ENVIRONMENTAL URBAN DESIGN AND LANDSCAPE MASTERPLAN
CHRISTCHURCH SOUTHERN MOTORWAY

MAY 2010

Fulton Hogan

NZ TRANSPORT AGENCY
WAKA KOTAHI

Beca

DESIGN STATEMENT

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DESIGN STATEMENT

1.0

1.1 DESIGN STATEMENT

LANDSCAPE AND URBAN DESIGN VISION

The design vision is to provide an environment that supports the green, leafy “Garden City” image that Christchurch City aspires to.

This concept has legacy in mind. The long-term vision is a grand parkway with road and cycleways passing through stands of mature canopy trees that display seasonal change and offer a scale that can be enjoyed by all modes of travel.

A Landscape and Urban Design Masterplan (LUDM) was prepared by Jasmax Architects in the tender stage (November 2009), describing the design vision and concept for the Christchurch Southern Motorway. This Environmental Urban Design and Landscape Masterplan (EUDLM) has been developed from the Jasmax Tender LUDM and in coordination with a range of disciplines including:

- Landscape architecture
- Urban design
- Architecture
- Art
- Ecology
- Various design engineering disciplines
- Planning
- Roading contractors

Christchurch Southern Motorway occupies a mixed greenfield and brownfield site that will connect urban with peri-urban and rural areas. Future land uses that are planned to abut the infrastructure will bring pressures that need to be addressed from the outset to ensure CSM is a good neighbour.

Considerations to ensure this project is integrated successfully into the fabric of the city have included:

- Identification of existing landscape and urban qualities that characterise the site. The development of a methodology to preserve and enhance them
- Developing an understanding of how navigation through the network can be more readily understood and made legible
- Integration of the new corridor into connections at both ends and local roads
- Prioritisation of pedestrian and cycle movement along and across the corridor for an overall gain in connectivity
- Identification and protection of valued view shafts by integrating them into the design
- Identification of areas where visual screening is required now and in the future
- Identification of affected areas to propose appropriate treatments for screening, improved amenity and noise attenuation
- Development of a visual and thematic continuity with other sections of the state highway and local road network
- Delivery of an environment that is safe and comfortable for all modes of travel
- Development of a whole of life legacy vision
- Achievement of an aggregate gain in environmental quality for ponds, waterways and terrestrial areas
- Scaling design elements appropriate to various modes of travel

KEY COMPONENTS OF THE PROPOSAL

Specific landscape qualities to be preserved and enhanced:

- Wooded parkland corridor
- Dry grasslands
- Waterways

Key strengths of the project area:

- Views to the Port Hills and Southern Alps from key points
- A long, gently curvilinear alignment that reveals itself gradually
- Potential for a variety of short and long views through plantings

Identification of qualities in the wider landscape that can be used to inform the design of surface finishes:

- The colours and geometry of the Canterbury plains
- The textures of dry browntop grasslands
- The forms of incised mountain ranges
- The patterns of abandoned braided river channels

Key features that support a potential southern gateway:

- Proximity to the Port Hills
- Elevated views to the Southern Alps
- Rural land use zoning protects the future phase 2 extension

Key provisions for contributing to art:

- Arts Consultant included in the team to assist delivery
- A strategy for identifying opportunities and delivery options
- Allowance for participative, consultative implementation
- Arts intervention complemented by quality architectural concepts

Figure 1: 3m shared pathway on the CSM duplication section

BACKGROUND AND CURRENT CONDITIONS

2.0

2.1 SCOPE

PRINCIPAL'S REQUIREMENTS

The EUDLM demonstrates good environmental and urban design outcomes with a specific sense of place. It seeks to reflect the values of the surrounding landscape, cultures and community by providing:

- Sensitivity to context, responding to the surrounding settings
- High quality design content, with cohesive and innovative solutions embracing all aspects of design including structures, highway furniture, landforms, storm water and planting
- Consistency in style and character throughout the corridor
- Facilitation of opportunities for art interventions and achieves these within design/construction solutions
- Low maintenance and self sustaining systems
- Noise attenuation solutions compatible with the overall concept
- Incorporation of heritage features
- Integration with adjacent open space network and access routes
- Specific visual screening solutions in relation to existing landfills
- Ecological corridors and environmental gain
- Noise attenuation solutions compatible with the overall concept
- Incorporation of heritage features
- Integration with adjacent open space network and access routes
- Specific visual screening solutions in relation to existing landfills
- Cost-effective solutions through integration of environmental considerations during design, construction and operation stages
- Phased plant growth to achieve a high quality, robust and self-sustaining landscape appropriate to site and local conditions
- Measures to deter graffiti, through plantings and surface finishes

In addition the proposal provides:

- Retention of existing vegetation wherever possible, such as transplanting of the Wilmers Road grassland
- Ecological sourcing of seeds and plant material
- Enhancement of riparian corridors
- Conformity to safety setbacks and clear zones
- Conformity to security clear zone – Hillmorton Hospital Forensic Unit – Appendix K1.12 of the Principal's Requirements

DELIVERABLES

The EUDLM consists of the following:

- Illustrated Landscape / Urban Design Report explaining the design rationale
- Concept plans at 1:2000
- A series of cross sections and perspectives
- Illustration of how walkway / cycleway facilities are included
- Illustration of materials and architectural solutions for surface finishes including retaining walls, subways, bridges, abutments, safety barriers, noise attenuation
- Schedules of plantings and grassing
- Description of how artwork will be provided

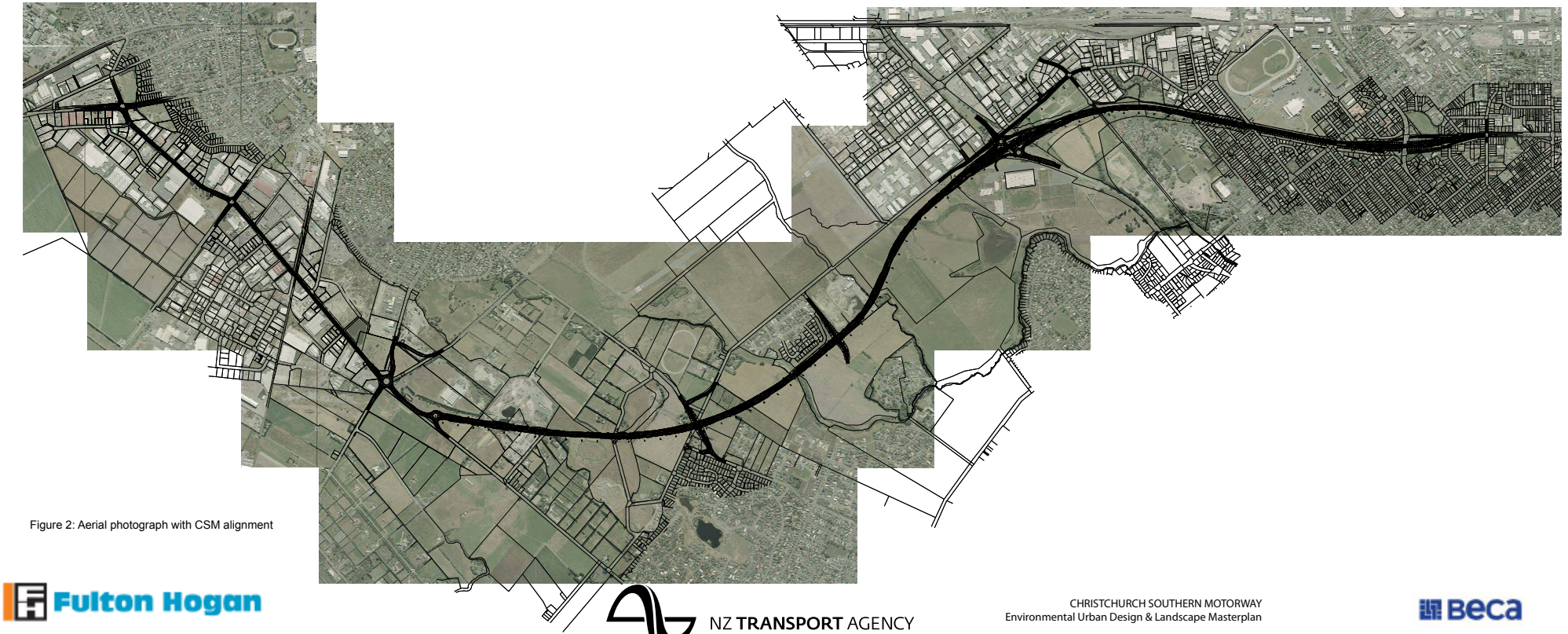


Figure 2: Aerial photograph with CSM alignment

DESIGNATION CONDITIONS

This framework demonstrates the proposals which respond specifically to requirements set out in:

- CCC CSM Designation Condition 7 (a-e) – Terrestrial Ecology
- CCC CSM Designation Condition 7& 11 – Halswell Junction Basin Earthworks and Rehabilitation of TCMA's
- CCC CSM Designation Condition 10 – Visual and Landscape Effects and Urban Design

In addition, the following matters form part of the NoR conditions:

- Ecological Recommendations
- Maintenance Manual
- Consultation with Christchurh City Council
- Terrestrial Ecology

CCC Designation Conditions (a-e) require a transplant strategy for rare and endangered native grassland species and areas of native riparian species. The native plant translocation strategy has been developed by EOS Ecology and is included in Apppendix 4.1. The strategy is set out to satisfy the conditions of consent and allow construction works around the Owaka ponds to proceed in advance of other transplant sites.

As outlined in the Principles Requirements A16.5.2.10 Planting, CCC CSM Designation Condition 7 Dr Colin Meurk of Landcare Research will be responsible for the transplant strategy, site assessment and management of the transplant process.

VISUAL AND LANDSCAPE EFFECTS AND URBAN DESIGN IDENTIFIED EFFCETS SUMMARY

NoR Condition 10 requires the the urban and landscape design be established in general accordance with the Landscape and Urban Design Report (2008) and landscape and urban design concept plans in the Assessment of Environmental Effects. Landscape and visual effects anticipated in the report were:

Upgrade section (Halswell Junction Road between Main South Road and Springs Road).

- minor landscape and visual effects

Greenfield section (Springs Road to Curletts Road)

- change from semi-rural land to a built character, with associated long, linear strip of motorway;

Duplication section (Curletts to Barrington Street)

- larger extent of road surface, introduction of new structures and removal of trees adjacent to the corridor.

Design Response

The EUDLM identifies the potential for positive improvements to the Greenfield section of the CSM, including capturing panoramic views for motorists, providing pedestrian and cycle links along the corridor, and linking these paths to public open spaces adjoining it. The EUDLM responds by providing a sequence of 'open' and 'contained' landscape treatments that included an open grassland area between Springs Road and Aidanfield Road (south side).

Halswell Junction Basin

Consent Conditions 7 and 11 requires a landscape plan be developed for the affected part of the site in consultation with CCC. Furthermore the plant species selection shall be consistent with the existing planting associated with the Halswell Junction basin margins. A landscape plan for the affected area will be developed in consultation with CCC during the detailed design phase.

Ecological Recommendations

In addition to the Terrestrial Ecology consent conditions the ecology design philosophy recommendations include:

Keep exotic deciduous species clear of waterway areas (ephemeral channels and permanently flowing waterways) to mitigate potential effects of leaf fall including channel blockage and reduction of dissolved oxygen levels on fish and invertebrates.

Retain where possible the existing marsh cress and associated species along the existing Heathcote River margins and design the planting of other native riparian species to not out compete the marsh cress.

Maintenance Manual

A maintenance manual will be developed during the detailed design phase and will be developed in consultation with CCC and approved by NZTA. It will form part of the Contractor's Environmental Management Plan and will address:

- Ongoing successional planting
- Annual care of plants including the replacement of any diseased or dying plants
- Specific managemment tasks required to achieve the visual outcomes intended;
- Regular application of fertiliser and re-mulching of planted areas;
- Mowing regimes and safe access points for maintenance;
- Spraying requirements;
- The control and removal of litter and grafitti; and
- Programme of works and draft budget for maintenance under the network management plan.

REFERENCES

We have read, understood and referred to the following:

- A7.3.5 of the PR's relating to the Tender Submission Report
- A12 of the PR's relating to Shared Paths / Footpaths / Cycleways
- A13 of the PR's relating to Safety Barriers
- A14 of the PR's regarding Noise Requirements
- A15 of the PR's regarding Fencing and Gates
- A16 of the PR's regarding Environmental and Urban Design
- Landscape and Urban Design Report, February 2008 (NOR AEE, Vol 2, App 11)
- CCC CSM Designation Condition 10 - Visual and Landscape Effects and Urban Design
- Landscape Concept Plans (SD Report, Vol 2, Sheets LS01 – LS30)
- Christchurch City South West Area Plan, April 2009
- NZTA Manual SP/M/020 Guidelines for Highway Landscaping, Ver 2
- Christchurch Southern Motorway Landscape and Urban Design Report, Feb 2008. OPUS
- NZTA Urban Design Policy
- MfE Urban Design Protocol, March 2005
- Ministry of Justice National Guidelines for Crime Prevention through Environmental Design in New Zealand, Nov 2005
- Indigenous Ecosystems of Otautahi Christchurch, Set 1. Lucas Associates

2.2 REGIONAL CONTEXT

THE LANGUAGE OF THE NETWORK

The CSM is part of the greater state highway network that adjoins SH1 at the western end and Brougham Street at the eastern end. At these tie-in's, the transitions will consider the quality and character of the journey preceding it to ensure a journey that is the best contextual fit.

The CSM project also interfaces with several local roads along its length. Ties-ins at these intersections will need to align with CCC aspirations for these streets, which will be coordinated in detail at post-tender stage.

This approach will ensure that CSM enhances the continuity of the existing network. This will achieve better experiences for drivers and local inhabitants with benefits for navigation, clarity of movement and the quality of the urban environment.

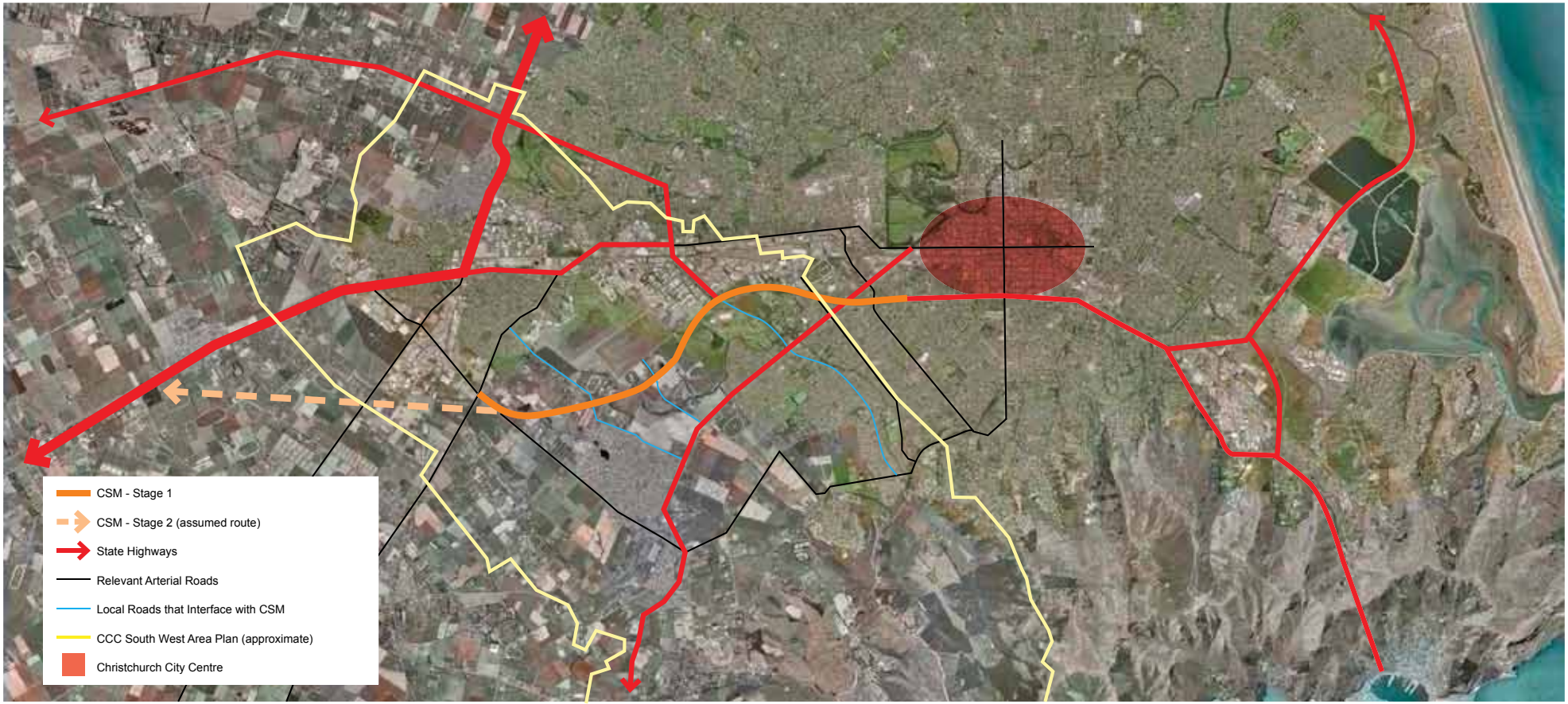


Figure 3: The regional land use and network setting of the Christchurch Southern Motorway project

WESTERN ENTRY: MAIN SOUTH ROAD – SH1

Approximately 650m of industrial land south of the SH1 / Halswell Junction Road intersection is a continuation of the character of Halswell Junction Road. To the south of the Christchurch urban area SH1 is a two-lane road through small rural lifestyle blocks and the commercial centre of Templeton, at which point the posted road speed is reduced from 100kmh to 70kmh. Views of the Port Hills along this section are obscured by shelterbelts, bunds and houses.

Halswell Junction Road between Shands Road and Springs Road is surrounded by industrial uses such as factories and container storage. Irregularly distributed large-format buildings are often set far back from the road, resulting in a lack of containment and a poor quality street edge.

Cycle movements along Halswell Junction Road are confined to the few courageous riders willing to brave the heavy traffic and 70kmh speed limits. There is limited opportunity to improve this environment within the current scope of this project.

Halswell Junction Road is lined up on views to the Port Hills and specifically on Halswell Valley which is flanked by Cass Peak and Coopers Knob. It is this experience that provides the first up close experience of the Port Hills for travellers entering Christchurch from the south.

This project considers Halswell Junction Road as a temporary entrance until the Phase 2 Extension is delivered.

Phase 2 extension is a future link that will continue CSM westward from Springs Road to emerge onto SH1 west of Templeton. It is here that the real opportunity is available to develop a southern gateway for Christchurch. The South West Area Plan proposes additional industrial land uses in the area, which could potentially present an unattractive entrance with large format buildings turning their backs onto the motorway.

A wide designated land area for planting and enforced building setbacks would assist the continuation of the semi-rural character and provide a more gentle and controlled transition into urban Christchurch.

The execution of landscaping and planting for the stage 2 extension should pay attention to achieving a ‘gateway’ experience that can be recognised in both east- and west-bound travel directions. The planting strategy in particular should create a progressive transition between the semi-urban environment and the rural environment.

EASTERN ENTRY: BROUGHAM STREET – SH73

Brougham Street is a 4 lane arterial with predominantly medium density residential land uses each side and residential side streets at close intervals. Signalised intersections at Colombo, Strickland and Selwyn Streets result in a stop-start movement pattern that is typical of busy arterial routes. Brougham Street experiences heavy traffic volumes at peak travel times, which is confined to a posted 50kmh speed limit.

A bend in the road between Strickland Street and Selwyn Street removes any opportunity to gain long views of the proposed Barrington Street overpass, the first structure along this route and the beginning of the 100kmh zone and the motorway environment.

A central planted median and contributions from the private realm provide a reasonable level of planted amenity to the Brougham Street streetscape. These are supported by several green open spaces between Colombo Street and the project area including Addington Reserve at the corner of Whiteleigh Street and Jerold Street.

Sidewalks to either side accommodate pedestrians only. Cyclists need to use the road shoulder to commute along this route, and it is not an attractive road for cycling. Alternative side roads would provide a safer, though possibly less direct route to connect with the 3m wide CSM shared path.

Figure 4: CSM Western Entry with Stage 2

Figure 5: Existing conditions - Halswell Junction Road looking east, showing view of the Port Hills

Figure 6: Photo - CSM Eastern Entry

2.3 LANDSCAPE CONTEXT

VIEWS AND VISUAL SCREENING

Views to the Port Hills from CSM are imposing and make a significant contribution to the journey along this alignment. The hills act as navigation markers for the traveller entering CSM from the west and a visual reference by which to judge travel through the wider landscape.

View to the Southern Alps are available from elevated sections including the duplication and Curletts Road Overpass.

Subsequent development of stage 2 will create further landscape views towards the west, with a particular focus on the long-distance relationship towards the Southern Alps as they disappear towards the horizon.

It is also notable that there are several situations where adjacent land uses offer very poor visual amenity. The most significant of these are the landfill areas immediately east of Halswell Junction Road, which closely relate to the area which will effectively form a gateway to Christchurch.

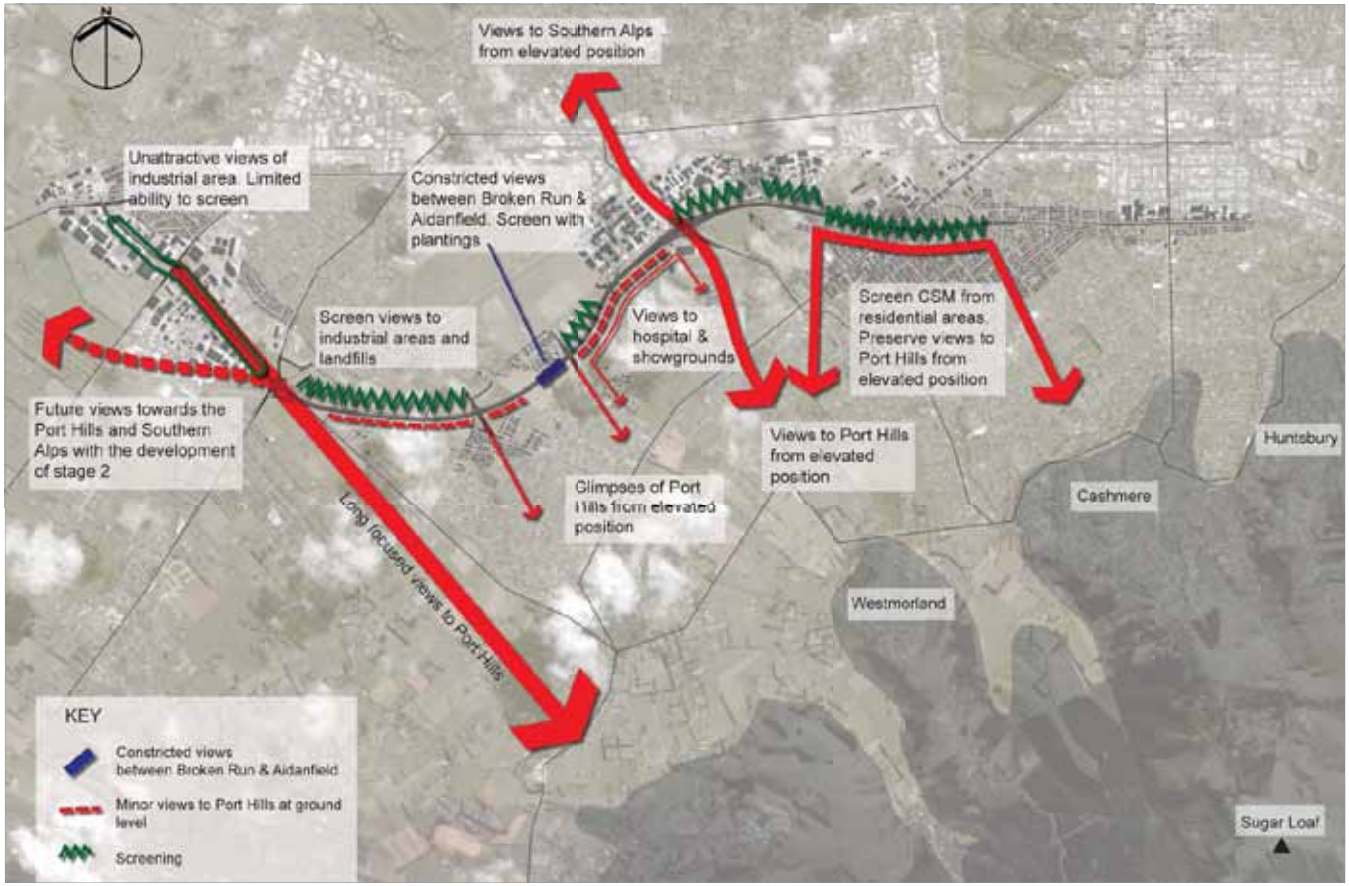


Figure 7: Diagram of existing landscape and urban views from within the motorway corridor

Figure 8: View of the Port Hills from Halswell Road near Springs Road intersection

Figure 9: View of the Port Hills at Curletts Road

Figure 10: Landfill E2 near Halswell Junction Road which will need to be visually screened from the corridor

SOILS

The site sits atop gravel outwash plains of varying ages and texture. Primarily Selwyn soils (Tussock young plains ecosystem) and Waimakariri & Kaiapoi soils (Houhere & Totara mid older plains ecosystem) with small pockets of Tai Tapu soils (Kahikatea lush older plains ecosystem).

The soils are thin and vary in their ability to hold soil moisture although all are relatively free draining. However, all have been modified over time through land management, and should be capable of supporting a range of native and exotic species.

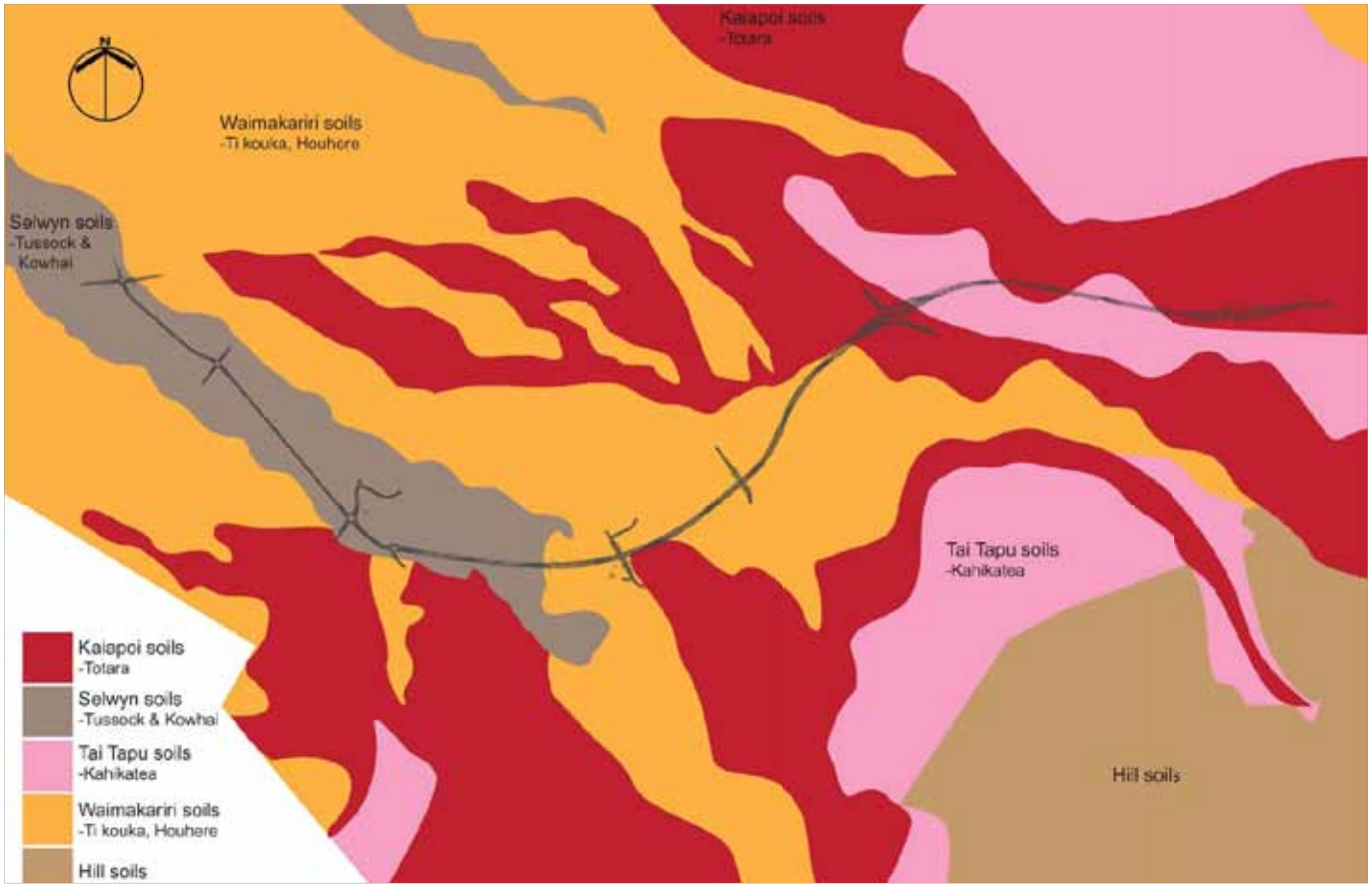


Figure 11: Map of soil types surrounding the motorway corridor

WATERWAYS

The CSM interfaces with several ephemeral and permanent waterways, including parts of the Heathcote River which are protected by provisions for ecological heritage sites under the District Plan.

These will require protection against the overland flow of sediments and nutrients, and an emphasis on provision of local native riparian plantings. This is particularly important as these waterways are part of the upper reaches of the local system, and therefore play an important role in determining the health of downstream ecologies.

The existing conditions in riparian margins vary widely, including relatively natural characters as well as highly managed, engineered drainage channels. It is noted that there are opportunities to return some of the more engineered conditions to a more natural state as part of the CSM project works.

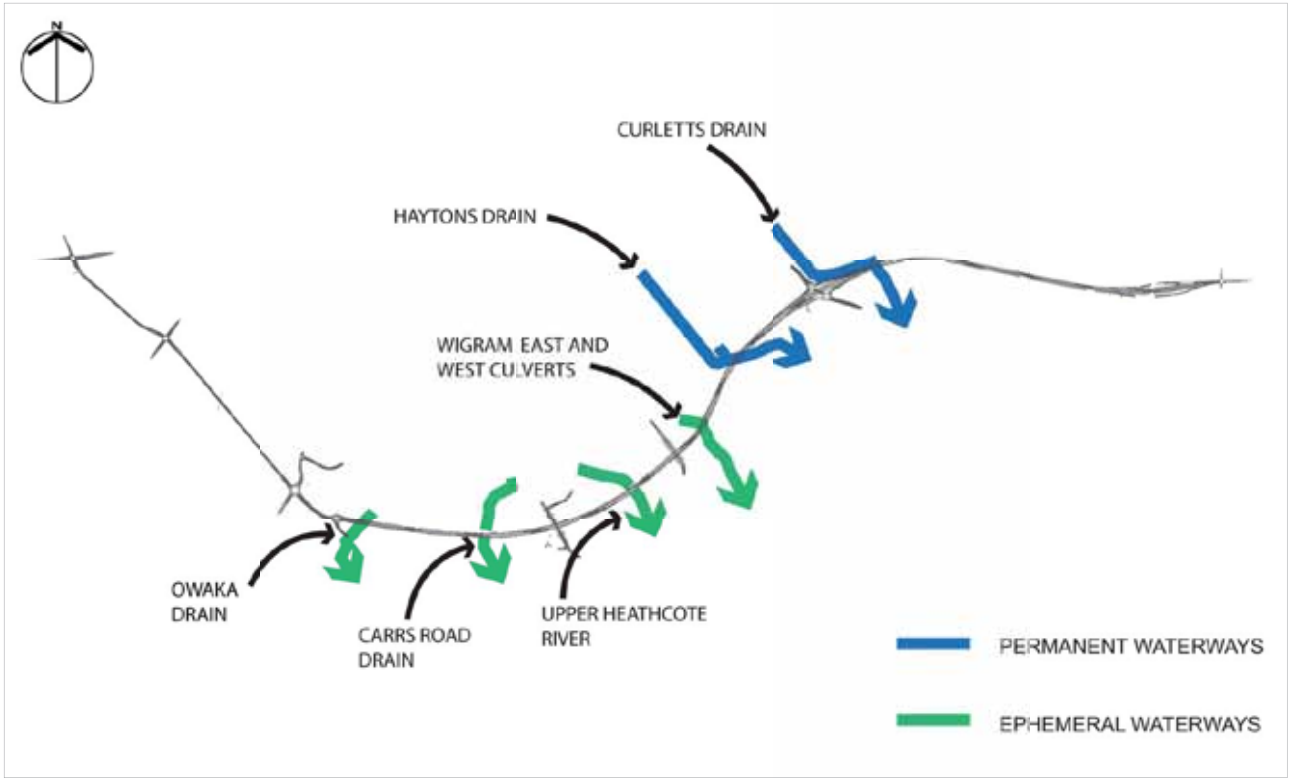


Figure 12: Map of waterways relating to the motorway corridor

Figure 13: Existing conditions around the Upper Heathcote River

Figure 14: Existing conditions at Hayton's Drain

Figure 15: Existing conditions at Curletts Drain

VEGETATION

Existing vegetation includes mature woodland plantings scattered between Barrington Street and Curletts Road. These are especially prevalent at Addington Park and between Hillmorton Hospital and Wrights Road. Borrowed views to mature woodland plantings in Marylands Reserve support a park-like environment in the eastern third of the project. These plantings will be retained wherever possible.

Dry young plains soils and the relatively dry climate support a narrow range of plantings and favours some hardy natives that are able to establish. Waterways crossing the alignment provide opportunities to signal the presence of water through plantings.

Between Curletts Road and Springs Road the plantings are predominantly shelterbelts, representative of the typical rural patterns found on the Canterbury Plains.

Between Springs Road and SH1, plantings are limited to variable tree specimens in landscape setbacks.

At the intersection of Wilmers Road and Springs Road is an area of grassland with high ecological value, protected under CCC District Plan clause 15.06 - Danthonia grassland.

Figure 17: Aerial of Hillmorton / Curletts Road area showing parkland plantings

Figure 16: Rural plantings on Carrs Road

Figure 18: Danthonia, the grass species found near Halswell Junction Road

Figure 19: Lack of vegetation on Halswell Junction Road

2.4 URBAN CONTEXT

The movement networks in a city collectively influence the way a city is understood, experienced and enjoyed by those who use and pass through it. This includes the succession of urban and landscape conditions, its regional setting and the links and sequences that connect central areas to suburban centres and rural environments.

Road networks set the block pattern of cities and they contribute to the permeability and legibility of a place and the well-being of its citizenry, if arranged well. If they are arranged poorly they can divide and disconnect communities and activities.

Successful access through the city requires that an urban design strategy provides the overarching link between disciplines. This will ensure that the urban design vision does not get lost in the technology of delivering movement networks without consideration of the city, its setting, natural assets and urban character.

URBAN DESIGN STRATEGY

A successful urban design strategy will develop solutions that deal predominantly with the functional and spatial relationships among:

- Underlying landforms and geology
- Natural elements, patterns and processes
- Public open spaces and un-built form
- Transport linkages and connections
- Built form and structures
- Current and future land uses

URBAN DESIGN VISION

Cities need a “vision” for their public realm to provide memorable streetscapes, transport corridors and public spaces. This vision will incorporate important concepts such as:

- Character and identity – for legible and memorable places that fit comfortably with the natural and cultural environment
- Continuity – a sense of being part of a wider state highway and local road network
- Sense of arrival and departure – to create a southern gateway for Christchurch
- Connectivity – for improved movement networks for all modes of travel
- Legacy – to provide a framework for future generations
- Safety – for clear sight lines, safe pedestrian routes and a safe driving environment
- Scale – ensuring that big infrastructure can comfortably accommodate all modes of movement

Figure 20: Aerial photograph showing adjacent Industrial Land Uses

Figure 21: Aerial photograph showing adjacent Residential Land Uses

CONTEXT AND CHARACTER

The CSM is a state highway that welcomes visitors to Christchurch at its southern gateway. The mountains, dry grasslands, cultivated paddocks and braided rivers make up the landscape and shape the travelling experience. Travelling through Canterbury presents an array of colours, textures, patterns and forms that can inform the design of elements within the project.

Values that are significant to Tangata Whenua in the CSM area include habitat corridors and waterways, the headwaters of the Heathcote River (Opawaho), nearby archaeological sites and traditional places and sites of significance in the Waka area and Te Heru o Kahukura. Further discussions with local iwi would identify appropriate treatments for these places, and opportunities to reveal them through design and artworks.

The Port Hills also form a significant element of the visual character of this area. The prominence of the hills, and the changing relationship between users of the corridor and the landform creates an enduring reference point and a dynamic experience.

Mature woodland plantings at Hillmorton, Marylands Reserve and Addington Reserve provide a structure to build from and develop a parkland setting for the project that supports the “Garden City” aspiration that Christchurch City promotes.

Figure 22: View of the Port Hills from Halswell Junction Road

Figure 23: Existing conditions at Curletts Road - the beginnings of a parkland character

Figure 25: Example of parkland environment adjacent to roadways

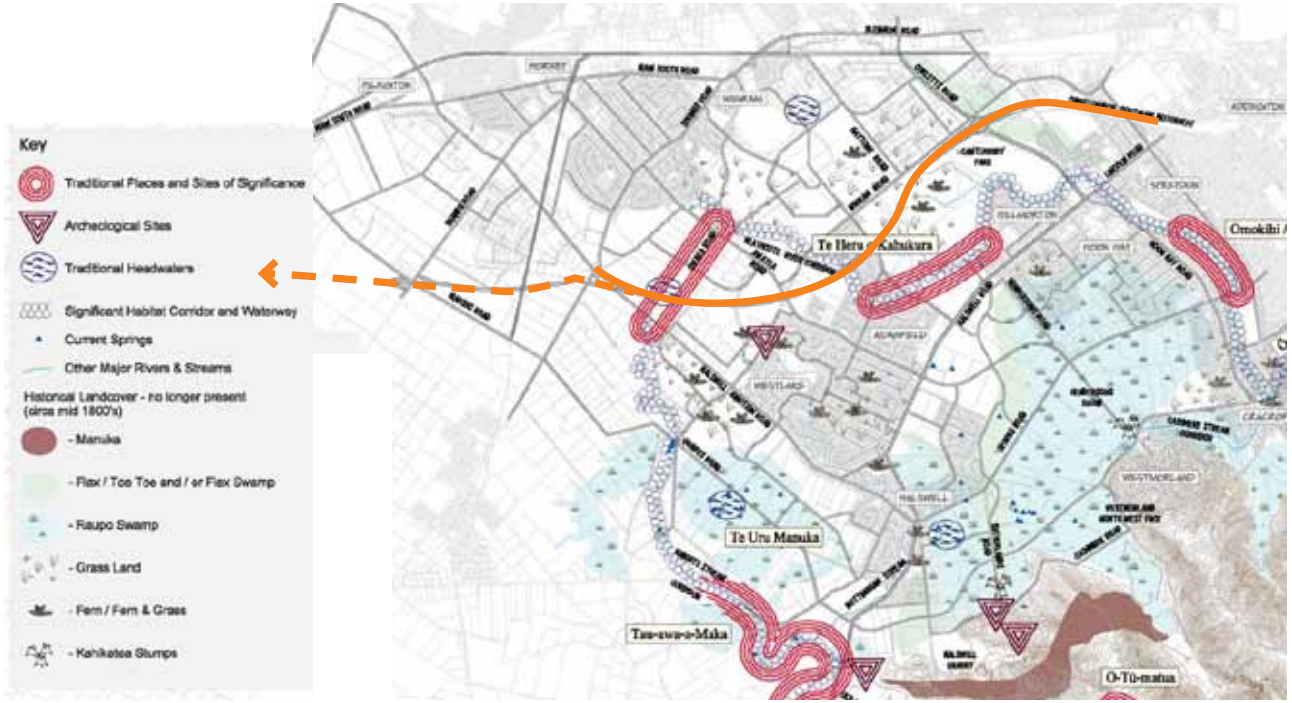


Figure 24: CCC plan 5 [Tangata Whenua values] from the South West Area Plan showing proximity to sites of significance and habitat corridors

LAND USE

Existing land uses around the CSM route include a range of developed urban conditions, as well as land which is vacant or used for a variety of rural functions. This is a significant part of the urban fringe which is expected to undergo large-scale change.

The CCC South-West Area Plan (SWAP) has emerged from an extensive planning process, and directs land use change in the wider locality as part of the city's future growth plan. Urban development will increase adjacent to the CSM, primarily in the form of residential and industrial land uses.

This EUDLM recognises the importance of facilitating and integrating with planned development:

- It is critical that connections into and across the local area are positively formed to stimulate and facilitate development of a positive local street network.
- Solutions for planting will need to accommodate future uses to screen undesirable views and maintain desirable views.

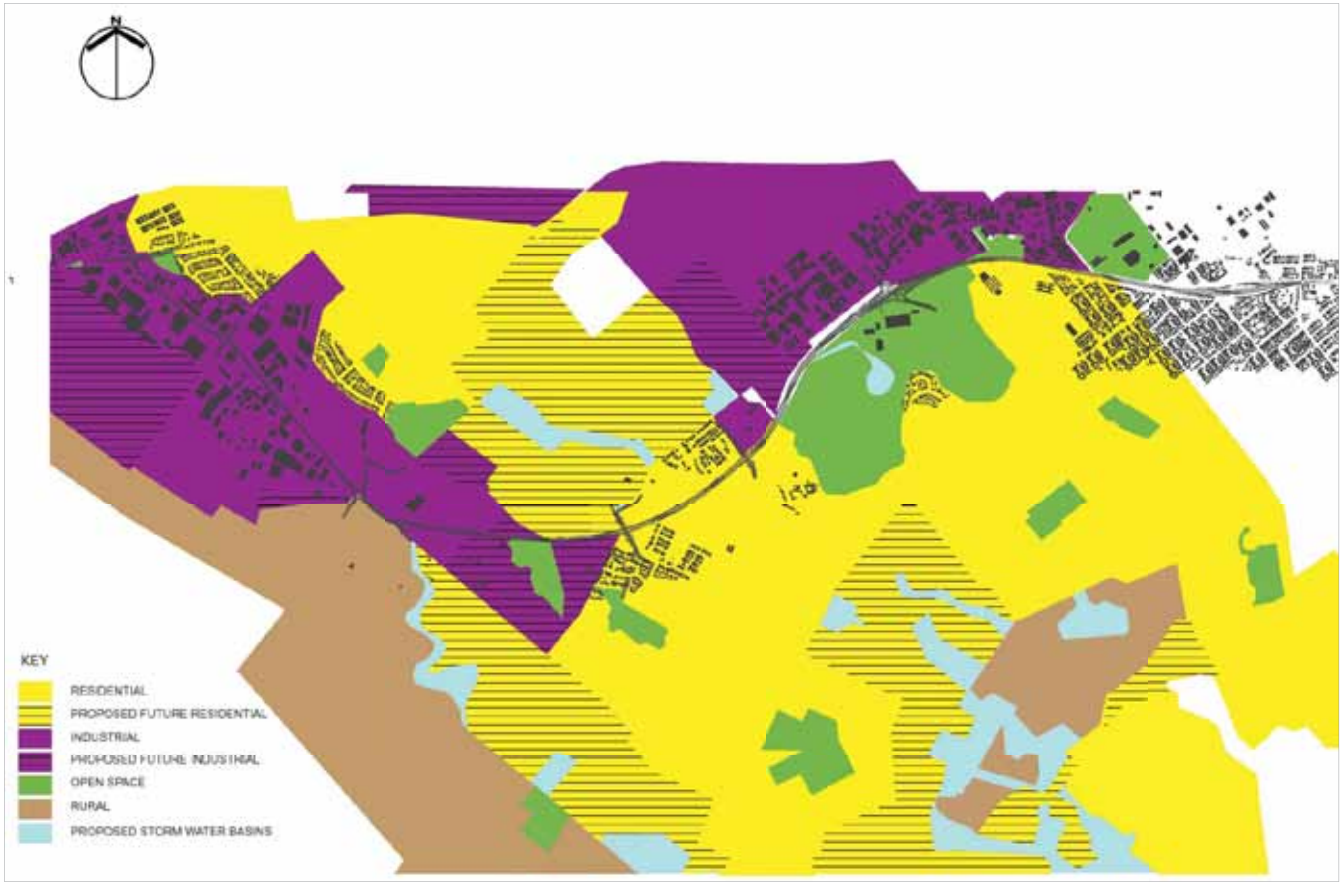


Figure 26: Land use zoning and existing building footprints around the motorway corridor

Figure 27: Existing rural land uses in Halswell

Figure 28: Modern residential development around Westlake

Figure 29: Existing industrial land uses between Springs Road and Shands Road

CONNECTIVITY

Motorway developments can produce negative impacts on local connectivity. It is important to ensure that provision for strategic, high-capacity travel does not restrict other movement patterns. This framework recognises that preceding processes of area and corridor planning have studied and identified how local road connections should be formed.

At this stage it is important to pay attention to the detailed formation of provisions for walking and cycling, building upon the cycling network in the city. This network facilitates reduced vehicle journeys, reduced emissions and a healthy population.

For the CSM, it is important to create quality off-road routes within the corridor. The nature of the connections must be safe and direct, and the forms and finishes of the routes must be attractive to users.

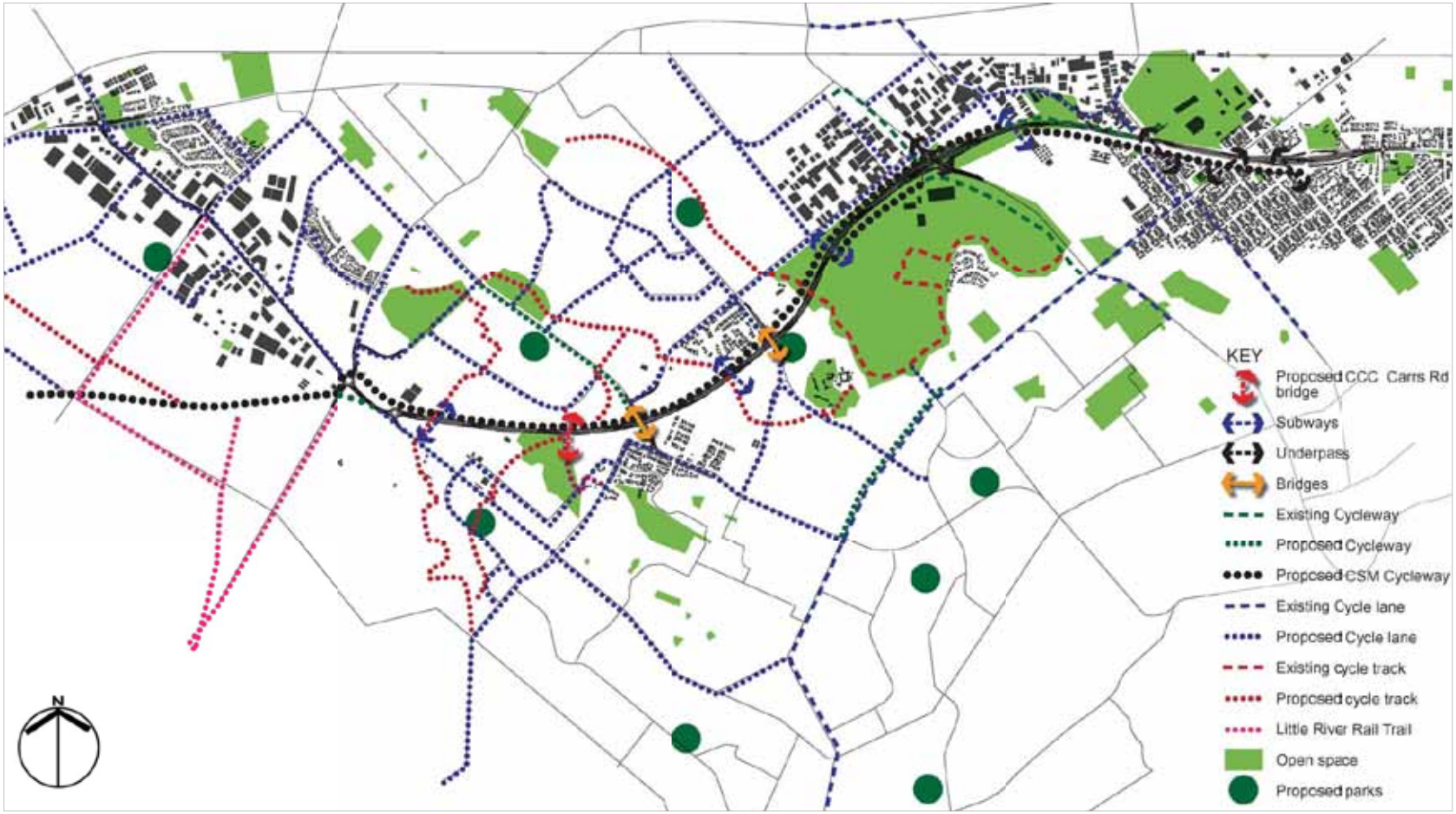


Figure 30: The planned cycleway network connecting with the motorway corridor

2.6 SWOT ANALYSIS

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Views	Proximity of Port Hills Halswell Junction Road lined up on view to Port Hills Views to Southern Alps from elevated positions	Unsightly industrial land uses on Halswell Junction Road Landfill E2 Industrial land use zoning Existing and future residential areas sensitive to impacts of CSM Fences and bunds on boundaries of Broken Run and Aidanfield subdivisions	Protect view shaft along Halswell Junction Road to Port Hills Protect views to Port Hills and Southern Alps wherever possible Screen Landfill E2 and future industrial areas with plantings Screen fences on boundaries of Broken Run and Aidanfield subdivisions with dense plantings	Future planned industrial areas between Halswell Junction Road and Awatea Road on south side of CSM, threatens the formation and character of the southern gateway.
Connectivity	Multiple crossing points across CSM and shared path	Subways difficult to make safe and attractive Multiple road crossings along CSM shared path	Best practice site planning and architectural finishes on subways to provide safe, attractive and direct routes	Potential anti-social behaviour associated with subways and underpasses.
Planting	Existing mature woodland plantings between Curletts Road and Barrington Street Adjacent public reserves and open spaces provide borrowed views to parklands Multiple waterways	Free draining soils & dry climate Ability to establish screen plantings on landfills	Develop concepts around existing reserves and mature woodland plantings to create parkway along CSM	Landfill E2
Environmental	Multiple waterways and possible green link between A+P Showgrounds and Wigram Wilmers Road ecological area	Little evidence of original ecology remaining	Establish riparian plantings on waterways and Halswell Junction Road storm water basin Incorporate rare and endangered species from Wilmers Road ecological grassland area into infrastructure	
Art			Barrington Street Overpass MSE wall at local road / pedestrian scale Subway walls	RIsk of vandalism, graffiti, other causes of damage to art elements after installation
Structures			Draw on natural features of Canterbury to characterise surface finishes and forms	RIsk of vandalism, graffiti, other causes of casual damage

Table 1: Summary analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT) for the project

LANDSCAPE AND URBAN DESIGN CONCEPTS

3.0

3.1 METHODOLOGY

Roading infrastructure projects like CSM need to put their best foot forward as they form a significant part of a city's urban fabric. Architecture shapes how we perceive our built environment and our enjoyment of it. CSM is a part of our built environment and as such will influence our experience of Christchurch City.

Design solutions therefore need to be creative, innovative and technically excellent. The methodology for delivering them should extend from strong concepts and encourage development of these concepts through detailed design and project execution. The Beca design team place a high value on an iterative and collaborative approach with clients, the design team and communities so that objectives can be clearly defined and solutions confidently derived at.

The following will ensure the intent of the conceptual design is achieved and meets the aspirations of the stakeholders:

- The Urban Designers and Landscape Architects will coordinate closely with the design engineers and Fulton Hogan to continue to develop detailed design solutions for plantings, site planning for the shared path & subways and the architecture and finishes of structures
- The design team will coordinate with Christchurch City planners, urban designers and landscape architects as required to ensure the designs meet Christchurch City expectations for mitigation and are aligned with the South West Area Plan (SWAP)

Additional focus will be given to developing the sense of arrival and departure for road users by controlling and protecting views to Port Hills, screening unsightly views and identifying opportunities for arts integration along the route. In addition, consideration will be given to the potential effects of contaminated land on plantings and connectivity of ecological habitats on enhancing biodiversity.

Elements of public art which are suggested in these concepts are illustrative examples only with all subject to review and agreement with key stakeholders. Where elements are illustrated in this document they are only indicative of potential works, and are not included as final and priced proposals.

Inclusion of artworks in the overall scheme will be progressed through the following provisions:

- The Arts Consultant will coordinate with the project team to scope out and develop a brief for potential public art work within the scope of the project
- The Arts Consultant will liaise with NZTA, Christchurch City Council and other local stakeholders as required

Figure 31: Concept sketch illustrating the integration of the roadway, cycle and pedestrian movement, planting and corridor infrastructure such as barriers

3.2 URBAN DESIGN

CONNECTIVITY - BRIDGES

Two bridges cross the CSM:

- Dunbars / Awatea
- Aidanfield Drive

While road bridges are not necessarily the most direct route for pedestrians and cyclists they are the most visible, improving personal safety and confidence. Tools are required to bridge the gap between the vehicular scale environment and a more human one. These include:

- Plantings
- Streetscape furnishings
- Easy grades
- Wide comfortable pavements
- Architectural treatments

CONNECTIVITY - SUBWAYS

This project features four subways at:

- Waka
- Heathcote River
- A&P Showgrounds (shared)
- Annex Road (existing, modified)

Subways under the carriageway may provide the most direct route for pedestrians and cyclists but if they are poorly located, planned and finished they can provide the greatest barrier to effective connectivity. Subways provide the greatest challenge to deliver a safe, attractive and utilised linkage across the road corridor. Best practice Crime Prevention Through Environmental Design Principles (CPTED) for avoiding poor outcomes includes:

- Providing clear lines of sight through the subway from as far back as possible to provide an option to retreat from perceived danger or take an alternative route
- Providing an alternative route wherever possible or safe retreat
- Design out places of concealment
- Ensuring clear lines of sight between pedestrians and vehicles & adjacent land uses
- Providing an open environment either side of the subway for clear lines of sight in all directions – for as far as possible
- Concrete headwalls will extend beyond the subway to maintain open lines of sight.
- Providing good quality lighting that is repaired immediately if damaged or worn. Lighting should be located directly overhead to deliver high lux levels, good colour render and low contrast to design out dark spots
- Providing a well proportioned environment that is roomy for personal comfort and allows maintenance of personal space if accommodating multiple users
- Providing an environment that is respectful of the people using it. It should be attractive and stimulating and give the impression that an effort is being made to provide the best possible facilities.
- Providing an environment that is clean and regularly maintained to remove rubbish and signs of vandalism
- Application of grafitti guard to all subwall wall surfaces and maintain a proactive grafitti removal maintenance regime.

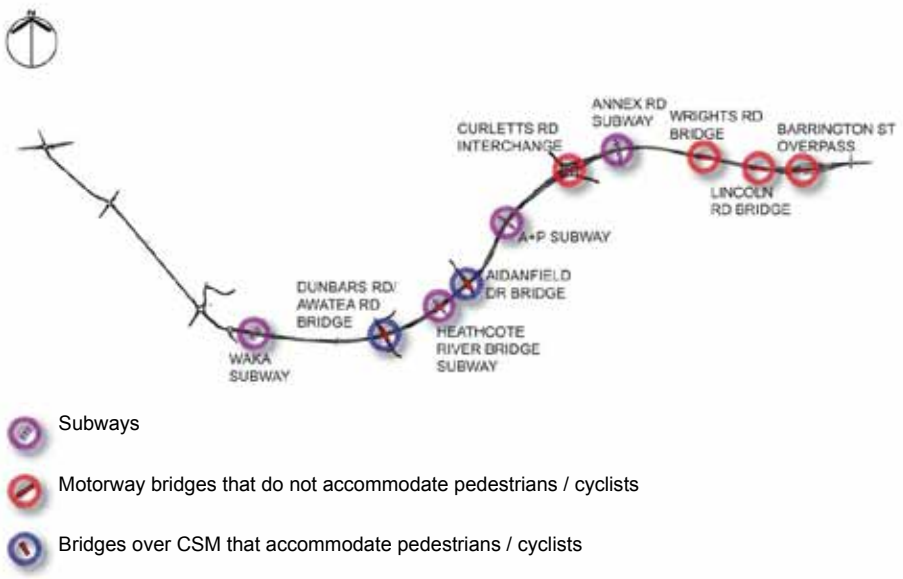


Figure 32: Bridge and Subway Locations Diagram

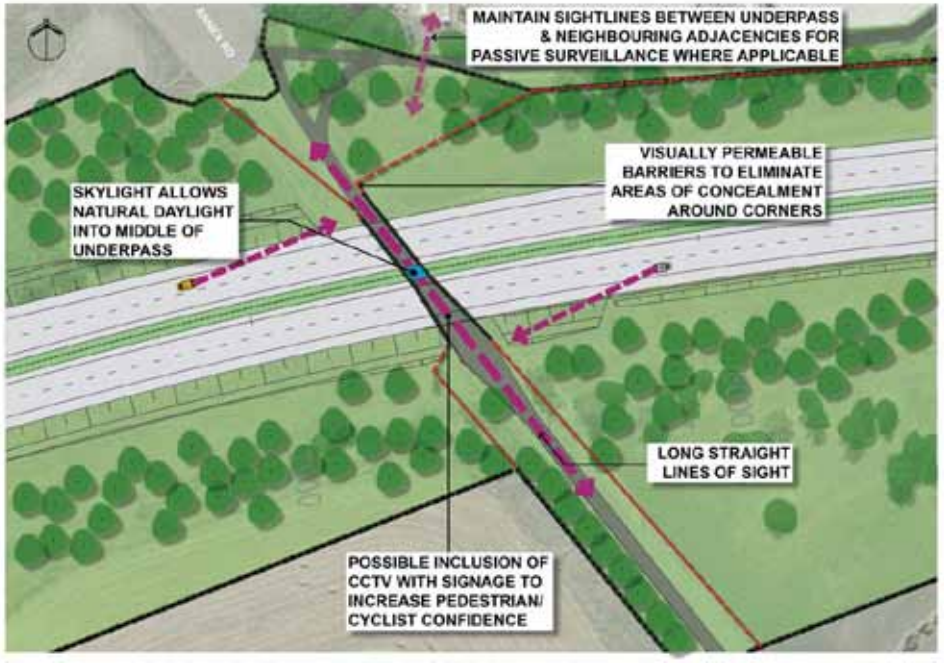


Figure 33: Design principles for subways

CONNECTIVITY - FOOTPATH/ CYCLEWAY

Non-motorised movements along the corridor require careful integration into the overall design. In a corridor designed for traffic travelling at 100kmh walking or cycling activities need to be encouraged to ensure that the environment is attractive and conducive to these movements.

A significant piece of infrastructure such as this route should aim to attract commuters and recreational cyclists through: attractive landscaping; use of planting and alignments to mitigate the visual effects of traffic; and adoption of effective CPTED techniques to promote a sense of safety for users. Key elements of the network such as subways require particular design attention.

The design proposes:

- A 3m wide path for shared use, surfaced in asphalt to provide smooth movement for cycles, pushchairs and wheelchairs. Combined footpath/ cycleway will be 2m wide along Halswell Junction Road.
- Consideration of all subway design criteria, particularly provision of clear lines of sight and passive surveillance, quality lighting and designing out opportunities for concealment
- Provision of lighting in an arrangement which creates a sense of safety and appropriate visibility for users at night.
- Following what is perceived to be the most direct route, particularly where the path follows only one side of the corridor and where there are few local alternatives
- A route which is visually joined with the active motorway environment through use of visually permeable safety fences
- Options for deviating from the path to avoid perceived danger in key locations
- An attractive route through groves of trees that provide an overhead canopy and a mixture of light and shade and a sense of depth to the enclosing space while allowing clear views through to pedestrians and cyclists for safety

The combined footpath/ cycleway alignments shall be subject to minor adjustments to accomodate changing ground conditions, adjustments to motorway geometry, provision for stormwater detention basins, fit within the motorway designation, connection to motorway structures and connections to the existing footpath and cycleway network outside of the designation.

Combined Footpath/ Cyclway Alignment

- Extend along the northern edge of Halswell Junction Road (from Main South Road to Springs Road) and branch both north and south on Springs Road. It will connect across the Springs Road roundabout and extend along the north and south side of the motorway. A link to Wilmers Road will be provided on the north side of the motorway.
- The branch on the south side of the motorway will merge with Halswell Junction Road just south of the proposed Halswell Junction Road roundabout.
- The combined footpath/ cycleway north of the motorway will extend from Springs Junction roundabout to Awatea Road where the combined footpath/ cycleway will extend north and cross at the junction to Wigram Road. Along this section the combined footpath/ cycleway will also connect south via the Owaka motorway subway.
- At Awatea Road the combined footpath/ cycleway will extend south over the Awatea Road bridge. A combined footpath/ cycleway is allowed for on both sides of the bridge and continue to the Awatea and Dunbars Road intersection.

Figure 34: The shared path setting is designed to integrate the path into the main corridor while providing separation and enhancement through strategic planting

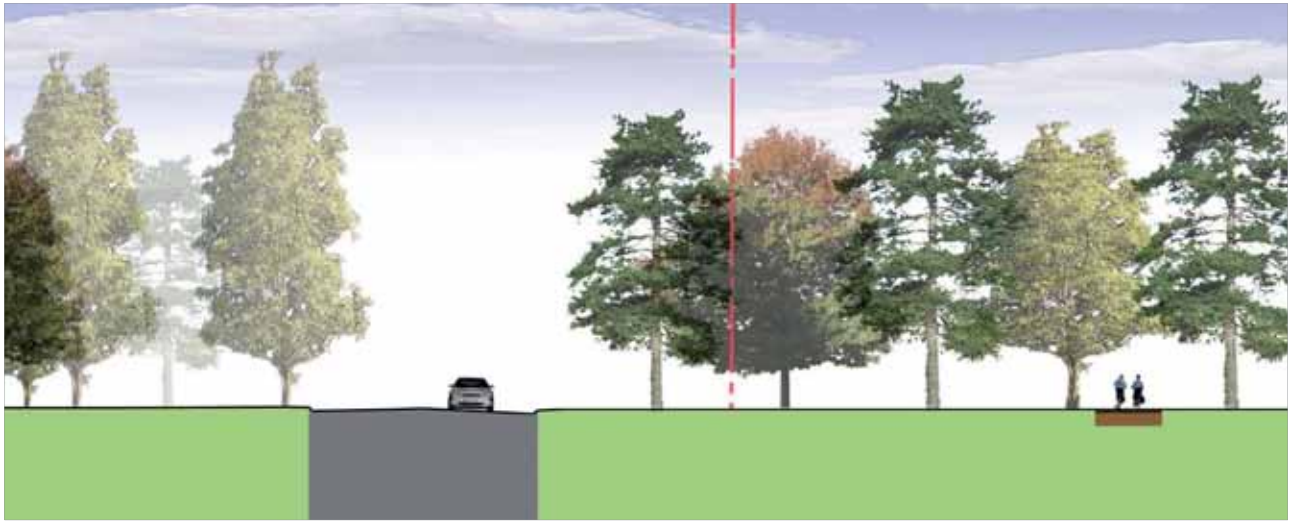


Figure 35: Where distance of separation allows, the path will be set amongst substantial numbers of trees to give a parkland feel

- From Awatea Road the combined footpath/ cycleway extends along the north side of the motorway to the Aidanfield Drive bridge. Within this section the combined footpath/ cycleway has a connection point at the Heathcote River and extends south via a combined footpath/ cycleway and Heathcote River subway
- At the Aidanfield Bridge the combined footpath/cycleway extends along the north side of the motorway and connects with the A&P subway. Beyond the subway to the north, the combined footpath/ cycleway will connect to Wigram Road west of Haytons Road and Wigram Road intersection.
- On the south side of the motorway the combined footpath/ cyclway extends from the A&P subway to the Curletts Road interchange where it connects with the existing footpath/ cycleway on the south side of Curletts Road.
- At Annex Road the combined footpath/ cycleway passes under the motorway via the Annex Road subway.
- From Annex Road the combined footpath/ cycleway extends along the north side of the motorway and follows the exisitng alignment of the Marylands reserve footpath to Wrights Road.
- At Wrights Road the combined footpath/ cycleway passes under the Wrights Road bridge and switches alignment to the south side of the motorway. The combined footpath/ cycleway then extends east and passes under Lincoln Road bridge and merges with the pedestrian footpath and on road cycle lanes on Barrington Street.

Combined Footpath/ Cyclway Surfaces

- Asphalt surfaces shall be used for the full extent of the combined footpath/ cycleway and tie into existing paths and/or cycle lanes to an even and smooth transition.
- The combined footpath/ cycleway extending through the subways shall be concrete.
- The combined footpath/ cycleway edges shall be timber and peg construction.

CHRISTCHURCH'S SOUTHERN GATEWAY

Formation of a gateway experience could be anything that announces the arrival into Christchurch City - it could be nothing more than a quality travelling environment that makes the best of its location to present Christchurch's best characteristics.

Halswell Junction Road is not considered a part of the long-term gateway environment. The current alignment takes the traveller along Halswell Junction Road at the western entrance to CSM, through an industrial estate with poor amenity value and constrained opportunities for improvement.

In contrast, there are better opportunities to develop a southern gateway for Christchurch as part of the future Phase 2 Extension.

The extension is outside the Christchurch City urban limits and is zoned rural. This relates smoothly to the typical character of SH1 further south and will provide an opportunity to transition the traveller from rural to urban over the length of the project area.

While the Stage 2 Extension is outside the scope of the CSM project, the design of CSM anticipates the transition into this rural environment. Future planning of the Phase 2 Extension will need to achieve the following to present a controlled rural to urban transition between SH1 and the eastern end of CSM at Barrington Street:

- Accommodate generous setbacks to the designation boundary to accommodate rural scale tree plantings over dry grasslands. These may take on a parkland arrangement or a continuation of the adjacent shelterbelt layouts
- Identify and maintain sight lines to the Port Hills
- Screen any undesirable views wherever they occur

Figure 36: Aerial of area with CSM Stage 2 extension

3.3 LANDSCAPE

PLANTING CONCEPT

The planting concept will provide a leafy, park-like environment inspired by:

- Park-like plantings between CSM and Hillmorton Hospital and opposite in Marylands Reserve
- Mature plantings in Addington Park adjacent Barrington Street
- Hagley Park and Deans Avenue shared paths that provide an attractive walking / cycling environment under mature canopies alongside busy roads

This is broken with large areas of open browntop grasslands and areas of multi-layered native plantings for screening, amenity and ecology. The enduring impression will be of leafy exotic woodlands interweaved with naturalised streams and drainage channels providing:

- Comfortable walking and cycling environments
- Seasonal change
- Containment and scale within the road corridor
- Controlled views to the city and natural features beyond
- A long term legacy for Christchurch that will support existing mature woodland and streetscape plantings across the city

Both enclosure / containment and views to the city and natural features beyond can be achieved through the careful placement of trees. The slow curving alignment will reveal views that are:

- Deep and long through vertical trunks and overhead canopies
- Shallow through the trees to offsite views

Following the Indigenous Ecosystems of Otautahi, plant lists have been assembled where native plantings are required for screening, amenity and ecology. These plant lists include hardy native species that can withstand drought and frost. They will provide:

- A diversity of colour, form and texture
- Dense screening through multiple layers - low, medium and tall
- A temporal dynamic as plants grow, emerge and overtop others
- Ecological value
- A sense of history as past planting patterns are restored
- A planting solution which minimises long-term operational costs and maximises ease of maintenance
- Opportunity to reintroduce rare or endangered species

Native plantings are proposed in several areas:

- At Aidanfield and Dunbars/Awatea bridges to settle the bridges in to the embankments and bridge the gap between the vehicular and human scales
- Screening of landfill E2 with hardy plantings that are close spaced, fast to establish and most able to withstand leachates from the underlying landfill
- Between Broken Run and Aidanfield subdivisions where the CSM is contained between 2m high timber fences
- Along the residential boundary between Barrington Street and Wrights Road to screen the CSM from residential areas (restricted to 3m high to avoid overshadowing)
- Embankments at Curletts Road Overpass to emphasise the linearity of CSM
- Riparian plantings at all permanent and ephemeral waterways and the stormwater wetland at the Halswell Junction Road basin
- Embankments between Barrington Street and Wrights Road with low hardy tussocks

All landscaping plantings have been designed and placed to meet safety, sightline and long-term maintenance costs and requirements.

ROADSIDE STORMWATER TREATMENT

Apart from the Halswell Junction Road basin, stormwater runoff is being treated in swales and wide shallow detention basins that hold water for short periods only. These will be located along the edge of the motorway and will be grassed with the same low mow grass mix on the remainder of the project. The edges of basins and swales will be rounded off as much as possible without decreasing their effectiveness.

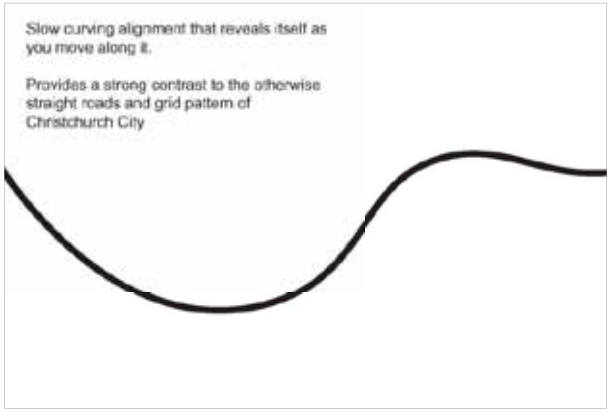


Figure 37: The long slow curves in the alignment create a dynamic relationship between travellers and the landscape

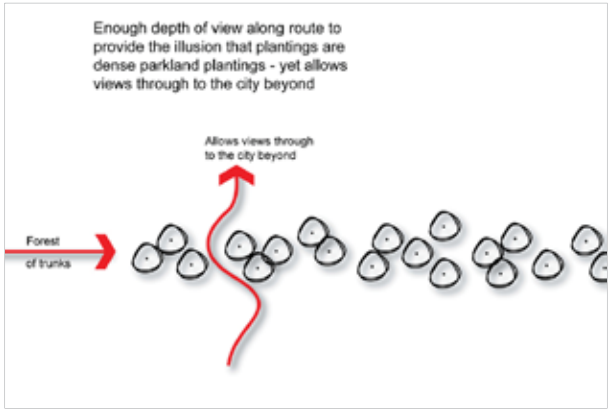


Figure 38: The tree planting concept involves grouping of trees to create contrasting degrees of visual permeability in different directions

Figure 39: An example of abandoned braided river channels

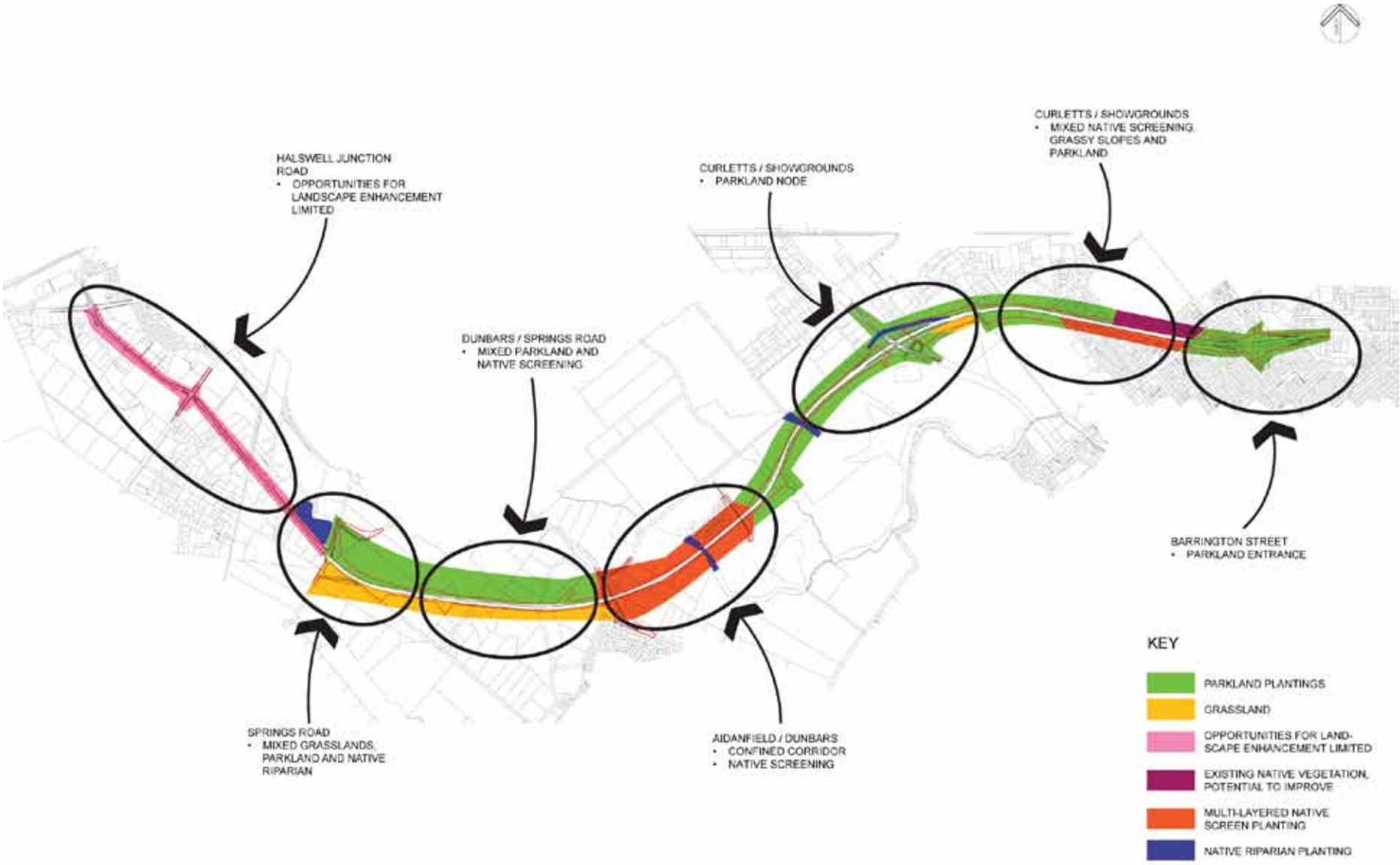


Figure 40: The landscape planting design strategy

PARKLAND AND PLANTING IMAGES

Figure 41: Masterplan sheet 1: Index plan. Scale 1:25,000

NOTE: Hallswell Junction Road not included in drawing set due to landscape opportunities limited to grassy berms only.

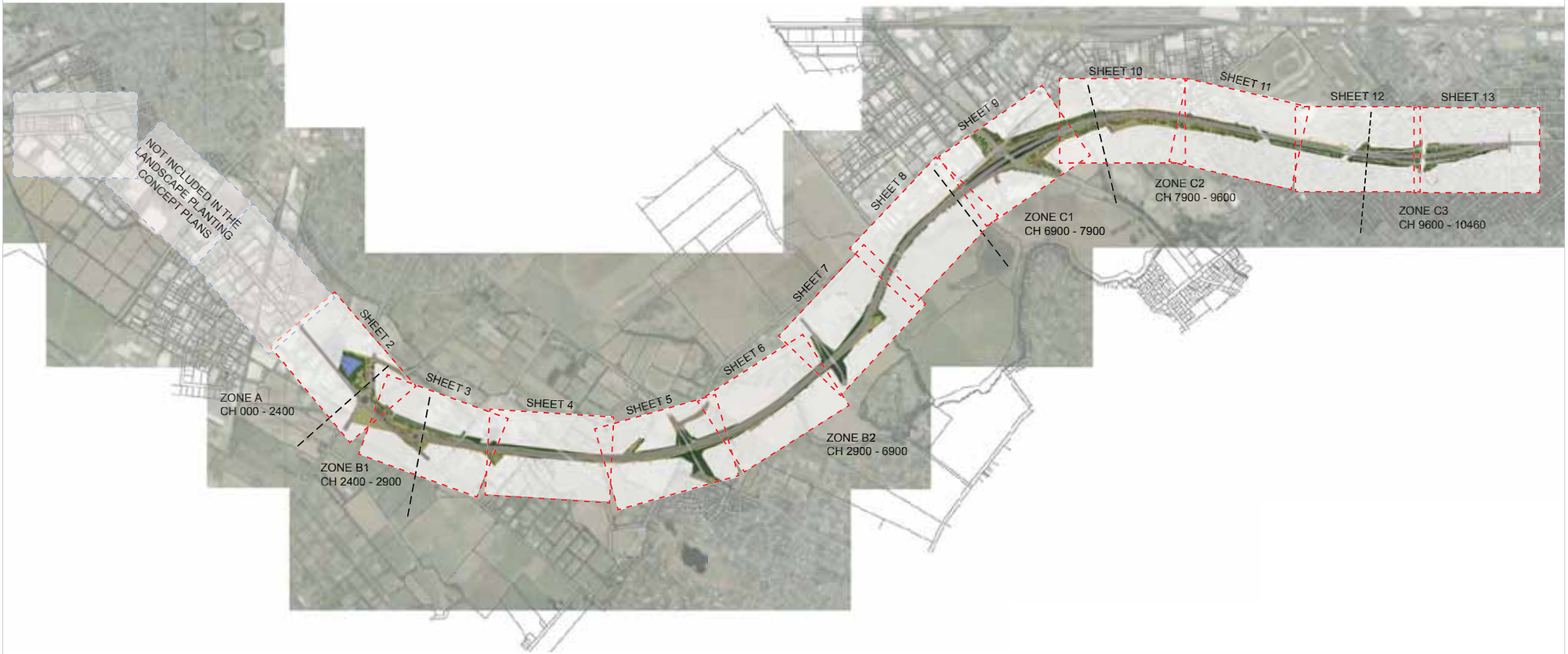
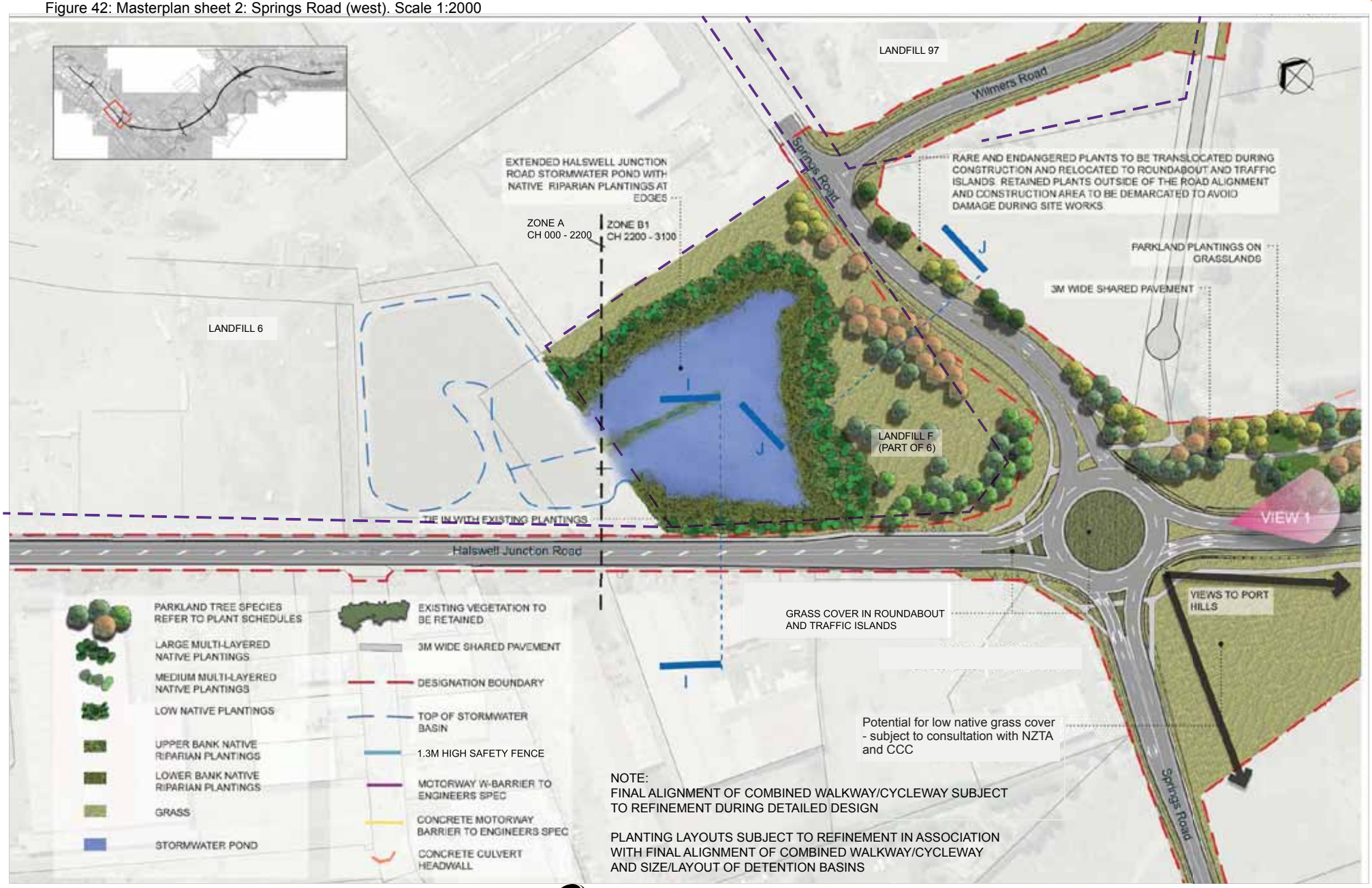
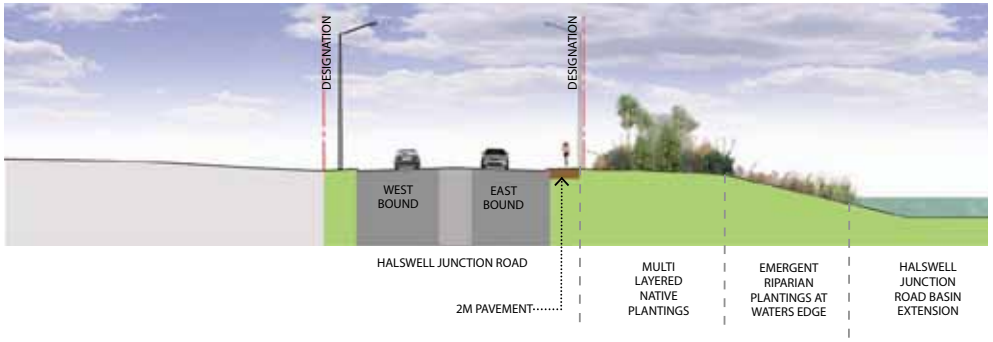


Figure 42: Masterplan sheet 2: Springs Road (west). Scale 1:2000



SPRINGS ROAD/HALSWELL JUNCTION ROAD BASIN EXTENSION
Figure 43: Cross-section J-J (CH 100). Scale 1:400

Figure 46: Existing conditions looking east from east of Springs Road



HALSWELL JUNCTION ROAD BASIN EXTENSION
Figure 44: Cross-section I-I (CH 2250). Scale 1:400

VIEW 1

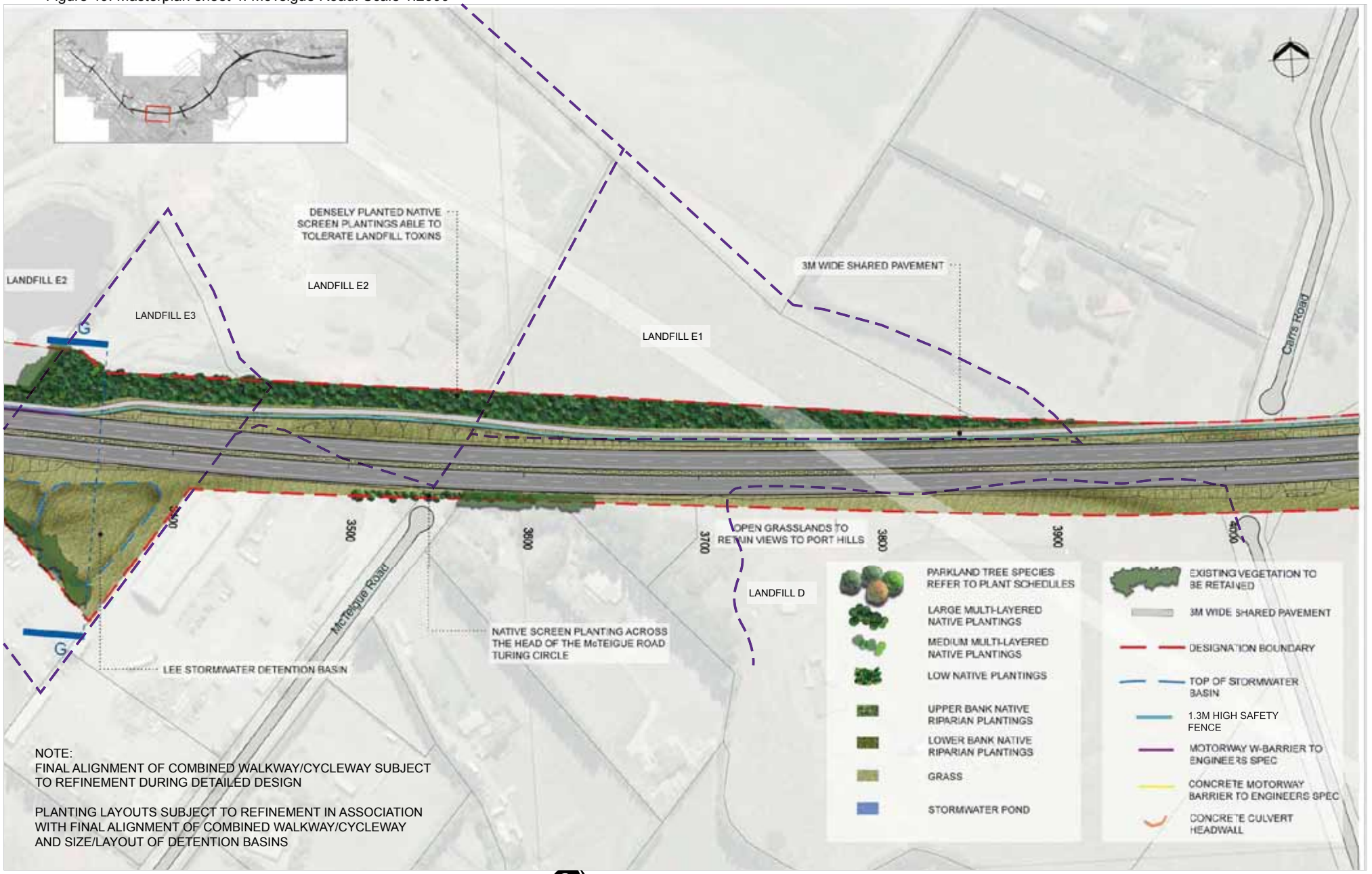
Figure 45: Perspective view 1, looking east from east of Springs Road

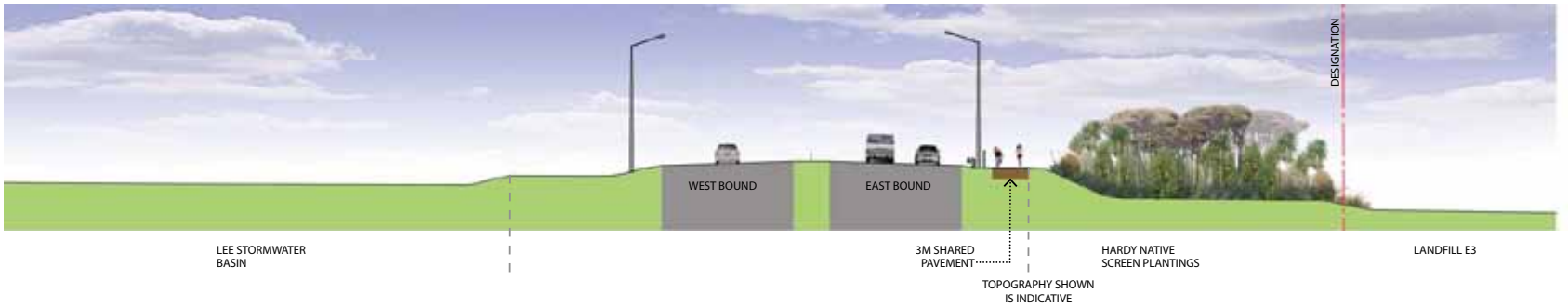
Figure 47: Masterplan sheet 3: Springs Road (east). Scale 1:2000

HALSWELL JUNCTION ROAD

Figure 48: Springs Road roundabout H-H (CH 150). Scale 1:400

Figure 49: Masterplan sheet 4: McTeigue Road. Scale 1:2000





LEE STORMWATER BASIN

Figure 50: Cross-section G-G (CH 3350). Scale 1:400

Figure 51: Masterplan sheet 5: Awatea Road. Scale 1:2000

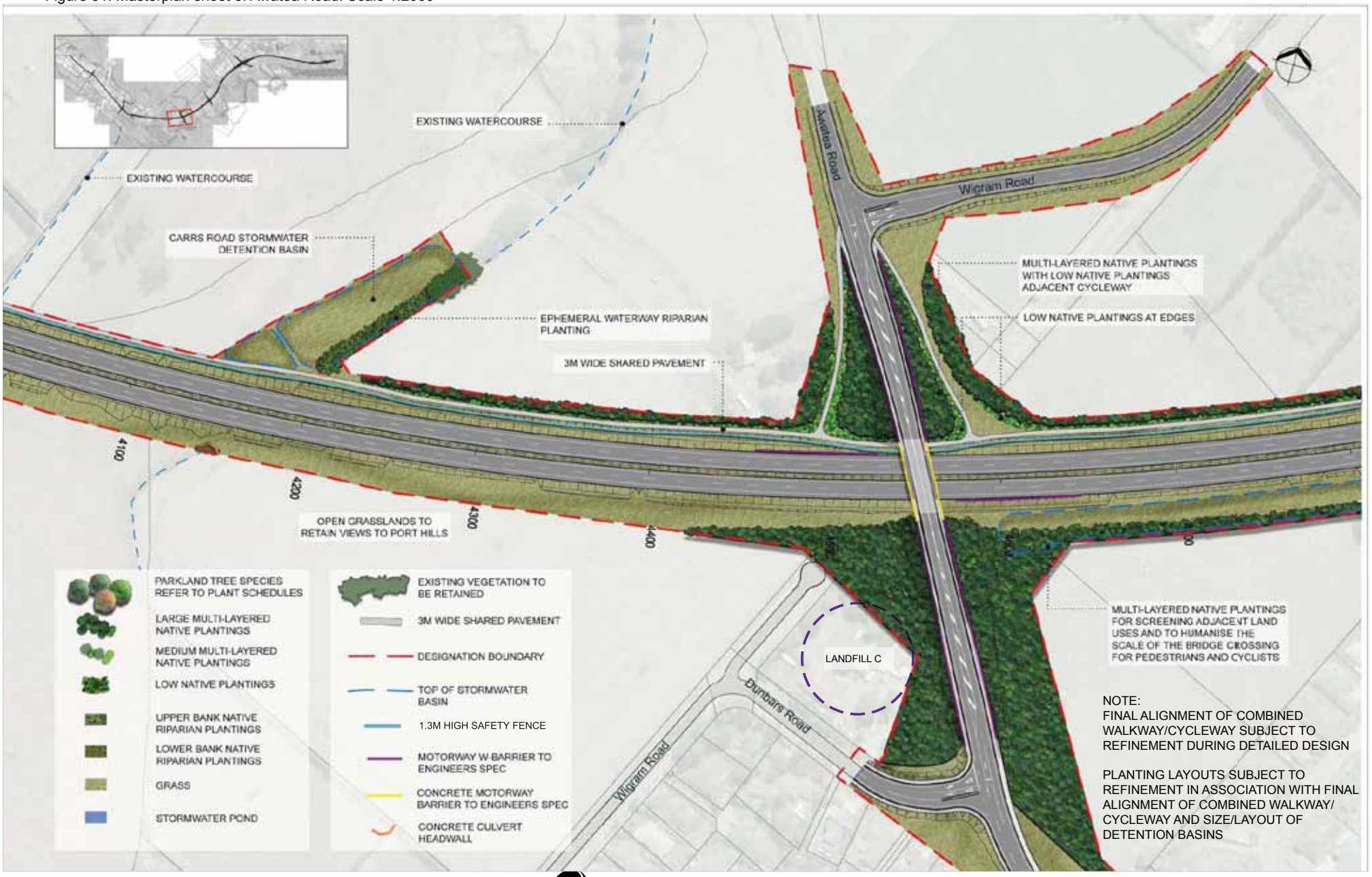


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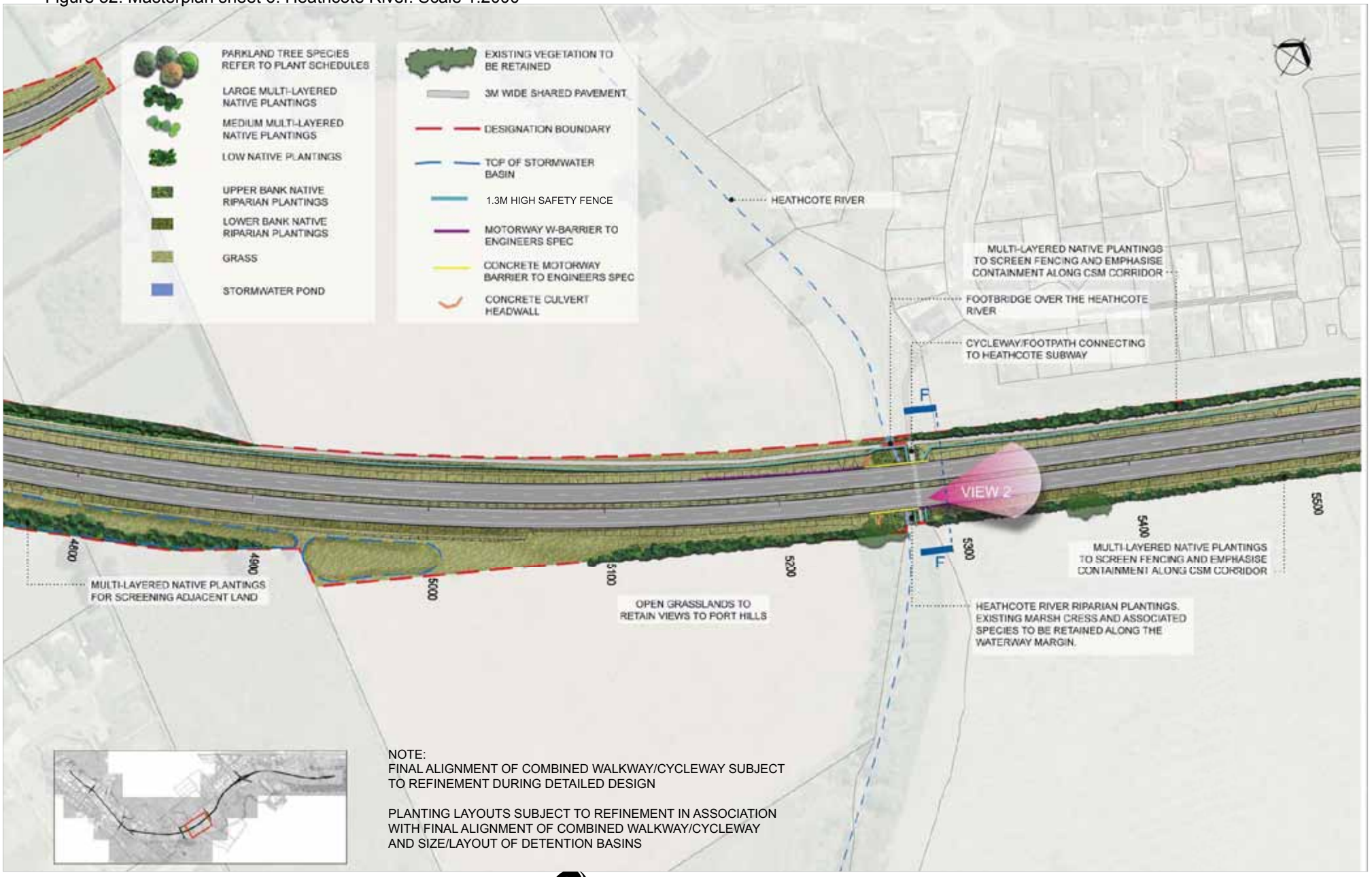
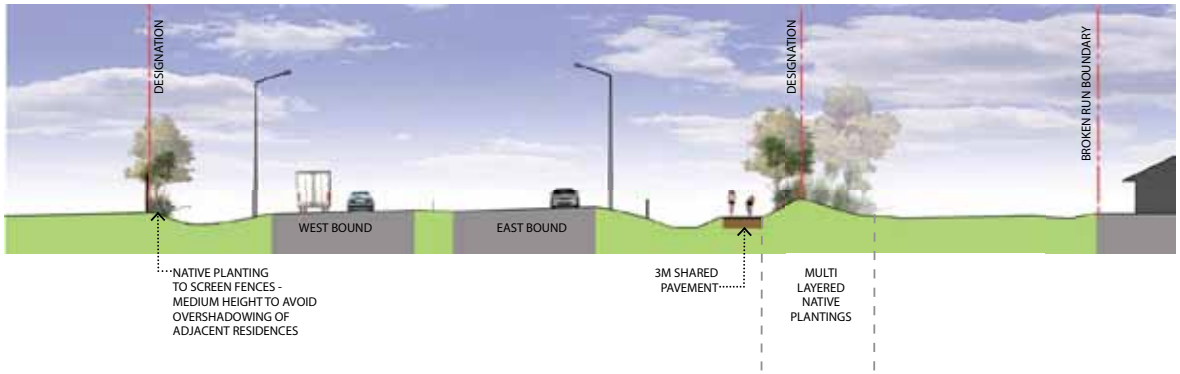
Figure 52: Masterplan sheet 6: Heathcote River. Scale 1:2000





AIDANFIELD/BROKEN RUN CORRIDOR

Figure 53: Cross-section F-F (CH 5400). Scale 1:400

Figure 55: Existing conditions at location of perspective view 2

Figure 54: Perspective view 2, looking east from west of Aidanfield Drive towards Dunbars/Awatea Bridge

Figure 56: Masterplan sheet 7: Aidanfield Drive. Scale 1:2000

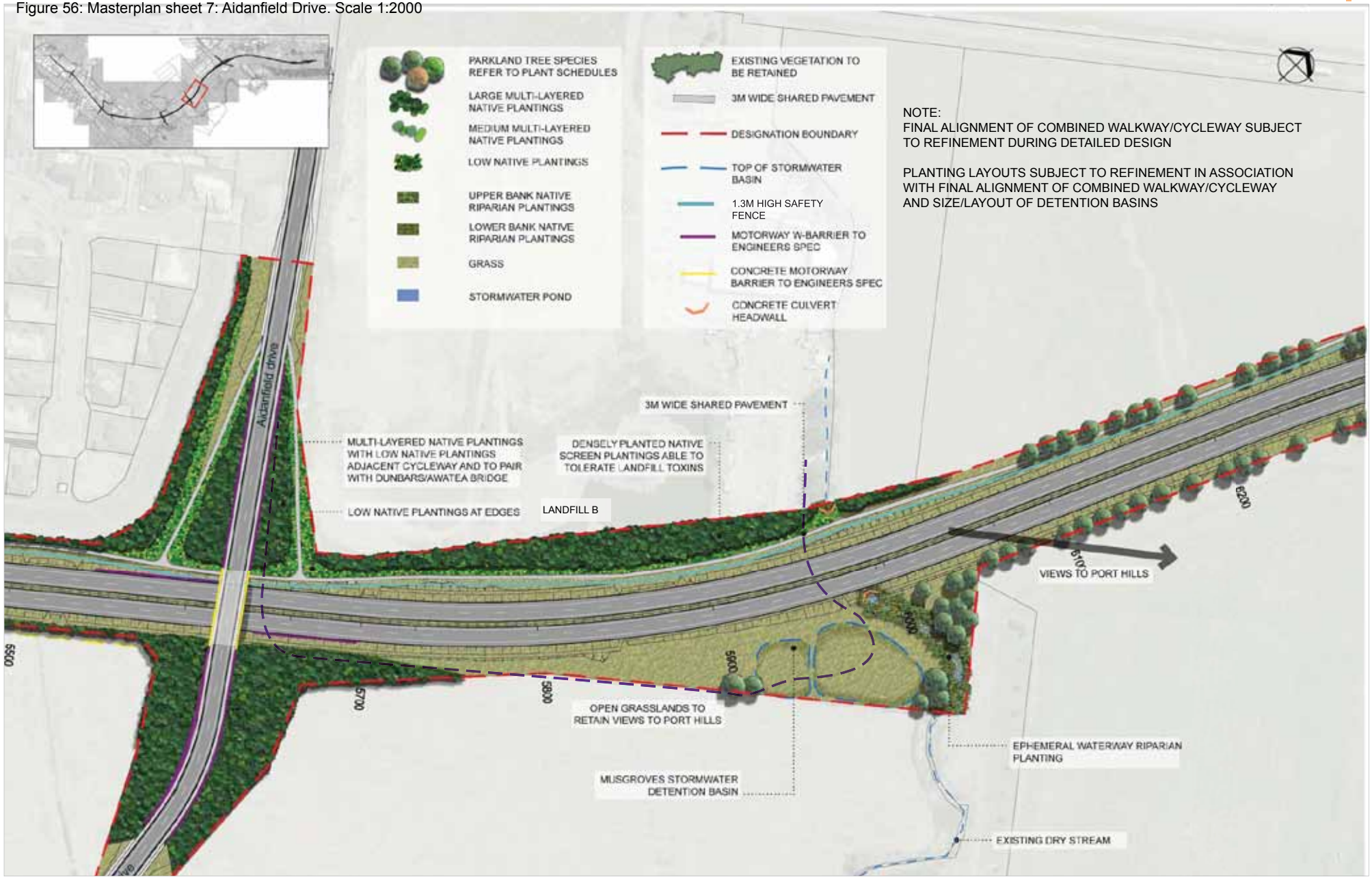


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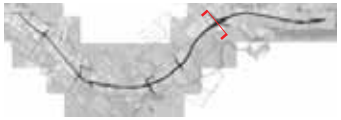
Figure 57: Masterplan sheet 8: Hayton Road. Scale 1:2000

HAYTONS DRAIN

Figure 58: Cross-section E-E (CH 6500). Scale 1:400

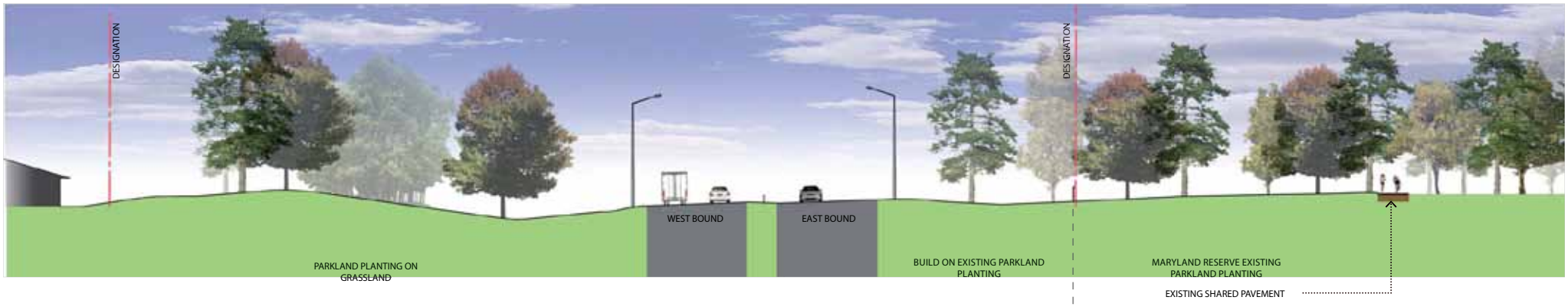
Figure 59: Masterplan sheet 9: Curletts Road. Scale 1:2000

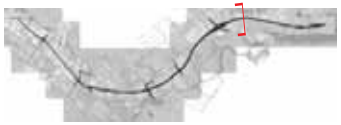


CURLETTS ROAD INTERCHANGE

Figure 60: Cross-section D-D (CH 7250). Scale 1:400

Figure 61: Masterplan sheet 10: Annex Road. Scale 1:2000





HILLMORTON

Figure 62: Cross-section C-C (CH 8150). Scale 1:400

Figure 63: Perspective view 3, looking north from the south side of Annex Road subway

Figure 64: Masterplan sheet 11: Wrights Road. Scale 1:2000

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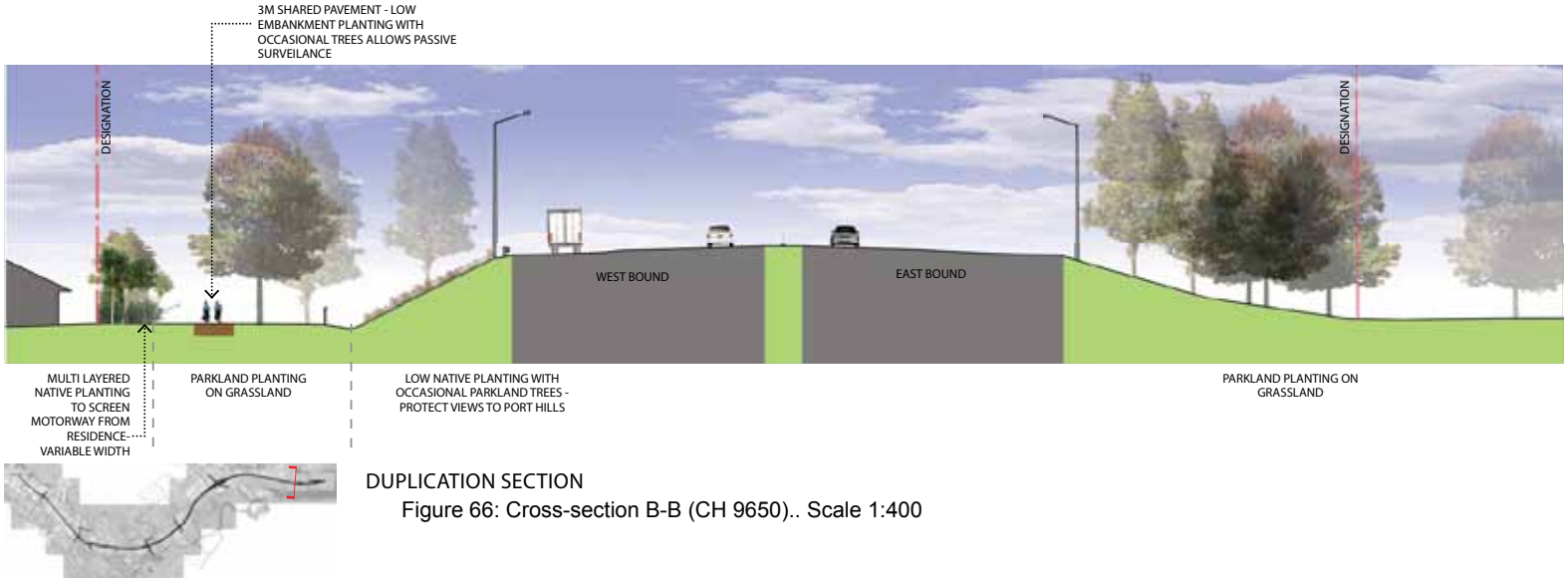
Figure 65: Masterplan sheet 12: Lincoln Road. Scale 1:2000



DUPLICATION SECTION

Figure 66: Cross-section B-B (CH 9650).. Scale 1:400

Figure 67: Perspective view 4, looking east from west of Lincoln Road.

Figure 68: Masterplan sheet 13: Barrington Street. Scale 1:2000

BARRINGTON STREET PARKLAND ENTRANCE

Figure 69: Cross-section A-A (CH 10000). Scale 1:400

3.5 PLANTING MANAGEMENT AND MAINTENANCE

A Management and Maintenance Plan will be developed during the Detailed Design Phase that will elaborate on the information below.

GRASS

All areas except where native plantings occur will be planted with a cover of low grow grass mix. Low grow grass only requires 3 mows per annum.

The NZTA Guidelines for Highway Landscaping Appendix 5: Low Growth Vegetation Guide specifies the following low grow species mix for the Canterbury region:

Sanguisorba minor	Sheeps Burnett
Agrostis tenuis	Brown Top
Trifolium repens	Huia White Clover

Table 2: Low-grow species mix for the Canterbury region

GENERAL MANAGEMENT AND MAINTENANCE ISSUES

Preparation

- Topsoils won from the site shall be stockpiled in maximum 2m high stockpiles. Hydroseed or apply straw mulch to stockpiles to stabilise. Manage stockpiles to maintain quality of soil and maintain aerobic conditions
- Topsoils shall be spread to 150mm deep for grassed areas; approximately 200mm in areas of riparian planting and up to 400mm deep in areas where native plantings occur.
- Well rotted bark mulch shall be spread to 100mm deep in areas where native plantings occur
- Where plantings occur on lower banks of streams or ponds, a biodegradable weed mat or similar shall be used
- Woodland trees shall be staked for 1 – 2 seasons only. Stakes should be replaced and repaired if damaged and removed when their use has expired
- Selected native revegetation species are self regenerating requiring little more than frequent inspections to remove litter and adventive weed species during the establishment phase
- During the event of sustained drought during the establishment phase, a water truck shall be used to irrigate plants
- Replace and repair all dead or damaged plants during the establishment phase
- Replace or top up well rotted bark mulch during the establishment phase as required
- Where weed matt or other biodegradable mulch fabric is used on waterway and pond embankments, check frequently for damage or early degradation and replace and repair as required
- Where Pukeko damage is likely to occur, plants shall be secured with biodegradable pins (where practical). Check frequently for damage and replace plants and pins as required

FREQUENCY OF VISITS AND ACTIVITIES

YEAR	NO OF VISITS	ACTIVITIES
1	6	Weed control Mow grass Removal of litter Replacement of dead, damaged or diseased plants Top up bark mulch Replace coir weed mat where damaged
2	6	Weed control Mow grass Removal of litter Replacement of dead, damaged or diseased plants Top up bark mulch Replace coir weed mat where damaged
3	3	Weed control Mow grass Removal of litter
4	3	Weed control Mow grass Removal of litter
5	3	Weed control Mow grass Removal of litter

Table 3: Schedule of maintenance visits and activities

Table is indicative only. Frequencies of visits to be determined during Detailed Design stage and development of Management and Maintenance Plan for CSM.

3.6 ARCHITECTURE

Architecture concerns the design of all structures including:

- Bridges
  - Fine tuning general form beyond engineering performance requirements
  - Treatment of surfaces for anti-graffiti protection
  - Surface finishes and form of barriers – TL4 & TL5
  - Surface finishes of bridge abutments – vertical and spill through
- Subways
  - Surface finishes of walls
  - Lighting
- 'MSE' (soil reinforcement) walls
- Lighting
- Boundary fences
- Safety barriers

ARCHITECTURAL DESIGN DRIVERS

The design of the architectural elements are informed by megathemes that characterise Canterbury:

- The fine texture of Browntop grasses prevalent throughout Canterbury and the Port Hills feature in the recessed bridge barrier panels through formwork and secondary treatment

Figure 70: The fine texture of Browntop grasses

- The geometry and colours of the Canterbury Plains feature in the preferred design of the subway walls and spill through abutments

Figure 71: The geometry and colours of the Canterbury Plains

- The incised and buckled forms of the Southern Alps feature in the design of cruciform MSE panels that contain the vertical abutments at Barrington Street and Heathcote River

Figure 72: The incised and buckled forms of the Southern Alps

BRIDGES

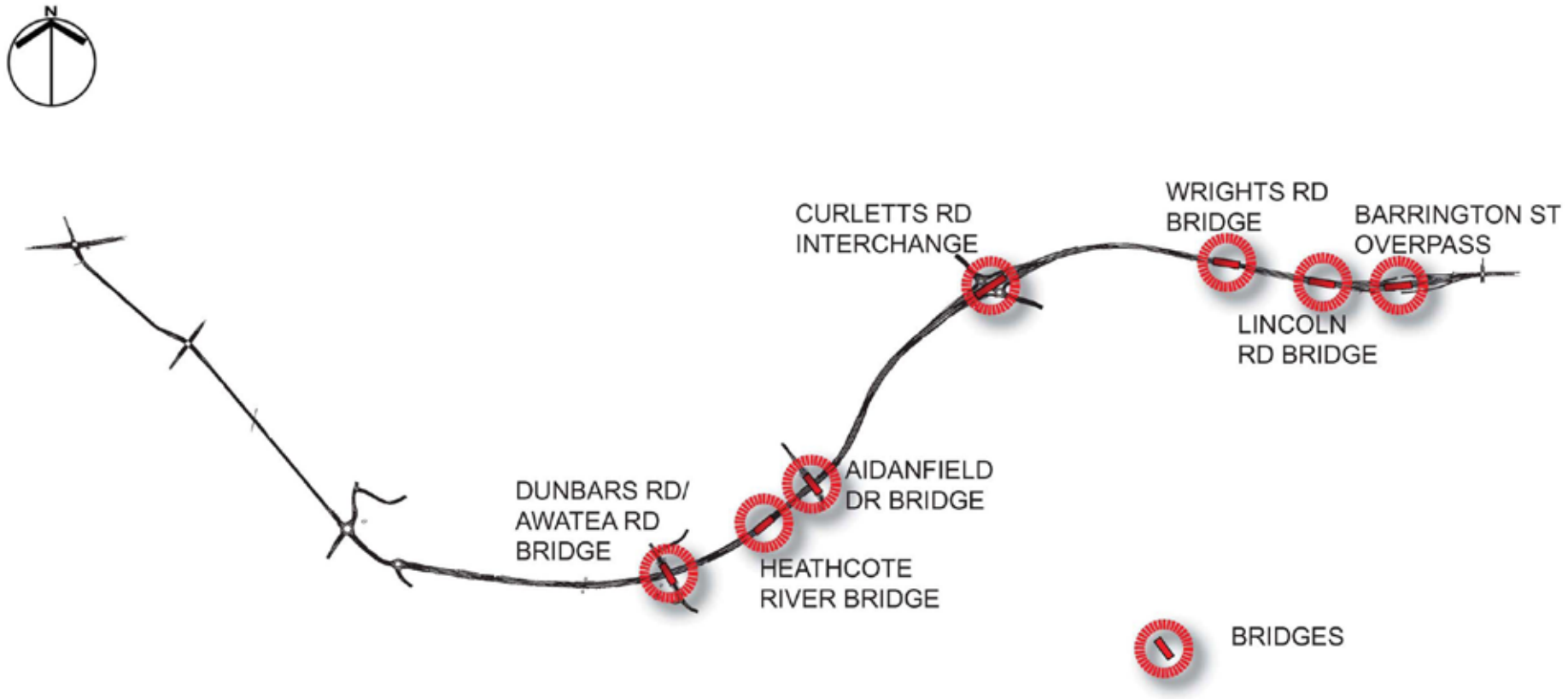


Figure 73: Bridge locations diagram

Dunbars / Awatea and Aidanfield Drive Bridges:

- Both bridges occur within a relatively short distance, appearing as a pair
- Both bridges feature TL4 barriers, roadside pavements and spill through abutments (described under Spill Through Abutments below)
- Barriers feature a recessed panel with textured finish taken through to end with no termination to make the bridge appear long and narrow
- Crosshead beam ends recessed back behind the barrier to be in shadow and recessive
- Description of finishes on spill through abutments is described under *Spill Through Abutments*

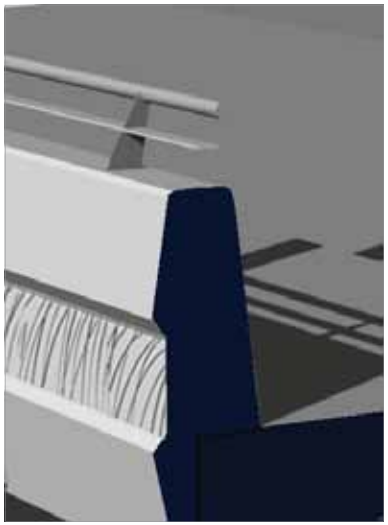


Figure 74: Close-up of TL4 barrier detail

Figure 75: Elevation of bridge showing section cut through motorway corridor

Curletts Road Overpass

- TL4 concrete barriers to same design as other bridges, featuring continuous recessed panel ‘stripe’ with textured finish
- Barrier stripe is continuous with no termination to reduce the apparent depth and visually elongate the bridge
- Crosshead beam ends are recessed behind the barrier to be partially in shadow and reduce the usual dominance of this element
- Spill through abutment treatment provides open, generous feel and good sightlines for Curletts Road users
- Description of finishes on this feature is described under Spill Through Abutments below

Figure 77: Perspective view of Curletts Road Overpass, at local road level

Figure 76: Elevation of Curletts Bridge showing section cut through motorway corridor

Barrington Street Overpass:

- Full height TL5 concrete barrier, recessed panel feature with textured finish. Recessed panel terminated short of end to accentuate “stubbiness” of bridge form
- Architectural finish on cruciform panels described below under *MSE Panels*

Lincoln Road and Wrights Road Duplications:

- Full height TL5 concrete barrier, recessed panel feature with textured finish. Recessed panel terminated short of end (not shown)

Figure 79: Perspective view of bridge showing full height TL5 barrier

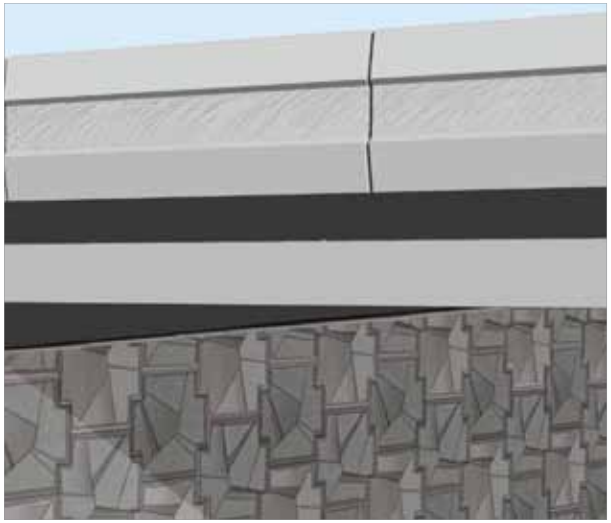


Figure 78: Close up of full heightTL5 barrier

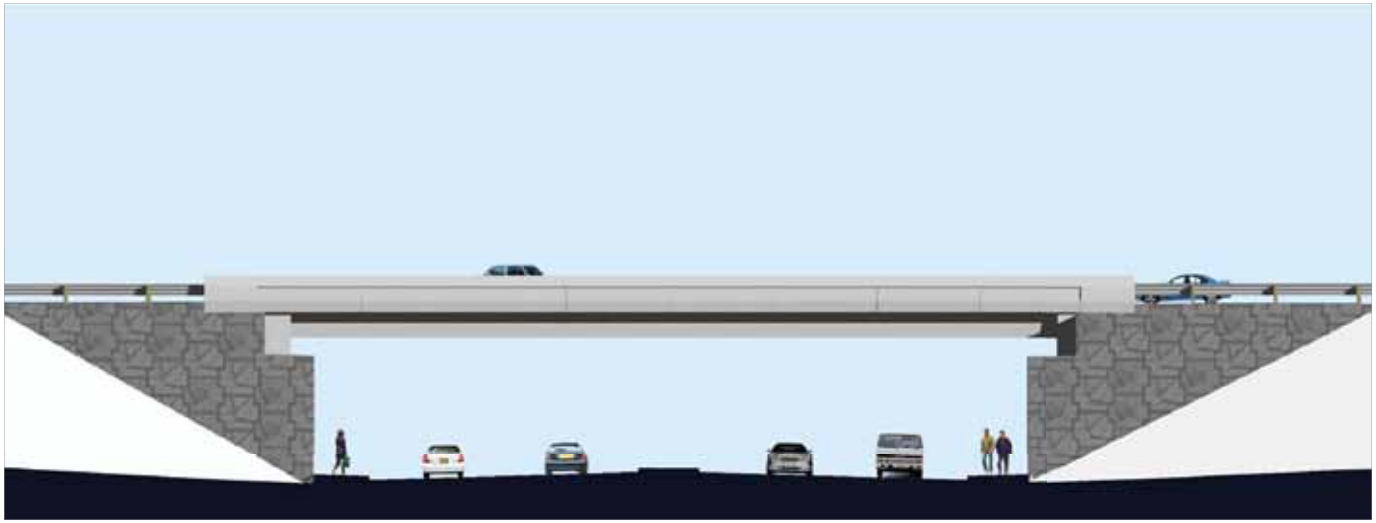


Figure 80: Elevation of bridge

SUBWAYS

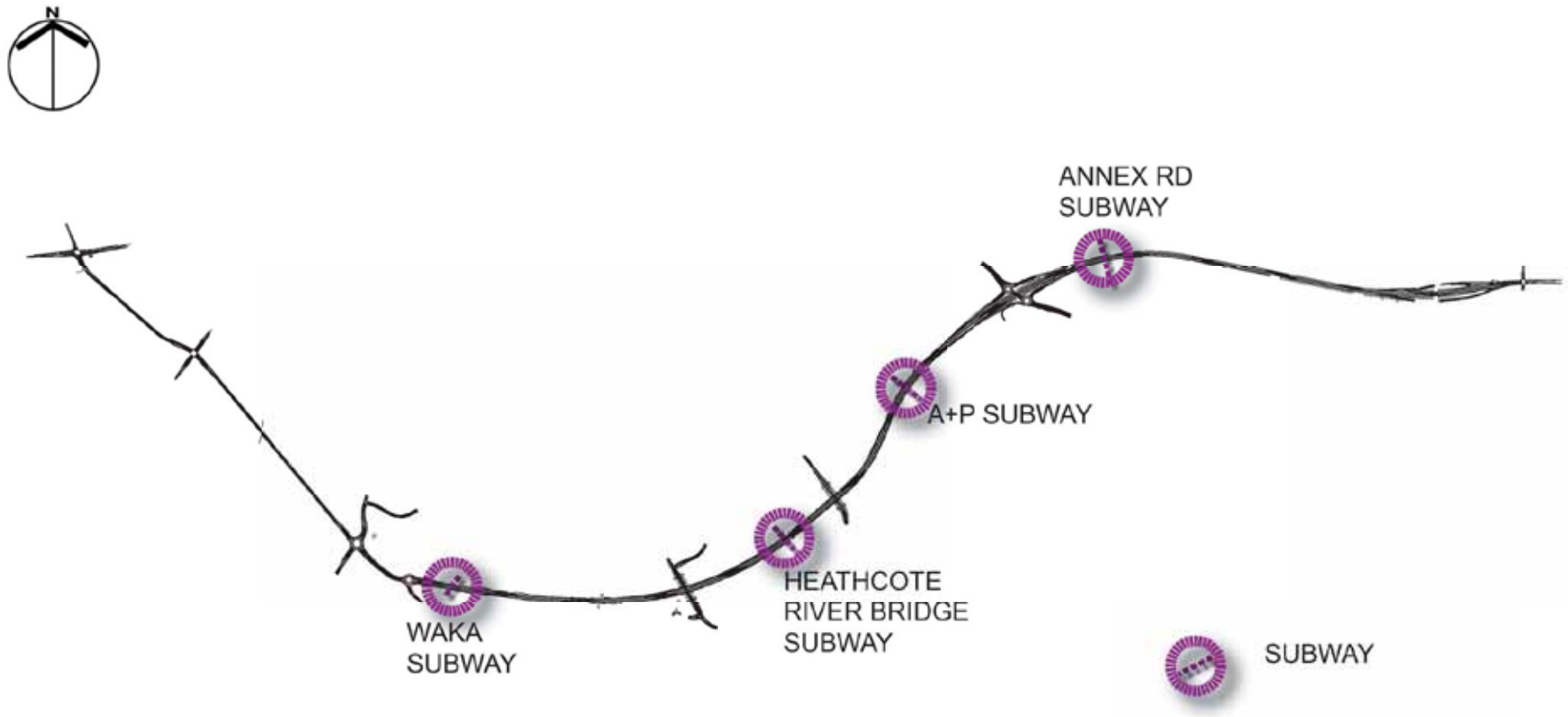


Figure 81: Subway locations diagram

SUBWAYS

- Surface finishes create an integrated piece of art (by others in coordination with Christchurch City) inspired by the colours and geometry of the Canterbury Plains.
- Subway walls will be plain concrete surface with grafitti guard applied
- One wall in each subway will extend further than otherwise required to lend it an air of importance
- Gaps at tops and bottoms and between panels lend an air of detachment – as if the wall appears to float
- Light gap in central median to add natural light to Waka and Annex Subways

Waka Subway

(Note: the example shown is illustrative only and represents an example of the potential outcome derived from an arts intervention process in coordination with NZTA and Christchurch City)

Figure 82: Visualisation of Waka Subway showing potential surface treatment

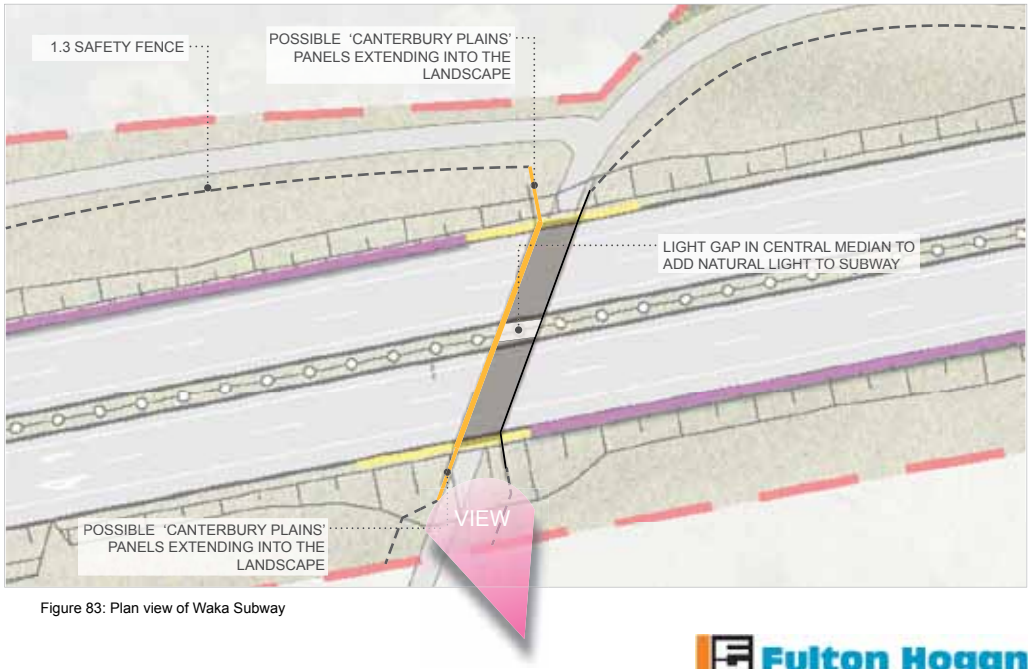


Figure 83: Plan view of Waka Subway

Heathcote Subway

- 3m wide shared pavement under bridge
- Cruciform MSE wall panels specific to CSM
- Native riparian plantings on banks with stone rip-rap under shadow of bridge
- Low plantings at edges to reduce concealment and maintain passive surveillance from CSM
- Safety lighting with vandal proof fittings and good colour render and illumination. Supported by lighting for 3m wide combined footpath/ cycleway
- 3m wide timber footbridge over river on north side of CSM

Note: Refer to MSE Wall section for panel details

Figure 84: Visualisation of Heathcote Subway showing potential MSE surface treatment

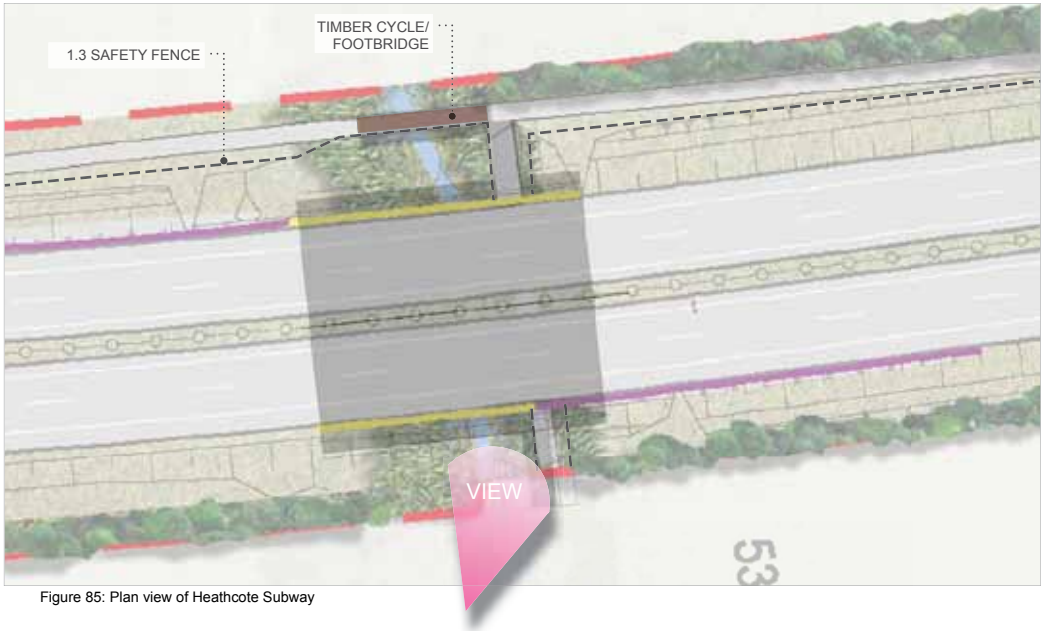


Figure 85: Plan view of Heathcote Subway

A and P Subway

- 3m wide shared pavement adjacent to carriageway
  Coloured wall panels on pedestrian side of subway
- Safety lighting with vandal proof fittings and good colour render and illumination. Supported by lighting for 3m wide shared pavement provided by CCC

(Note: the example shown is illustrative only and represents an example of the potential outcome derived from an arts intervention process in coordination with NZTA and Christchurch City)

Figure 86: Visualisation of A and P Subway showing potential surface treatment

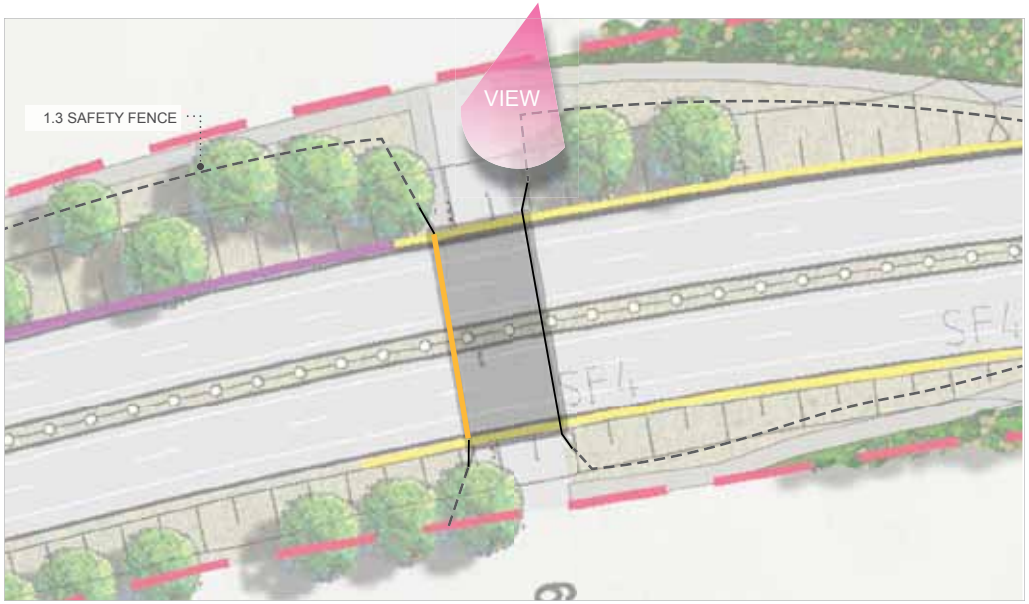


Figure 87: Plan view of A and P Subway

Annex Road subway

- Splays out to 3m wide shared pavement where it adjoins existing 2m wide subway
- Coloured wall panels on one side of subway
- Safety lighting with vandal proof fittings and good colour render and illumination. Supported by lighting for 3m wide shared pavement provided by CCC

(Note: the example shown is illustrative only and represents an example of the potential outcome derived from an arts intervention process in coordination with NZTA and Christchurch City)

Figure 88: Visualisation of Annex Subway showing potential surface treatment

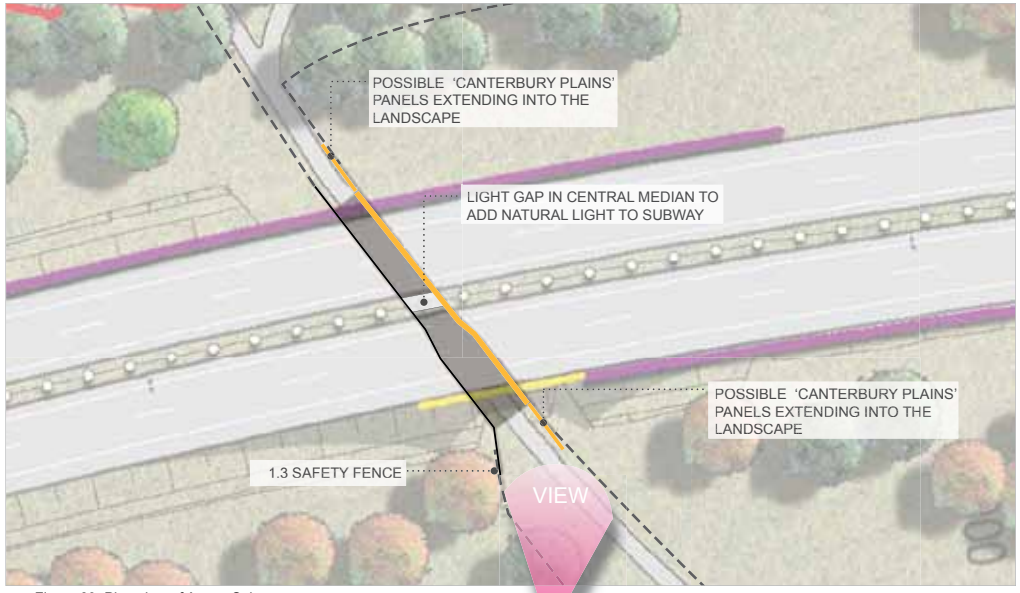


Figure 89: Plan view of Annex Subway

MSE WALLS

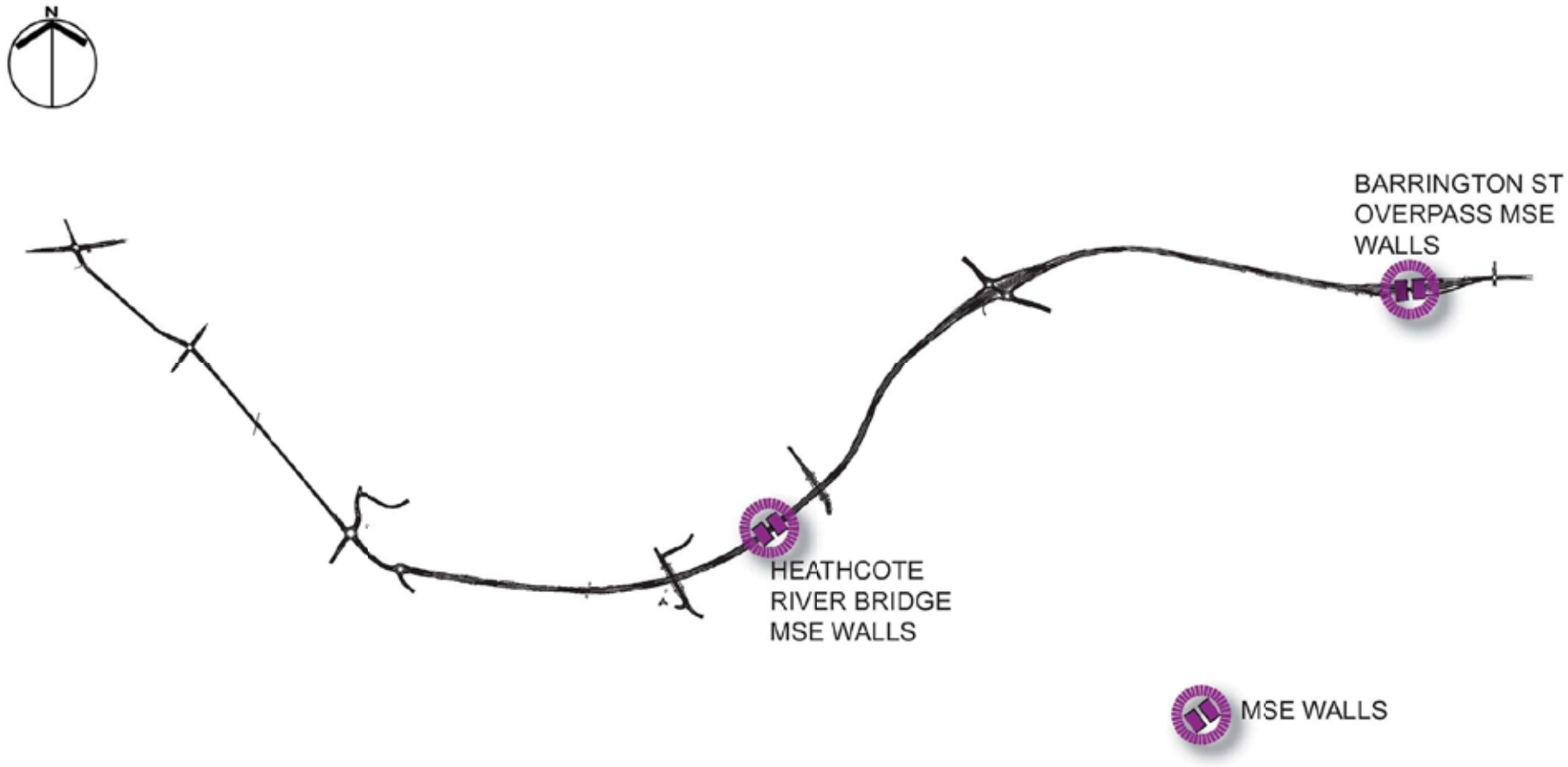


Figure 90: MSE wall locations diagram

MSE WALLS

- Cruciform MSE panels prone to settlement feature architectural formwork with approx 40 to 50mm proud faces
- Panels will be formed in plain concrete finish with the relief pattern providing shadow lines and a random pattern finish
- Patterned panels that abut the corner units will comprise two custom panels and the straight abutment wall sections will include a further two custom panels to achieve the random pattern design intent
- Corners will feature corner anchoring units which allow patterned panels to neatly abut to, while allowing for and disguising potential vertical settlement

Figure 91: 3D perspective of MSE wall panel corner unit

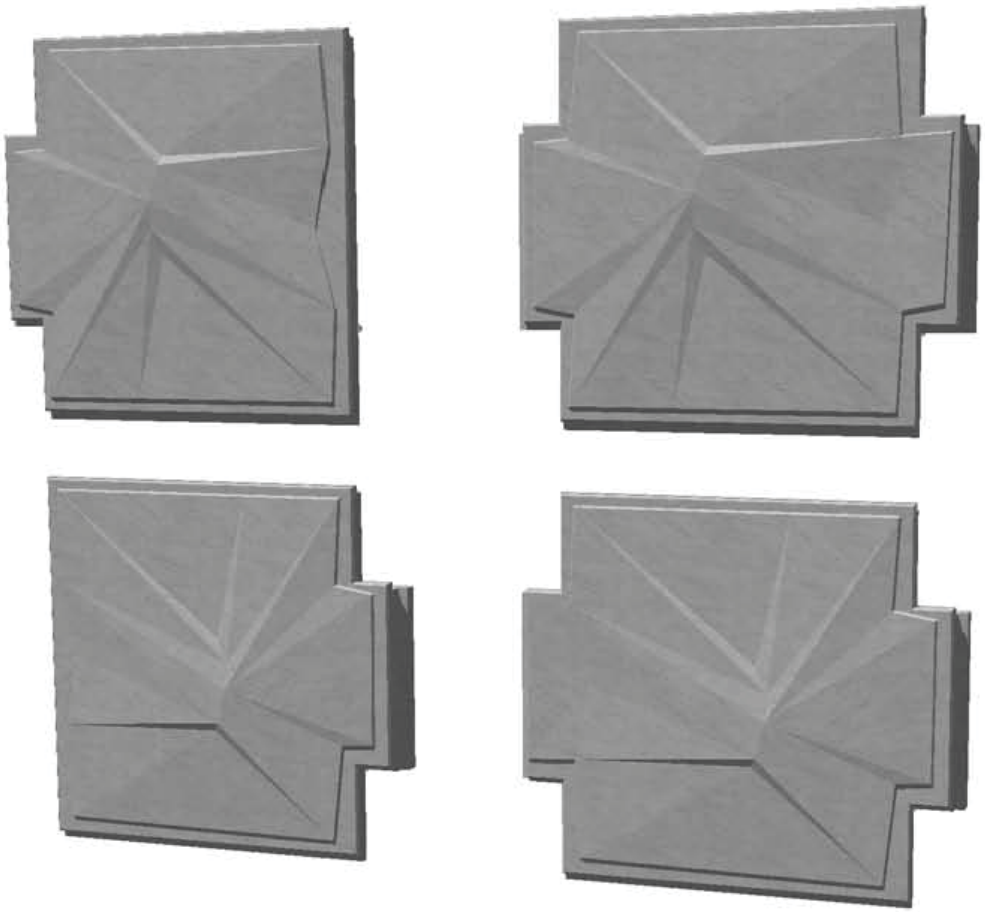


Figure 92: 3D Perspective MSE wall panels
2x full panels and 2x corner abutment panels

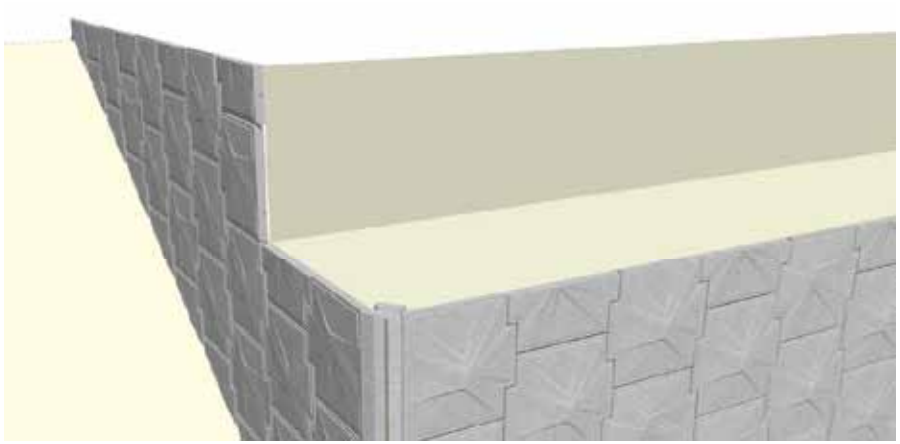


Figure 93: Perspective of MSE wall illustrating two patterned panels abuting the corner unit and two patterned full panels on wall faces.

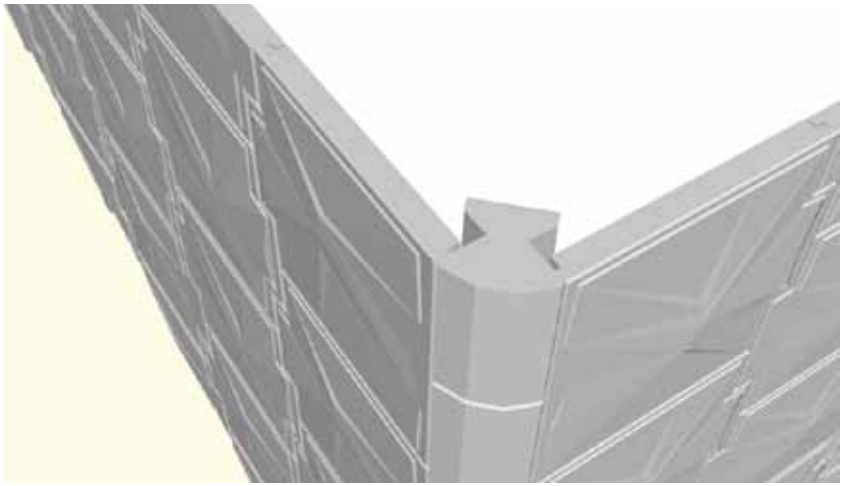


Figure 94: Perspective image of MSE wall with standard corner unit

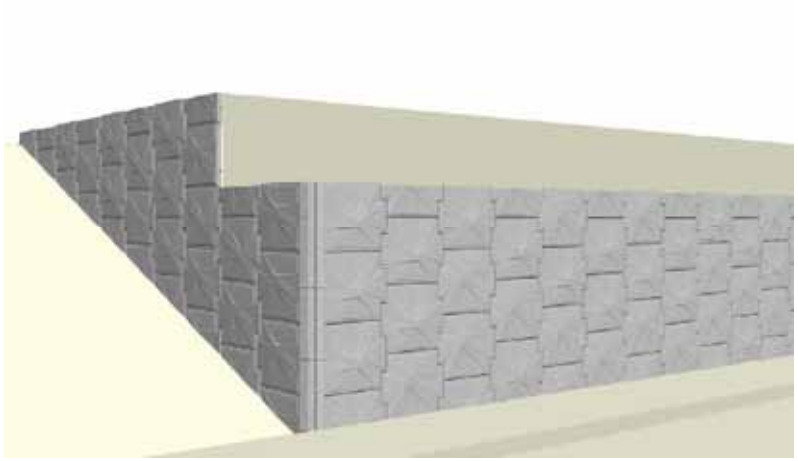


Figure 95: Perspective of MSE wall and abutment return

Figure 97: Perspective view of bridge showing MSE wall treatment

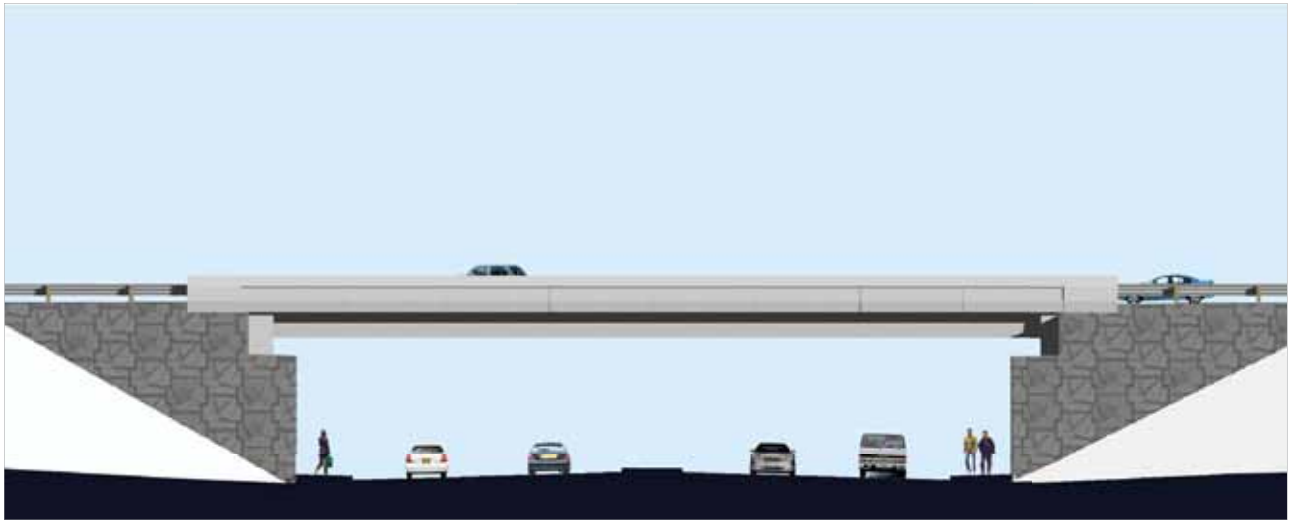


Figure 96: Elevation of bridge showing MSE wall

SPILL THROUGH ABUTMENTS

Surface finishes create an integrated piece of art inspired by the colours and geometry of the Canterbury Plains

Spill through abutment panels will be located at the following bridges:

- Curletts Road
- Aidanfield Drive
- Dunbars Road

Spill through abutments will consist of coloured concrete panels laid on the battered ground surface area of the spillways below the structure or bridge between the abutment and the toe of the batter. Each colour panel area will be 1200 x 1200mm and made up of several unit panels. Coloured panels will be arranged randomly.

NOTE: Where bridges are duplicated at Lincoln Road and Wrights Road the abutments will continue the existing abutment treatment of stone embedded in concrete.

Figure 98: Perspective view of Curletts Road Overpass showing potential spill through surface treatment

BOUNDARY FENCING

Fencing to be provided along the designation has been defined in the Principal's Requirements, and shall be as set out below. Key areas of permanent and temporary fencing are also to be provided to meet specific time scales set out in the Principal's Requirements, including provisions in relation to the Canterbury Park/A&P ground.

Existing motorway fencing east of Annex Road

This will be retained as currently installed wherever possible. This includes the post and wire fence in front of Hillmorton Hospital.

New fences on boundaries with adjacent properties

These will be 1.2m high lamb-proof "Cyclone" Tightlock 9-wire with a single no.8 SWG galvanised high tensile top wire, unless existing agreements with landowners require an alternative provision.

Boundaries with stopped-up existing roads

Where Wigram Road, McTeigue Road and Wilmers Road are to be stopped up, a 1.2m timber post and four-rail fence will form the new boundary between the local road and the motorway designation.

Between the cycleway and the roadway

1.3m high galvanised fold-top fence and galvanised steel posts ("Hurricane" system or equivalent approved by NZTA) will be provided. The fence will be aligned with adequate separation from the combined footpath/ cycleway to avoid potential contact between pedestrians and cyclists and the fence. The separation will however be tighter where the transitional tapers at the end of the combined footpath/ cycleway where necessary.

A concrete strip extending a minimum of 100mm to either side of the fence shall be provided at the base of the fence. Reflective tape shall be fixed where the end of the fences are exposed and forms a potential collision hazard

At the 'HJR' basin adjacent Springs Road interchange

Extension of the existing drainage basin shall be protected by fencing matching the existing security fence around this basin.

SAFETY BARRIERS

The Safety barrier requirements have been defined in the Principal's Requirements and are outlined in the Design Philosophy Statement by Beca (BIL).

LIGHTING

The lighting requirements have been defined in the Principal's Requirements and is outlined in the Design Philosophy Statement by Connetics Ltd.

Motorway and gateway sculptures have been successfully placed in many cities around the world and are proven to be effective in increasing the esteem of the city to locals and visitors. Many function as 'cultural markers' - a measure of a city's identity, status and cultural awareness.

Provision by NZTA for art interventions is in line with recent Christchurch City Council initiatives. Since 2000 Christchurch City has installed a number of public artworks as a means of enhancing the city. The Council recognises "...the key role of the arts in Christchurch's social, cultural and economic development, and as a vehicle for urban renewal and city marketing".

VISION FOR MOTORWAY ART JOURNEY

- Add colour, life, history and memories to enhance the local environment and journeys/movement contacting the route
- Highlight the context and values of the surrounding communities
- Integrate art within textures, surfaces and spaces to be constructed as part of the project scope
- Identify and encourage additional future interventions through provision outside of the scope of this project

Design and art-led interventions would consider addressing the following themes related to the region and area:

- Colours and textures of the Canterbury checkerboard planes
- Local Maori myths and legends
- Protecting and preserving vistas and views of the Port Hills
- Ecology and sites pre-histories

SITE OPPORTUNITIES: INTEGRATED ART COMPONENTS

We define integrated artworks as follows:

- Created as part of the project, integrated into structures, surface treatments, earth forms and planting installations. As such the designs will often blur the distinction between art and architecture ("the mother art")

The integrated art component should respond to a range of different experiential relationships: travelling at high or low speeds; viewing from a distance or at close range; daytime and nighttime conditions

- Conceived especially for the site
- Robust and low-maintenance
- Permanent and not transferable

Integrated artwork opportunities have been identified within the architectural solutions for spill through abutment, MSE wall panels and bridge barriers. Design proposals for these locations are shown in detail in relevant sections of this EUDLM document.

(Note: the coloured subway panels shown in this EUDLM are illustrative only and represent an example of the potential outcome derived from an arts intervention process in coordination with NZTA and Christchurch City Council)

Figure 99: Recent additions to Christchurch's public artworks, left to right Chalice (2000), Neil Dawson; Nucleus (2006), Phil Price; Flour Power (2008), Regan Gentry

POST-CONSTRUCTION ART OPPORTUNITIES

An “Arts Intervention Report” will be written as an output from this project, providing the NZTA, CCC and other stakeholders with a framework for implementing future art projects. This would:

- Identify arts coordination and works attributed to the provisional sum in the contract.
- Identify fully the nature of the site opportunities
- Identify design themes or criteria for works of art
- Identify processes for commissioning, procuring and managing artists and pieces of art

METHODOLOGY

For this project we propose the involvement of Deborah McCormick of Art & Industry Consultants Limited as an Art Consultant. This specialist input will enable effective management of art-led work elements. Deborah’s contribution will be of particular value in terms of:

- Identifying alternative funding methods to commission stand alone sculptures and motorway public artworks including in partnership with NZTA, CCC, The Art & Industry Biennial Trust, Creative New Zealand (CNZ), private sponsors; patrons and benefactors
- Setting out a process to select and engage artists
- Developing planning and timelines for a stand alone artwork
- Advise on appropriate commission models for artists.

We request approval from the Engineer to commission Deborah McCormack of Art and Industry Consultants Ltd under the contract provisional sum as outlined in the Basis of Measurement and Payment 4.15.8 Urban Design Murals/Artworks SoP 23-304

Procurement of artists - options

- Artists could be engaged at the design stages to input and respond to a range of briefs for these sites to be developed by the appointed Art Consultant
- Artists could be engaged via a direct invitation, open competition or a limited range of designs may be sought from selected artists via an RFP

Design Development

- Designs could be worked up under supervision of the Art Consultant
- The Art Consultant will advise on procurement of further funding
- The Art Consultant will work between the artist and the contractor to coordinate and streamline implementation

APPENDICES

4.0

4.1 PLANTING SCHEDULES

CSM CHRISTCHURCH SOUTHERN MOTORWAY - PLANT SCHEDULE - ZONE A

NOTES;

1. All tree species listed are taken from Christchurch City Council's Planting list of suitable species and will be subject to a further species selection review during detailed design.
2. The quantities shown are indicative only and will be refined in line with final areas and plant spacings outlined in the plant schedules.
3. Availability – the species and stock sizes shown on the schedule are preliminary. Development of the type and range of species, varieties and stock sizes shall be undertaken at the detail
4. To take account of the variable nature for the supply of larger nursery stock trade the contractor shall include in their price advance ordering to contract grow over on full growing season stock to the specified size in the schedule. Where this is not possible alternative species and cultivars may be offered for approval provided they are of similar form and size.
5. Tree to include double staking and adjustable tree ties, stakes min 2800 long, 50mm dia. drive min. 750mm into the ground.
6. Allow tree pits of a min 1000mm x 1000mm x 800mm deep, backfilled with quality topsoil with min 20% tree compost mix and slow release fertilizer, to be re-applied annually during the
7. Allow for regular inspection and maintenance during the maintenance period, including adjusting ties, refirming and establishment watering. Note: Where practical all native plants to be locally sourced

Riparian Planting (Stream/Pond Edge)					AREA (m²):	3345
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Eleocharis acuta		Pb3	0.60		5%	537
Carex maorica		Pb3	0.60		10%	1074
Carex secta	Pukio	Pb3	0.60		40%	4297
Carex virgata		Pb3	0.60		30%	3223
Cyperus ustulatus		Pb3	0.60		5%	537
Schoenoplectus tabernaemontani		Pb3	0.60		10%	1074
					100%	
					TOTAL PLANTS:	10742

Riparian Planting (Lower Bank - Stream/Pond)					AREA (m²):	2880
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma propinqua	Mikimiki	Pb3	1.20		15%	347
Coprosma rotundifolia		Pb3	1.20		10%	231
Cordyline australis	Ti kouka	Pb3	1.20		5%	116

Cortaderia richardii	Toetoe	Pb3	1.20		10%	231
Cyperus ustulatus		Pb3	0.60		5%	462
Hebe salicifolia	Koromiko	Pb3	1.20		15%	347
Juncus pallidus		Pb3	1.20		5%	116
Leptospermum scoparium	Manuka	Pb3	1.20		15%	347
Myrsine divaricata	Weeping Mapou	Pb3	1.20		10%	231
Phormium tenax	Harakeke	Pb3	1.20		10%	231
					100%	
				TOTAL PLANTS:		2659

Riparian Planting (Upper Bank - Stream/Pond)				AREA (m²):		3525
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma crassifolia	Thick leaved Mikimikmi	Pb3	1.20		10%	283
Coprosma lucida	Shining Karamu	Pb3	1.20		5%	141
Coprosma propinqua	Mikimiki	Pb3	1.20		5%	141
Coprosma robusta	Karamu	Pb3	1.20		10%	283
Cordyline australis	Ti kouka	Pb3	1.20		5%	141
Cortaderia richardii	Toetoe	Pb3	1.20		3%	85
Cyperus ustulatus		Pb3	0.60		1%	113
Dacrycarpus dacrydioides	Kahikatea	Pb3	1.20	Restrict to waterway edges only. Not pond	1%	28
Griselinia littoralis	Kapuka	Pb3	1.20		5%	141
Hebe salicifolia	Koromiko	Pb3	1.20		8%	212
Hoheria angustifolia	Lacebark	Pb3	1.20		5%	141
Kunzea ericoides	Kanuka	Pb3	1.20		10%	283
Leptospermum scoparium	Manuka	Pb3	1.20		5%	141
Myrsine divaricata	Weeping Mapou	Pb3	1.20		5%	141
Phormium tenax	Harakeke	Pb3	1.20	Plant at edges	5%	141
Pittosporum tenuifolium	Kohuhu	Pb3	1.20		8%	212
Pseudopanax crassifolius	Lancewood	Pb3	1.20		5%	141
Sophora microphylla	Kowhai	Pb3	1.20		5%	141
					100%	

				TOTAL PLANTS:		2915

Low Mow Grass				AREA (m²):		17850
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Sanguisorba minor	Sheeps Burnett				33	
Agrostis tenuis	Brown Top				34	
Trifolium repens	Huia White Clover				33	

Woodland Plantings				Total Specimen Tree Numbers:		47
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
*Acer Platanoides "Crimson King"	Purple Norway Maple	Openground or Pb60 - 95		Deciduous, exotic	1%	0
Betula papyrifera	Paper Bark Birch	Openground or Pb60 - 95		Deciduous, exotic. Plant in drifts at varying centres	5%	2
*Castanea sativa	Sweet Chestnut	Openground or Pb60 - 95		Deciduous, exotic	1%	0
Fagus sylvatica	European Beech	Openground or Pb60 - 95		Deciduous, exotic	10%	5
*Fraxinus excelsior	Common Ash	Openground or Pb60 - 95		Deciduous, exotic	2%	1
Fraxinus ornus	Manna Ash	Openground or Pb60 - 95		Deciduous, exotic	5%	2
Prunus spp (e.g.yedoensis 'Awanui')	Flowering cherries	Openground or Pb60 - 95		Deciduous, exotic. Plant in drifts close to cycleway	5%	2
Quercus coccinea	Scarlet Oak	Openground or Pb60 - 95		Deciduous, exotic	15%	7
Querucs robur	Common Oak	Openground or Pb60 - 95		Deciduous, exotic	10%	5
Tillia cordata	Small Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	5
*Tillia petiolaris	Weeping Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	1
Tillia platyphyllos	Larged Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	5
*Tillia tomentosa	Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	1
*Ulmus procera	English Elm	Openground or Pb60 - 95		Deciduous, exotic	2%	1
*Cedrus libani	Cedar of Lebanon	Openground or Pb60 - 95		Evergreen, exotic	1%	0
Cedrus deodora	Deodar Cedar	Openground or Pb60 - 95		Evergreen, exotic	2%	1
*Chamaecyparis lawsonia	Lawsons Cypress	Openground or Pb60 - 95		Evergreen, exotic	2%	1
*Cupressus torulosa	Bhutan Cypress	Openground or Pb60 - 95		Evergreen, exotic	1%	0
*Eucalypus delegatensis	Alpine Ash	Openground or Pb60 - 95		Evergreen, exotic	1%	0
*Eucalypus nitens	Blue Gum	Openground or Pb60 - 95		Evergreen, exotic	2%	1
Podocarpus totara	Totara	Openground or Pb60 - 95		Evergreen, native	10%	5
*Prumnopitys taxifolia	Matai	Openground or Pb60 - 95		Evergreen, native	1%	0
* denotes species / stock sizes of potential limited availability refer to notes 3 and 4 for further information.					100%	
				TOTAL PLANTS:		47

CSM CHRISTCHURCH SOUTHERN MOTORWAY - PLANT SCHEDULE - ZONE B1						
Low Mow Grass					AREA (m²):	59610
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Sanguisorba minor	Sheeps Burnett				33	
Agrostis tenuis	Brown Top				34	
Trifolium repens	Huia White Clover				33	

Woodland Plantings					Total Specimen Tree Numbers:	102
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
*Acer Platanoides "Crimson King"	Purple Norway Maple	Openground or Pb60 - 95		Deciduous, exotic	1%	1
Betula papyrifera	Paper Bark Birch	Openground or Pb60 - 95		Deciduous, exotic. Plant in drifts at varying centres	5%	5
*Castanea sativa	Sweet Chestnut	Openground or Pb60 - 95		Deciduous, exotic	1%	1
Fagus sylvatica	European Beech	Openground or Pb60 - 95		Deciduous, exotic	10%	10
*Fraxinus excelsior	Common Ash	Openground or Pb60 - 95		Deciduous, exotic	2%	2
Fraxinus ornus	Manna Ash	Openground or Pb60 - 95		Deciduous, exotic	5%	5
Prunus spp (e.g.yedoensis 'Awanui')	Flowering cherries	Openground or Pb60 - 95		Deciduous, exotic. Plant in drifts close to cycleway	5%	5
Quercus coccinea	Scarlet Oak	Openground or Pb60 - 95		Deciduous, exotic	15%	15
Querucs robur	Common Oak	Openground or Pb60 - 95		Deciduous, exotic	10%	10
Tillia cordata	Small Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	10
*Tillia petiolaris	Weeping Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	2
Tillia platyphyllos	Larged Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	10
*Tillia tomentosa	Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	2
*Ulmus procera	English Elm	Openground or Pb60 - 95		Deciduous, exotic	2%	2
*Cedrus libani	Cedar of Lebanon	Openground or Pb60 - 95		Evergreen, exotic	1%	1
Cedrus deodora	Deodar Cedar	Openground or Pb60 - 95		Evergreen, exotic	2%	2
*Chamaecyparis lawsonia	Lawsons Cypress	Openground or Pb60 - 95		Evergreen, exotic	2%	2
*Cupressus torulosa	Bhutan Cypress	Openground or Pb60 - 95		Evergreen, exotic	1%	1
*Eucalypus delegatensis	Alpine Ash	Openground or Pb60 - 95		Evergreen, exotic	1%	1
*Eucalypus nitens	Blue Gum	Openground or Pb60 - 95		Evergreen, exotic	2%	2

Podocarpus totara	Totara	Openground or Pb60 - 95		Evergreen, native	10%	10
*Prumnopitys taxifolia	Matai	Openground or Pb60 - 95		Evergreen, native	1%	1
* denotes species / stock sizes of potential limited availability refer to notes 3 and 4 for further information.					100%	
					TOTAL PLANTS:	102

CSM CHRISTCHURCH SOUTHERN MOTORWAY - PLANT SCHEDULE - ZONE B2

Riparian Planting (Stream/Pond Edge)					AREA (m²):	417
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Eleocharis acuta		Pb3	0.60		5%	67
Carex maorica		Pb3	0.60		10%	134
Carex secta	Pukio	Pb3	0.60		40%	536
Carex virgata		Pb3	0.60		30%	402
Cyperus ustulatus		Pb3	0.60		5%	67
Schoenoplectus tabernaemontani		Pb3	0.60		10%	134
					100%	
				TOTAL PLANTS:		1339

Riparian Planting (Lower Bank - Stream/Pond)					AREA (m²):	1063
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma propinqua	Mikimiki	Pb3	1.20		15%	128
Coprosma rotundifolia		Pb3	1.20		10%	85
Cordyline australis	Ti kouka	Pb3	1.20		5%	43
Cortaderia richardii	Toetoe	Pb3	1.20		10%	85
Cyperus ustulatus		Pb3	0.60		5%	171
Hebe salicifolia	Koromiko	Pb3	1.20		15%	128
Juncus pallidus		Pb3	1.20		5%	43
Leptospermum scoparium	Manuka	Pb3	1.20		15%	128
Myrsine divaricata	Weeping Mapou	Pb3	1.20		10%	85
Phormium tenax	Harakeke	Pb3	1.20		10%	85
					100%	
				TOTAL PLANTS:		981

Riparian Planting (Upper Bank - Stream/Pond)					AREA (m²):	1300
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma crassifolia	Thick leaved Mikimikmi	Pb3	1.20		10%	104
Coprosma lucida	Shining Karamu	Pb3	1.20		5%	52
Coprosma propinqua	Mikimiki	Pb3	1.20		5%	52
Coprosma robusta	Karamu	Pb3	1.20		10%	104
Cordyline australis	Ti kouka	Pb3	1.20		5%	52
Cortaderia richardii	Toetoe	Pb3	1.20		3%	31
Cyperus ustulatus		Pb3	0.60		1%	42
Dacrycarpus dacrydioides	Kahikatea	Pb3	1.20	Restrict to waterway edges only. Not pond	1%	10
Griselinia littoralis	Kapuka	Pb3	1.20		5%	52
Hebe salicifolia	Koromiko	Pb3	1.20		8%	78
Hoheria angustifolia	Lacebark	Pb3	1.20		5%	52
Kunzea ericoides	Kanuka	Pb3	1.20		10%	104
Leptospermum scoparium	Manuka	Pb3	1.20		5%	52
Myrsine divaricata	Weeping Mapou	Pb3	1.20		5%	52
Phormium tenax	Harakeke	Pb3	1.20	Plant at edges	5%	52
Pittosporum tenuifolium	Kohuhu	Pb3	1.20		8%	78
Pseudopanax crassifolius	Lancewood	Pb3	1.20		5%	52
Sophora microphylla	Kowhai	Pb3	1.20		5%	52
					100%	
				TOTAL PLANTS:		1075

Low Mow Grass					AREA (m²):	138560
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Sanguisorba minor	Sheeps Burnett				33	
Agrostis tenuis	Brown Top				34	
Trifolium repens	Huia White Clover				33	

Bridge Embankments - Dunbars/Awatea, Aidanfield, Curletts					AREA (m²):	44120
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma crassifolia	Thick leaved Mikimiki	Pb3	1.20		10%	3542
Coprosma propinqua	Mikimiki	Pb3	1.20		5%	1771
Coprosma robusta	Karamu	Pb3	1.20		12%	4250
Coprosma rubra	Red stemmed Coprosma	Pb3	1.20		10%	3542
Coprosma virescens	Pale green Coprosma	Pb3	1.20		5%	1771
Cordyline australis	Ti kouka	Pb3	1.20		5%	1771
Dodonaea viscosa	Akeake	Pb3	1.20		5%	1771
Kunzea ericoides	Kanuka	Pb3	1.20		12%	4250
Olearia paniculata	Akiraho	Pb3	1.20		5%	1771
Phormium tenax	Harakeke	Pb3	1.20	Plant at edges	10%	3542
Pittosporum tenuifolium	Kohuhu	Pb3	1.20		5%	1771
Podocarpus totara	Totara	Pb12	1.20	Plant sparingly to avoid shading road surface	1%	354
Pseudopanax crassifolius	Lancewood, Horoeka	Pb3	1.20		5%	1771
Sophora microphylla	Kowhai	Pb3	1.20		10%	3542
					100%	
				TOTAL PLANTS:		35421

Low Native Planting					AREA (m²):	2940
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Anemanthele lessonia	Gossamer Grass	Pb3	0.60		30%	4904
Carex comans	Maurea	Pb3	0.60		40%	6538
Chionochloa flavicans	Mini Toetoe	Pb3	0.90		30%	2179
					100%	
				TOTAL PLANTS:		13621

LandFill Plantings - E1, E2 & E3					AREA (m²):	10945
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Aristotelia serrata	Wineberry	Pb8	1.00		10%	1265
Kunzea ericoides	Kanuka	Pb8	1.00		10%	1265
Cassinia leptophylla	Tauhinu	Pb5	1.00		7%	886
Coprosma robusta	Karamu	Pb8	1.00		15%	1898
Cortaderia fulvida	Toetoe	Pb3	1.00		10%	1265
Dodonaea viscosa	Akeake	Pb8	1.00		8%	949
Olearia odorata	A scented shrub daisy	Pb5	1.00		5%	633
Olearia paniculata	Akiraho	Pb8	1.00		5%	633
Phormium tenax	Harakeke	Pb8	1.00		30%	3796
					100%	
				TOTAL PLANTS:		12590

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Woodland Plantings					Total Specimen Tree Numbers:	130
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
*Acer Platanoides "Crimson King"	Purple Norway Maple	Openground or Pb60 - 95		Deciduous, exotic	1%	1
Betula papyrifera	Paper Bark Birch	Openground or Pb60 - 95	Plant in drifts at varying centres	Deciduous, exotic.	5%	7
*Castanea sativa	Sweet Chestnut	Openground or Pb60 - 95		Deciduous, exotic	1%	1
Fagus sylvatica	European Beech	Openground or Pb60 - 95		Deciduous, exotic	10%	13
*Fraxinus excelsior	Common Ash	Openground or Pb60 - 95		Deciduous, exotic	2%	3
Fraxinus ornus	Manna Ash	Openground or Pb60 - 95		Deciduous, exotic	5%	7
Prunus spp (e.g.yedoensis 'Awanui')	Flowering cherries	Openground or Pb60 - 95	Plant in drifts close to cycleway	Deciduous, exotic.	5%	7
Quercus coccinea	Scarlet Oak	Openground or Pb60 - 95		Deciduous, exotic	15%	20
Querucs robur	Common Oak	Openground or Pb60 - 95		Deciduous, exotic	10%	13

Tillia cordata	Small Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	13
*Tillia petiolaris	Weeping Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	3
Tillia platyphyllos	Larged Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	13
*Tillia tomentosa	Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	3
*Ulmus procera	English Elm	Openground or Pb60 - 95		Deciduous, exotic	2%	3
*Cedrus libani	Cedar of Lebanon	Openground or Pb60 - 95		Evergreen, exotic	1%	1
Cedrus deodora	Deodar Cedar	Openground or Pb60 - 95		Evergreen, exotic	2%	3
*Chamaecyparis lawsonia	Lawsons Cypress	Openground or Pb60 - 95		Evergreen, exotic	2%	3
*Cupressus torulosa	Bhutan Cypress	Openground or Pb60 - 95		Evergreen, exotic	1%	1
*Eucalypus delegatensis	Alpine Ash	Openground or Pb60 - 95		Evergreen, exotic	1%	1
*Eucalypus nitens	Blue Gum	Openground or Pb60 - 95		Evergreen, exotic	2%	3
Podocarpus totara	Totara	Openground or Pb60 - 95		Evergreen, native	10%	13
*Prumnopitys taxifolia	Matai	Openground or Pb60 - 95		Evergreen, native	1%	1
* denotes species / stock sizes of potential limited availability refer to notes 3 and 4 for further information.					100%	
					TOTAL PLANTS:	130

CSM CHRISTCHURCH SOUTHERN MOTORWAY - PLANT SCHEDULE - ZONE C1						
Riparian Planting (Stream/Pond Edge)					AREA (m²):	1790
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Eleocharis acuta		Pb3	0.60		5%	287
Carex maorica		Pb3	0.60		10%	575
Carex secta	Pukio	Pb3	0.60		40%	2299
Carex virgata		Pb3	0.60		30%	1724
Cyperus ustulatus		Pb3	0.60		5%	287
Schoenoplectus tabernaemontani		Pb3	0.60		10%	575
					100%	
					TOTAL PLANTS:	5748

Riparian Planting (Lower Bank - Stream/Pond)					AREA (m²):	4565
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma propinqua	Mikimiki	Pb3	1.20		15%	550
Coprosma rotundifolia		Pb3	1.20		10%	366
Cordyline australis	Ti kouka	Pb3	1.20		5%	183
Cortaderia richardii	Toetoe	Pb3	1.20		10%	366
Cyperus ustulatus		Pb3	0.60		5%	733
Hebe salicifolia	Koromiko	Pb3	1.20		15%	550
Juncus pallidus		Pb3	1.20		5%	183
Leptospermum scoparium	Manuka	Pb3	1.20		15%	550
Myrsine divaricata	Weeping Mapou	Pb3	1.20		10%	366
Phormium tenax	Harakeke	Pb3	1.20		10%	366
					100%	
					TOTAL PLANTS:	4215

Riparian Planting (Upper Bank - Stream/Pond)					AREA (m²):	5575
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma crassifolia	Thick leaved Mikimikmi	Pb3	1.20		10%	448
Coprosma lucida	Shining Karamu	Pb3	1.20		5%	224
Coprosma propinqua	Mikimiki	Pb3	1.20		5%	224
Coprosma robusta	Karamu	Pb3	1.20		10%	448
Cordyline australis	Ti kouka	Pb3	1.20		5%	224
Cortaderia richardii	Toetoe	Pb3	1.20		3%	134
Cyperus ustulatus		Pb3	0.60		1%	179
Dacrycarpus dacrydioides	Kahikatea	Pb3	1.20	Restrict to waterway edges only. Not pond	1%	45
Griselinia littoralis	Kapuka	Pb3	1.20		5%	224
Hebe salicifolia	Koromiko	Pb3	1.20		8%	336
Hoheria angustifolia	Lacebark	Pb3	1.20		5%	224
Kunzea ericoides	Kanuka	Pb3	1.20		10%	448
Leptospermum scoparium	Manuka	Pb3	1.20		5%	224
Myrsine divaricata	Weeping Mapou	Pb3	1.20		5%	224
Phormium tenax	Harakeke	Pb3	1.20	Plant at edges	5%	224

Pittosporum tenuifolium	Kohuhu	Pb3	1.20		8%	336
Pseudopanax crassifolius	Lancewood	Pb3	1.20		5%	224
Sophora microphylla	Kowhai	Pb3	1.20		5%	224
					100%	
				TOTAL PLANTS:		4610

Low Mow Grass				AREA (m²):		95975
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Sanguisorba minor	Sheeps Burnett				33	
Agrostis tenuis	Brown Top				34	
Trifolium repens	Huia White Clover				33	

Bridge Embankments - Dunbars/Awatea, Aidanfield, Curletts					AREA (m²):	9945
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma crassifolia	Thick leaved Mikimiki	Pb3	1.20		10%	798
Coprosma propinqua	Mikimiki	Pb3	1.20		5%	399
Coprosma robusta	Karamu	Pb3	1.20		12%	958
Coprosma rubra	Red stemmed Coprosma	Pb3	1.20		10%	798
Coprosma virescens	Pale green Coprosma	Pb3	1.20		5%	399
Cordyline australis	Ti kouka	Pb3	1.20		5%	399
Dodonaea viscosa	Akeake	Pb3	1.20		5%	399
Kunzea ericoides	Kanuka	Pb3	1.20		12%	958
Olearia paniculata	Akiraho	Pb3	1.20		5%	399
Phormium tenax	Harakeke	Pb3	1.20	Plant at edges	10%	798
Pittosporum tenuifolium	Kohuhu	Pb3	1.20		5%	399
Podocarpus totara	Totara	Pb12	1.20	Plant sparingly to avoid shading road surface	1%	80
Pseudopanax crassifolius	Lancewood, Horoeka	Pb3	1.20		5%	399
Sophora microphylla	Kowhai	Pb3	1.20		10%	798
					100%	
					TOTAL PLANTS:	7984

Woodland Plantings					Total Specimen Tree Numbers:	237
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
*Acer Platanoides "Crimson King"	Purple Norway Maple	Openground or Pb60 - 95		Deciduous, exotic	1%	2
Betula papyrifera	Paper Bark Birch	Openground or Pb60 - 95	Plant in drifts at varying centres	Deciduous, exotic.	5%	12
*Castanea sativa	Sweet Chestnut	Openground or Pb60 - 95		Deciduous, exotic	1%	2
Fagus sylvatica	European Beech	Openground or Pb60 - 95		Deciduous, exotic	10%	24
*Fraxinus excelsior	Common Ash	Openground or Pb60 - 95		Deciduous, exotic	2%	5
Fraxinus ornus	Manna Ash	Openground or Pb60 - 95		Deciduous, exotic	5%	12
Prunus spp (e.g.yedoensis 'Awanui')	Flowering cherries	Openground or Pb60 - 95	Plant in drifts close to cycleway	Deciduous, exotic.	5%	12
Quercus coccinea	Scarlet Oak	Openground or Pb60 - 95		Deciduous, exotic	15%	36
Querucs robur	Common Oak	Openground or Pb60 - 95		Deciduous, exotic	10%	24
Tillia cordata	Small Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	24

*Tillia petiolaris	Weeping Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	5
Tillia platyphyllos	Larged Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	24
*Tillia tomentosa	Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	5
*Ulmus procera	English Elm	Openground or Pb60 - 95		Deciduous, exotic	2%	5
*Cedrus libani	Cedar of Lebanon	Openground or Pb60 - 95		Evergreen, exotic	1%	2
Cedrus deodora	Deodar Cedar	Openground or Pb60 - 95		Evergreen, exotic	2%	5
*Chamaecyparis lawsonia	Lawsons Cypress	Openground or Pb60 - 95		Evergreen, exotic	2%	5
*Cupressus torulosa	Bhutan Cypress	Openground or Pb60 - 95		Evergreen, exotic	1%	2
*Eucalypus delegatensis	Alpine Ash	Openground or Pb60 - 95		Evergreen, exotic	1%	2
*Eucalypus nitens	Blue Gum	Openground or Pb60 - 95		Evergreen, exotic	2%	5
Podocarpus totara	Totara	Openground or Pb60 - 95		Evergreen, native	10%	24
*Prumnopitys taxifolia	Matai	Openground or Pb60 - 95		Evergreen, native	1%	2
* denotes species / stock sizes of potential limited availability refer to notes 3 and 4 for further information.					100%	
					TOTAL PLANTS:	237

CSM CHRISTCHURCH SOUTHERN MOTORWAY - PLANT SCHEDULE - ZONE C2						
Duplication / Barrington St Overpass Batters					AREA (m²):	8690
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Chionochloa flavicans	Mini Toetoe	Pb3	0.9		100%	12403
					TOTAL PLANTS:	12403

Low Mow Grass					AREA (m²):	76785
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Sanguisorba minor	Sheeps Burnett				33	
Agrostis tenuis	Brown Top				34	
Trifolium repens	Huia White Clover				33	

Native Plantings South of Duplication					AREA (m²):	2525
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma crassifolia	Thick leaved Mikimiki	Pb3	1.20		10%	203
Coprosma propinqua	Mikimiki	Pb3	1.20		5%	101
Coprosma robusta	Karamu	Pb3	1.20		12%	243
Coprosma rubra	Red Stemmed Coprosma	Pb3	1.20		12%	243
Coprosma virescens	Pale Green Coprosma	Pb3	1.20		4%	81
Cordyline australis	Ti Kouka	Pb3	1.20		6%	122
Dodonaea viscosa	Akeake	Pb3	1.20		5%	101
Griselinia littoralis	Kapuka	Pb3	1.20		5%	101
Hebe strictissima	Koromiko	Pb3	1.20		4%	81
Hoheria angustifolia	Lacebark	Pb3	1.20	Plant sparingly to avoid shading of adjacent residences	1%	20
Olearia paniculata	Akiraho	Pb3	1.20		5%	101
Phormium tenax	Harakeke	Pb3	1.20	Plant at edges	10%	203
Pittosporum eugeniodes	Tarata	Pb3	1.20		5%	101
Pittosporum tenuifolium	Kohuhu	Pb3	1.20		3%	61
Pseudopanax crassifolius	Lancewood, Horoeka	Pb3	1.20		3%	61
Sophora microphylla	Kowhai	Pb3	1.20		10%	203
					100%	
					TOTAL PLANTS:	2027

Woodland Plantings					Total Specimen Tree Numbers:	215
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
*Acer Platanoides "Crimson King"	Purple Norway Maple	Openground or Pb60 - 95		Deciduous, exotic	1%	2
Betula papyrifera	Paper Bark Birch	Openground or Pb60 - 95		Deciduous, exotic. Plant in drifts at varying centres	5%	11
*Castanea sativa	Sweet Chestnut	Openground or Pb60 - 95		Deciduous, exotic	1%	2
Fagus sylvatica	European Beech	Openground or Pb60 - 95		Deciduous, exotic	10%	22
*Fraxinus excelsior	Common Ash	Openground or Pb60 - 95		Deciduous, exotic	2%	4
Fraxinus ornus	Manna Ash	Openground or Pb60 - 95		Deciduous, exotic	5%	11
Prunus spp (e.g.yedoensis 'Awanui')	Flowering cherries	Openground or Pb60 - 95		Deciduous, exotic. Plant in drifts close to cycleway	5%	11
Quercus coccinea	Scarlet Oak	Openground or Pb60 - 95		Deciduous, exotic	15%	32

Querucs robur	Common Oak	Openground or Pb60 - 95		Deciduous, exotic	10%	22
Tillia cordata	Small Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	22
*Tillia petiolaris	Weeping Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	4
Tillia platyphyllos	Larged Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	22
*Tillia tomentosa	Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	4
*Ulmus procera	English Elm	Openground or Pb60 - 95		Deciduous, exotic	2%	4
*Cedrus libani	Cedar of Lebanon	Openground or Pb60 - 95		Evergreen, exotic	1%	2
Cedrus deodora	Deodar Cedar	Openground or Pb60 - 95		Evergreen, exotic	2%	4
*Chamaecyparis lawsonia	Lawsons Cypress	Openground or Pb60 - 95		Evergreen, exotic	2%	4
*Cupressus torulosa	Bhutan Cypress	Openground or Pb60 - 95		Evergreen, exotic	1%	2
*Eucalypus delegatensis	Alpine Ash	Openground or Pb60 - 95		Evergreen, exotic	1%	2
*Eucalypus nitens	Blue Gum	Openground or Pb60 - 95		Evergreen, exotic	2%	4
Podocarpus totara	Totara	Openground or Pb60 - 95		Evergreen, native	10%	22
*Prumnopitys taxifolia	Matai	Pb95		Evergreen, native	1%	2
* denotes species / stock sizes of potential limited availability refer to notes 3 and 4 for further information.					100%	
				TOTAL PLANTS:		215

CSM CHRISTCHURCH SOUTHERN MOTORWAY - PLANT SCHEDULE - ZONE C3						
Duplication / Barrington St Overpass Batters				AREA (m²):		11030
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Chionochloa flavicans	Mini Toetoe	Pb3	0.9		100%	15743
				TOTAL PLANTS:		15743

Low Mow Grass				AREA (m²):		29205
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Sanguisorba minor	Sheeps Burnett				33	
Agrostis tenuis	Brown Top				34	
Trifolium repens	Huia White Clover				33	

Native Plantings South of Duplication					AREA (m²):	3950
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
Coprosma crassifolia	Thick leaved Mikimiki	Pb3	1.20		10%	317
Coprosma propinqua	Mikimiki	Pb3	1.20		5%	159
Coprosma robusta	Karamu	Pb3	1.20		12%	381
Coprosma rubra	Red Stemmed Coprosma	Pb3	1.20		12%	381
Coprosma virescens	Pale Green Coprosma	Pb3	1.20		4%	127
Cordyline australis	Ti Kouka	Pb3	1.20		6%	190
Dodonaea viscosa	Akeake	Pb3	1.20		5%	159
Griselinia littoralis	Kapuka	Pb3	1.20		5%	159
Hebe strictissima	Koromiko	Pb3	1.20		4%	127
Hoheria angustifolia	Lacebark	Pb3	1.20	Plant sparingly to avoid shading of adjacent residences	1%	32
Olearia paniculata	Akiraho	Pb3	1.20		5%	159
Phormium tenax	Harakeke	Pb3	1.20	Plant at edges	10%	317
Pittosporum eugeniodes	Tarata	Pb3	1.20		5%	159
Pittosporum tenuifolium	Kohuhu	Pb3	1.20		3%	95
Pseudopanax crassifolius	Lancewood, Horoeka	Pb3	1.20		3%	95
Sophora microphylla	Kowhai	Pb3	1.20		10%	317
					100%	
					TOTAL PLANTS:	3171

Woodland Plantings				Total Specimen Tree Numbers:		150
botanical name	common name	grade	plant spacing framework (m)	comments	% of mix	quantity
*Acer Platanoides "Crimson King"	Purple Norway Maple	Openground or Pb60 - 95		Deciduous, exotic	1%	2
Betula papyrifera	Paper Bark Birch	Openground or Pb60 - 95		Deciduous, exotic. Plant in drifts at varying centres	5%	8
*Castanea sativa	Sweet Chestnut	Openground or Pb60 - 95		Deciduous, exotic	1%	2
Fagus sylvatica	European Beech	Openground or Pb60 - 95		Deciduous, exotic	10%	15
*Fraxinus excelsior	Common Ash	Openground or Pb60 - 95		Deciduous, exotic	2%	3
Fraxinus ornus	Manna Ash	Openground or Pb60 - 95		Deciduous, exotic	5%	8
Prunus spp (e.g.yedoensis 'Awanui')	Flowering cherries	Openground or Pb60 - 95		Deciduous, exotic. Plant in drifts close to cycleway	5%	8
Quercus coccinea	Scarlet Oak	Openground or Pb60 - 95		Deciduous, exotic	15%	23
Querucs robur	Common Oak	Openground or Pb60 - 95		Deciduous, exotic	10%	15
Tillia cordata	Small Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	15
*Tillia petiolaris	Weeping Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	3
Tillia platyphyllos	Larged Leaved Lime	Openground or Pb60 - 95		Deciduous, exotic	10%	15
*Tillia tomentosa	Silver Lime	Openground or Pb60 - 95		Deciduous, exotic	2%	3
*Ulmus procera	English Elm	Openground or Pb60 - 95		Deciduous, exotic	2%	3
*Cedrus libani	Cedar of Lebanon	Openground or Pb60 - 95		Evergreen, exotic	1%	2
Cedrus deodora	Deodar Cedar	Openground or Pb60 - 95		Evergreen, exotic	2%	3
*Chamaecyparis lawsonia	Lawsons Cypress	Openground or Pb60 - 95		Evergreen, exotic	2%	3
*Cupressus torulosa	Bhutan Cypress	Openground or Pb60 - 95		Evergreen, exotic	1%	2
*Eucalypus delegatensis	Alpine Ash	Openground or Pb60 - 95		Evergreen, exotic	1%	2
*Eucalypus nitens	Blue Gum	Openground or Pb60 - 95		Evergreen, exotic	2%	3
Podocarpus totara	Totara	Openground or Pb60 - 95		Evergreen, native	10%	15
*Prumnopitys taxifolia	Matai	Openground or Pb60 - 95		Evergreen, native	1%	2
* denotes species / stock sizes of potential limited availability refer to notes 3 and 4 for further information.					100%	
				TOTAL PLANTS:		150

4.2 PLANTING THEME IMAGES

PARKLAND TREE SPECIES




Acer platanoiodes 'Crimson King'





Sweet Chestnut (*Castanea sativa*)





Common ash (*Fraxinus excelsior*)



Manna ash (*Fraxinus ornus*)

Scarlet oak (*Quercus coccinea*)

PARKLAND TREE SPECIES





Common oak (*Quercus robur*)



Small leaved lime (*Tilia cordata*)



English elm (*Ulmus procera*)

NATIVE PLANT SPECIES

Carex secta

Cortaderia fulvida

Cabbage Tree (*Cordyline australis*)

Chionochloa flavicans

Coprosma lucida

Coprosma repens

Kahikatea (*Dacrycarpus dacrydioides*)

Dodonea viscosa

Griselinia littoralis

Leptospermum scoparium

Phormium tenax

4.3 TERRESTRIAL ECOLOGY TRANSLOCATION METHODOLOGY

The following transplant strategy has been completed by EOS Ecology under the guidance of Colin Meurk of Landcare Research to address CCC CSM NoR Conditions 7 a to e – Terrestrial Ecology and prioritise the start of the construction works at the Owaka Pond site.

Transplant Strategy

A transplant strategy will be developed for four areas within the motorway designation:

- Wilmers Road grassland area (plants of concern: broadleaf herbs, Geranium solanderi, mat pohuehue, Muehlenbeckia spp.)
- Owaka Pond area (plant of concern: Lachnagrostis)
- Upper Heathcote River area (plants of concern: marsh cress and associated species)
- Haytons Drain riparian margin (plants of concern: some existing native plantings)

Each area will undergo the following site assessment and if necessary, a transplant or protection strategy as outlined below.

1.1.1 Site Assessment

Each location will be assessed by a qualified terrestrial ecologist/ botanist to identify the plant species that may require protection/ translocation and to better demarcate the area in which these plants are found. This area will be compared to the motorway designation (e.g., the road, berms, and swale areas) and construction zones (including land reforming areas), and if plants are within these areas then a suitable transplantation strategy will be devised. If the plants are within the wider designation zone but are not within the construction areas or path of construction vehicles then a suitable protection plan will be devised to ensure they remain intact and protected during the construction and planting phase. For those plants that will need to be removed from the area then it will also need to be determined whether the plants can be immediately transplanted to an adjacent area outside of the construction zone, or whether they will need to be cared for off-site until it is suitable to transplant them to a new area.

1.1.2 Plant Protection Strategy

A plant protection strategy will be devised for those areas where the Site Assessment has determined that the plants can remain where they are. This will incorporate delineating the area to be protected with stakes and flag tape. These areas will also be identified on a site map with associated details about avoiding the area, and this will be referred to by the on-site construction team. A qualified botanist will also be required to sign-off that the area has been sufficiently demarcated. The area will also be checked by a qualified ecologist during the construction phase and following completion of the project to ensure that the plants are being sufficiently protected.

1.1.3 Plant Translocation Strategy

a. Plant removal

A plant removal strategy will be devised for those areas that require the removal of plants. A site-specific transplant strategy will be developed for each area that it is required, but this cannot occur until the site assessments (see above) have been completed. In general however the plant removal strategy will involve the following principle steps.

Those small-medium sized plants (such as the native endangered grasses and broadleaf herbs in the Wilmers Road, Owaka, and Upper Heathcote areas) will be removed by suitably trained personnel using spades so that sufficient root mass is also removed intact.

If the plants cannot be immediately translocated to an adjacent area outside of the designation zone then the removed plants will be immediately placed in large bins lined with damp newspaper that, once full, will be moved to a shaded and cool area ready for potting. The plants will then be transported off site and properly potted into soil media suitable for the soil preference of the particular plant. The plants will then be cared for off-site until such a time that they are ready for transplanting. The transplanting will be undertaken at a suitable time of year, considering as well where the plants are to be relocated to. For example, if the plants are to be relocated to an area within the motorway designation then they will be held until the site is ready for planting, whereas if they are to be moved to an adjacent area outside of the designation they can be planted as soon as conditions are appropriate.

For areas where larger plants may need to be removed (such as the native planting around Haytons Drain) then a specific removal plan will be developed that is suitable for the removal of larger plants. In this case the larger size of the plants could preclude them from being cared for off site. Thus they will ideally be moved and replanted in the adjacent area outside of the designation zone on the same day.

The transplantation strategy for each area will be signed off by a qualified botanist. The plant removal will be overseen by a suitably qualified botanist, who will also be responsible for checking the area at the completion of the plant removal to ensure that all plants have been removed, and to sign-off on the adequate removal of the target plants from the designated area.

b. Transplanting b. Transplanting

i. Determining appropriate habitat

Before plants can be transplanted to a new area the appropriate conditions for each particular plant species needs to be determined. Factors to consider will include (but not be limited to) soil type, moisture level, microclimate, species interactions (e.g., ability to cope with competition from introduced plants), appropriate maintenance regime. Once these factors have been determined then the area within the motorway designation that meets these requirements will be chosen for their transplantation.

This site selection will need to be signed off by a qualified botanist.

ii. Translocation of plants

Once a suitable site has been selected then the plants will be planted within this area at a time that is suitable for planting. The timing will be affected not only by the most suitable time of year for planting, but also where the plants are to be relocated to. For example, if the plants are to be relocated to an area within the motorway designation then this cannot occur until the area is ready for planting, whereas if they are to be moved to an adjacent area outside of the designation they can be planted as soon as conditions are appropriate.