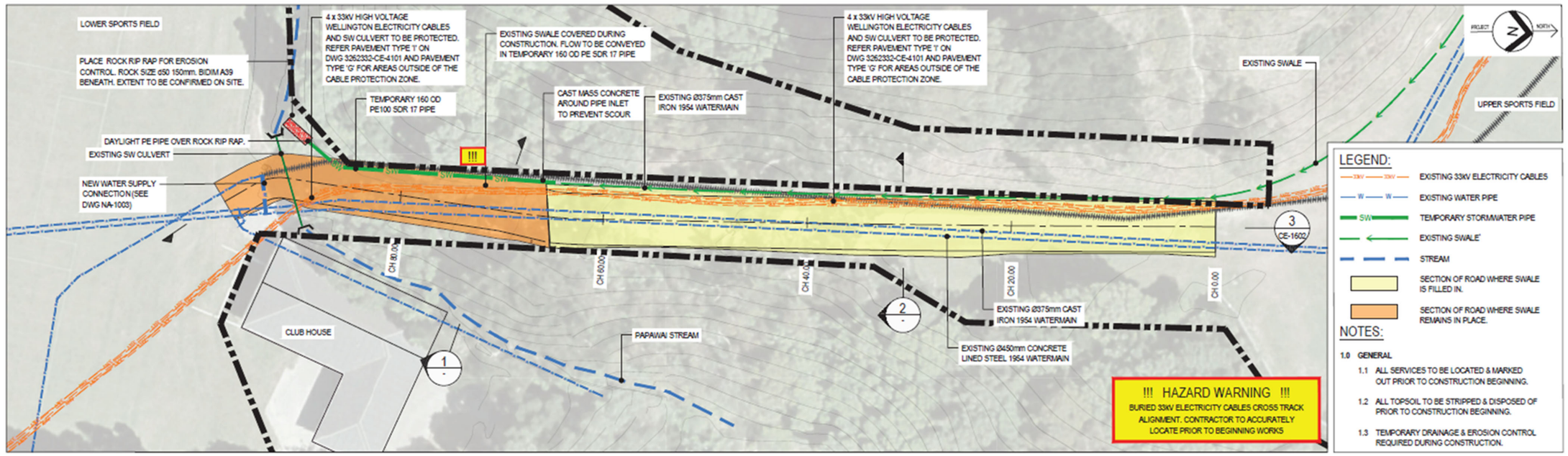
The access track between the upper and lower playing fields may need to be widened, and some trees along its margins removed or pruned to allow for movement of large vehicles. The extent of tree works needs to be confirmed in conjunction with the Project Ecologist, Landscape Architect with the correct protocol in Section 7.3.2 Vegetation Clearance in this LEMP in place prior to any clearance of vegetation.

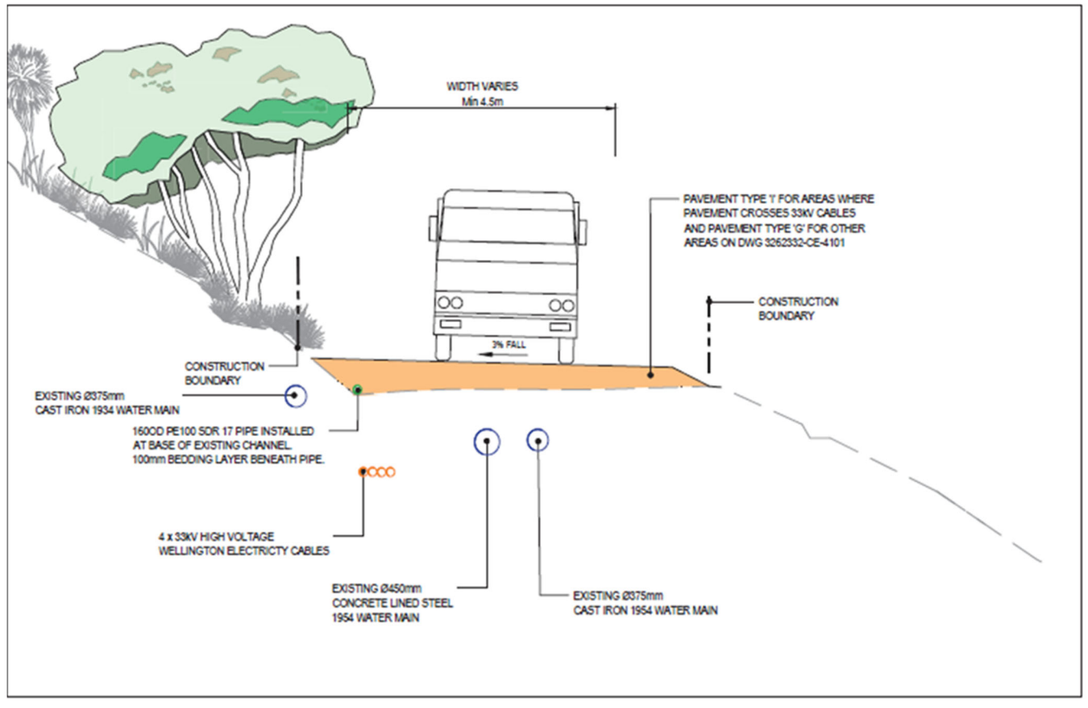
The swale on the western edge is to remain operational. Planting has been included along the access way stream side edge that protects and strengthens the top of the stream bank adjacent to the access way and stream edge crossing at the bottom of the access way. This is to help stabilise the

bank to avoid erosion and sedimentation impact on the Papawai Stream environment. See planting Schedule and planting plan sheet 3 in the Landscaping Design Drawings for further detail (Appendix 4).

A grassed swale on the tracks western edge takes directs run off before meeting with the Papawai stream at the end of the track between fields.

Figure 24: Cross sections showing the upper and lower link track – temporary works





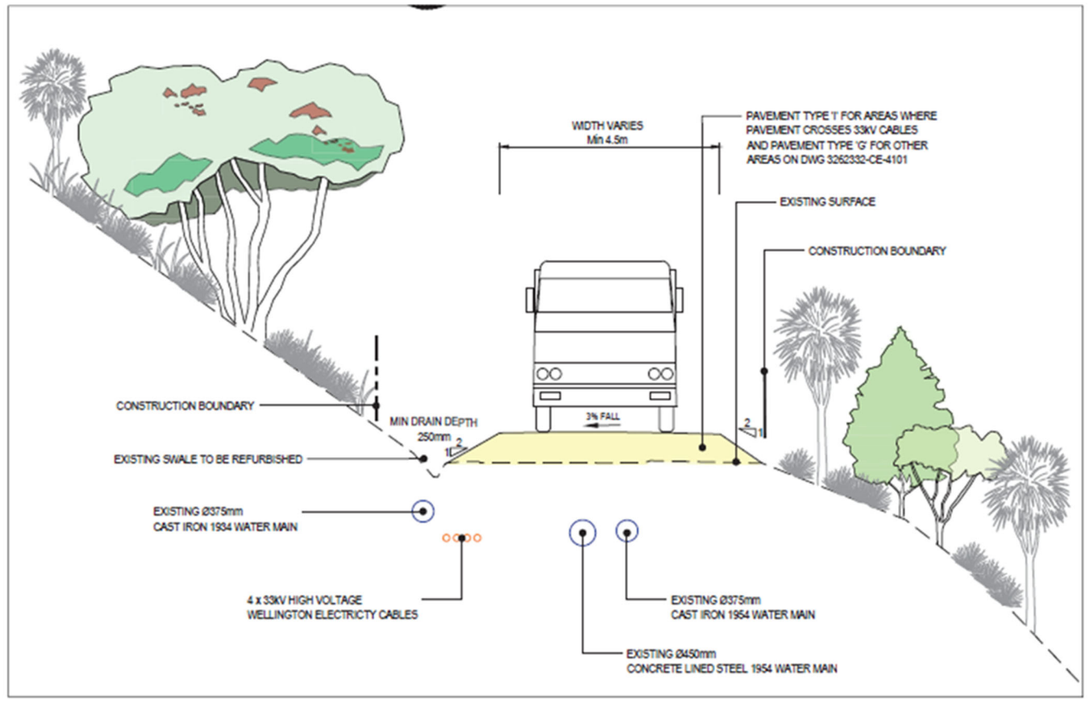
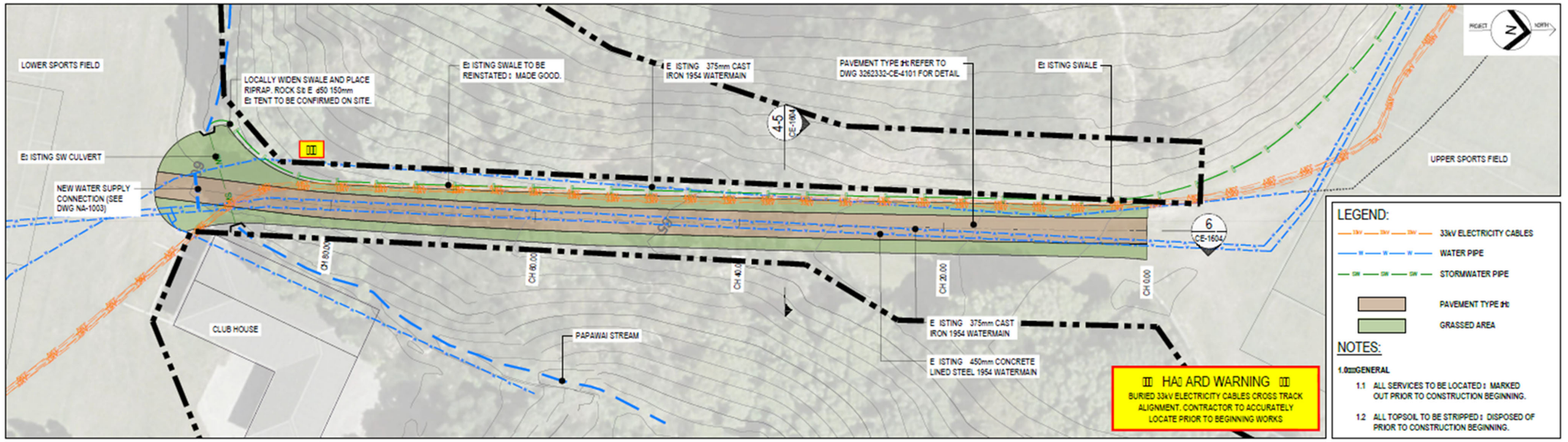
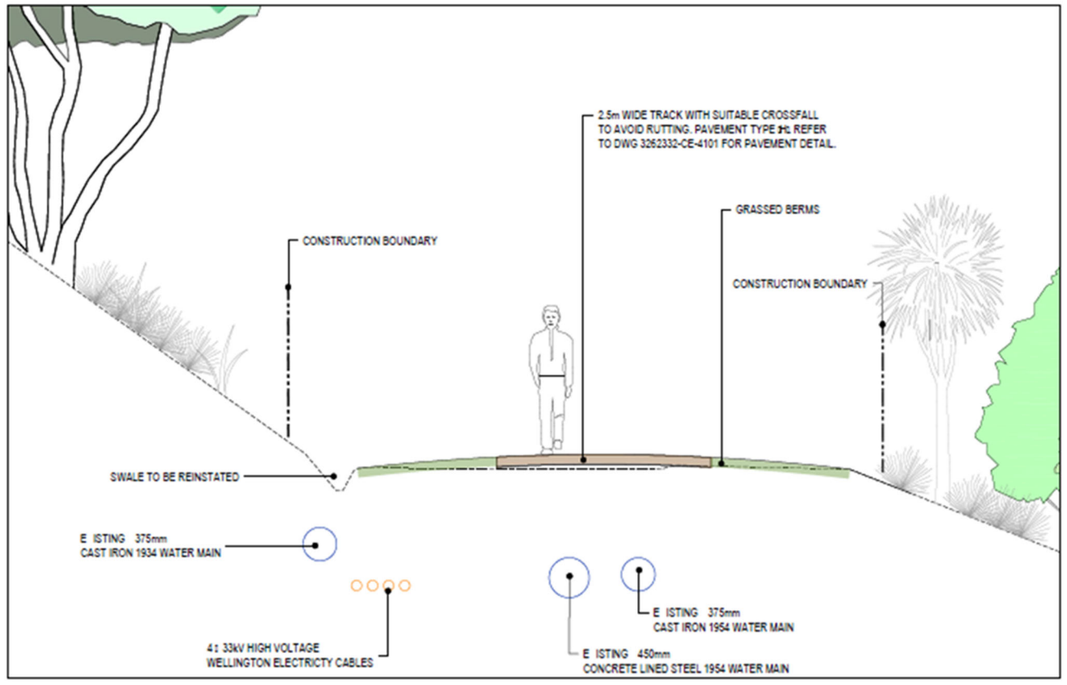
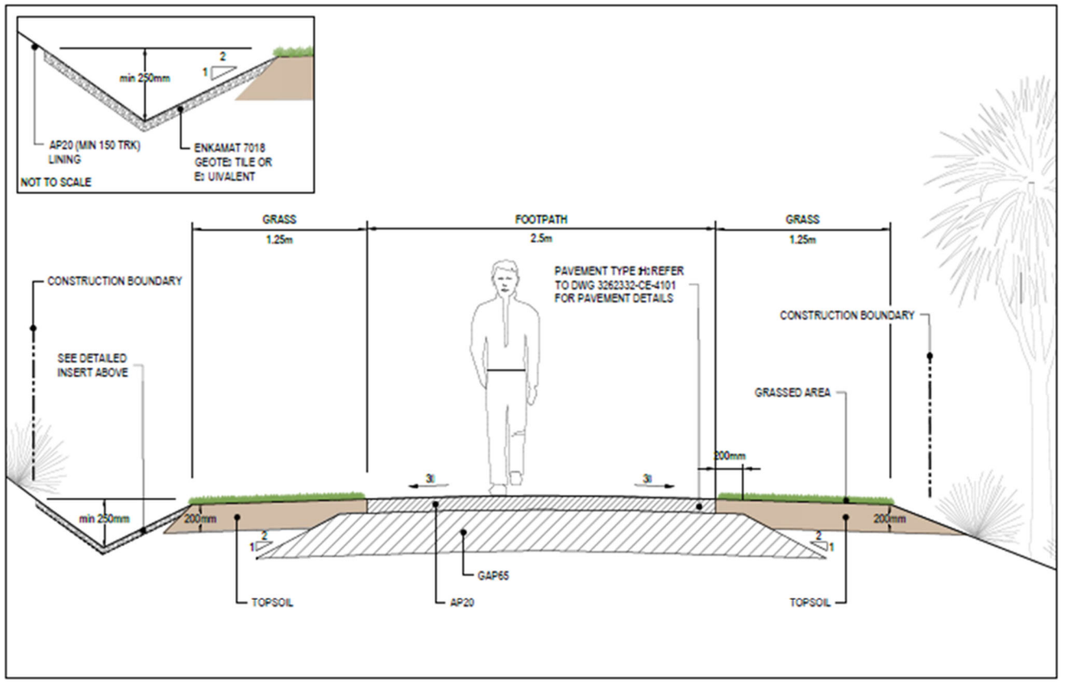


Figure 25: Cross sections showing the upper and lower link track – Final works





4 TYPICAL CROSS SECTION - LOWER LINK TRACK - FINAL TREATMENT GENERAL SECTION



5 TYPICAL CROSS SECTION - LOWER LINK TRACK - FINAL TREATMENT DETAILED SECTION

9.3 *Defects and liability period*

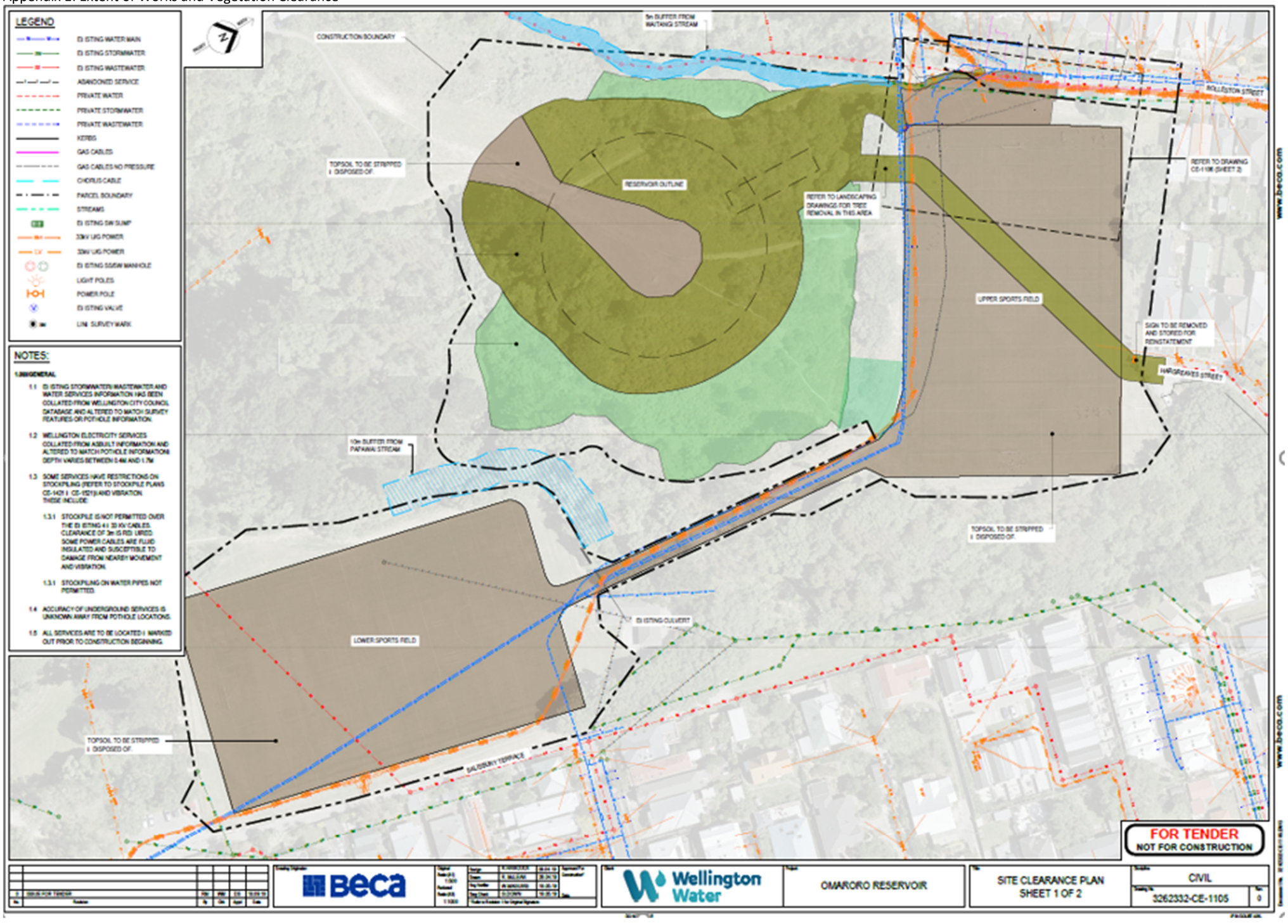
9.3.1 *Defects and Liability Period – Playing Fields*

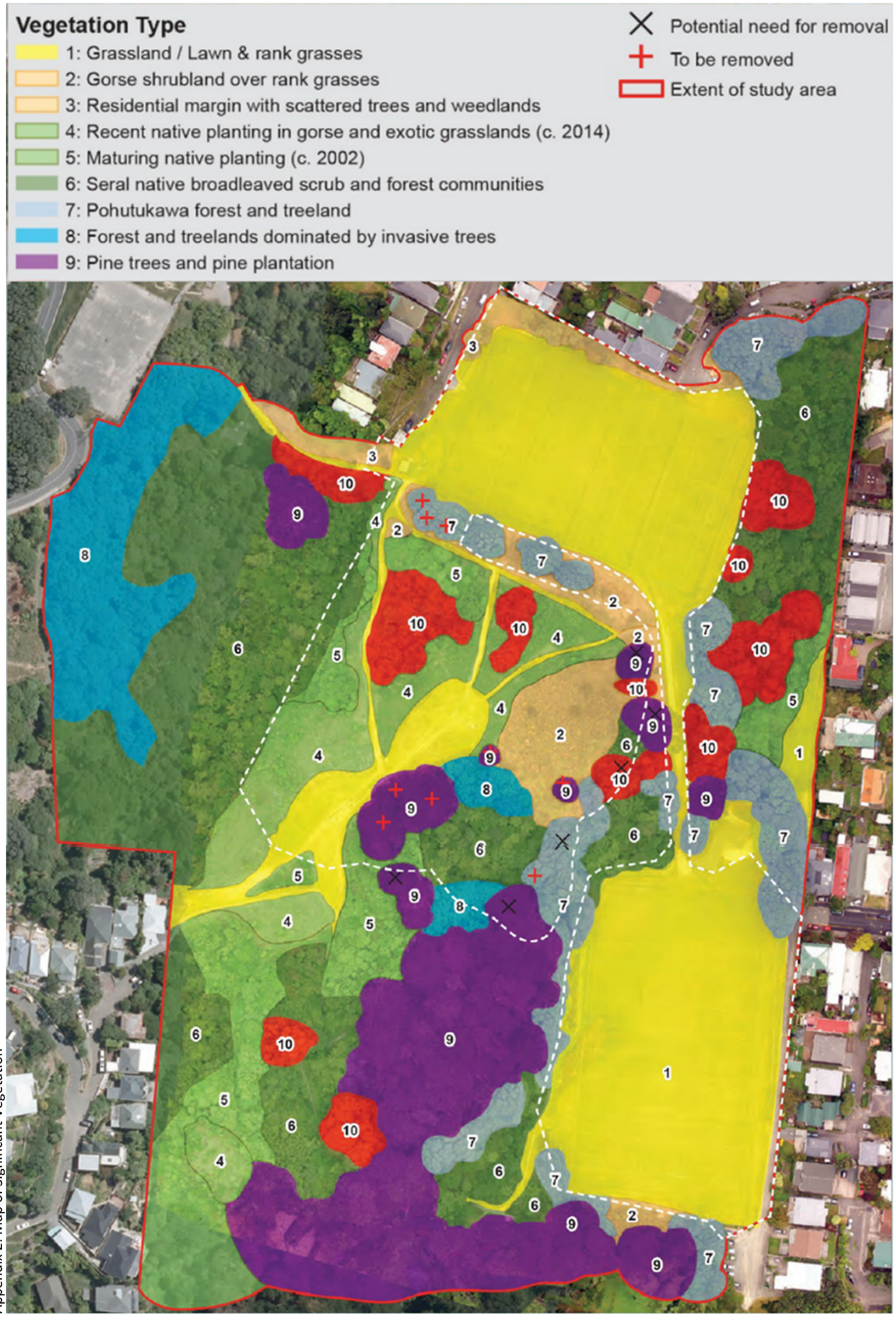
Table 79: Defects and Liability Period – Playing Fields Requirements Identified Within WCC and TBA Regulatory Permissions

Wellington City Council Designation Conditions		
Condition number	Condition requirement	LEMP Section Reference
Playing Fields Management Plan		
DC.42		
a)	There shall be a 1-year defects liability period for works associated with the reinstatement of each of the upper and lower playing fields, including access tracks, retaining walls (where required), fencing and drainage. This 1 year period will commence from the date that the CMO (in consultation with the Manager, Open Space and Recreation Planning and the Manager, Sports and Recreation Operations and Contracts), confirms in writing that the reinstated field or fields, and related tracks, retaining walls, fencing and drainage are suitable for organised sports use and public activities to commence.	9.3.1 Defects and liability period – Playing Fields
b)	Within the defects liability period the Requiring Authority is responsible for meeting all reasonable costs associated with ensuring the successful reinstatement of the fields.	9.3.1 Defects and liability period – Playing Fields
c)	At the end of the period in DC.42 a), the Requiring Authority shall provide confirmation to the CMO that the playing field reinstatement, including any required retaining works, permanent maintenance vehicle access works (including the access track between the upper and lower field), fencing and any required defect remedial work/s has been successful. This confirmation shall involve an appropriately qualified and experienced sports turf specialist.	9.3.1 Defects and liability period – Playing Fields
Town Belt Act Licence Conditions		
Condition number	Condition requirement	LEMP Section Reference or Relevant Management Plan
Monitoring, inspection and defects period		
LC.95	**Defects and liability period - Playing Fields**	
	There will be a two seasons defects period on the playing field reinstatement. This means that from the date that the CMO, in consultation with the Manager, Open Space and Recreation Planning, confirms in writing that the reinstated field or fields, and related tracks, retaining walls, fencing and drainage are suitable for organised sports use and public activities to commence, two seasons of sport (i.e. a winter and summer season) will be played on the field/fields to confirm that the fields are performing as anticipated. This may extend beyond the one-year timeframe of the Designation condition 42 however it is a more accurate test of the performance of the field/s.	9.3.1 Defects and liability period – Playing Fields

During the defects period the playing fields will be available for normal use by WCC as would be appropriate for this level of playing field ie the consent holder cannot attribute failure of the new drainage system on adverse weather conditions or overuse during this period (excepting perhaps rare storm events as may be acknowledged by WCC). The field must perform and be remediated by the consent holder if it does not.

Appendix 1: Extent of Works and Vegetation Clearance





Appendix 2: Map of Significant Vegetation

Appendix 3: Landscape Concept

Appendix 4 – Landscape Detailed Design Drawings

Appendix 5 – Technical Specification Landscape

Appendix 6 - Construction Specification - Sport field drainage and turf establishment

Appendix 7 – Sports Playing Field Drawings

Appendix 8 - Playing Field Remediation Design Report

Sports Surface Design & Management
SPECIALIST TURF CONSULTANCY SERVICES





Playing Field Remediation Design Report

For: Prince of Wales Park, Newton, Wellington

August 2019

Contents

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DOCUMENT CONTROL — SPORTS SURFACE DESIGN & MANAGEM

Rev. No.	Date	Revision Details	Author	Reviewed
0	May 2019	Draft for review	MC (SSDM)	BC(SSDM)
1	22.05.2019	For review	MC/BC(SSDM)	DB(Beca)
2	29.08.2019	Updated with irrigation	MC (SSDM)	

CONTACT DETAILS

Sports Surface Design & Management
Postal address: PO Box 33-127, Takapuna, Auckland, 0740
Physical address: 64 Porana Road, Takapuna, Auckland 0627
Website: www.ssdm.co.nz
Contact: Matt Cresswell, Senior Manager
M 021 800 632
E matt.cresswell@ssdm.co.nz

1. Overview

The Omāroro Reservoir project involves the installation of a 35 mega litre reservoir that will be buried at the location of the Prince of Wales Park, Mt. Cook, Wellington. Due to scale of this project a significant amount of spoil shall be generated from excavations which facilitate the installation and construction of the reservoir structure.

It has been proposed that the majority of this spoil shall be placed and stockpiled on the upper and lower sports fields at the Park. In addition to this there will be a need to operate and store construction equipment on these platforms as well as create temporary sediment pools.

Following completion of the reservoir installation, the 2 sports fields are to be reinstated to at least the same standard as prior to the works. The aim of the Client is to enhance the performance of the existing sports fields upon handing back to the Council. This will be achieved through the improvement of the existing (poor) surface levels and the installation of primary sports field drainage and automated irrigation systems to both fields.

Sports field reinstatement works will be based on the following platform areas:

- Upper = 7,135m2
- Lower = 8,115m2

In relation to playing field areas, the existing playing field dimensions will remain as follows:

- Upper 65m wide x 106m long
- Lower 66m wide x 107m long

The existing fields already have non-compliant run-off zones. These non-compliances have been amended as part of the design due to efforts to improve the perimeter drainage through the use of swales specifically on the upper field where:

- There is a new swale along the Northern touchline providing 2-3m runoff to edge of swale.
- There is a new swale along the Eastern dead ball line providing 3-5m runoff to the low point of the swale (as small as 1m to edge of swale).
- There is a new swale along the southern touchline providing 2m runoff to edge of swale

Sports field remediation shall consist of the following key phases (not necessarily undertaken in shown order):

1. Initial trimming of sub grade to form general level
2. (Imported) topsoil placement
3. Installation of primary subsoil drainage system
4. Final trim of top-soiled surface to correspond to design grades
5. Irrigation installation
6. Seeding
7. Grow-in and turfgrass establishment

2. Subgrade and Surface Shape

2.1 Sub grade

The subgrade will have been formed to a grade 150mm below the finished surface design level to a tolerance of +0mm to -50mm.

2.2 Surface grade

The finished surface design levels are set out in Drawings 3262332-CE-1401 & 3262332-CE-1501.

The surface levels are to achieve a tolerance of no greater than a 15mm deviation beneath a 3m straight edge.

The designed surface gradients of >0.8% will fall side-line to side-line allowing subsoil drains to be installed at a constant depth, thereby increasing ease of installation.

2.2.1 Levelling Equipment

Machinery with an automatic dual axis laser grade function will be required.

Levelling equipment will be automatically controlled by electronic and hydraulic means, without having to manually adjust the height of the levelling bar during the grading process to achieve design levels.

Levelling equipment will be powered by a tractor of no more than 150 hp fitted with low ground pressure, rather than conventional tyres.

The levelling equipment should be able to cultivate and level in a single operation to prevent smearing and glazing of the topsoil

3. Sub soil drainage design

A conventional sports field primary subsoil drainage system will be installed on both sports field platforms consisting of a main and lateral subsoil drainage network.

3.1 Lateral drains

Sports field subsoil lateral drains are to conform to the following requirements:

- Diameter: 110 mm
- Type: Nexusflo or approved equivalent
- Description: corrugated, smooth internal walled, perforated
- Trench width: minimum 140mm
- Installation depth: minimum 500mm
- Installation gradient: minimum 0.8% (to follow surface grade)
- Spacing: 7.5 m- unless shown otherwise on drawings
- Backfill- 350mm gravel/50mm blinding sand/100mm topsoil cap (Drawing 3262332-CE-3303)
- 25mm layer of angular bedding material beneath lateral subsoil drains

Grading curves for the lateral drain backfill materials are as follows:

Gravel PSD

Particle size (mm)	% passing
16	100
8	95-100
4	10-35
2	0-6
1	0-2

Blinding Sand PSD

Particle size (mm)	% passing
8	98-100
4	92-100
2	75-100
1	50-95
0.5	10-60
0.25	0-20
0.125	0-2
0.63	0-1

3.1.1 Flow rates

110mm Nexuslfo lateral drains at 0.8% (approximate surface grade) have a flow rate of approximately 4.5L/s. All water infiltration into these lateral drains shall be through horizontal soakage from the soil and they are not expected to ever reach capacity while the platform remains as a soil field.

3.2 Main drains

Sports field sub soil main drains shall conform to the following requirements:

- Diameter: 150 mm
- Type: uPVC (SN4) Rubber ring joint
- Trench width: maximum 300mm
- Trench depth: minimum 575mm
- Bedding: 25mm depth GAP7
- Jointing: EPDM elastomeric sealer rings(push socket)
- Minimum installation gradient: 1.0% (upper field) and 0.6%(lower field)

3.2.1 Junctions and fittings

Purpose-built junction fittings shall be used on the 150mm uPVC collector drain and the lateral drains (e.g. 150 x 100 mm 45° reducing junctions) and will be installed progressively as the collector drain is completed.

An inspection/flushing point will be installed on each lateral drain within 1 metre of its connection to the main collector drain as follows:

- The lateral drain shall connect to a vertically-directed 45° elbow.
- A length of 100mm ø approved rigid solid walled pipe shall be glued to the elbow and then capped with an approved 110mm ø threaded end cap such that the cap finishes no less than 250 mm below the finished field surface.
- A small metal plate (100 mm by 100 mm) shall be placed in the gravel backfill immediately over the threaded cap for future detection purposes.
- All Nexus drain pipe shall be inserted and secured with a galvanised self-tapping screw into the purpose-built junctions.

3.2.2 Flow rates

The 150mm uPVC collector drains have flow rates between 16L/s (at 0.6%) and 22L/s (at 1%).
These drains have the capacity to be utilised if the sports fields are upgraded to sand slit/sand carpet in the future.

3.3 Stormwater manholes

Sports field main drains will fall to 1050mm ø stormwater manholes installed as part of the sports field construction works.

Stormwater manhole installation will meet the following requirements:

Item	Detail
Diameter	3 no. at 1050mm
Depth	Depth sufficient to accommodate depth of pipe connections and silt trap
Silt trap	300mm in upgraded SW505680
Lids	Medium duty solid lid. The cast iron frame and cover may require adjustment rings to ensure the top of the lid finishes as per the plans.
Riser sections	The number of joints in the chamber shall be kept to a minimum by use of the maximum height of riser practicable. The maximum number of adjusting rings shall be two. Pre-cast sections shall be aligned to provide vertical sides
Joint seals	Joints between riser units and the lid section shall have cast rebated edges and sealed with bitumastic compound or similar approved material. All joints shall be constructed to ensure that they are watertight.
Connections	All connections into SWMHs shall be made by a registered drainlayer.
Relevant NZS	3107
Relevant local standard	Wellington Water-Regional Specifications for Water Services _ July 2016
Backfill	Filling around the chamber and to a depth of 150mm below the surrounding ground level shall be of selected material containing no vegetation, nor construction debris, and no stones above 26.5mm in size nor clay lumps larger than 75mm in size, compacted carefully in 150mm layers by means of a mechanical tamper or hand rammed as appropriate until the material is at least as dense as the surrounding ground. The final 150mm of backfill shall be original topsoil or approved topsoil and brought to the surface to finish flush with the manhole lid or surrounding surface levels.

4. Profile design

4.1 Topsoil Depth

A topsoil profile shall be installed to a minimum consolidated depth of 150mm.

4.2 Topsoil characteristics

Topsoil must be an approved stone-free loam with a well-developed aggregate structure, sourced from a reputable supply company from stripped grassland or cultivated land. Soil arising from reclaimed land, industrial sites or which has been used for the disposal of industrial, domestic or agricultural wastes shall not be used.

The topsoil shall be screened to an 8 mm aggregate size. It shall not contain any foreign matter such as glass, stones, brick fragments, wood, concrete, steel, clay lumps, tree roots larger than 8mm measured across its largest dimension or other undecomposed plant remains.

The topsoil shall not contain any more than 15% organic matter, 25% clay and no more than 50% sand by weight. Nutrient and composition analysis is to be submitted to the engineer for approval prior to placement.

The topsoil is to be placed in a single uniform layer and consolidated and levelled by plant specifically designed for sports turf surface formation in accordance with the levels and tolerances detailed in 2.0.

4.3 Compost

Where compost is required for amending the site topsoil material, it shall meet the following criteria:

- The material shall be homogeneous and screened through an 8 mm screen for root zone amendment purposes.
- The material shall have a minimum organic matter content of 30% and should be derived primarily or urban green waste, free of material that is recognisable as being of plant origin (e.g. large twigs, leaves etc.). The compost shall not contain material derived from other sources (e.g. sewage sludge, bark fines, animal and food waste etc.).
- Compost shall be aged to a state of equilibrium and be free of undecomposed material.
- Material shall be composted to the mesophyllic stabilisation phase such that the thermophillic (heat generating) process is complete.
- Compost used for any one project should come from a single batch of material. A production log may be required for each batch showing details of turning and screening as well as results of temperature and moisture tests.
- Any material added to the compost during the composting process shall be declared (e.g. lime, fertiliser, sand etc.).
- The compost supplied shall be declared free of viable weed seed and herbicide residues.

- Testing may be carried out and shall include measurement of pH, organic matter content, C/N ratio, moisture content, plus total N, P, K, Ca, Mg, Na and S. A bioassay may also be conducted to confirm that no residual herbicides are present.

  The compost supplied shall be expected to comply with the following ranges:

Item	Range/result
Particle sizing	> 95% particles through 8 mm mesh and 100% particles to pass through 15 mm mesh
pH	6.0-8.0
C:N Ratio	< or equal to 30:1
Organic Matter Content	> or equal to 30% by weight
Ash Content	< or equal to 70% by weight
Delivery Moisture Content	30-50% by weight
Total N	0.4-3.0% by weight
Total P	0.2-1.5% by weight
Total K	0.4-8.0% by weight
Odour	'Earthy' or 'musty'
Colour	Brown to black
Bioassay	Min. 80% germination after 10 days
Weed germination	No weed germination in bioassay

5. Turfgrass Establishment

5.1 Turf grass species selection

A turf grass blend containing turf-type ryegrass, brown-top bent grass and slender creeping fescue has been selected to best suit the non-irrigated nature of these sports fields.

Species (blend % by weight)	Sowing rate (kg/ha)
• Turf-type perennial ryegrass (80%), • Brown-top bent grass (10%) • Slender creeping fescue (10%).	400

5.2 Turf seed application

Seeding will be completed by the way of three passes with a turf type dimple or drill seeder at a rate of 400kg/Ha.

5.3 Establishment fertilisers

Prior to seeding the sports fields are to be fertilised with DAP (di ammonium phosphate) at a rate of 250kg/Ha to aid in turf grass establishment.

Topsoil nutrient analysis will be conducted during placement of topsoil to inform balancing fertiliser requirements (should this be necessary).

5.4 Turf Grow In

The turf grow in period shall be 16 weeks during which time all necessary turf maintenance requirements will be met. These requirements include:
- Mowing
- Fertiliser supply and application
- Weed control
- Decompaction
- Irrigation management

Practical completion will be issued for this stage pending the grow-in completion standards detailed in section 7.3 page 17 beingachieved.

6. Irrigation

A fully commissioned, automatic pop up irrigation system is to be provided using Rainbird componentry.
The irrigation system design is detailed in Appendix 13 - Sports Field Irrigation Design Drawings,

- Omāroro Reservoir V1
- Omāroro Reservoir V1 – Upper field
- Omāroro Reservoir V1 – Lower field
- Omāroro Reservoir V1 – Pump BF Layout

6.1 Performance requirements

The final system is expected to achieve specific performance requirements which include the following:

- Distribution Uniformity (DU) 85%
- Scheduling Coefficient (SC) 1.3
- Mean Precipitation Rate 11mm to 15mm per hour

All performance figures shall be achieved while operating the sprinklers within the manufacturers' recommended pressure range.

6.1.1 Fittings for direct burial

Only Teflon-coated stainless steel nuts, bolts, washers and threads or galvanised (not electro-plated) nuts, bolts, washers and threads are to be used on all fittings.

6.1.2 Pipes and fittings

Item	Detail
Pipe grade	All mainline pipe to be PN12 rated and sub-main pipe to be PN9, conforming to AS/NZS 4130 for MDPE
Pipe depth	Pipe depth shall be sufficient to ensure 400mm cover at all times from surface of topsoil layer
Mainline criteria	Maximum water velocity: 1.5 ms^{-1} Maximum pressure loss: 100 kpa
Sub-main criteria	Maximum water velocity: 2.0 ms^{-1} Maximum pressure variation: 10% along its length
Pipe fittings	All pipe fittings to be minimum PN15 (1500 kpa) rated.
Thrust blocks	On pipeline sections with rubber ring joints, thrust blocks must be installed at all places where there is a change in pipe direction. Thrust blocks must be installed in accordance with NZS 7643:1979.
Backfilling	Backfilling shall be placed initially as a 200mm layer and compacted by foot tamping. After this, the balance of the trench shall be backfilled and consolidated such that no further settlement occurs. The final 150mm shall be approved quality topsoil.

6.1.3 Solenoid control valves

Item	Detail
Minimum operating pressure	1400 kPa
Max. pressure loss	25 kPa
Physical requirements	Flow control. Internal bleed manual control. Valve bonnet to be secured with stainless steel nuts. Industry standard 24VAC 2-watt solenoid.

6.1.4 Isolating valves

All isolating valves must have a minimum PN16 rating.

i Lateral isolation

Isolating valves shall be either brass gate valves suitable for in-ground service, or Philmac Nyglas plastic ball valves. The use of ball valves and wafer butterfly valves with levers is not permitted.

ii Mainline isolation

Mainline valves are to be resilient wedge gate, sluice or butterfly valves. All mainline valves must incorporate a handle to allow valve operation without specialist tools. The use of ball valves and wafer butterfly valves with levers is not permitted.

iii Ball valves

A 25mm ball valve (pressure test point) is to be installed where appropriate with a 150mm round valve box.

iv Quick coupling valves

A minimum of two evenly spaced quick coupling valves shall be provided which shall be 25mm brass quick-coupling valves compatible with Harvin #5 keys.

Quick-coupling valves will be connected to the mainline pipe by swing joints and secured by means of a stabiliser bracket. Quick-coupling valves shall be installed in 150mm round valve boxes installed flush with the finished sand carpet level.

6.1.5 Sprinklers

Item	Detail
Design operating pressure	Ideal operating pressure: 500 kpa (70psi) Minimum operating pressure: 450 kpa
Design radius of throw	Shall be 0.5m greater than sprinkler spacing

Coefficient of Uniformity	Minimum Coefficient of Uniformity: 85% Scheduling Coefficient: 1.3
Physical requirements	25mm BSP sprinkler inlet Minimum of 100mm pop-up height Exposed diameter less than 75mm with a rubber cover Stainless steel sheathed riser stem Low head drainage valve Full range of interchangeable nozzles Part circle versions, if applicable, to have adjustable arc settings Minimum three-year warranty

6.1.6 Swing joints

All swing joints shall be:

- High pressure with double O-ring
- 25mm diameter with BSP thread
- Minimum riser length of 300mm

6.1.7 Valve boxes

All valve boxes shall be constructed from high impact plastic or galvanised steel. They must be able to support the weight of a vehicle without damage. In addition:

- All solenoid valve boxes to be installed with lids at surface level.
- Valve box lids shall be of the bolt-down type and be supplied with bolts fitted.
- Valve boxes for solenoid valves must be large enough to comfortably fit both the nyglass isolating valve & the solenoid valve. This means a 430mm x 300mm rectangular box would be a minimal requirement.
- Valve boxes for mainline isolating gate valves must be large enough to fit the valve & the handle. This means a 400mm x 300mm rectangular box would be a minimal requirement. Mainline isolation valve boxes are to be installed flush with the finished sand carpet layer.
- Valve boxes for the QC valves shall be 150mm round as minimum.
- Thorough compacting of the soil around both the valve box and extension are required using a hand compacting tool.
- All installed valve boxes are to be marked by a flag or peg

The base of each valve box shall be supported around the perimeter by bricks, pavers, H4 treated timber or other load bearing material. No part of the valve box or any of these materials shall rest on any pipes.

The bottom of the valve box shall contain a piece of geotextile fabric covering the full width of the box and then 100mm of drainage aggregate material placed on top. There shall be a minimum of 50mm clearance between the underside of any pipe or valve and the top of the aggregate level.

6.1.8 Control cabling

All control cabling shall be polyethylene sheathed and suitable for direct burial (i.e. Tyflo WSE1705 or equivalent).

- A minimum conductor size of 1.5mm2 shall be utilised.
- No cable joints are acceptable between control valve and the controller.
- All cable connections shall be made with 3M-DBY waterproof connectors or equivalent.
- All cable under sealed paths or roadways shall be housed in conduit.
- A 500mm loop of cable shall be provided at each valve box.
- Cable shall be bundled and secured every 5m and laid underneath the pipework. If no pipework is present, then cables shall be buried to 450mm depth, 100mm below electrical warning tape.

6.1.9 Control equipment

Item	Detail
Controller	• The controller is to be a Rain Bird ESP-LXD with an IQ cartridge for remote access. • This is to be installed inside the existing building on site.All cable inside the building are to be run inside conduit. • A Rain Bird WR-2 rain sensor is to be installed on the existing building
Decoders	• Rain Bird FD-101 decoders are to be used for each solenoid valve. • Rain Bird FD-102 decoders are to be used for the pump to switch between duty points. Decoders required: • FD-101 x 25 • FD-102 x 2
Surge Protection and Earthing	• A surge pipe and plate is to be installed directly outside the building on the cable path. This is to be installed inside a rectangular valve box. • 2 x Rain Bird LSP-1 surge protection devices are to be installed inside a solenoid valve box at each end of each field. Surge Devices required: • Rain Bird Surge pipe and plate x 1 • Rain Bird LSP-1 x 4 • (5 earth rods and clamps will also be required)

6.2 Headworks

6.2.1 Pump shed

A shed to house the pump and backflow preventer is to be constructed meeting or exceeding the following requirements:

- Built on concrete slab a minimum of 150mm thick (built to the WCC building code) with allowance for the 90mm MD pipe to enter up stream of the back flow and exit downstream of the pump along with the 3 phase power supply and 2 x 25mm conduits for the irrigation control cable .
- A maximum of 1.8m high and 5m long.
- Clad and painted in the same material and colour as the existing changing building.
- To have a minimum of two lockable doors at the front for access to the pump and backflow for install and future servicing as required. Consideration should be given to having an opening on top of the pump to access the pump's VSD if this cannot be done easily from the front.
- A minimum of 6 ventilation points (two on the front and back and one at either end) to provide air flow for the pump.
- To be constructed with weather proof noise mitigation material so that "the design of the enclosure shall ensure that noise level at any location beyond the boundary of the park generated by the operating pumps shall not exceed the allowable limits for the residential zone in the District Plan." Consideration should also be given to installing rubber matting under the pump to reduce noise further.
- A PDL 56 series 16 amp socket installed inside the shed for the pump plug.

6.2.2 Booster pump

A booster pump capable of boosting the system by 5l/s @ 500kpa (lower field) and 650kpa (upper field) will be required.
The specified pump for this project is to be 1 x Lowara 15SV06 HPS -Single Hydropac Booster Set.
Three phase, 400 V power is to be supplied for pump operation as part of the contract works to the location on the drawings.
It is the contractor's responsibility to liaise with Wellington Electricity and certified electrical sub-contractors to ensure the necessary supply to site and pump shed location.

The Set shall include the following:

- 1 x Lowara 15SV06F550T vertical multistage pump, complete with 5.5 kW, 2900 rpm, 3 phase, 50 Hz WEG W21 IP55motor.
- 1 x 5.5 KW Hydrovar variable speed drive pump controller mounted directly on the pump motor.
- 1 x pressure transducer connected to the Hydrovar to ensure a constant pump discharge pressure.

- 1 x PDL 56 series 3-phase plug and 3 or 5 metre cable.
- 1 x 35 litre pressure tank.
- 1 x Aquastat thermal cut out, mounted on the pump to prevent pump overheating.
- 50 mm Dia. inlet/outlet stainless steel pump manifold
- Pressure gauge, isolating & check valve.
- All mounted on a stainless steel base.

This pump will swap between two different duty points depending on which field is being irrigated at that time. Therefore two Rain Bird FD-102 decoders will need to be wired into the pump via two relays and the irrigation control cable.
This pump will need to be installed on a concrete base inside the new shed with the inlet connected to the new backflow also enclosed in the shed.
The outlet will need to exit through the concrete slab via the 90mm MD mainline pipe.

6.2.3 Backflow prevention

A new 80mm RPZ backflow preventer with associated Wye Strainer and two 80mm isolation valves is to be installed inside the new shed, with the inlet pipe feeding through the concrete base of the shed and the outlet joining into the booster pump inlet also enclosed in the shed.

The backflow preventer shall be supplied and installed to WCC/Wellington Water specifications utlising approved products (https://www.wellingtonwater.co.nz/contractors/technical-information/approved-products-register/) and tested and certified by a registered IQP.

6.3 Pressure testing

Before accepting as complete, demonstration of pressure testing of the competed irrigation system is required using the following procedure;

Pipe type	Test detail
MDPE	Ensure pipe is adequately anchored Remove all air from the pipeline Pressurise the pipe at 1200 kPa, and maintain the pressure at that level for 30 minutes by additional pumping as required. Inspect for leaks. Rapidly reduce the pressure by bleeding water from the system down to nominal 200 kPa at the test gauge. Isolate the installation again. Record the pressure reading over the following intervals: • Between 0 & 10 minutes, record pressure every two minutes • Between 10 & 30 minutes, record pressure every five minutes • Between 30 & 90 minutes, record pressure every ten minutes The pressure reading will rise due to the contraction of the pipe once the pressure is reduced to 200 kPa. It will then level off. If it falls after levelling off there is a leak within the system and the pressure test fails.

7. Quality Control and Reporting

For the purpose of quality control, key inspection hold points have been included in the works specification. Clearly defined requirements are listed and must be achieved (and signed off jointly by the contractor and engineer) prior to progression to the next phase.

7.1 Key Hold Points

The following key hold points will be observed:

- General set-out and materials approval
- Topsoil placement and levelling
- Primary drainage installation
- Irrigation system installation
- Basal fertiliser application and final level
- Seeding
- Grow-in completion

Each of the above hold points have associated completion standards that need to be met which are detailed in the Works specification.

7.2 Reporting

The Contractor is to provide the Engineer (or its representative) with a regular (i.e. minimum weekly) update of all grow-in activities that have occurred following sowing. The report may be verbal or written and is to be communicated to the Engineer (or its representative). The report shall cover the previous 7-day period.

7.3 Completion Standards

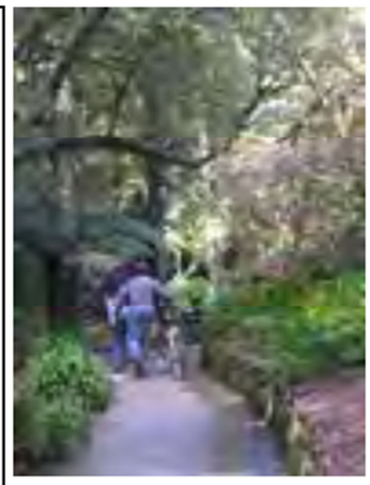
The following grow-in completion standards are expected to have been achieved and will be checked and signed off prior to practical completion:

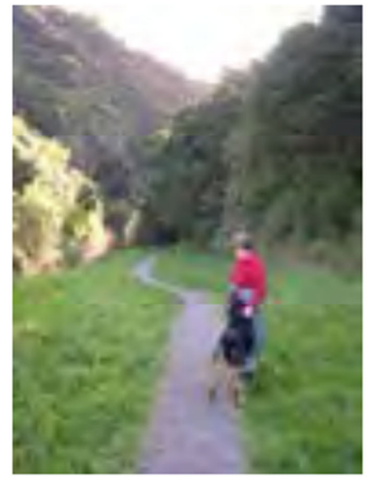
Handover requirement	Standard	Measurement procedure
Turfgrass height Presence of clippings	No greater than 40 mm Uniformly dispersed No individual clumps	Glass prism Visual Visual
Ground cover	90% ground cover with sown species 75 mm diameter patches of bare ground	Visual 0.5 m^2 frame
Micro-levels	15 mm over 3 m	3 m straight edge
Broadleaf weeds	5% ground cover	Visual

Appendix 9: Civil Construction Design Drawings

Physical Characteristics

- Short Walk Tracks require no special equipment but still provide an off-road, outdoor experience. They are usually suitable for walking shoes and trainers.
- Min width =0.75m. Max width = 2.0m. The minimum width shall cover no more than 5% of the total length of each track.
- Maximum gradient = 10° (1:5.7) not including steps, with no more than 12 steps per flight. The gradient can increase to 15° over small sections of the track. Steps must be even and consistent, max. riser 0.2m, min. tread 0.3m.
- Dual use track: Where there is a long section of track at the minimum width of 0.75 metres, passing bays will be developed in practical and appropriate places. These will have a minimum width of 1 metre and a minimum length of 3 metres. The track surface is to be well compacted so that tyres do not unduly degrade the surface.
- A Short Walk will be well defined, and may be benched. The track will be clearly marked to allow inexperienced users to find their way in all weather conditions.
- Short Walks provide pedestrian access on a well-formed, drained, all-weather surface. Up to 10% of the total track length may have short wet or muddy sections.
- Vegetation must be clear from the total width of the path and to a height of 2.5m, giving visitors a clear passage, an unimpeded view of the surface and good visibility on corners. Windfalls are to be cleared within 48 hours of notification.
- Short Walks will be clearly signposted with directional signs at all entrances and junctions. Signs will include walking times. Dual use tracks will be clearly signed as such.

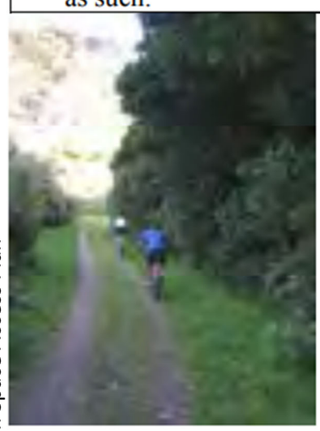


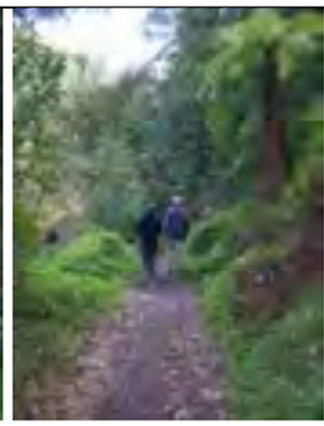


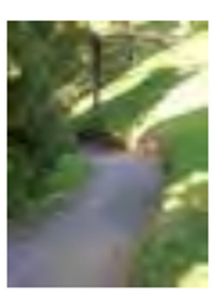
User Groups

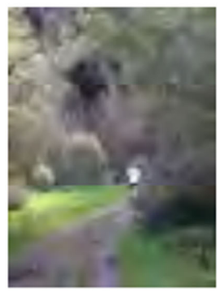
Short Walks are well-formed tracks that provide for easy, low risk recreation suitable for most ages and fitness levels.

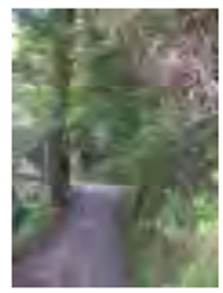
- **Walkers:** Caters for all ages and most walking abilities. Some tracks may be accessible to people with mobility difficulties or limitations. Tracks are usually suitable for walking shoes and trainers. They require no special equipment but still provide an off-road, outdoor experience. Can be used by conventional pushchairs.
- **Runners:** Allows for runners with a wide range of experience and fitness levels.
- **Mountain Buggies:** Relatively easy with no or few obstacles. Once there are more than two steps in a flight, the track can be considered 'average'. Once there are more than 6 steps per flight, the track can be considered difficult.
- **Bikers:** Where cycle access is allowed, caters for easy to average cyclists. The track width makes it a little less easy and safe for family cyclists. Considered to be more difficult than 'average' when the slope becomes steeper than 12° or with flights of more than 6 steps.

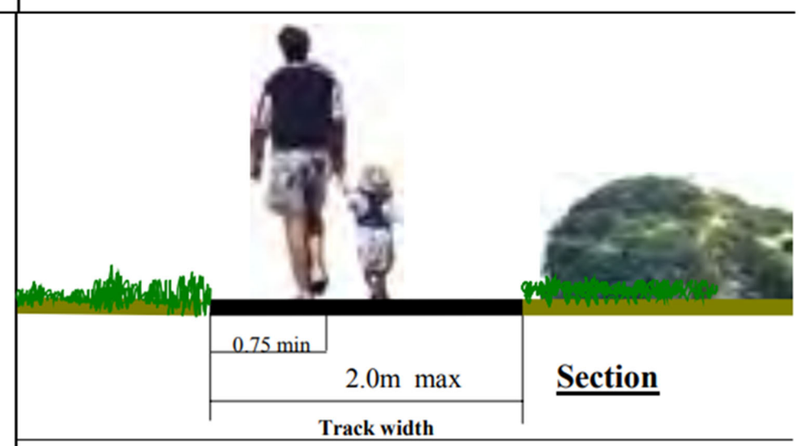


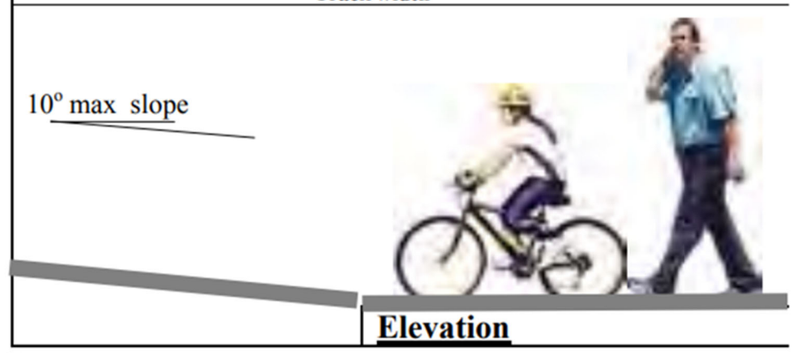










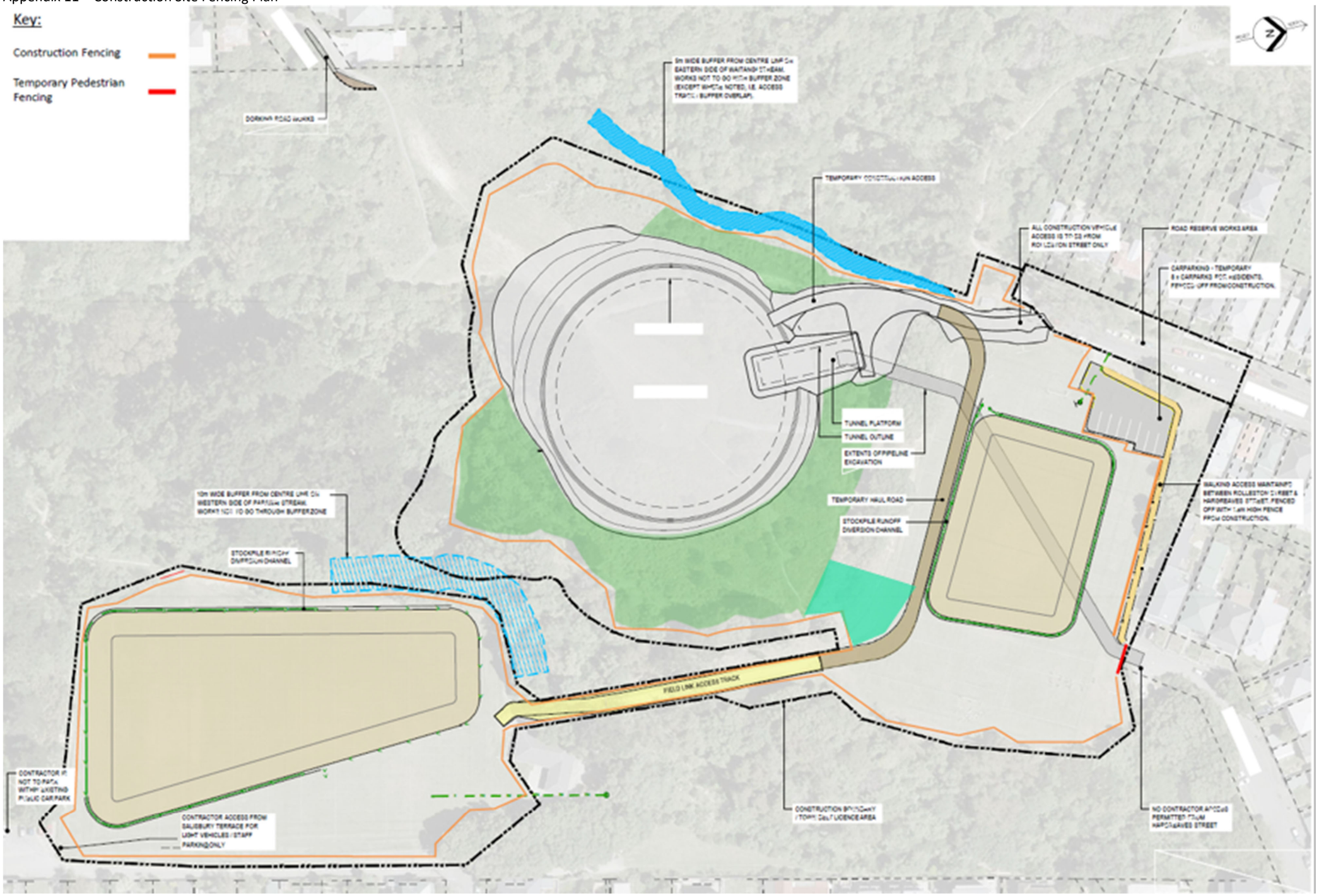


Drakeford Williams

Track Strategy

Short Walk

Appendix 11 – Construction Site Fencing Plan



Appendix 12 - Proposed Annual Sports Field Maintenance Programme

Proposed annual maintenance schedule for sports fields at Prince of Wales Park-Upper and Lower Playing Fields

Sports field maintenance programme (post remediation)

The following Sportsfield Maintenance Programme (SMP) has been developed for the upper and lower playing fields at the Prince of Wales Park, Wellington.

The fields have been reinstated as soil fields with subsoil primary drainage and automated irrigation only.
This programme has been developed with a normal usage requirement of the fields in mind and with a focus upon achieving a reasonable level of year-round surface performance notwithstanding the known limiting factors of the site such as the absence of secondary drainage.
In no way does this programme guarantee the year-round playability of the remediated sports fields as this will come down to a number of factors that include (but is not limited to): Implementation of maintenance practices, usage (regulated or unregulated), and weather conditions.
All activities are to be undertaken in accordance with WCC policies and procedures and in accordance with the regulations of the Health and Safety at Work Act 2015

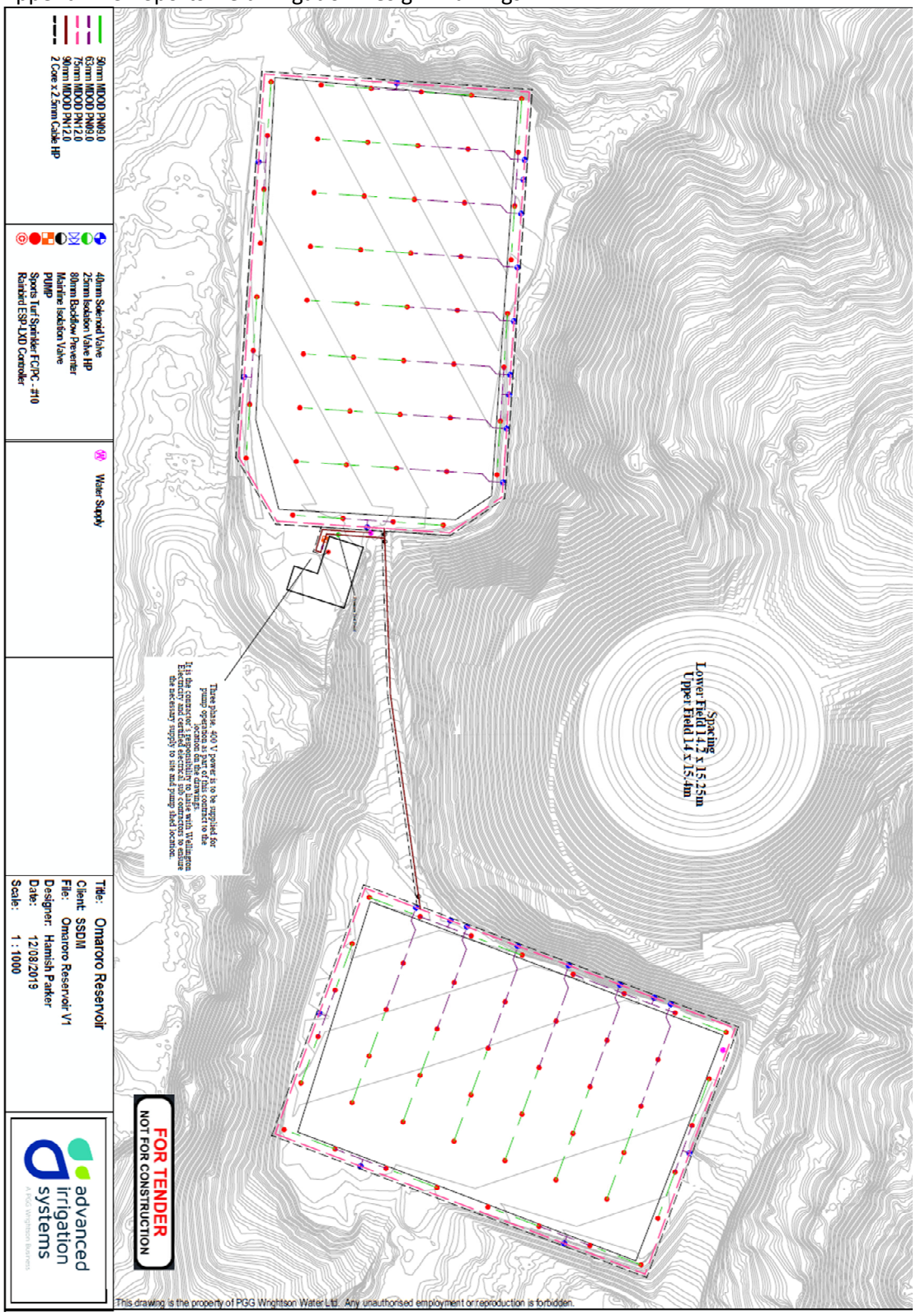
Further assumptions: The maintenance programme is based on an estimated weekly use in winter of approximately 6 8-hours/week.

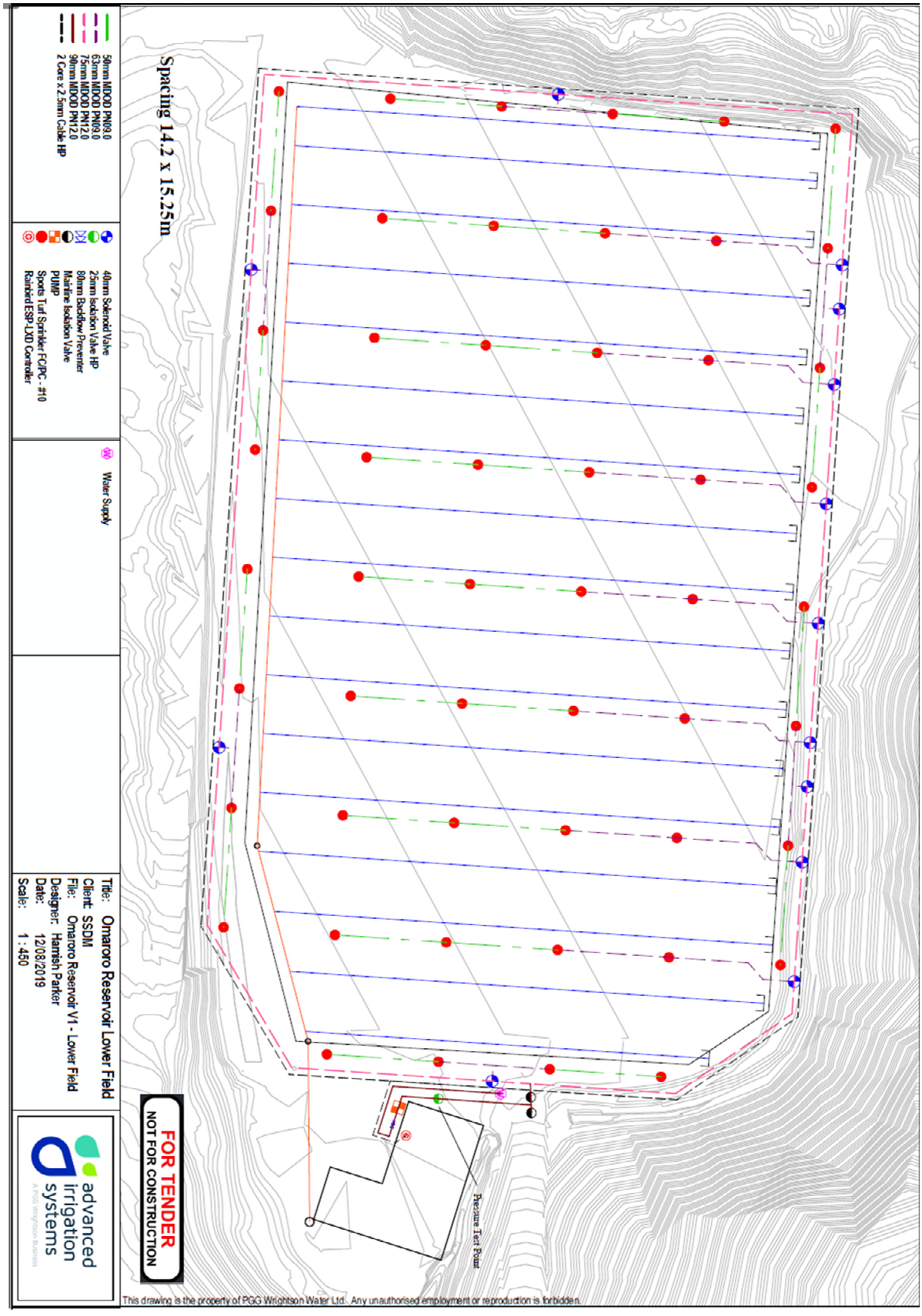
Item	Description	Unit	Quantity	Rate	Total
1.0	Upper Platform (7,135m2)				
1.1	Mowing				
1.1.1	Mowing shall be carried out using a sharp, well adjusted ride on rotary mower with low pressure turf tyres (or approved equivalent) to maintain turf height at no greater than 40mm.Mowing timing and frequency shall ensure that clippings are dispersed uniformly over the field with no scalping,clumps or windrows.Mower type to be approved by the Engineer.	Month	12	$ -	$ -
1.2	Fertilising				
1.2.1	Supply and apply 12 5 14 NPK turf fertiliser @ 250kg/ha (in two directions) using specialist turf spreader (to be approved by the Engineer)	No.	4	$ -	$ -
1.3	Linemarking				
1.3.1	Initial field linemark set out (winter)	No.	1	$ -	$ -
1.3.2	Weekly line marking for winter sports (1 April to 31 August) utilising specialist turf type linemarker and linemarking paint to WCC specifications and standards	No.	22	$ -	$ -
1.3.3	Initial field linemark set out (summer)	No.	1	$ -	$ -
1.3.4	Weekly line marking and goal set up for summer sports (1 November to 31 March)utilising specialist turf type linemarker and linemarking paint to WCC specifications and standards.	No.	20	$ -	$ -
1.4	Physical treatment winter				
1.4.1	Verti drain 18mm solid tyne single pass monthly during winter.Tine spacing of not greater than 120 mm by 120 mm and a minimum tine penetration of 150 mm at 15° kick.This may be substituted with vibra mole or Ground Breaker operation ground condition dependant	No.	3	$ -	$ -
1.5	Maintainance herbicide/fungacide				
1.5.1	Supply /apply Clopyralid (eg. Versatill or similar approved) at 1 L/ha for broad leaf weed control in accordance with WCC sports field spray policies and proceedures. (PROVISIONAL)	No.	1	$ -	$ -
1.5.2	Supply/apply pre emergent herbicide Ethofumesate (eg. Nortron 500SC, Turfweed or similar approved) @ 4 L/ha. Application should be timed prior to rainfall in accordance with WCC sports field spray policies and proceedures.(PROVISIONAL)	No.	2	$ -	$ -
1.5.3	Supply/apply a broad.spectrum contact fungicide i.e. Mancozeb to protect against turf loss through melting out over Christmas period in accordance with WCC sports field spray policies and proceedures. (PROVISIONAL)	No.	1	$ -	$ -
1.6	Goal posts				
1.6.1	Install/remove goal posts	LS	1	$ -	$ -
1.7	Renovation (spring)				
1.7.1	Double pass Cambridge roll surface post winter to adress micro levels.	No.	1	$ -	$ -
1.7.2	Carry out decompaction of field platform utilising a "soil recycler", ground breaker,vibra mole or approved equivalent including dragmatting of recycled soil.Engineer to approve equipment.	No.	1	$ -	$ -
1.7.3	Supply /apply ryegrass seed (approved turf type.certified) via turf type dimple seeder @ 150 Kg/Ha	No.	1	$ -	$ -
1.7.4	Supply/apply starter fertiliser:DAP (or an approved equivalent) @ 250Kg/ha	No.	1	$ -	$ -
1.8	Renovation (autumn)				
1.8.1	Carry out decompaction of field platform utilising a "soil recycler", ground breaker,vibra mole or approved equivalent including dragmatting of recycled soil.Engineer to approve equipment.	No.	1	$ -	$ -
1.8.2	Supply /apply ryegrass seed (approved turf type.certified) via turf type dimple seeder @ 150 Kg/Ha	No.	1	$ -	$ -
1.8.3	Supply/apply DAP (or an approved equivalent) @ 250Kg/ha	No.	1	$ -	$ -
1.9	Irrigation				

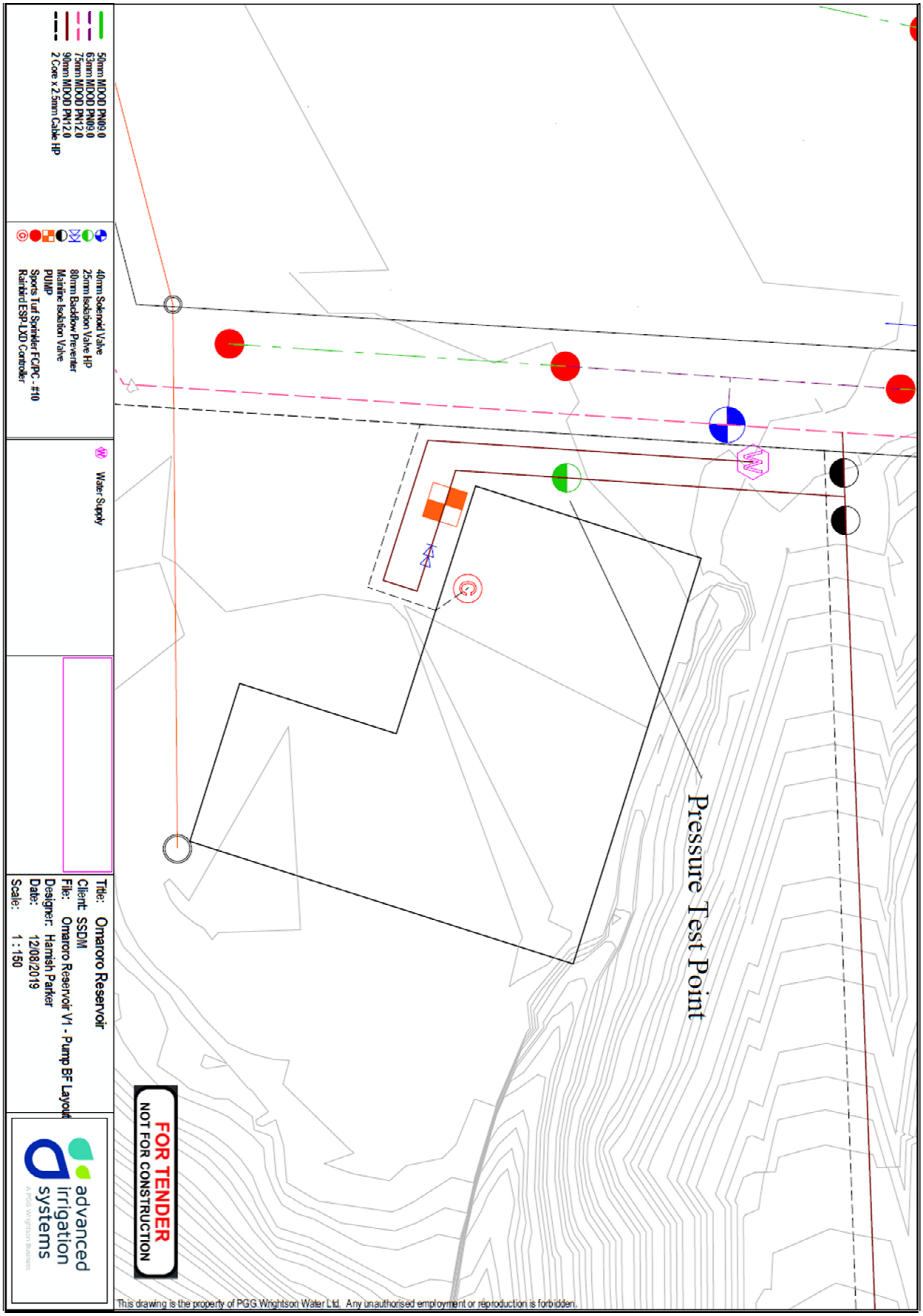
2.9.1	Pre season mainatainace check and adjustment	No.	1	$	$
2.9.2	Sesonal operation and management	No.	1	$	$
1.10	Reporting				
1.10.1	Compile and produce a monthly maintainance operation report summarising works carried out.The report will include but will not be limited to details around:Mowing ,irrigation ,linemarking, fertilising ,physical treatment and rennovation opeartions and frequencies.Chemical applications(including volumes,rates and application dates).The report is to include a monthly summary of any other operations carried out and any issues observed.	No.	12	$ -	$ -
	Sub total				$
2.0	Lower Platform (8,115m2)				
2.1	Mowing				
2.1.1	Mowing shall be carried out using a sharp, well adjusted ride on rotary mower with low pressure turf tyres (or approved equivalent) to maintain turf height at no greater than 40mm.Mowing timing and frequency shall ensure that clippings are dispersed uniformly over the field with no scalping,clumps or windrows.Mower type to be approved by the Engineer.	Month	12	$ -	$ -
2.2	Fertilising				
2.2.1	Supply and apply 12 5 14 NPK turf fertiliser @ 250kg/ha (in two directions) using specialist turf spreader (to be approved by the Engineer)	No.	4	$	$
2.3	Linemarking				
2.3.1	Initial field linemark set out (winter)	No.	1	$ -	$ -
2.3.2	Weekly line marking for winter sports (1 April to 31 August) utilising specialist turf type linemarker and linemarking paint to WCC specifications and standards	No.	22	$	$
2.3.3	Initial field linemark set out (summer)	No.	1	$	$
2.3.4	Weekly line marking and goal set up for summer sports (1 November to 31 March)utilising specialist turf type linemarker and linemarking paint to WCC specifications and standards.	No.	20	$ -	$ -
2.4	Physical treatment winter				
2.4.1	Verti drain 18mm solid tyne single pass monthly during winter.Tine spacing of not greater than 120 mm by 120 mm and a mininmum tine penetration of 150 mm at 15° kick.This may be substituted with vibra mole or Ground Breaker operation ground condition dependant	No.	3	$ -	$ -
2.5	Maintainance herbicide/fungacide				
2.5.1	Supply /apply Clopyralid (eg. Versatill or similar approved) at 1 L/ha for broad leaf weed control in accordance with WCC sports field spray policies and proceedures. (PROVISIONAL)	No.	1	$ -	$ -
2.5.2	Supply/apply pre emergent herbicide Ethofumesate (eg. Nortron 500SC, Turfweed or similar approved) @ 4 L/ha. Application should be timed prior to rainfall in accordance with WCC sports field spray policies and proceedures.(PROVISIONAL)	No.	2	$ -	$ -
2.5.3	Supply/apply a broad spectrum contact fungicide i.e. Mancozeb to protect against turf loss through melting out over Christmas period in accordance with WCC sports field spray policies and proceedures. (PROVISIONAL)	No.	1	$ -	$ -
2.6	Goal posts				
2.6.1	Install/remove goal posts	LS	1	$ -	$ -
2.7	Renovation (spring)				
2.7.1	Double pass Cambridge roll surface post winter to adress micro levels.	No.	1	$ -	$ -
2.7.2	Carry out decompaction of field platform utilising a "soil recycler", ground breaker,vibra mole or approved equivalent including dragmatting of recycled soil.Engineer to approve equipment.	No.	1	$ -	$ -
2.7.3	Supply /apply ryegrass seed (approved turf type certified) via turf type dimple seeder @ 150 Kg/Ha	No.	1	$ -	$ -
2.7.4	Supply/apply starter fertiliser DAP (or an approved equivalent) @ 250Kg/ha	No.	1	$ -	$ -
2.8	Renovation (autumn)				
2.8.1	Carry out decompaction of field platform utilising a "soil recycler", ground breaker,vibra mole or approved equivalent including dragmatting of recycled soil.Engineer to approve equipment.	No.	1	$	$
2.8.2	Supply /apply ryegrass seed (approved turf type certified) via turf type dimple seeder @ 150 Kg/Ha	No.	1	$ -	$ -
2.8.3	Supply/apply DAP (or an approved **equivalent) @ 250Kg/ha**	No.	1	$	$
2.9	Irrigation				
2.9.1	Annual backflow preventer testing and certification	No.	1	$	$ -
2.9.2	Annual booster pump inspection and maintainance	No.	1	$	$
2.9.3	Pre season mainatainace check and adjustment	No.	1	$	$ -
2.9.4	Sesonal operation and management	No.	1	$	$
2.10	Reporting				
2.10.1	Compile and produce a monthly maintainance operation report summarising works carried out.The report will include but will not be limited to details around:Mowing ,irrigation,linemarking, fertilising ,physical treatment and rennovation opeartions and frequencies.Chemical applications(including volumes,rates and application dates).The report is to include a monthly summary of any other operations carried out and any issues observed.	No.	12	$	$
	Sub total				$
	TOTAL (Upper + Lower) excl GST				$

	Description	Quantity	Unit	Rate	Amount
	Completion of grow in/hand over (autumn)				
April	Application of 12 5 14 at 150Kg/Ha - -	280	Kg	$	$
	Mow fields with sharp rotary (weekly) - -	4	LS	$	$
May	Verti drain both fields - -	2	No.	$	$
	Mow fields with sharp rotary (weekly) - -	4	No.	$	$
June	Mow fields with sharp rotary (weekly) - -	4	No.	$	$
	Application of 12 5 14 at 150Kg/Ha - -	280	Kg	$	$
July	Mow fields with sharp rotary (weekly) - -	4	No.	$	$
	Verti drain both fields - -	2	No.	$	$
	Plan spring renovation of fields				
August	Carry out soil nutrient analysis of both fields to confirm requirement s - -	2	No.	$	$
	Mow fields with sharp rotary (weekly) - -	4	No.	$	$
	Cambridge roll surface post winter to adress micro levels (both fields) - -	2	No.	$	$
September	Supply and apply ryegrass seed (approved turf type) via dimple seeder @ rate of 150 Kg/Ha to each field.Direct drill also considered(2 passes at 45 deg angle required) - -	300	Kg	$	$
	Supply and apply Bio boost (or an approved equivalent) at an application rate of: 250 Kg/ha (both fields)	500	Kg	$	$
	Apply: 17 2 17 (or an approved equivalent) application rate: 250Kg/ha -	500	Kg	$	$
	Supply and apply a granular slow release wetting agent . This should be applied at a rate of 340 Kg/Ha. Apply just prior to forecast rainfall. - -	680	Kg	$	$
	Mow fields with sharp rotary (as required)	4	No.	$	$

Appendix 13 - Sports Field Irrigation Design Drawings




Spacing 14.2 x 15.25m
50mm MDOD PN09.0
63mm MDOD PN09.0
75mm MDOD PN12.0
90mm MDOD PN12.0
2 Core x 2.5mm Cable HP
40mm Solenoid Valve
25mm Isolation Valve HP
80mm Backflow Preventer
Mainline Isolation Valve
PUMP
Sports Turf Sprinkler FC/PC - #10
Rainbird ESP-LXD Controller
Water Supply
Title: Omaroro Reservoir Lower Field
Client: SSDM
File: Omaroro Reservoir V1 - Lower Field
Designer: Hamish Parker
Date: 12/08/2019
Scale: 1 : 450
advanced irrigation systems
FOR TENDER
NOT FOR CONSTRUCTION
Pressure Test Point
This drawing is the property of PGG Wrightson Water Ltd. Any unauthorised employment or reproduction is forbidden.


50mm MDOD PN09.0
63mm MDOD PN09.0
75mm MDOD PN12.0
90mm MDOD PN12.0
2 Core x 2.5mm Cable HP
40mm Solenoid Valve
25mm Isolation Valve HP
80mm Backflow Preventer
Mainline Isolation Valve
PUMP
Sports Turf Sprinkler FC/PC - #10
Rainbird ESP-LXD Controller
Water Supply
Pressure Test Point
FOR TENDER
NOT FOR CONSTRUCTION
Title: Omaroro Reservoir
Client: SSDM
File: Omaroro Reservoir V1 - Pump BF Layout
Designer: Hamish Parker
Date: 12/08/2019
Scale: 1 : 150
advanced irrigation systems
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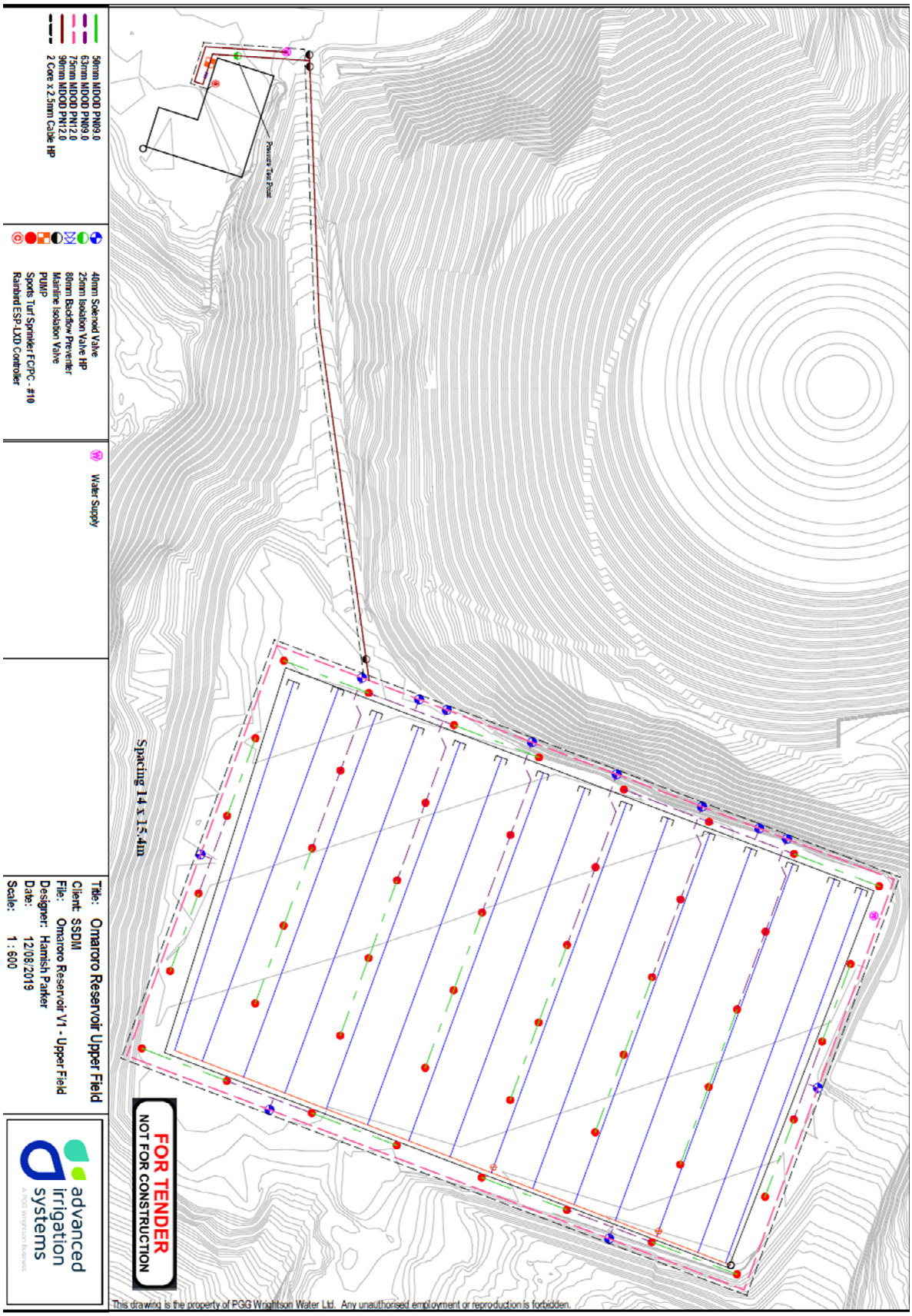

50mm MDOD PN09.0
63mm MDOD PN09.0
75mm MDOD PN12.0
90mm MDOD PN12.0
2 Core x 2.5mm Cable HP
40mm Solenoid Valve
25mm Isolation Valve HP
80mm Backflow Preventer
Mainline Isolation Valve
PUMP
Sports Turf Sprinkler FC/PC - #10
Rainbird ESP-LXD Controller
Water Supply
Pressure Test Point
Spacing 14 x 15.4m
Title: Omaroro Reservoir Upper Field
Client: SSDM
File: Omaroro Reservoir V1 - Upper Field
Designer: Hamish Parker
Date: 12/08/2019
Scale: 1 : 600
FOR TENDER
NOT FOR CONSTRUCTION
advanced irrigation systems
This drawing is the property of PGG Wrightson Water Ltd. Any unauthorised employment or reproduction is forbidden.

LOWARA
a xylem brand

Brown Brothers Engineers Ltd.
16 Sir James Wattie Drive, Hornby, Christchurch
+64-8042 Christchurch
03 364 6655
niall.fitzsimons@brownbros.co.nz

Customer	Date 12/07/2019
Contact	Project
Phone number	Project no.
Email	

Technical Data

15SV06F055T
1016LD451

Operating data

Pumpe type	Single head pump		Fluid		Water
No. of pumps / Reserve		1 / 0	Operating temperature t A	°C	4
Nominal flow	l/s	5	pH-value at t A		7
Nominal head	m	65	Density at t A	kg/dm³	1
Static head	m	0	Kin. viscosity at t A	mm²/s	1.569
Inlet pressure	bar	0.096	Vapor pressure at t A	bar	0.00789
Environmental temperature	°C	20	Solids		0
Available system NPSH	m	0	Altitude	m	1000

Pump data

Make	Lowara			Nominal	l/s	5	(5)
Speed		1/min 2900	Flow	Max-	l/s	6.7	
Number of stages		6		Min-	l/s		
Max. casing pressure		bar		Nominal	m	65.4	
Max. working pressure		bar 8.7	Head	at Qmax	m	44.2	
Head H(Q=0)		m 88		at Qmin	m	87.6	
Weight		kg 67	Shaft power		kW	4.4	(4.4)
	Max.	mm 105	Max. shaft power		kW	4.7	
Impeller R	designed	mm 105	Efficiency		%	72.39	
	Min.	mm 105	NPSH 3%		m	1.8	

Pump Materials

Pump body	Stainless steel / AISI 304
Impeller	Stainless steel / AISI 304
Diffuser	Stainless steel / AISI 304
Outer sleeve	Stainless steel / AISI 304
Shaft	Stainless steel / AISI 304
ADAPTER	Cast iron
Base	Aluminium
Coupling	Aluminium
SEAL HOUSING	Stainless steel / AISI 304
Coupling protection	Stainless steel / AISI 304
Shaft sleeve and bushing	Tungsten carbide
Fill / drain plugs	Stainless steel / AISI 304
Tie rods	Galvanized steel
Wear Ring	Technopolymer PPS

Shaft Seal

e-6V Mechanical seal	Roten
e-6V - Uniten (-30 / +120 °C)	
1 - Rotating part	Silicon Carbide
2 - Stationary part	Resin impregnated carbon
3 - Elastomers	EPDM
4 - Springs	AISI 316
5 - Other components	AISI 316

Motor data

Manufacturer	Lowara	Electric voltage	400 V	Speed	2910 1/min	Insulation class	155 (F)
Specific design	IE3 Three phase surface motor (e-6V)			Frame size	132R	Colour	RAL 5010
Type	PLM132RB5/355 E3 (220-240/380-415V)						
Rated power	5.5 kW	Degree of protection	IP55				
Electric current	10.4 A						

Remarks:

Tender Hydraulic

Brown Brothers Engineers Ltd.
16 Sir James Wattie Drive, Hornby, Christchurch
+64-8042 Christchurch
03 364 6655
niall.fitzsimons@brownbros.co.nz

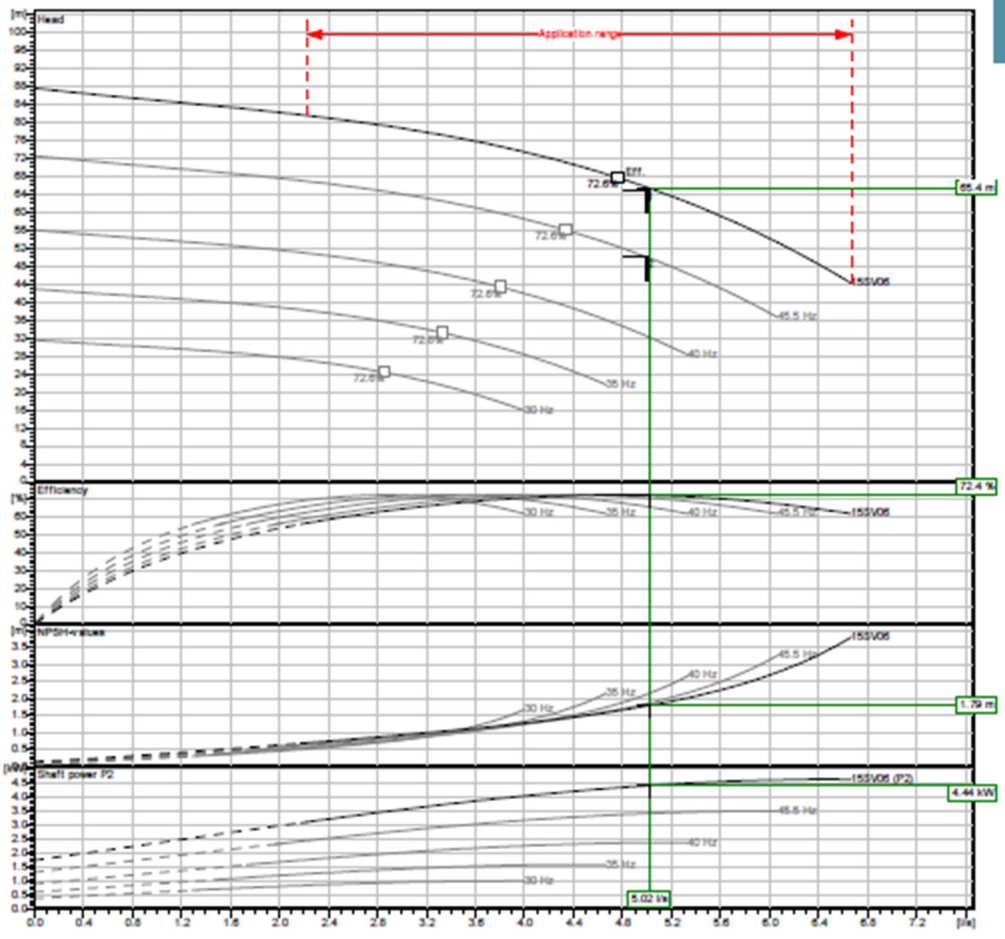
Customer	
Contact	
Phone number	
Email	
Date	12/07/2019
Project	
Project no.	

15SV06F055T
1016LD451

Hydraulic data

Operating Data Specification		Hydraulic data (duty point)		Impeller design	
Flow	5 l/s	Flow	5.02 l/s	Impeller R	105 mm
Head	65 m	Head	65.4 m	Frequency	50 Hz
Static head	0 m	MEI >=0,7		Speed	2900 1/min

Power datas refered to:
Water [100%] ; 4°C; 1kg/dm³; 1.67mm²/s
Performance according to ISO 9906:2012 – Grade 3B



LOWARA a xylem brand

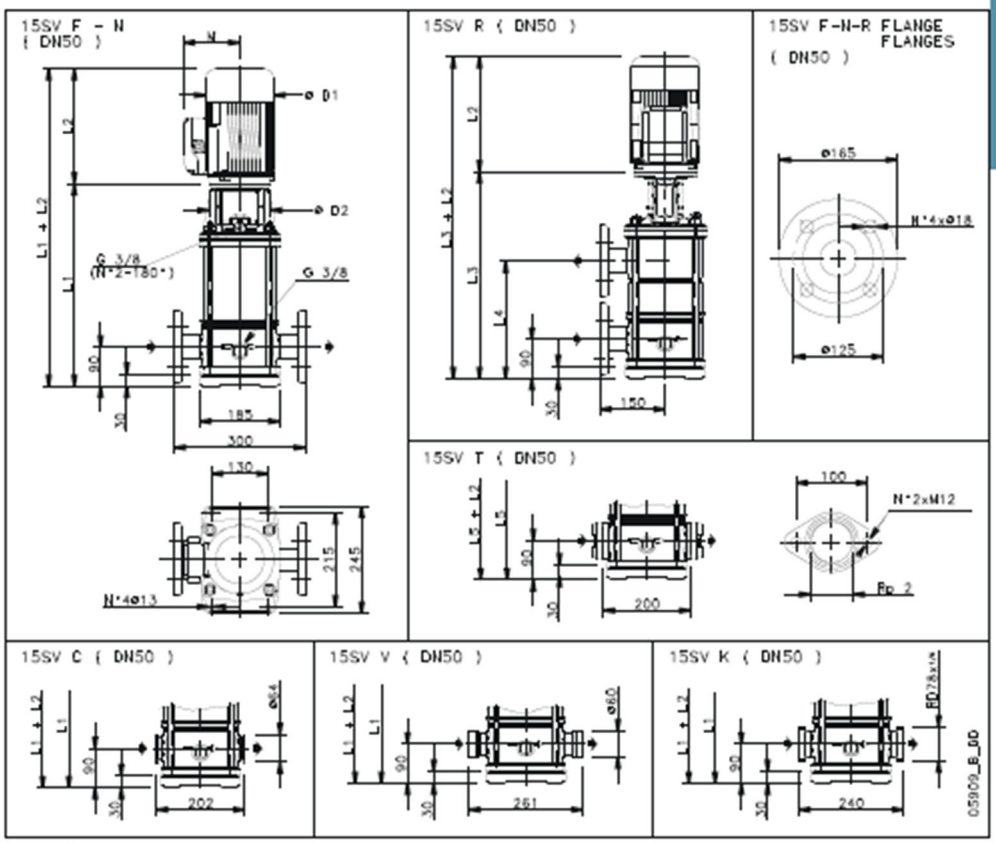
Brown Brothers Engineers Ltd.
16 Sir James Wattie Drive, Hornby, Christchurch
+64-8042 Christchurch
03 364 6655
niall.fitzsimons@brownbros.co.nz

Customer	Date 12/07/2019
Contact	Project
Phone number	Project no.
Email	

Dimensional Data

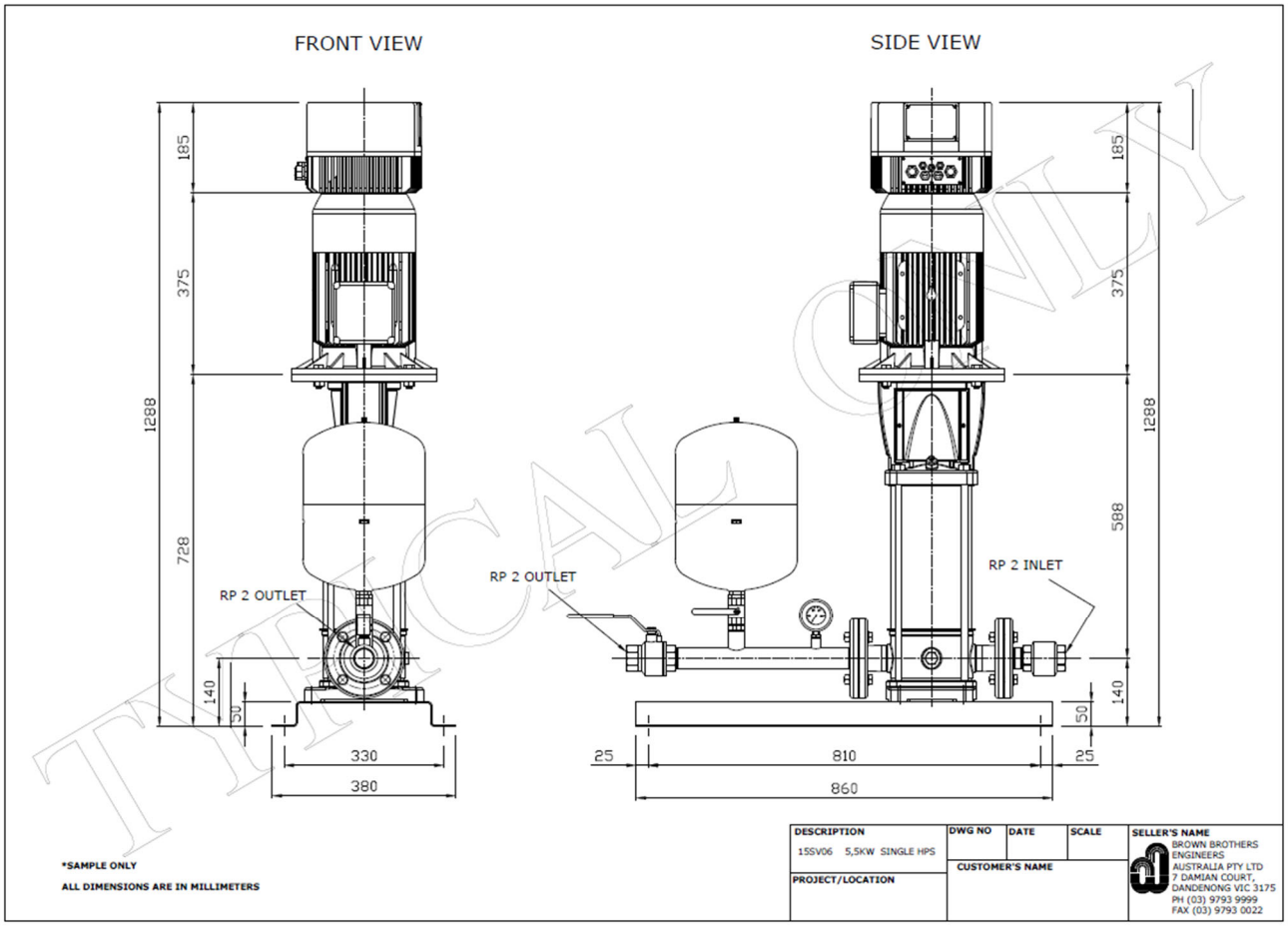
15SV06F055T
1016LD451

Drawing



Dimensions mm

D1	214					Weight
D2	300					67 kg
L1	578					
L2	375					
L3	578					
L4	397					
L5	578					
M	168					



Appendix 14 – Department of Conservation Wildlife Permit – Lizards

Appendix 15 – Correspondence between Boffa Miskell and WCC on a Decision on Bird Nest Boxes – *To be attached once received.*

Appendix 16 – Long Term Management and Maintenance Schedule

This Schedule is considered a "living document" that is to be worked on with WCC over the course of the Project.

OMARORO LONG TERM MANAGEMENT AND MAINTENANCE SCHEDULE

Type	Area	Description	Unit	Rate
PLANTING				
Native Revegetation planting West of reservoir (above Waitangi Stream refer plant schedule)	Reservoir fill slopes	Planting to include weeding, mulch top up	393m²	
Riparian planting to Waitangi and Papawai Streams (refer plant	Streamsides	Planting to include releasing where relevant	911m²	
TURF MOWING				
	Reservoir roof	No change		21.2 x 10 cuts
Grass species	Edge of tunnel access driveway	Mowing as per WCC standards for edge of fields	123m²	21.2 x 10 cuts
	Edges of access track between fields	Mowing as per WCC standards for edge of fields	1.3m wide each side 94m long	21.2 x 10 cuts
Low growing grass mix for dry slopes to pipe area to upper field	Pipe tunnel to upper field	No change	37m²	21.2 x 10 cuts
Total				
TRACKS				
	City to Sea walkways	Maintain as per WCC Open Space Access Plan	149 Lm x 1.2m wide	$50 x 8hr
	Eastern walkway	Maintain as per WCC Open Space Access Plan	39.5 Lm x 1.2m wide	$50 x 2hr
FENCING				
	High sportfield fencing (existing)	No change in maintenance required (vandalism repair as		
	Riddiford carpark two rail parks fence	New fence (vandalism repair only, replacement at end of life)		
	Bespoke fence above service tunnel entry	New fence (vandalism repair only, replacement at end of life)		
ASSETS				
	Seat with plaque	No change		
	General park signage	No change		
	Walkway signs	No change		