Arrowsouth

Private Open Space Management Plan

Prepared by:

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In collaboration with Lane Neave and CHA Surveyors Ltd

For Arrowsouth Properties Ltd
Updated 2 February 2021

Disclaimer

Rough and Milne Landscape Architects endeavours to ensure that the information in this publication is accurate and current. However we do not accept liability for any error or omission.

This publication is intended to provide the best possible guidance to Arrowsouth Properties Ltd, with regard to establishing and maintaining private open space areas within the Arrowtown South Special Zone. However, the information is provided as a general guidance only and is not intended as a substitute for specific advice. Rough and Milne Landscape Architects takes no responsibility for the accuracy of this information, its completeness or fitness for purpose.

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Printing Instructions

Screen version: Print in A3 landscape format, single sided (colour). Bind on short edge

Print version: Print in A4 portrait format, double sided (colour). Bind on long edge

INTRODUCTION

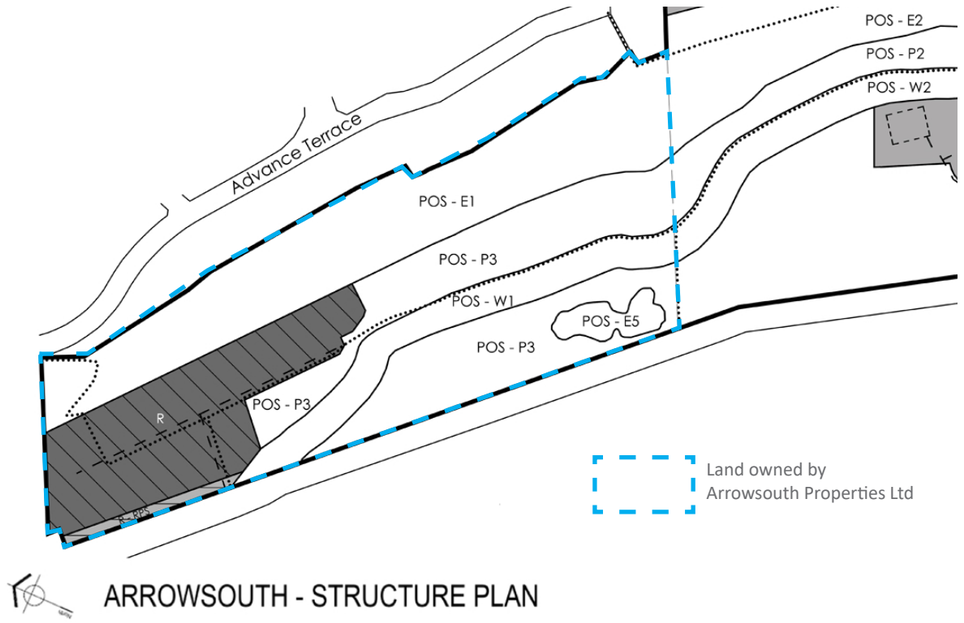
The objective of the Private Open Space Management Plan (POSMP) is to outline a strategy for establishing, re-vegetating and maintaining Private Open Space (POS) areas within land owned by Arrowsouth Properties Ltd, within the Arrowtown South Special Zone.

It is intended that the POSMP will inform the current land owner and future residents of the vision and strategy for regenerating and managing each area of POS. The areas are named in the Structure Plan (and in this document) as follows:

POS-E1 | Escarpment
POS-E5 | Outcrop
POS-P3 | Pastures
POS-W1 | Waterway
RPS | Roadside Planting Strip

This comprehensive management plan details the Escarpment, Waterway and Pasture private open spaces, as well as the Roadside Planting Strip (RPS), and outlines a strategy for each, including:

- a public track plan, showing the location of public tracks and construction methods
- site preparation, including weed and pest management, stock and rabbit fencing, as well as indicative costs
- a revegetation strategy, including plant species and densities, a programme for planting as well as indicative costs
- a maintenance and ongoing management plan, including a programme that addresses allocation of responsibilities, timing of maintenance and indicative costs



VISUAL AMENITY VALUES

The land owned by Arrowsouth Properties Ltd is a long, reasonably narrow strip of gently rolling land defined by the toe of the escarpment and McDonnell Road. The landscape is characterised by rural farmland with grazed pasture, exotic tree planting, a spring fed stream, a small wetland area and a few rocky outcrops. This landscape unit is accessed and viewed by public from McDonnell Road. Existing dwellings located at the top of the escarpment also overlook the lower level.

Despite being dominated by invasive weeds, the site, in its location on the edge of Arrowtown, is valued for its visual amenity associated with the site's rural, open, verdant character, and the presence of wilding deciduous trees which are characteristic of Arrowtown in Autumn.

Although the overall master plan will alter the character of the landscape, the intention of the plan is to protect and enhance visual amenity of the site, while introducing ecological values at the same time. While an area of housing at the northern end of the site will compromise some of the open space character, the southern end of the site will be retained as open pastures, the addition of extensive native planting will improve the site's naturalness. Native birds and other wildlife will be encouraged to habitat in the area. Established public tracks will increase the recreational values associated with the site.

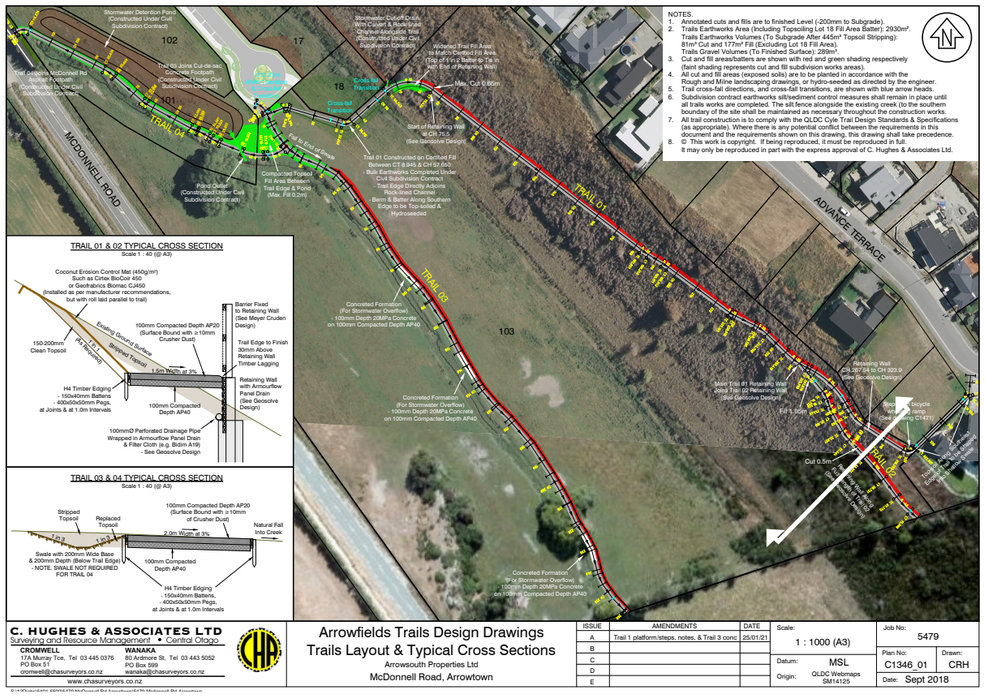
The visual amenity values will change from those associated with the rural landscape to values more closely associated with the natural landscape. The overall vision will not only improve visual amenity values, but will introduce ecological and recreational values to the site as well.

PUBLIC TRAILS

VISION

As per the District Plan rules, public access will be established through parts of the site that connect on to the wider pedestrian and cycle path network throughout Arrowtown. A 1.5m wide gravel track a will be established on the escarpment to connect foot and cycle paths on McDonnell Rd with Advance Tce above the escarpment. A second track will split off near the top of the track which will one day be connected to the wider track network on the escapment. A 2m wide gravel track will meander beside the waterway to allow public to access to the enhanced stream environment.

TRACK SET OUT PLAN (CHA LTD)



Revised 12/12/19:
Revision pertains to substitution of retained structure with timber boardwalk

Revised 21/01/21
Revised trail layout

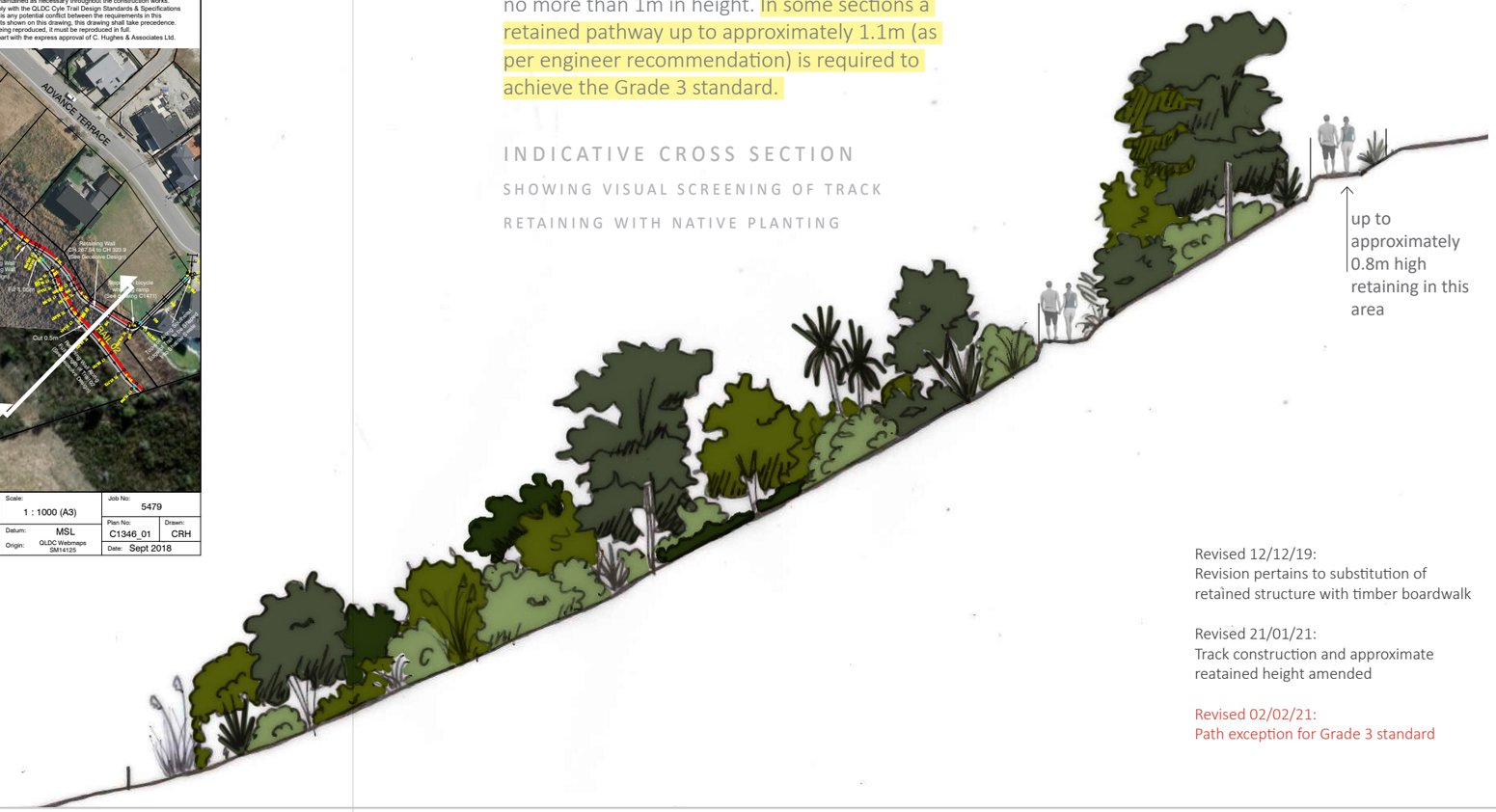
TRACK CONSTRUCTION

Tracks beside the waterway are to be 2m wide compacted gravel paths, constructed with 40mm timber edging, 200mm compacted base course, bound with 10mm of crusher dust on surface.

The proposed escarpment paths have been designed to meet Grade 3 standard wherever possible. However, there is a section near the top of the escarpment where steps are required. These steps do not comply with the Grade 3 standard. The escarpment paths will be no more than 1.5m wide, have a compacted gravel surface, and cut batters which will be no more than 1m in height. In some sections a retained pathway up to approximately 1.1m (as per engineer recommendation) is required to achieve the Grade 3 standard.

INDICATIVE CROSS SECTION

SHOWING VISUAL SCREENING OF TRACK RETAINING WITH NATIVE PLANTING



LANDSCAPE MITIGATION STRATEGY

All cut and fill batter slopes are to be grassed or planted as soon as practicable following path construction to ensure slope stability and visual mitigation of the bare earth. Retaining structures of more than 0.5m in height will be screened with larger grade native vegetation (including PB5 grade mountain flax and pittosporums) to more rapidly mitigate their visual effect. Ribbonwood saplings at least 1.2m in height will be planted strategically to screen the highest areas of boardwalk. The intention is that in time, these trees and shrubs will grow up to screen any indication of the tracks in views from McDonnell Road.

Revised 12/12/19:
Revision pertains to substitution of retained structure with timber boardwalk

Revised 21/01/21:
Track construction and approximate reatained height amended

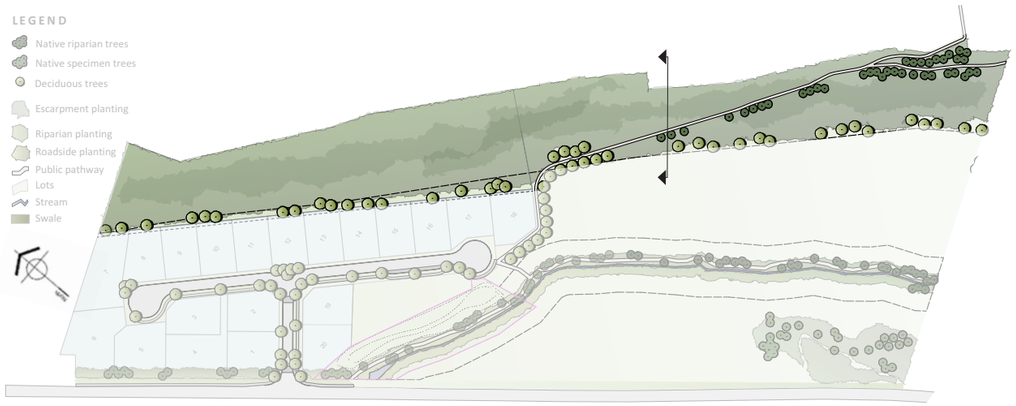
Revised 02/02/21:
Path exception for Grade 3 standard

POS-E1 | ESCARPMENT

VISION

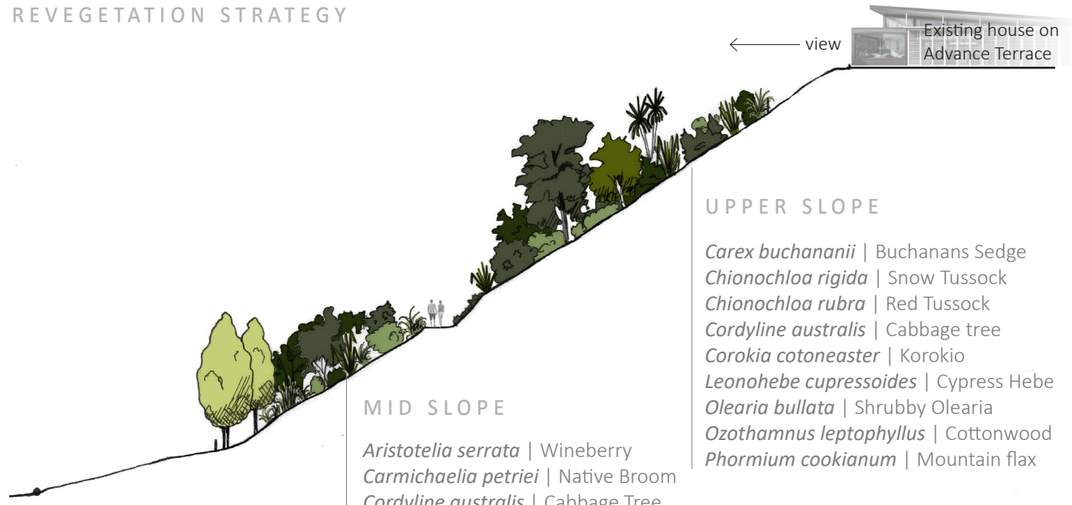
The vision for the escarpment is to create a self sustaining native shrub land. Plants selected for revegetation are typical to the Wakatipu Basin and hardy to local conditions to ensure the best success rate of planting. In time, the shrubland will attract native fauna and provide enhanced visual, ecological and recreational amenity for nearby residents. The escarpment shall be cleared and kept free of invasive weed species such as broom, gorse and briar, as well as being free from animal pests such as rabbits and hares.

LOCATION PLAN



Photograph of the existing escarpment, which was sprayed in March 2014

REVEGETATION STRATEGY



TOE SLOPE

Austroderia richardii |Toetoe
Carex buchananii | Buchanans sedge
Chionochloa rubra | Red tussock
Coprosma propinqua | Mikimiki
Coprosma rugosa | Coprosma
Hebe salicifolia | Koromiko
Leptospermum scoparium | Manuka
Olearia fragrantissima | Fragrant Tree Daisy
Olearia lineata | Tree Daisy
Phyllocladus alpinus | Mountain Toatoa
Phormium cookianum | Mountain Flax
Poa cita| Silver Tussock
Sophora microphylla | Kowhai

MID SLOPE

Aristotelia serrata | Wineberry
Carmichaelia petriei | Native Broom
Cordyline australis | Cabbage Tree
Coprosma crassifolia | Mikimiki
Coprosma rigida | Rigid mikimiki
Coprosma virescens | Taupata
Discaria toumatou | Matagouri
Fuscospora fusca | Red beech
Fuscospora cliffortioides| Mountain Beech
Griselinia littoralis |Broadleaf
Olearia odorata | Scented Tree Daisy
Leptospermum scoparium | Manuka
Phyllocladus alpinus | Mountain Toatoa
Phormium cookianum | Mountain Flax
Pittosporum eugenoides | Lemonwood
Pittosporum tenuifolium | Kohuhu
Plagianthus regius | Ribbonwood

UPPER SLOPE

Carex buchananii | Buchanans Sedge
Chionochloa rigida | Snow Tussock
Chionochloa rubra | Red Tussock
Cordyline australis | Cabbage tree
Corokia cotoneaster | Korokio
Leonohebe cupressoides | Cypress Hebe
Olearia bullata | Shrubby Olearia
Ozothamnus leptophyllus | Cottonwood
Phormium cookianum | Mountain flax

Deciduous Tree Clusters:
Acer 'Autumn Blaze' | Autumn Blaze Maple
Fraxinus angustifolia 'Raywoodii' | Claret Ash
Quercus robur 'Fastigiata' | Upright Oak
Tilia cordata | Small Leaved Lime

POS-E1 | ESCARPMENT

TRACK CONSTRUCTION

TRACK CONSTRUCTION
Set out (according to surveyor's plans) and construct the 1.5m wide public tracks traversing the escarpment using earth moving machinery. Ensure cuts and batters are no greater than 1m in height. To ensure this, install a 0.5-1.1m retaining structure (to be approved by engineer) on the downhill side of the track where necessary. Install 200mm compacted base course, bound with 10mm of crusher dust on surface. Hydroseed or plant out all bare earth as soon as possible following track construction.

Revised 12/12/19:
Revision pertains to substitution of retained structure with timber boardwalk

Revised 21/01/21:
Revision pertains to installation of 0.5-1.1m retained structure instead of boardwalk

SITE PREPARATION

CLEARING WEEDS
The escarpment was sprayed in March of 2014, so only requires mulching of larger dead woody material and an additional spray to kill new broom seedlings which have re-grown since the original spray. Smaller dead weeds can remain in place to provide shelter and protection to new native seedlings.

RABBIT AND STOCK EXCLUSION
It is recommended that a rabbit and stock proof fence is installed around the perimeter of the escarpment revegetation area. Timber step styles with cycle ramps or spring loaded gates should be installed where the fence crosses the public track. Once the fence is in place, intensive rabbit eradication within the fenced area should be carried out by a pest eradication professional (either shooting, pindone poisoning or other method).

REVEGETATION

ORDER PLANTS
Plants could take up to 18 months to grow from seed to a size that can be planted out, so it's important to give nurseries plenty of time to contract-grow the required number of plants. It is suggested that planting is staged over two planting seasons. Bare root stock saplings are only availabe in winter when trees are dormant. Be sure to factor this in when sourcing and ordering.

SET OUT AND PLANT
Set out plant sites by using colour coded dazzle, according to the planting plan. Spot spray rank grass (if necessary) 1m around each planting site using a 'z' pattern (if necessary). Seedlings should be planted in a hole that is twice the size of the root ball and at a base-of-stem depth of 2-5cm below the soil surface (this will help direct water to the roots when it rains). Install wool mulch collars to each plant at time of planting.

MAINTENANCE

GROWING SEASONS (GS) 1 & 2
Maintenance will include monthly visits from a contractor during Oct - March to spot spray weeds, monitor and replace dead plants and monitor/control rabbits. A growing season is considered to be the period between the last frost in Spring and the first frost in Autumn.

GROWING SEASONS (GS) 3 & THEREAFTER
Maintenance will begin to taper as plants become established and weeds are less likely to strangle plants. The Owners Group will take over maintenance of the planting on Lot 104 at the end of the second growing season. Maintenance during the third to fifth growing season will include bi-monthly visits to spot spray weeds, monitor and replace dead plants and monitor/control rabbits. Following that, maintenance will likley taper to twice per year and finally once per year.

INDICATIVE PROGRAMME

Table NOT revised for 12/12/19 or 21/01/21 revision

2017/18	2018	2018	2018	2018/19	2019	2019	2019	2019/20	2020	2020	2020	2020/21	2021	2021	2021	2021/22	2022	2022
summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter
GROWING SEASON			GROWING SEASON				GROWING SEASON				GROWING SEASON				GROWING SEASON			
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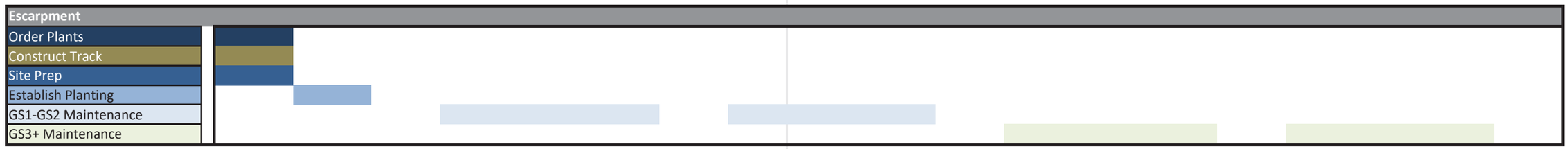


POS-E1 | ESCARPMENT

INDICATIVE PLANT SCHEDULE

Code	Botanical Name	Common Name	Grade	Spacing	Quantity
Ac 'AB'	Acer 'Autumn Blaze'	autumn blaze maple	BR	as shown	7
Ar s	Aristotelia serrata	wineberry	DRT	3000	143
Au r	Austroderia richardii	toetoe	DRT	1500	308
Ca bu	Carex buchananii	buchanans sedge	DRT	700	3336
Ca pe	Carmichaelia petriei	native broom	DRT	1500	572
Ch ri	Chionochloa rigida	snow tussock	DRT	900	846
Ch ru	Chionochloa rubra	red tussock	DRT	1000	1280
Co a	Cordyline australis	cabbage tree	DRT	3000	219
Co c	Coprosma crassifolia	thick-leaved mikimiki	DRT	1500	143
Co co	Corokia cotoneaster	korokio	DRT	1500	76
Co p	Coprosma propinqua	coprosma	DRT	1500	308
Co ri	Coprosma rigida	mingimingi	DRT	1500	572
Co ru	Coprosma rugosa	coprosma	DRT	1500	308
Co v	Coprosma virescens	taupata	DRT	1500	572
Di t	Discaria toumatou	matagouri	DRT	1500	572
Fr a 'R'	Fraxinus angustifolia 'Raywoodii'	claret ash	BR	as shown	14
Fu f	Fuscospora fusca	red beech	DRT	3000	143
Fu s	Fuscospora solandri	black beech	DRT	3000	143
Gr l	Griselinia littoralis	kapuka/broadleaf	DRT	3000	572
He s	Hebe salicifolia	koromiko	DRT	3000	76
Le cu	Leonohebe cupressoides	Fragrant hebe	DRT	1500	304
Le s	Leptospermum scoparium	manuka	DRT	1500	219
Ol bu	Olearia bullata	Olearia bullata	PB5	1500	304
Ol fr	Olearia fragrantissima	fragrant tree daisy	DRT	3000	76
Ol l	Olearia lineata	tree daisy	DRT	3000	76
Ol od	Olearia odorata	scented tree daisy	DRT	3000	143
Oz l	Ozothamnus leptophyllus	cottonwood	DRT	1500	304
Ph al	Phyllocladus alpinus	mountain toatoa	DRT	3000	219
Ph c	Phormium cookianum	mountain flax	DRT/PB5	1500	860/96
Pi eu	Pittosporum eugeniodes	lemonwood	DRT	3000	143
Pi t	Pittosporum tenuifolium	kohuhu	DRT/PB5	1500	476/96
Pl r	Plagianthus regius	ribbonwood	DRT/1.2m	3000	103/40
Po c	Poa cita	silver tussock	DRT	700	1832
Qu r 'F'	Quercus robur 'Fastigiata'	upright oak	BR	as shown	7
So m	Sophora microphylla	kowhai	DRT	3000	308
Ti c	Tilia cordata	small leaved lime	BR	as shown	9
					15825

NOTE:

Spacings are shown in milimeters

DRT = Deep Root Trainer grade. Similar size plants come in other grade descriptions such as RX90, V150/V130 or 285cc/310cc, depending on availability. These grades are also acceptable.

PB5 = Plant Bag 5 grade or 3L pot.

BR = Bare Root Stock - also known as Open Ground (OG) stock.

1.2m = 1.2m high native tree sapling

INDICATIVE COSTS (SCHEDULE)

Estimate of reveg costs: Main Escarpment (POS E1)	qty	unit	rate	Site prep + ordering	Plant establishment	GS1 Maintenance	GS2 Maintenance	GS3+ Maintenance by Primary Land Owner*	GS3+ Maintenance by each resident*
Total POS area (incl track and planting)	**2.353**	**ha**							
Total area as part of Private Lots (ha) (46.5% of total area)	1.012	ha							
Tree felling and mulching^^	30	ea	$ 110.00	$ 3,300					
Pre-plant weed spraying (monthly Oct - April)	2.353	ha	$ 1,000.00	$ 14,118	$ 7,059				
Rabbit + stock fencing	1135	lm	$ 19.00	$ 21,565					
Initial rabbit eradication (shooting)	6	hr	$ 60.00	$ 360					
Ongoing rabbit control (monitoring and poisoning)	2.353	ha	$ 420.00	$ 988		$ 988	$ 988	$ 988	
DRT plant supply (50% to order, 50% when delivered)	15556	ea	$ 3.30	$ 25,667	$ 25,667				
PB5 plant supply (50% to order, 50% when delivered)	192	ea	$ 8.80	$ 845	$ 845				
BRS tree supply (50% to order, 50% when delivered)	37	ea	$ 25.00	$ 463	$ 463				
1.2m native sapling supply (50% to order, 50% when delivered)	40	ea	$ 40.00	$ 800	$ 800				
Set out and planting of DRT grade plants	15556	ea	$ 3.30		$ 51,335				
Set out and planting of PB5 grade plants	192	ea	$ 8.80		$ 1,690				
Set out, planting and staking of BRS trees and 1.2m saplings	77	ea	$ 25.00		$ 1,925				
Wool mulch collars	15825	ea	$ 2.00		$ 31,650				
GS1-GS2 Maintenance^		year	$ 3,693.48			$ 3,693	$ 3,693		
GS3+ Maintenance~		year	$ 2,216.09					$ 1,186	$ 86
Total				**$ 68,106**	**$ 121,433**	**$ 4,682**	**$ 4,682**	**$ 2,174**	**$ 86**
Total per hectare				$ 28,944	$ 51,608	$ 1,990	$ 1,990	$ 1,620	$ 1,019
Total per m2				$ 2.89	$ 5.16	$ 0.20	$ 0.20	$ 0.16	$ 0.10

All figures are GST exclusive

Notes and Assumptions:

All costs and figures are indicative only and are subject to further refinement

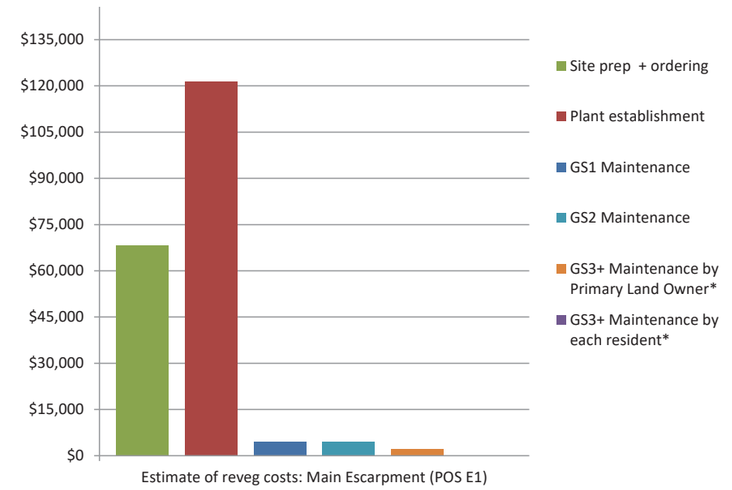
*GS3+ costs shown are an average per year for ongoing maintenance (expected to taper)

^^ worked out at 2hrs labour @$55/hr per tree

^ worked out as 5% of (total cost to plant less cost of mulch collars). Includes herbicide spray and plant replacement

~worked out as 3% of (total cost to plant less cost of mulch collars). Includes herbicide spray and plant replacement

INDICATIVE COSTS (GRAPH)



Estimate of reveg costs: Main Escarpment (POS E1)

POS-E5 | OUTCROP

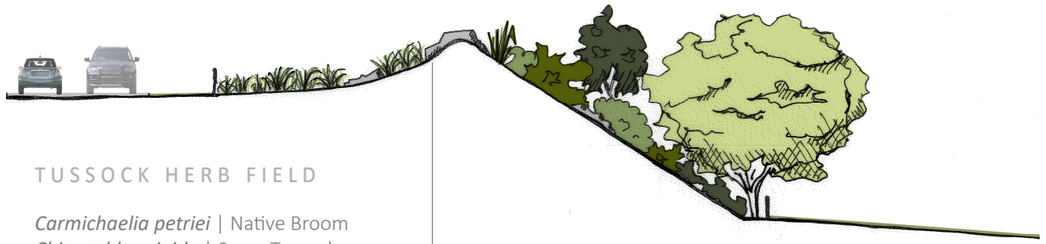
VISION

The schist outcrop on the lower plane has potential to be an attractive feature of the site (one visible from McDonnell Road), but is presently obscured with broom and gorse, and infested with rabbits. The long term enhancement goal for the outcrop is to remove the gorse and broom to reveal the schist formations and revegetate the area surrounding it with native vegetation that will encourage native birds, lizards and invertebrates to habitate there.

PLAN

Photograph of the existing outcrop, which is currently dominated by weed species

REVEGETATION STRATEGY



TUSSOCK HERB FIELD

Carmichaelia petriei | Native Broom
Chionochloa rigida | Snow Tussock
Chionochloa rubra | Red Tussock
Festuca novae-zelandiae | Tawny Tussock
Melicytus alpinus | Porcupine shrub
Olearia bullata | Shrubby Olearia

ROCKY OUTCROP

Carmichaelia petriei | Native Broom
Chionochloa rigida | Snow Tussock
Chionochloa rubra | Red Tussock
Coprosma propinqua | Mikimiki
Coprosma rugosa | Coprosma
Discaria toumatou | Matagouri
Festuca novae-zelandiae | Tawny Tussock
Griselinia littoralis | Broadleaf
Melicytus alpinus | Porcupine shrub
Myrsine australis |Matipo
Olearia arborescens | Tree Daisy
Olearia bullata | Shrubby Olearia
Phormium cookianum | Mountain Flax
Pittosporum eugeniodes | Lemonwood
Sophora microphylla |Sth Island Kowhai

POS-E5 | OUTCROP

SITE PREPARATION

CLEARING WEEDS
The outcrop is presently infested with woody weeds such as gorse and broom and a scattering of exotic trees. To clear, these weeds will need to be sprayed or cut down and poisoned. Once dead, larger shrubs and trees can be mulched on site while smaller weeds can be left in place to provide shelter and protection to native seedlings.

RABBIT AND STOCK EXCLUSION
It is recommended that a rabbit and stock proof fence is installed around the perimeter of the revegetation area. Once the fence is in place, intensive rabbit eradication within the fenced area should be carried out by a pest eradication professional (either shooting or pindone poisoning).

REVEGETATION

ORDER PLANTS
Plants could take up to 18 months to grow from seed to a size that can be planted out, so it's important to give nurseries plenty of time to contract-grow the required number of plants. It is recommended that planting is carried out in one planting season.

SET OUT AND PLANT
Set out plant sites by using colour coded dazzle. Spot spray rank grass 1m around each planting site using a 'z' pattern (if necessary). Seedlings should be planted in a hole that is twice the size of the root ball and at a base-of-stem depth of 20-50mm below the soil surface (this will help direct water to the roots when it rains). Install combi guards (including felt collar) to each plant at time of planting.

MAINTENANCE

GROWING SEASONS (GS) 1 & 2
Maintenance will include monthly visits from a contractor during Oct - March to spot spray weeds, monitor and replace dead plants and monitor rabbits. A growing season is considered to be the period between the last frost in Spring and the first frost in Autumn.

GROWING SEASONS (GS) 3 & THEREAFTER
Maintenance will begin to taper as plants become established and weeds are less likely to strangle plants. Maintenance during the third to fifth growing season will include bi-monthly visits to spot spray weeds, monitor and replace dead plants and monitor/control rabbits. Following that, maintenance should taper to twice per year and finally once per year.

INDICATIVE PROGRAMME

2017/18	2018	2018	2018	2018/19	2019	2019	2019	2019/20	2020	2020	2020	2020/21	2021	2021	2021	2021/22	2022	2022
summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter
GROWING SEASON			GROWING SEASON				GROWING SEASON				GROWING SEASON				GROWING SEASON			
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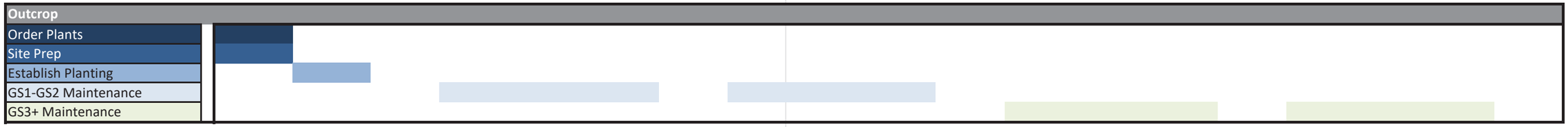


POS-E5 | OUTCROP

INDICATIVE PLANT SCHEDULE

Code	Botanical Name	Common Name	Grade	Spacing	Quantity
Ca pe	Carmichaelia petriei	native broom	DRT	1500	165
Ch ri	Chionochloa rigida	snow tussock	DRT	900	64
Ch ru	Chionochloa rubra	red tussock	DRT	1000	64
Co p	Coprosma propinqua	coprosma	DRT	1500	101
Co ru	Coprosma rugosa	coprosma	DRT	1500	101
Di t	Discaria toumatou	matagouri	DRT	1500	101
Fe nz	Festuca novae-zelandiae	tawny tussock	DRT	700	64
Gr l	Griselinia littoralis	kapuka/broadleaf	DRT	3000	101
Me a	Melicytus alpinus	porcupine shrub	DRT	800	244
My a	Myrsine australis	Matapo	DRT	1500	101
Ol a	Olearia arborescens	tree daisy	DRT	3000	25
Ol bu	Olearia bullata	Olearia bullata	PB5	1500	165
Ph c	Phormium cookianum	mountain flax	DRT	1500	101
Pi eu	Pittosporum eugeniodes	lemonwood	DRT	3000	25
So m	Sophora microphylla	kowhai	DRT	3000	25
					1447

NOTE:

Spacings are shown in milimeters

DRT = Deep Root Trainer grade. Similar size plants come in other grade descriptions such as RX90, V150/V130 or 285cc/310cc, depending on availability. These grades are also acceptable.

BR = Bare Root Stock - also known as Open Ground (OG) stock.

INDICATIVE COSTS (SCHEDULE)

Estimate of costs: Outcrop (POS E5)	qty	unit	rate	Site prep + ordering	Plant establishment	GS1 Maintenance	GS2 Maintenance	GS3+ Maintenance by Primary Land Owner*
Total POS area (all planted)	**0.2265**	**ha**						
Tree felling and mulching^^	15	ea	$ 110.00	$ 1,650				
Pre-plant weed spraying (monthly Oct - April)	0.2265	ha	$ 1,000.00	$ 1,359				
Rabbit + stock fencing	218	lm	$ 19.00	$ 4,142				
Initial rabbit eradication (shooting)	3	hr	$ 60.00	$ 180				
Ongoing rabbit control (monitoring and poisoning)~	0.2265	ha	$ 420.00			$ 95	$ 95	$ 95
DRT Plant supply (50% to order, 50% when delivered)	1447	ea	$ 3.30	$ 2,388	$ 2,388			
Set out and planting	1447	ea	$ 3.30		$ 4,775			
Wool mulch collars	1447	ea	$ 2.00		$ 2,894			
GS1-GS2 Maintenance^	1	year	$ 333			$ 333	$ 333	
GS3+ Maintenance~	1	year	$ 200					$ 200
Total				**$ 9,719**	**$ 10,057**	**$ 428**	**$ 428**	**$ 295**
Total per hectare				$ 42,908	$ 44,400	$ 1,889	$ 1,889	$ 1,302
Total per m2				$ 4.29	$ 4.44	$ 0.19	$ 0.19	$ 0.13

All figures are GST exclusive

Notes and Assumptions:

All costs and figures are indicative only and are subject to further refinement

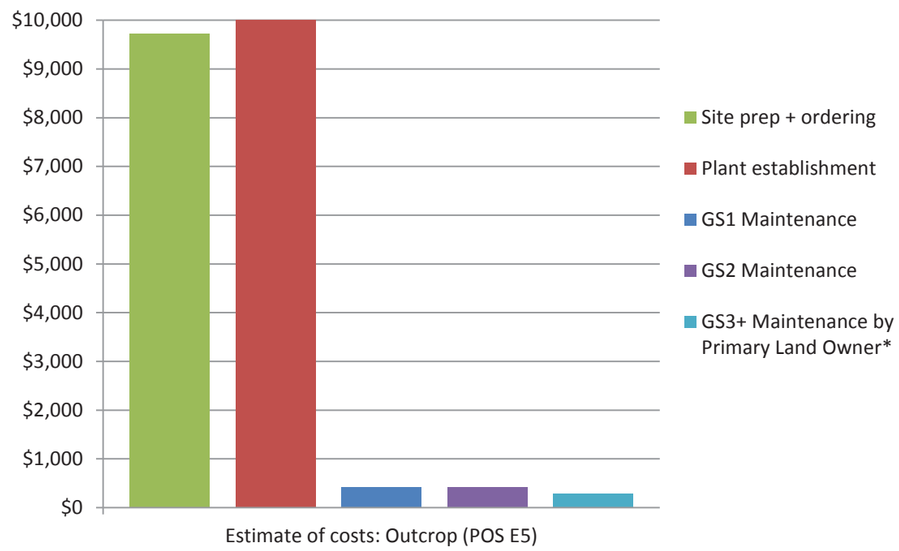
*GS3+ costs shown are an average per year for ongoing maintenance (expected to taper)

^^ worked out at 2hrs labour @$55/hr per tree

^ worked out as 5% of (total cost to plant less cost of mulch collars). Includes herbicide spray and plant replacement

~worked out as 3% of (total cost to plant less cost of mulch collars). Includes herbicide spray and plant replacement

INDICATIVE COSTS (GRAPH)



POS-P3 | PASTURE

VISION

The flatter area on the lower plane is characterised by open, grazed pasture with a scattering of exotic trees and herbaceous pasture weeds. The long term enhancement goal for the pasture open space areas is to maintain the open character by continuing to graze the area, but to enhance visual amenity and ecological health by managing weed species. Rabbit populations would also be monitored and controlled.

LOCATION PLAN

Photograph of the existing pastoral area

TRACK CONSTRUCTION

Set out (according to surveyor's plans) and construct a 1.5m wide public track that links the cul-de-sac head with the escarpment trail. Install 40mm timber edging and 200mm of compacted basecourse, bound with 10mm of crusher dust on surface.

Revised 21/01/21:
Revision pertains to construction of trail

SITE PREPARATION

CLEARING WEEDS

The pastoral area is presently infested with a scattering of broom seedlings and a few exotic trees. To clear weeds, they will need to be sprayed or hand pulled, and trees cut down and mulched, their stumps poisoned.

RABBIT CONTROL

Intensive rabbit eradication should be carried out in the surrounding area by a pest eradication professional (either shooting or pindone poisoning).

STOCK FENCING

Post and wire stock fencing is to be erected between the escarpment and waterway fences, beside the newly constructed path. This is to contain stock which are to graze the pastures and provide clear separation between public and private areas.

REVEGETATION

ORDER PLANTS

Bare root stock saplings are only available in winter when trees are dormant. Be sure to factor this in when sourcing and ordering.

SET OUT AND PLANT

Set out trees according to the plant plan. Prepare a 750x750mm tree pit, backfilled with a good quality topsoil and compost mix. Plant sapling in tree pit and stake according to best practice.

MAINTENANCE

GROWING SEASONS (GS) 1 & 2

Maintenance will include monthly visits from a contractor during Oct - March to spot spray weeds and monitor rabbits.

GROWING SEASONS (GS) 3 & THEREAFTER

Maintenance will begin to taper as weed seedlings are less likely to germinate. Maintenance during the third to fifth growing season will include bi-monthly visits to spot spray weeds, and monitor/control rabbits. Following that, maintenance will taper further to twice per year and finally once per year.

POS-P3 | PASTURE

INDICATIVE COSTS (SCHEDULE)

Estimate of costs: Pastures (POS P3)	qty	unit	rate	GS1 Site Prep + Planting	GS2 Maintenance	GS3+ Maintenance by Primary Land Owner*
Total POS area	**2.889**	**ha**				
Stock fencing (in addition to fencing around reveg areas)	61	lm	$ 15.00	$ 915		
Weed spraying (monthly Oct - April)	2.889	ha	$ 800.00	$ 13,867		
BRS tree supply	15	ea	$ 25.00	$ 375		
Planting and staking	15	ea	$ 25.00	$ 375		
Initial Rabbit eradication	3	hr	$ 60.00	$ 180		
GS2 Maintenance^	2.889	ha	$ 400.00		$ 2,311	
GS3+ Maintenance~	2.889	ha	$ 400.00			$ 1,155.60
Total				**$ 15,712**	**$ 2,311**	**$ 1,156**
Total per hectare				$ 5,439	$ 800	$ 400
Total per m2				$ 0.54	$ 0.08	$ 0.04

All figures are GST exclusive

Notes and Assumptions:

All costs and figures are indicative only and are subject to further refinement

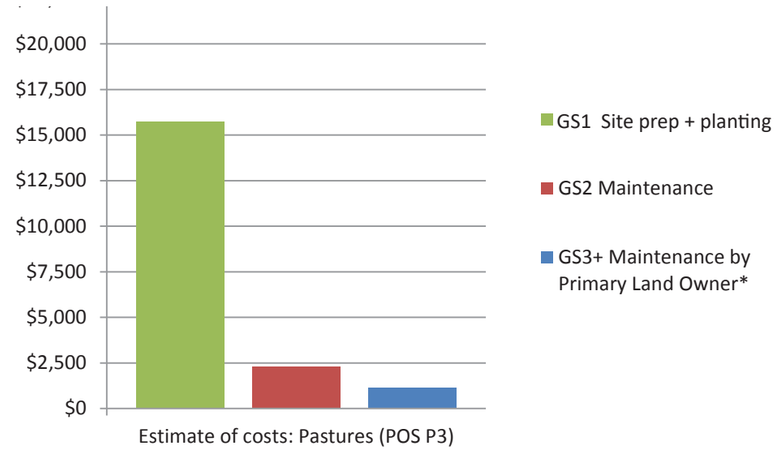
*GS3+ costs shown are an average per year for ongoing maintenance (expected to taper)

Maintenance of pasture areas includes grazing of stock or cutting of grass for hay at no additional

^ provisional sum for spot spray twice per year + mowing of area not grazed

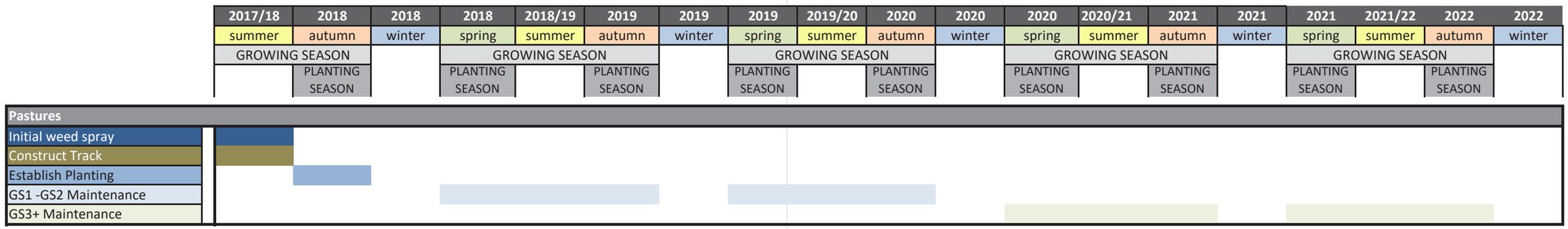
~ provisional sum for spot spray once per year + mowing of area not grazed

INDICATIVE COSTS (GRAPH)



Estimate of costs: Pastures (POS P3)

INDICATIVE PROGRAMME



POS-W1 | WATERWAY

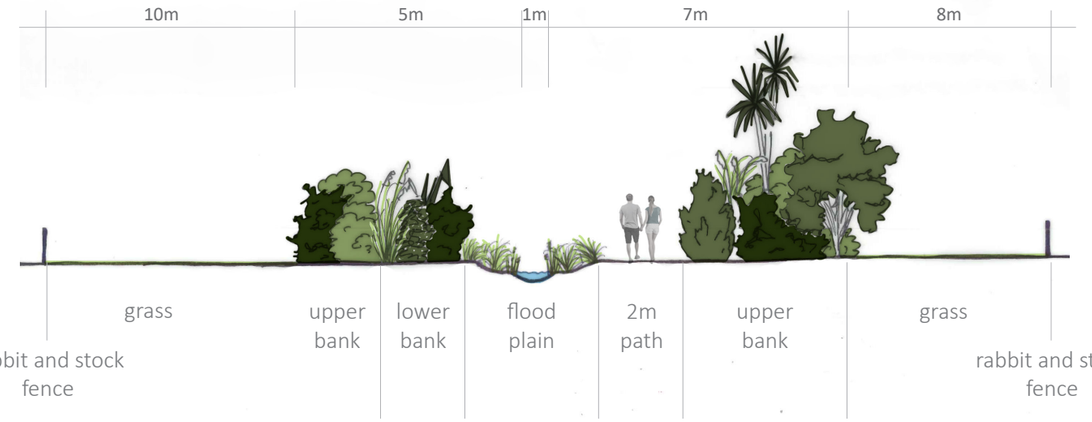
VISION

A spring-fed stream (approx 1m wide) flows in a south-eastern direction from a culvert outlet beneath McDonnell Road near the the north west corner of the site across the lower plane. The stream is currently unfenced to stock and suffers from pugging and erosion within the flood zone leaving it in poor ecological health. The long term enhancement goal is to revegetate the stream margin with native riparian planting that will improve the ecological health and amenity of the stream. Riparian planting will assist with water quality, provide habitat for wildlife and reintroduce a native seed source to the area.

LOCATION PLAN

Photograph of the existing stream which has suffered significant stock damage (pugging)

REVEGETATION STRATEGY



FLOOD PLAIN

Carex buchananii | Buchanans Sedge
Carex secta | Pukoi
Carex sinclairii | Sinclair's Sedge
Chionochloa rubra | Red Tussock
Juncus edgariae | Wiwi

LOWER BANK

Austroderia richardii | Toetoe
Chionochloa rubra | Red Tussock
Coprosma propinqua | Coprosma
Coprosma rugosa | Coprosma
Coprosma virescens |Taupata
Olearia bullata | Shrubby Olearia
Olearia odorata | Tree Daisy
Phormium tenax | Harakeke

UPPER BANK

Austroderia richardii | Toetoe
Carmichaelia petrei | Native Broom
Chionochloa rubra |Red Tussock
Cordyline australis | Cabbage Tree
Coprosma crassifolia | Thick-Leaved Mikimiki
Coprosma propinqua | Coprosma
Coprosma rugosa | Coprosma
Coprosma virescens | Taupata
Discaria toumatou | Matagouri
Halocarpus bidwillii | Bog Pine
Leonohebe cupressoides | Cypress Hebe
Leptospermum scoparium | Manuka
Olearia lineata | Tree Daisy
Phyllocladus alpinus | Mountain Toatoa
Pittosporum tenufolium | Kohuhu
Sophora microphylla | Kowhai

POS-W1 | WATERWAY

TRACK CONSTRUCTION

Set out (according to surveyor's plans) and construct a 2m wide public track that meanders beside the waterway on it's north eastern bank. Install 40mm timber edging and 200mm of compacted basecourse, bound with 10mm crusher dust on surface. Install spring gates where the path crosses the rabbit proof fence.

Revised 21/01/21:
Revision pertains to construction of trail

SITE PREPARATION

CLEARING WEEDS
The riparian edge is presently devoid of any substantial weeds, except for a cluster of crack willow trees. These trees will need to be felled, mulched and their stumps poisoned. Any other herbaceous weeds should be hand pulled or sprayed.

RABBIT AND STOCK EXCLUSION
A rabbit and stock proof fence is to be installed 15m either side of the stream, as per the structure plan rules. Once the fence is in place, if necessary, rabbit eradication within the fenced area should be carried out by a pest eradication professional (either shooting or pindone poisoning) although it is unlikley any rabbits will be trapped within the confines of the fence.

REVEGETATION

ORDER PLANTS
Plants could take up to 18 months to grow from seed to a size that can be planted out, so it's important to give nurseries plenty of time to contract-grow the required number of plants. It is recommended that planting is carried out in one planting season.

SET OUT AND PLANT
Set out plant sites according to the indicative plant plan by using colour coded dazzle. Spot spray rank grass 1m around each planting site using a 'z' pattern (if necessary). Seedlings should be planted in a hole that is twice the size of the root ball and at a base-of-stem depth of 20-50mm below the soil surface (this will help direct water to the roots when it rains). Install combi guards (including felt collar) to each plant at time of planting.

MAINTENANCE

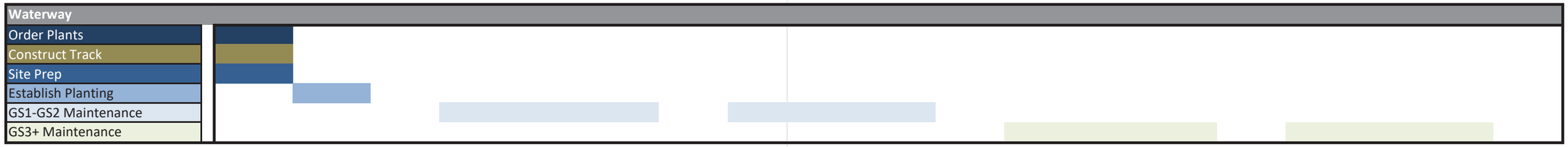
GROWING SEASONS (GS) 1 & 2
Maintenance will include monthly visits from a contractor during Oct - March to spot spray weeds, monitor and replace dead plants, and monitor rabbits. A growing season is considered to be the period between the last frost in Spring and the first frost in Autumn.

GROWING SEASONS (GS) 3 & THEREAFTER
Maintenance will begin to taper as plants become established and weeds are less likely to strangle plants. Management of planting within Lot 101 of the POS-W1 is to be handed over to QLDC at the end of the second growing season. Maintenance during the third to fifth growing season will include bi-monthly visits to spot spray weeds, monitor and replace dead plants and monitor/control rabbits. Following that, maintenance will taper to twice per year and finally once per year to monitor weeds.

INDICATIVE PROGRAMME

Table NOT revised for 21/01/21 revision

2017/18	2018	2018	2018	2018/19	2019	2019	2019	2019/20	2020	2020	2020	2020/21	2021	2021	2021	2021/22	2022	2022
summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter
GROWING SEASON			GROWING SEASON				GROWING SEASON				GROWING SEASON				GROWING SEASON			
	PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON	



POS-W1 | WATERWAY

INDICATIVE PLANT SCHEDULE

Code	Botanical Name	Common Name	Grade	Spacing	Quantity
Au r	Austroderia richardii	toetoe	DRT	1500	160
Ca bu	Carex buchananii	buchanans sedge	DRT	700	223
Ca pe	Carmichaelia petriei	native broom	DRT	1500	76
Ca s	Carex secta	pukoi	DRT	900	138
Ca si	Carex sinclairii	sinclair's sedge	DRT	700	223
Ch ru	Chionochloa rubra	red tussock	DRT	1000	486
Co a	Cordyline australis	cabbage tree	DRT	3000	10
Co c	Coprosma crassifolia	thick-leaved mikimiki	DRT	1500	76
Co p	Coprosma propinqua	coprosma	DRT	1500	160
Co ru	Coprosma rugosa	coprosma	DRT	1500	160
Co v	Coprosma virescens	taupata	DRT	1500	160
Di t	Discaria toumatou	matagouri	DRT	1500	76
Ha bi	Halocarpus bidwillii	bog pine	DRT	1500	76
He s	Hebe salicifolia	koromiko	DRT	3000	76
Ju e	Juncus edgariae	wiwi	DRT	900	138
Le cu	Leonohebe cupressoides	Fragrant hebe	DRT	1500	76
Le s	Leptospermum scoparium	manuka	DRT	1500	18
Ol bu	Olearia bullata	Olearia bullata	PB5	1500	84
Ol l	Olearia lineata	tree daisy	DRT	3000	18
Ol od	Olearia odorata	scented tree daisy	DRT	3000	19
Ph al	Phyllocladus alpinus	mountain toatoa	DRT	3000	10
Ph t	Phormium tenax	harakeke	DRT	1500	84
Pi t	Pittosporum tenuifolium	kohuhu	DRT	1500	76
So m	Sophora microphylla	kowhai	DRT	3000	10
					2633

NOTE:

Spacings are shown in milimeters

DRT = Deep Root Trainer grade. Similar size plants come in other grade descriptions such as RX90, V150/V130 or 285cc/310cc, depending on availability. These grades are also acceptable.

BR = Bare Root Stock - also known as Open Ground (OG) stock.

INDICATIVE COSTS (SCHEDULE)

Estimate of costs: Waterway (POS W1)	qty	unit	rate	Site prep + ordering	Plant establishment	GS1 Maintenance	GS2 Maintenance	GS3+ Maintenance by primary land owner*	GS3+ Maintenance by QLDC*
Total POS area	**0.7737**	**ha**							
Total planting area	0.343	ha							
Total grass area	0.4307	ha							
Total area of POS W1 to be vested in QLDC (39.35% of total area)	0.3042	ha							
Pre-plant weed spraying (monthly Oct - April)	0.7737	ha	$ 500.00	$ 2,321					
Tree felling and mulching^^	12	ea	$ 115.00	$ 1,380					
Rabbit + stock fencing (15m either side of waterway)	738	lm	$ 19.00	$ 14,022					
Ongoing rabbit control (monitoring and poisoning)	0.343	ha	$ 420.00			$ 144	$ 144	$144	
DRT Plant supply (50% to order, 50% when delivered)	2633	ea	$ 3.30	$ 4,344	$ 4,344				
Planting and setout	2633	ea	$ 3.30		$ 8,689				
Wool mulch collars	2633	ea	$ 2.00		$ 5,266				
GS1-GS2 Maintenance^ (includes mowing grass in fenced area)	1	year	$ 2,005.59			$ 2,006	$ 2,006		
GS3+ Maintenance~ (includes mowing grass in fenced area)	1	year	$ 1,763.35					$1,069	$694
Total				**$ 22,068**	**$ 18,299**	**$ 2,150**	**$ 2,150**	**$1,214**	**$694**
Total per hectare				$ 28,522	$ 53,351	$ 2,778	$ 2,778	$ 2,585	$ 2,281
Total per m2				$ 2.85	$ 5.34	$ 0.28	$ 0.28	$ 0.26	$ 0.23

All figures are GST exclusive

All costs and figures are indicative only and are subject to refinement

GS = Growing Season

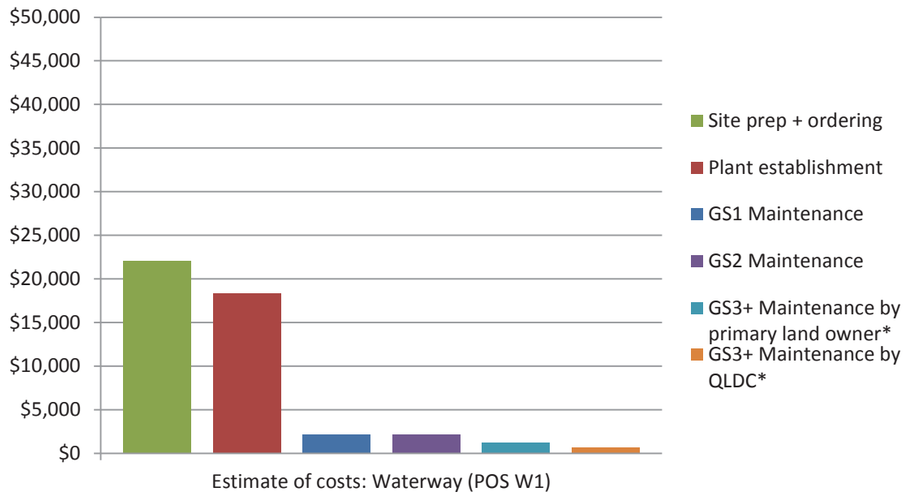
*GS3+ costs shown are an average per year for ongoing maintenance (expected to taper)

^^ worked out at 2hrs labour @$55/hr per tree

^worked out as 5% of (total cost to plant less cost of mulch collars) + $1400 per year for mowing grass. Includes herbicide spray and plant replacement

~worked out as 3% of (total cost to plant less cost of mulch collars) + $1400 per year for mowing grass. Includes herbicide spray and plant replacement

INDICATIVE COSTS (GRAPH)



RPS | ROADSIDE PLANTING STRIP

VISION

A 6m strip of land beside McDonnell Road at the north western-most corner of the site is presently on the edge of pasture lands but will one day exist between the road and new residential development. The long term enhancement goal for this strip is to establish native planting that will contribute to softening and blending the proposed residential development with the wider area.

LOCATION PLAN

Photograph of the existing roadside

REVEGETATION STRATEGY

ROADSIDE PLANTING

Coprosma crassifolia | Thick-Leaved Coprosma
Corokia cotoneaster |Wire-Netting Bush
Coprosma virescens | Green Coprosma
Olearia odorata | Scented Tree Daisy
Phormium cookianum |Mountain Flax
Pittosporum eugenoides | Lemonwood
Pittosporum tenuifolium | Kohuhu

RPS | ROADSIDE PLANTING STRIP

SITE PREPARATION

CLEARING WEEDS
The roadside is presently infested with broom seedlings and rank grass which will require spraying prior to planting.

RABBIT EXCLUSION
Rabbit netting may be applied to the existing roadside boundary fence, although it is proposed that plants are also protected from rabbits using individual combi guards around each plant. Rabbit control will be dealt with through rabbit eradication programmes in other POS areas.

REVEGETATION

ORDER PLANTS
Plants could take up to 18 months to grow from seed to a size that can be planted out, so it's important to give nurseries plenty of time to contract-grow the required number of plants. It is recommended that planting during one planting season.

SET OUT AND PLANT
Set out plant sites by using colour coded dazzle. Spot spray rank grass 1m around each planting site using a 'z' pattern (if necessary). Seedlings should be planted in a hole that is twice the size of the root ball and at a base-of-stem depth of 20-50mm below the soil surface (this will help direct water to the roots when it rains). Install combi guards (including felt collar) to each plant at time of planting.

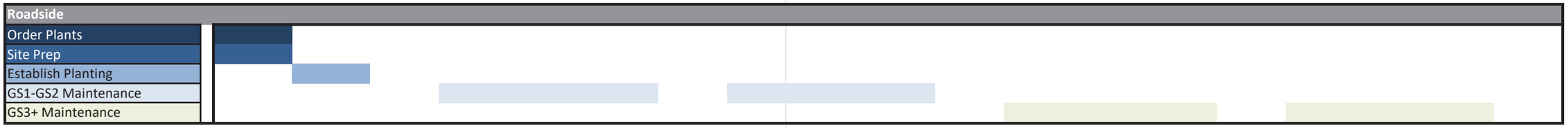
MAINTENANCE

GROWING SEASONS (GS) 1 & 2
Maintenance will include monthly visits from a contractor during Oct - March to spot spray weeds, monitor and replace dead plants and monitor rabbits.

GROWING SEASONS (GS) 3 & THEREAFTER
Maintenance will begin to taper as plants become established and weeds are less likely to strangle plants. Residents will take over maintenance of the planting on their own lots following the second growing season. Maintenance during the third to fifth growing season will include bi-monthly visits to spot spray weeds, monitor and replace dead plants and monitor/control rabbits. Following that, maintenance will taper to twice per year and finally once per year to monitor weeds.

INDICATIVE PROGRAMME

2017/18	2018	2018	2018	2018/19	2019	2019	2019	2019/20	2020	2020	2020	2020/21	2021	2021	2021	2021/22	2022	2022
summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter	spring	summer	autumn	winter
GROWING SEASON			GROWING SEASON				GROWING SEASON				GROWING SEASON				GROWING SEASON			
	PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON		PLANTING SEASON	



RPS | ROADSIDE PLANTING STRIP

INDICATIVE PLANT SCHEDULE

Code	Botanical Name	Common Name	Grade	Spacing	Quantity
Co c	Coprosma crassifolia	thick-leaved mikimiki	PB3	1500	101
Co co	Corokia cotoneaster	korokio	PB3	1500	101
Co v	Coprosma virescens	taupata	PB3	1500	101
Ol od	Olearia odorata	scented tree daisy	PB3	3000	25
Ph c	Phormium cookianum	mountain flax	PB3	1500	101
Pi eu	Pittosporum eugeniodes	lemonwood	PB3	3000	25
Pi t	Pittosporum tenuifolium	kohuhu	PB3	1500	25
					479

NOTE:

Spacings are shown in milimeters

PB3 = Plant Bag size 3, same as 2L pot size

INDICATIVE COSTS (SCHEDULE)

Estimate of costs: Roadside (RPS)	qty	unit	rate	Site prep + ordering	Plant establishment	GS1 Maintenance	GS2 Maintenance	GS3+ Maintenance by each resident*
Total POS area (all planting)	**0.0726**	**ha**						
Total area as part of residential Lots (100% of POS area)	0.0726	ha						
Pre-plant weed spraying (monthly Oct - April)	0.0726	ha	$ 1,000.00	$ 436				
PB3 Plant supply (50% to order, 50% when delivered)	479	ea	$ 5.50	$ 1,317	$ 1,317			
Planting and setout	479	ea	$ 5.50		$ 2,635			
Combi Guards^^	479	ea	$ 3.00		$ 1,437			
GS1-GS2 Maintenance	1	year	$ 191.60			$ 192	$ 192	
GS3+ Maintenance	1	year	$ 114.96					$ 23
Total				**$ 1,753**	**$ 5,389**	**$ 192**	**$ 192**	**$ 23**
Total per hectare				$ 24,144	$ 74,225	$ 2,639	$ 2,639	$ 1,583
Total per m2				$ 2.41	$ 7.42	$ 0.26	$ 0.26	$ 0.16

Notes and Assumptions:

All figures are GST exclusive

All costs and figures are indicative only and are subject to refinement

GS = Growing Season

PB3 grade plants are specified on the roadside strip to speed establishment

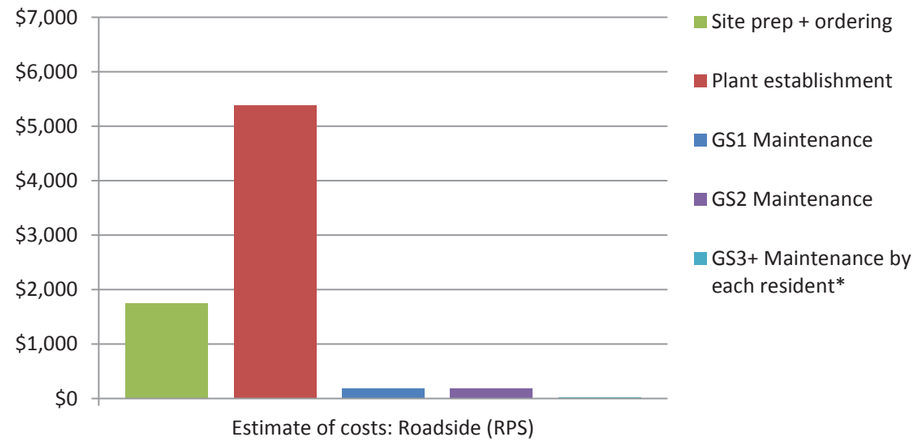
*GS3+ costs shown are an average per year for ongoing maintenance (expected to taper)

^worked out as 5% of (total cost to plant less cost of combi guards). Includes herbicide spray and plant replacem

~worked out as 3% of (total cost to plant less cost of combi guards), Includes herbicide spray and plant replacem

^^Combi guards provide rabbit and weed protection in the absence of a rabbit exclusion fence

INDICATIVE COSTS (GRAPH)



SUMMARY

TOTAL PLANT SCHEDULE

Code	Botanical Name	Common Name	Grade	Spacing	Quantity
Ac 'AB'	Acer 'Autumn Blaze'	autumn blaze maple	BR	as shown	7
Ar s	Aristotelia serrata	wineberry	DRT	3000	143
Au r	Austroderia richardii	toetoe	DRT	1500	468
Ca bu	Carex buchananii	buchanans sedge	DRT	700	3559
Ca pe	Carmichaelia petriei	native broom	DRT	1500	813
Ca s	Carex secta	pukoi	DRT	900	138
Ca si	Carex sinclairii	sinclair's sedge	DRT	700	223
Ch ri	Chionochloa rigida	snow tussock	DRT	900	910
Ch ru	Chionochloa rubra	red tussock	DRT	1000	1830
Co a	Cordyline australis	cabbage tree	DRT	3000	229
Co c	Coprosma crassifolia	thick-leaved mikimiki	DRT	1500	320
Co co	Corokia cotoneaster	korokio	DRT	1500	177
Co p	Coprosma propinqua	coprosma	DRT	1500	569
Co ri	Coprosma rigida	mingimingi	DRT	1500	572
Co ru	Coprosma rugosa	coprosma	DRT	1500	569
Co v	Coprosma virescens	taupata	DRT	1500	833
Di t	Discaria toumatou	matagouri	DRT	1500	749
Fe nz	Festuca novae-zelandiae	tawny tussock	DRT	700	64
Fr a 'R'	Fraxinus angustifolia 'Raywoodii'	claret ash	BR	as shown	14
Fu f	Fuscospora fusca	red beech	DRT	3000	143
Fu s	Fuscospora solandri	black beech	DRT	3000	143
Gr l	Griselinia littoralis	kapuka/broadleaf	DRT	3000	673
Ha bi	Halocarpus bidwillii	bog pine	DRT	1500	76
He s	Hebe salicifolia	koromiko	DRT	3000	152
Ju e	Juncus edgariae	wiwi	DRT	900	138
Le cu	Leonohebe cupressoides	Fragrant hebe	DRT	1500	380
Le s	Leptospermum scoparium	manuka	DRT	1500	237
Me a	Melicytus alpinus	porcupine shrub	DRT	800	244
My a	Myrsine australis	Matapo	DRT	1500	101
Ol a	Olearia arborescens	tree daisy	DRT	3000	25
Ol bu	Olearia bullata	Olearia bullata	PB5	1500	553
Ol fr	Olearia fragrantissima	fragrant tree daisy	DRT	3000	76
Ol l	Olearia lineata	tree daisy	DRT	3000	94
Ol od	Olearia odorata	scented tree daisy	DRT	3000	187
Oz l	Ozothamnus leptophyllus	cottonwood	DRT	1500	304
Ph al	Phyllocladus alpinus	mountain toatoa	DRT	3000	229
Ph c	Phormium cookianum	mountain flax	DRT/PB5	1500	986/96
Ph t	Phormium tenax	harakeke	DRT	1500	84
Pi eu	Pittosporum eugeniodes	lemonwood	DRT	3000	193
Pi t	Pittosporum tenuifolium	kohuhu	DRT/PB5	1500	577/96
Pl r	Plagianthus regius	ribbonwood	DRT/1.2m	3000	103/40
Po c	Poa cita	silver tussock	DRT	700	1832
Qu r 'F'	Quercus robur 'Fastigiata'	upright oak	BR	as shown	7
So m	Sophora microphylla	kowhai	DRT	3000	343
Ti c	Tilia cordata	small leaved lime	BR	as shown	24
					20399

NOTE:

Spacings are shown in milimeters

DRT = Deep Root Trainer grade. Similar size plants come in other grade descriptions such as RX90, V150/V130 or 285cc/310cc, depending on availability. These grades are also acceptable.

BR = Bare Root Stock - also known as Open Ground (OG) stock.

TOTAL COST ESTIMATE

			Arrowsouth Properties Ltd	
Private Open Space (POS)	**Rate***	**Unit**	**Area**	**Est Cost***
Escarpment (POS E1, E2, E3)	$ 84,531	ha	2.353	$ 198,903
Outcrop (POS E5, E6)	$ 91,086	ha	0.2265	$ 20,631
Waterway (POS W1, W2, W3)	$ 87,430	ha	0.7737	$ 67,644
Pastures (POS P1, P2, P3)	$ 6,239	ha	2.889	$ 18,023
Roadside (RPS)	$ 103,647	ha	0.0726	$ 7,525
Total		**ha**	**6.3148**	**$ 312,726**

Notes and Assumptions:

* Rates and estimated costs are indicative only and GST exclusive. They are based on a more detailed preliminary costing for POS areas on Arrowsouth Properties Ltd land and include site prep, fence construction, rabbit control, revegetation and maintenance for the first two growing seasons.

rough & milne landscape architects