

Appendix I – Urban Design and Landscape Comparative Assessment Addendum

Albion Park Rail bypass

September 2017



Prepared for:



Prepared by:

SPACKMAN MOSSOP ^{AND} MICHAELS

PO Box 880 Darlinghurst, NSW 1300
P (02) 9361 4549 F (02) 9361 4569
www.sm2group.com.au
ABN 65 065 578 985

Version control:

Version	Status	Date	Author	Released by
A	Preliminary Draft	09/02/2017	EH	MW
B	Revised Preliminary Draft	17/02/2017	EH	MW
C	RMS Review	01/03/2017	EH	MW
D	Final Draft	24/03/2017	EH	MW
E	Revised	31/03/2017	EH	MS
F	Revised	03/04/2017	JF	MS
G	Revised Issue	13/04/2017	EH	MW
H	Revised	26/04/2017	JF	MW
I	Revised	28/04/2017	JF	MW
K	Revised	17/05/2017	JF	MW
L	Revised	24/05/2017	AC	MW
M	Revised	09/06/2017	EH	MW
N	Revised	14/06/2017	JF	MW
O	Revised	26/06/2017	JF	MW
P	Revised following agency review	06/09/2017	JF	MW

Table of Contents

1.	INTRODUCTION	5
1.1	PURPOSE OF THIS ADDENDUM	5
1.2	PROJECT DESCRIPTION	5
1.3	REVISED DESIGN	7
1.4	REVIEW OF POTENTIAL NOISE MITIGATION MEASURES	7
2.	URBAN DESIGN AND LANDSCAPE CHARACTER STRATEGY	10
2.1	URBAN DESIGN AND LANDSCAPE CHARACTER	10
3.	ASSESSMENT OF PROPOSED CHANGES	11
3.1	LANDSCAPE CHARACTER ASSESSMENT	11
3.2	VISUAL IMPACT ASSESSMENT	15
3.3	SUMMARY OF VISUAL IMPACT ASSESSMENT	22
3.4	REFINEMENT OF NOISE MITIGATION MEASURES	23
4.	CONCEPT DESIGN DRAWINGS	25
5.	CONCLUSION	46
5.1	LANDSCAPE CHARACTER IMPACTS OF THE REVISED DESIGN	46
5.2	VISUAL IMPACT OF THE REVISED DESIGN	46

List of Figures

Figure 1-1: Project Location	6
Figure 1.2: Typical section of concrete and acrylic panel noise barrier	9
Figure 3-1: Landscape Character Zones	12
Figure 3-2: Viewpoints location in the project area	16

List of Tables

Table 2-1: Urban Design Objectives as per “ <i>Technical Paper 10</i> ”	10
Table 3-1: Roads and Maritime Impact grading matrix used to assess landscape character and visual impact	11
Table 3-2: Landscape Character Zones - landscape character and visual impact matrix	14
Table 3-3: Summary of viewpoints affected by the revised road design and project boundary adjustments	22

List of Plates

Plate 3-1: New viewpoint 40 - Princes Motorway looking north (source: Google StreetView)	17
Plate 3-2: New viewpoint 40 - Photomontage illustrating the proposed changes to the existing Princes Motorway corridor in southern Dapto including noise barriers (source: Spatial Media)	17
Plate 3-3: New viewpoint 41 - eastern end of Mount Brown Road (source: HCJV)	19
Plate 3-4: New viewpoint 41 - Photomontage illustrating the proposed Dapto northbound noise barrier (source: Spatial Media)	19

Blank page

1. INTRODUCTION

1.1 PURPOSE OF THIS ADDENDUM

Roads and Maritime Services (Roads and Maritime) propose to build a 9.8 kilometre extension of the Princes Motorway between Yallah and Oak Flats that would bypass Albion Park Rail, refer to *Figure 1-1 Project Location*.

An Environmental Impact Statement (EIS) was prepared by Roads and Maritime to assess the potential impacts of the proposal. The EIS was publicly exhibited by the Department of Planning and Environment between 28 October and 27 November 2015.

Supporting the EIS was *Technical Paper 10 - Urban Design Concept, Landscape Character and Visual Impact Assessment Report (Technical Paper 10)* prepared by Spackman Mossop Michaels for NSW Roads and Maritime Services in October 2015.

Roads and Maritime has prepared a *Submissions and Preferred Infrastructure Report* that addresses issues raised in submissions received during the exhibition of the EIS. It also describes and assesses the proposed design refinements.

This *Urban Design and Landscape Comparative Assessment Addendum* (the Addendum) forms an appendix to the *Submissions and Preferred Infrastructure Report* and details the additional urban design and visual impact investigations undertaken since the EIS. The purpose of the Addendum is to assess the revised design to determine whether it would result in any changes to the urban design, landscape character and visual impacts identified in *Technical Paper 10*.

In doing so, this Addendum focuses on areas of change between the EIS design and the revised design. They are outlined in *section 1.3 Revised design* below and further elaborated on where appropriate in *section 3 Assessment of proposed changes*.

Aspects and elements of the design that have not changed since the EIS are not discussed or assessed in this Addendum, as they have previously been assessed in *Technical Paper 10*. This Addendum should therefore be read in conjunction with *Technical Paper 10* which provides the landscape character and visual impact assessment for the majority of the design.

1.2 PROJECT DESCRIPTION

Key features of the project include:

- Two lanes in each direction divided by a median (with capacity to upgrade to three lanes in each direction in future)
- Three interchanges provided at Yallah, Albion Park and Oak Flats would connect the local road network with the motorway
- Bridges to carry the motorway over Duck Creek, Macquarie Rivulet and Frazers Creek
- Bridges to carry the motorway over the Princes Highway and Tongarra Road
- A bridge to carry the motorway over the South Coast Rail Line
- Improved pedestrian and cycle connections
- Improvements to directly impacted sporting facilities at the Croom Regional Sporting Complex and changes to the southern access.

Figure 1-1: Project Location



1.3 REVISED DESIGN

Following the EIS display, a review of the design was undertaken in response to feedback following stakeholder consultation. As a result of this review process, Roads and Maritime has refined a number of aspects of the project as exhibited in the EIS. Design refinements have been developed to minimise impacts where possible and in response to:

- Consultation with the community during the EIS exhibition period
- Submissions received during and following the EIS exhibition period
- Landowner discussions during property acquisition and adjustment
- Further concept design review of the EIS design.

The key design refinements proposed include:

- Reconfiguration of the central interchange to minimise the impact on agricultural land and allow northbound traffic to exit the motorway onto Tongarra Road
- Reduction in the project footprint within agricultural land
- Some refinements to intersection arrangements in response to further detailed traffic modelling
- Changes to proposed noise mitigation measures - refer following section.

1.4 REVIEW OF POTENTIAL NOISE MITIGATION MEASURES

The revised design proposes changes to the noise mitigation measures for the project. They have the potential to affect the landscape character and views in the project area.

The potential changes are described below. The resulting landscape character and visual impacts are discussed in sections 3.1 and 3.2 to determine the extent to which they alter the landscape character and visual impacts of the proposed bypass as identified in *Technical Paper 10*. This will help facilitate decision making in the next stages of the project.

1.4.1. Noise Barriers

The following changes have been made to the design:

- Dapto northbound:
 - A change in alignment, length and height of the proposed noise barrier along the northbound Princes Motorway carriageway in Dapto, relative to the EIS design.
 - Replacement of the existing northbound noise wall with a new noise barrier of increased height.
- Dapto southbound:
 - Replacement of the existing noise wall along the Princes Motorway southbound carriageway in Dapto with a new noise barrier of increased height. Extension of the length of the noise barrier southbound towards Cormack Avenue.

The location and alignment of both barriers is illustrated in section 4 *.Concept Design Drawings*.

Dapto northbound

The EIS design indicated a noise barrier may be required along the edge of the northbound on-ramp to the Princes Motorway, extending approximately 440 metres from south of Semillon Place to north of Mount Brown Road. The likely height of the barrier was not known at that time.

The revised design provides for an approximately 925 metre long noise barrier. It extends from north of the roundabout at the Princes Highway interchange towards the northern project boundary at the Martin Street footbridge.

The revised design would

- Replace the existing northbound noise wall that commences approximately 150 metres south of the Martin Street footbridge with a new, substantially taller noise barrier
- Provide a new noise barrier near the existing road corridor boundary, following the top of the existing cutting, at the rear of existing residential properties

The height of the Dapto northbound noise barrier would be 6.5 meters for about four fifths of the length of the barrier, with the northern fifth 8 meters high above existing ground level. At the rear of the wall towards residential properties would be an approximately three meters wide combined drainage and maintenance access apron. A typical cross section of the barrier is illustrated in *Figure 1-2*.

While construction of the project would have involved removal of existing vegetation within the project footprint on the western side of the mainline, replacement of the existing noise barrier and construction of the noise barrier in the revised alignment may potentially result in the removal of additional mature vegetation at the rear of residential properties. Removal of vegetation would be limited to within the nominated project footprint. Depending on the final design and alignment of the barrier relative to the on-ramp and residential properties, opportunities to reinstate vegetation may be limited.

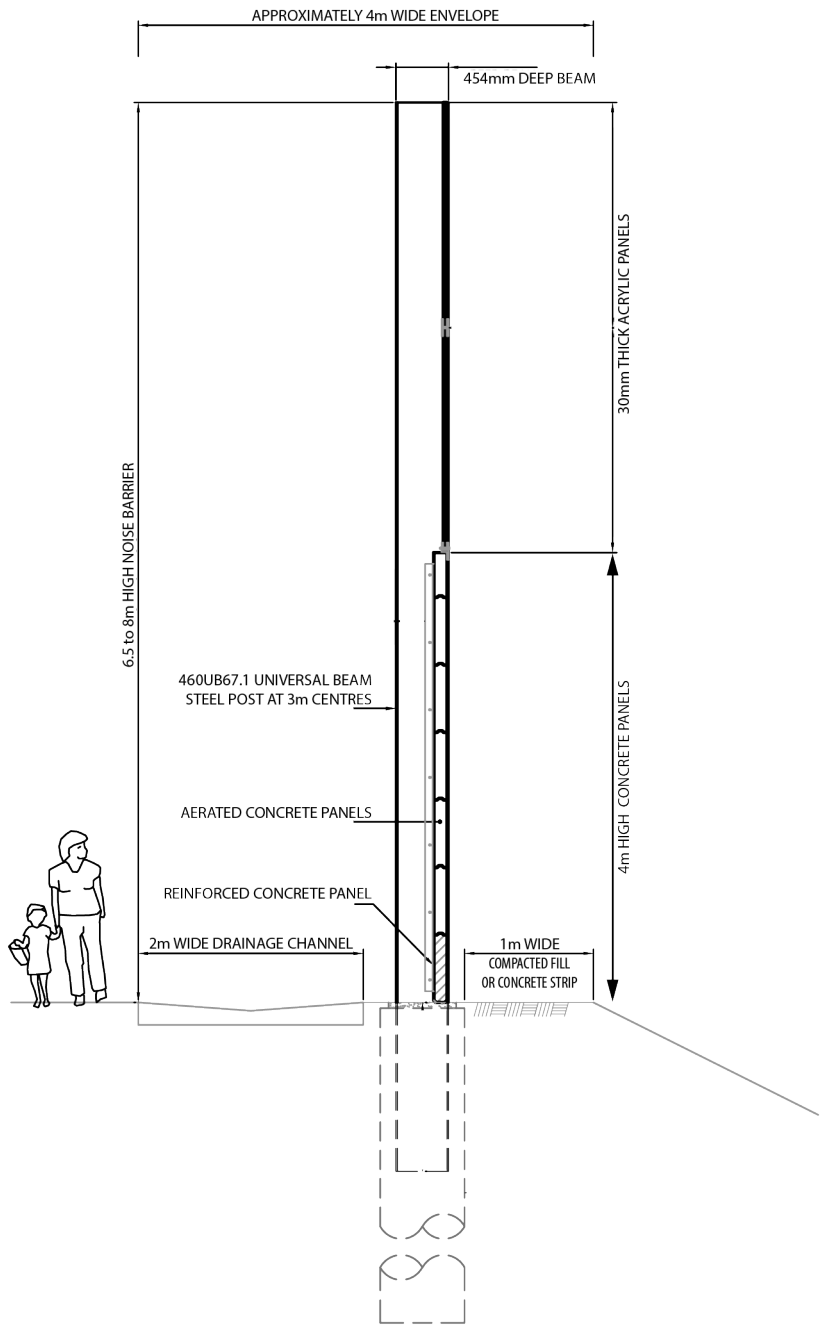
Dapto southbound

The EIS design did not propose any changes to the existing noise wall along the southbound carriageway of the Princes Motorway.

The revised design proposes to replace the existing noise wall between the southbound carriageway and residential property boundaries east of the Princes Motorway. The new noise barrier would be 7.5 meters high and extend further south than the existing barrier. The new barrier would be approximately 411 meters long and would follow an alignment along the rear of properties from the northern project boundary to the southern end of Cadigan Place. Similarly to Dapto northbound, the noise barrier would require a three meter wide combined drainage and maintenance access apron at the rear.

As the EIS design did not anticipate any works in the area between the southbound carriageway and residential property boundaries, it is likely that the replacement and extension of the noise barrier would result in the removal of additional existing mature vegetation, relative to what may have been required for the construction of the EIS design. Depending on the final alignment of the barrier, opportunities to reinstate vegetation may be limited.

Figure 1-2: Typical section of concrete and acrylic panel noise barrier



2. URBAN DESIGN AND LANDSCAPE CHARACTER STRATEGY

2.1 URBAN DESIGN AND LANDSCAPE CHARACTER

An Urban Design and Landscape Character Strategy was included in section 3.2 of *Technical Paper 10*. The strategy describes the interrelationship between the works and adjoining areas. The strategy design presented in *Technical Paper 10* guides the integration of elements such as retaining walls, cuttings, fill embankments, pedestrian and cyclist connections and habitat corridors into the proposed motorway corridor, to assist in maintaining the existing character of the local area.

As part this integrated design approach, an urban design strategy was developed to guide the overall concept design for the bypass. The purpose of the strategy is to articulate how urban design can contribute to the successful achievement of the overall project objectives. An integrated design approach has been adopted for the Albion Park Rail bypass in order to ensure that the best possible outcomes are achieved.

The overall project objectives for the Albion Park Rail bypass are:

- Provide a motorway standard bypass of Albion Park Rail
- Provide a minimum of one in 20 year flood immunity
- Provide access for A-double vehicles
- Provide east-west connectivity for current and future land use.

The urban design and landscape character strategy has directly influenced key engineering aspects of the concept design to date including the proposed road alignment, bridges, retaining walls, cuttings and embankments. The intention is that the urban design and landscape character strategy will continue to inform the development of the bypass when it proceeds to detailed design and construction.

The revised road concept design address more efficiently the urban design and landscape character strategy by reducing the proposed footprint into the existing landscape, therefore the over-arching aim of the urban design strategy and the project specific objectives and principles identified in *Technical Paper 10* and shown in *Table 2-1* below, still remain the same.

Table 2-1: Urban Design Objectives as per Technical Paper 10

	No.	Objectives
LANDSCAPE AND SCENIC QUALITY	1	To achieve a project that fits sensitively with the existing landscape and scenic qualities and characteristics of the Albion Park Rail and Albion Park setting
DESIGN OF THE MOTORWAY, INTERCHANGES AND BRIDGES	2	To achieve an integrated road design form and character that minimises the visual impacts on the adjoining areas
	3	To achieve a design that efficiently utilises road related elements which minimise visual impacts and require minimal maintenance
HERITAGE AND CULTURAL VALUES	4	To protect the integrity of the heritage and cultural values of the Albion Park Rail and Albion Park area
USER'S CONNECTIVITY	5	To contribute to the accessibility and connectivity into and through Albion Park Rail, Albion Park and other surrounding areas
URBAN DEVELOPMENT	6	To create a project that facilitates future urban development and revitalisation along and surrounding the proposed project area
PUBLIC DOMAIN	7	To enhance the quality and value of the public domain along and surrounding the proposed project area

3. ASSESSMENT OF PROPOSED CHANGES

3.1 LANDSCAPE CHARACTER ASSESSMENT

A review of the landscape character of the study area, against the revised road design, has been addressed within this section of the Addendum, in order to show any changes to the landscape character assessment as described in *Technical Paper 10*.

The impact assessment grading matrix, adopted from the *Guideline for Landscape Character and Visual Impact Assessment* (Roads and Maritime 2013), shown in *Table 3-1*, is used in both the landscape character and visual impact assessments.

Table 3-1: Roads and Maritime impact grading matrix used to assess landscape character and visual impact

		MAGNITUDE			
		HIGH	MODERATE	LOW	NEGLIGIBLE
SENSITIVITY	HIGH	HIGH	HIGH TO MODERATE	MODERATE	NEGLIGIBLE
	MODERATE	HIGH TO MODERATE	MODERATE	MODERATE TO LOW	NEGLIGIBLE
	LOW	MODERATE	MODERATE TO LOW	LOW	NEGLIGIBLE
	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE

Technical Paper 10 identified twelve Landscape Character Zones (LCZ) within the study area - refer *Figure 3-1*. Those zones have been defined through gaining an understanding of land use, topography, heritage and vegetation in combination with other factors intrinsic to the local landscape.

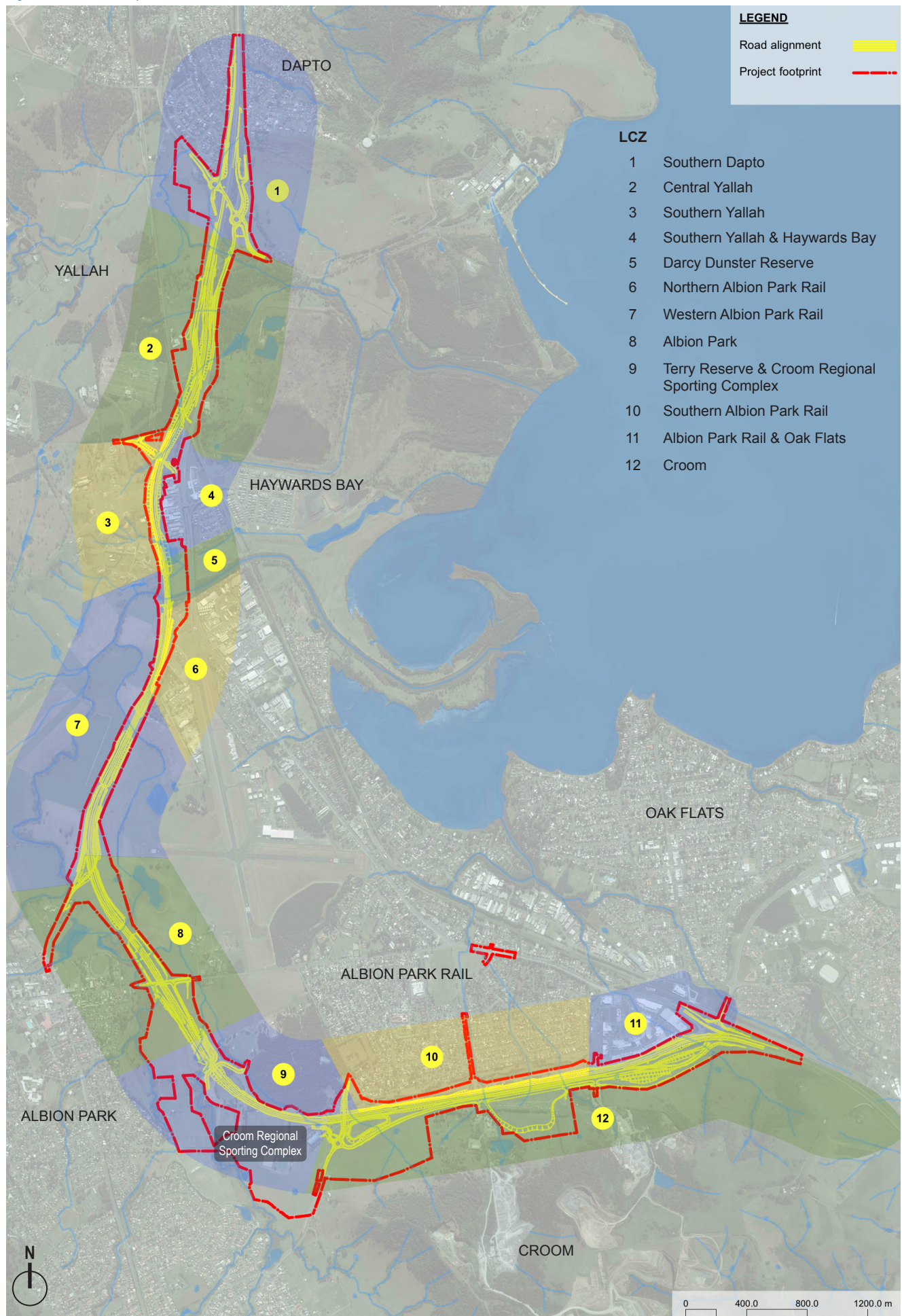
The twelve LCZs are:

LCZ 1	Southern Dapto	LCZ 8	Albion Park
LCZ 2	Central Yallah	LCZ 9	Terry Reserve & Croom Regional Sporting Complex
LCZ 3	Southern Yallah	LCZ 10	Southern Albion Park Rail
LCZ 4	Southern Yallah & Haywards Bay	LCZ 11	Albion Park Rail & Oak Flats
LCZ 5	Darcy Dunster Reserve	LCZ 12	Croom
LCZ 6	Northern Albion Park Rail		
LCZ 7	Western Albion Park Rail		

Overall, the proposal would have an impact on landscape character. The proposed bypass would impact on all LCZs to some degree, including those parts of the works proposed within an established road corridor.

From the perspective of local property owners, tourists, motorists and cyclists, landscape character would be impacted, due to the magnitude of the proposal in this area.

Figure 3-1: Landscape Character Zones



The impact of the revised road design on the LCZs compared to the EIS design is described below and summarised in *Table 3-2*.

LCZ 1 - Southern Dapto

The major change in this LCZ is the proposed replacement of the existing northbound and southbound noise walls with substantially taller noise barriers, as well as the introduction of a northbound noise barrier where currently none exist. Both magnitude and sensitivity of this LCZ were previously assessed as high, therefore the landscape character impact within this LCZ remains unchanged as **high**.

LCZ 2 - Central Yallah

Both magnitude and sensitivity of this LCZ within the current design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 3 - Southern Yallah

Both magnitude and sensitivity of this LCZ within the current design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 4 - Southern Yallah & Haywards Bay

Both magnitude and sensitivity of this LCZ within the current design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 5 - Darcy Dunster Reserve

Both magnitude and sensitivity of this LCZ within the current design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 6 - Northern Albion Park Rail

Both magnitude and sensitivity of this LCZ within the current design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 7 - Western Albion Park Rail

Both magnitude and sensitivity of this LCZ within the current design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 8 - Albion Park

Although the revised road design reduces the footprint of the project through this LCZ, the final impact remains the same due to the high sensitivity of the area and the changes to the landscape character as a result of the introduction of a new motorway through an undeveloped agricultural and floodplain area.

LCZ 9 - Terry Reserve & Croom Regional Sporting Complex

Both magnitude and sensitivity of this LCZ within the revised design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 10 - Southern Albion Park Rail

Both magnitude and sensitivity of this LCZ within the revised design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 11 - Albion Park Rail & Oak Flats

Both magnitude and sensitivity of this LCZ within the revised design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

LCZ 12 - Croom

Both magnitude and sensitivity of this LCZ within the revised design remains the same due to the proposed minor changes in road alignments and adjustments in the project boundary.

SUMMARY OF LANDSCAPE CHARACTER ASSESSMENT

Table 3.2 summarises the landscape character impacts of the proposed bypass. It features both the impacts identified in *Technical Paper 10* and the revised impacts as per this Addendum.

The table illustrates that, while there have been changes to the design and adjustments in the project boundary, impact ratings on all LCZs have remained as presented in the EIS.

Table 3-2: Landscape Character Zones - landscape character and visual impact matrix

LCZ	SENSITIVITY	MAGNITUDE	EIS IMPACT	REVISED IMPACT
LCZ 1	High	High	HIGH	HIGH
LCZ 2	High	Low	MODERATE	MODERATE
LCZ 3	High	High	HIGH	HIGH
LCZ 4	High	Low	MODERATE	MODERATE
LCZ 5	High	High	HIGH	HIGH
LCZ 6	Low	Low	LOW	LOW
LCZ 7	High	Moderate	HIGH-MODERATE	HIGH-MODERATE
LCZ 8	High	High	HIGH	HIGH
LCZ 9	High	High	HIGH	HIGH
LCZ 10	High	Low	MODERATE	MODERATE
LCZ 11	Moderate	Low	MODERATE-LOW	MODERATE-LOW
LCZ 12	High	Moderate	HIGH-MODERATE	HIGH-MODERATE

3.2 VISUAL IMPACT ASSESSMENT

A review of the visual impact of the revised road design within the study area, is presented in this section of the Addendum, in order to highlight changes to the visual impact assessment as described in *Technical Paper 10*.

As a result of the proposed revised design and adjustments to the project boundary, there are changes to the visual impact, from what has been described in *Technical Paper 10*. These include changes to the visibility of the proposed bypass from some of the selected viewpoints in the EIS, as well as to some viewpoints not discussed in the EIS. .

The following areas would be affected by the proposed design changes:

1. Southern Dapto
2. South of the Illawarra Regional Airport
3. Stapleton's Bridge/ Tongarra Road
4. Swansea Dairy site and farmhouse

The following sections discuss the changes relative to the EIS and the likely visual impacts identified in *Technical Paper 10*. The locations of viewpoints are shown in *Figure 3-2*.

3.2.1. Southern Dapto

Views in Southern Dapto would potentially be affected by

- The proposed replacement of the existing northbound noise wall in Dapto with a new barrier of greater length and substantially increased height
- The increased length and height of a new Dapto northbound noise barrier combined with a more prominent alignment at the top of the cutting adjoining residential property
- The proposed replacement of the existing southbound noise wall in Dapto with a new barrier of greater length and substantially increased height

Viewpoints potentially affected by these changes are viewpoints 1 and 2.

Two new viewpoints 40 and 41 were introduced to assess the visual impact of proposed changes to noise mitigation measures on residential areas in southern Dapto, as well as on the existing Princes Motorway.

Potential changes to the visual impact are discussed below.

Viewpoint 1 - Dapto hillside near Carlyle Close

Due to the angle of the viewpoint, the intervening topography and vegetation, changes to the design would not be able to be perceived from this viewpoint. Viewpoint 1 would retain the same visual impact rating as identified in the EIS.

Viewpoint 2 - Semillon Place, Dapto

The height of the proposed Dapto northbound noise barrier has been increased relative to the EIS design. However, due to direction of the view from this viewpoint, this change would not be able to be perceived. Viewpoint 2 would retain the same visual impact rating as identified in the EIS.

Figure 3-2: Viewpoints in the project area



Viewpoint 40 - Princes Motorway

Viewpoint 40 is located along the Princes Motorway, looking north towards the project boundary. Being located along an existing major road featuring an attractive backdrop and mature framing vegetation, the visual sensitivity of motorists is considered moderate - refer *Plate 3-1*.

The current design proposes to replace existing noise walls with noise barriers up to 8 meters high along the northbound carriageway and up to 7.5 meters high along the southbound carriageway - refer *Plates 3-1 and 3-2*. This would result in the removal of existing vegetation which is unlikely to be replaced due to safety and maintenance requirements within the road corridor. In addition there would be a notable increase in the height of the barriers framing the corridor, creating an effect of driving along a sunken road amongst walls in excess of 2.5 storeys tall. The magnitude of the proposed change is assessed as high and therefore the visual impact rated as **moderate-high**.



Plate 3-1: New viewpoint 40 - Princes Motorway looking north (source: Google StreetView)



Plate 3-2: New viewpoint 40 - Photomontage illustrating the proposed changes to the existing Princes Motorway corridor in southern Dapto including noise barriers (source: Spatial Media)

Viewpoint 41 - Mount Brown Road, Dapto

Viewpoint 41 is located at the eastern end of Mount Brown Road, a residential cul-de-sac in southern Dapto, west of the Princes Motorway - refer *Plate 3-3*.

The proposed Dapto northbound noise barrier would be located along residential property boundaries and terminate the view at the eastern end of the street. The wall is proposed to be up to 6.5m high above existing ground level and would include a combined drainage and maintenance access apron between the wall and private properties, leaving little space for vegetative screening - refer *Plate 3-4*.

The barrier may result in the removal of additional existing mature vegetation currently located between residential properties and the Princes Motorway that potentially may not have been affected by construction of the EIS design.

Construction of the barrier would fundamentally alter the outlook along the street and from residential properties as the currently tree-lined backdrop would be replaced by a noise barrier in excess of two storeys tall.

The barrier may also affect attractive long-distance views across the Macquarie Valley, currently enjoyed from a number of properties. Depending on design resolution and the level of transparency of the barrier, it has the potential to block the eastern sun and create over-shadowing effects on residential properties, affecting both internal living spaces and backyards.

Viewers of the barrier would be predominantly local residents. Their sensitivity to change in their home environment and its visual setting is likely to be **high**. The visual impact on the view has been assessed as **high**. It is unlikely to reduce over time due to the lack of available space for vegetative screening or the like.

3.2.2. South of the Illawarra Regional Airport

The revised design has reduced the footprint of the works, as a result of the removal of the northbound exit lane to Albion Park via the Illawarra Highway. It has also moved the project boundary away from the airport precinct north of Tongarra Road. The angle of the bridge (BR09) over Frazers Creek has been slightly changed to the north-west. The northbound exit has been relocated to south of and exiting onto Tongarra Road.

Viewpoints potentially affected by these changes are viewpoints 14, 15, 16 and 18.

Viewpoint 14

The visual impact from viewpoint 14 would be reduced as a result of the removal of the northbound exit lane, reducing roadworks in this area and enabling retention of existing vegetation along the Illawarra Highway. The magnitude of the proposed upgrade is revised to low, reducing the visual impact on viewpoint 14 to **moderate-low**.

Viewpoint 15

Due to the oblique angle of the viewpoint and a distance in excess of 500 metres, the removal of the northbound exit would be difficult to discern from this viewpoint. However, the resulting retention of existing vegetation would somewhat reduce the visual changes to this view relative to the EIS. However in the context of the scale of the proposed upgrade this change is only small and would not reduce the overall magnitude of the change in this view.



Plate 3-3: New viewpoint 41 - eastern end of Mount Brown Road (source: HCJV)



Plate 3-4: New viewpoint 41 - Photomontage illustrating the proposed Dapto northbound noise barrier (source: Spatial Media)

Viewpoint 16

Viewpoint 16 from Albion Park Showground would retain the same visual impact rating due to the angle and distance of the view which would render the removal of the northbound exit difficult to discern.

Viewpoint 18

Viewpoint 18 from Ravensthorpe would retain the same visual impact rating due to the angle and distance of the view which would render the change in location of the northbound exit and the change in the Frazers Creek bridge angle difficult to discern. The visual impact on this view is primarily a result of the bridge structure over Tongarra Road which has not changed from the EIS design.

In summary, changes to the design south of the Illawarra Regional Airport would only alter the visual impact rating for viewpoint 14, reducing the impact from previously moderate to moderate-low.

3.2.3. Stapleton's Bridge/ Tongarra Road

The new location of the northbound exit lane from the proposed bypass to Tongarra Road increases the footprint of the proposed works south of Tongarra Road, with flow-on effects on the landscape design.

The current design moves the works boundary slightly to the east, closer toward Ravensthorpe and now includes the Stapleton Bridge fully within the works boundary. The Tongarra Road alignment has moved slightly to the south, away from Ravensthorpe, to tie back into the existing road prior to reaching Stapleton's Bridge. Other changes include the relocation of the northbound Albion Park exit to the southern side of and connecting to Tongarra Road.

Viewpoints potentially affected by these changes are viewpoints 16, 17, 18, 19, 20, 21, 22 and 23. Viewpoints 16 and 18 were discussed in section 3.2.2 above. The remaining viewpoints are discussed below.

Viewpoint 17

Viewpoint 17 looking east along Tongarra Road would retain the same visual impact rating. Due to the distance, topography and intervening vegetation the new northbound exit would not be discernible.

Viewpoint 19

Viewpoint 19 looking south-west from Tongarra Road towards Terrys Reserve would retain the same visual impact rating. Being located on the far side of the mainline and with an elevation lower than the bypass itself, the proposed relocated northbound exit ramp would not be discernible.

Viewpoint 20

Viewpoint 20 looking north-east from Frazer Crescent would retain the same visual impact rating. Being located on the far side of the mainline and with an elevation lower than the bypass itself, the proposed relocated northbound exit ramp would not be discernible.

Viewpoint 21

Viewpoint 21 looking west from the BMX track would retain the same visual impact rating. Due to the viewing distance in excess of 500 metres and intervening vegetation, the proposed relocated northbound exit ramp would not be discernible.

Viewpoint 22

Viewpoint 22 looking north-east from the new underpass would retain the same visual impact rating. Due to the viewing distance in excess of 400 metres and intervening vegetation, the proposed relocated northbound exit ramp would not be discernible.

Viewpoint 23

Viewpoint 23 looking north from the Pony Club in Terry Reserve would retain the same visual impact rating. With a viewing distance in excess of 450 metres, the proposed increase in road infrastructure associated with the relocated northbound exit ramp would not be discernible. It would not alter the magnitude of the proposal within the view which was previously assessed as high. The visual impact rating remains the same, namely high.

In summary, changes to the design south of Tongarra Road would not alter the visual impact rating for any of the nearby viewpoints.

3.2.4. Swansea Dairy Site And Farmhouse

Design changes in the vicinity of the Swansea Dairy site and farmhouse include the extension of the temporary works boundary towards the Swansea farmhouse to create larger ancillary sites for use during construction activities. As a result, the temporary works boundary has been extended towards the Swansea farmhouse. This adjustment would lead to a larger temporarily disturbed area which would need to be rehabilitated following construction.

Viewpoints potentially affected by these changes are viewpoints 27 and 28.

Viewpoint 27

Viewpoint 27 looking south from Croome Road would retain the same visual impact rating. The major change to this view would result from the 5 meter high stockpile mound in the foreground of the view. The mound has not changed since the EIS and would block views of the bypass itself as well as of much of the bridge approach. Therefore any changes to the design would not be able to be perceived from this view.

Viewpoint 28

Viewpoint 28 looking south-west from the east-west link road would retain the same visual impact rating. The new boundary adjustments would lead to an increase in temporary visual impacts during construction. However, long term, the impacts on the view and on the Swansea farmhouse and dairy site would be minimal due to the minor impact of clearing of the existing grassy vegetation, which would be easy to restore to its current condition.

In summary, visual impacts on viewpoints in this area (27, 28) would remain the same as assessed in the EIS. Temporary visual impacts during construction would increase due to larger ancillary sites and higher visual exposure of the Swansea dairy site.

Viewpoint 29

Viewpoint 29 would retain the same visual impact rating. The amended project boundary would not be discernible from this view.

3.3 SUMMARY OF VISUAL IMPACT ASSESSMENT

15 of the 39 viewpoints used to assess the visual impact in *Technical Paper 10* are potentially affected by the revised road design and adjustments to the project boundary, representing about one third of all viewpoints. Those viewpoints are summarised in *Table 3-3* below. The table shows the visual impact identified in *Technical Paper 10* and the amended visual impact based on the revised design.

There are two areas where the revised road design has changed to a degree where it would affect the visual impact ratings identified in the EIS: in southern Dapto and south of the Illawarra Regional Airport.

South of the Illawarra Regional Airport the northbound exit lane onto the Illawarra Highway has been removed and the footprint of the proposed bypass has been reduced. As a result, the visual impact of the proposed bypass on viewpoint 14 would be lower than that identified in the EIS.

Two new views were introduced to assess the visual impact of the revised new noise mitigation measures in southern Dapto on motorists and residents. The assessment has found that there is an increase in visual impact as a result of the noise barriers that produce a moderate-high and high visual impact respectively.

Table 3-3: Summary of viewpoints affected by the revised road design and project boundary adjustments.

VIEWPOINT	EIS DESIGN VISUAL IMPACT (TECHNICAL PAPER 10)			VISUAL IMPACT OF REVISED DESIGN		
	Sensitivity	Magnitude	Impact	Sensitivity	Magnitude	Impact
VP 1	H	M	HIGH-MODERATE	H	M	HIGH-MODERATE
VP 2	H	M	HIGH-MODERATE	H	M	HIGH-MODERATE
VP 14	M	M	MODERATE	M	L	MODERATE-LOW
VP 15	M	M	MODERATE	M	M	MODERATE
VP 16	H	H	HIGH	H	H	HIGH
VP 17	M	H	HIGH-MODERATE	M	H	HIGH-MODERATE
VP 18	H	H	HIGH	H	H	HIGH
VP 19	M	M	MODERATE	M	M	MODERATE
VP 20	M	M	MODERATE	M	M	MODERATE
VP 21	H	H	HIGH	H	H	HIGH
VP 22	H	H	HIGH	H	H	HIGH
VP 23	H	H	HIGH	H	H	HIGH
VP 27	M	H	HIGH-MODERATE	M	H	HIGH-MODERATE
VP 28	M	M	MODERATE	M	M	MODERATE
VP 29	M	H	HIGH-MODERATE	M	H	HIGH-MODERATE
VP 40	N/A - new viewpoint			M	H	HIGH-MODERATE
VP 41	N/A - new viewpoint			H	H	HIGH

TABLE LEGEND



Reduced visual impact relative to EIS



Increased or new visual impact relative to EIS

3.4 REFINEMENT OF NOISE MITIGATION MEASURES

The Dapto northbound and Dapto southbound noise barriers discussed in this Addendum have been determined following the Roads and Maritime *Noise Criteria Guidelines*, however, these need to be confirmed during detailed design.

This process to confirm the final noise barrier layout and heights would be:

- Consideration of the protrusions into the operational and aspirational OLS that are identified in the Aviation Impact Assessment addendum report. In the event that the protrusion is deemed unacceptable, this may restrict the maximum height of the noise barriers
- Confirmation that there are no engineering feasibility issues preclude the construction of the noise barriers discussed in this Addendum
- Establish a community groups for each corresponding noise barrier at Dapto which consists of the residents from properties identified as exceeding, without mitigation, the *Noise Criteria Guideline* (Roads and Maritime, 2015) in the adjoining noise catchment area and any residents otherwise impacted by the construction of the noise wall
- Develop feasible options for each noise barrier including the associated potential impacts for each options such as visual, noise and overshadowing. Visual impacts include both changes to the urban character and setting and potential impacts on long-distance views. A “no change” to existing barrier or “no barrier” option would be included in each option series
- Present the options to the relevant community groups allowing the opportunity for the group members to provide feedback on the preferred option to be utilised in the short listing of the two preferred options
- Select the preferred noise barrier option with the majority community support from the consultation process undertaken.

Technical Paper 10 identified a range of management measures designed to reduce or remove the landscape character and visual impacts that would result from the proposed bypass. In response to the additional impacts identified in this Addendum, the following modified management measure is proposed for inclusion in the project approval:

The need for operational phase noise management measures, including low noise pavement, noise barriers or architectural treatments, will be confirmed during detailed design. The chosen noise barrier design will be selected following investigations into engineering feasibility of the proposed mitigation measures and community consultation with residents from properties identified as exceeding, without mitigation, the Noise Criteria Guideline (Roads and Maritime, 2015) in the adjoining noise catchment area. The mitigation measures will be provided as early as practicable in the construction program to reduce potential noise impacts associated with construction.

From an urban design and visual perspective, were noise barriers found to be the preferred noise mitigation strategy during future detailed design studies and consultation, the design of the barriers should seek to minimise the identified visual and amenity impacts.

Any noise barriers required along the proposed upgrade is to be designed and developed in accordance with the Roads and Maritime *Noise wall design guideline* to maximise urban

design and visual outcomes. This may involve refinements to both the design and the alignment of the barrier. The latter may provide opportunities to provide for a landscaped strip between noise barriers and residential properties, in order to reinstate a vegetated outlook over time.

4. CONCEPT DESIGN DRAWINGS

The general approach to the landscape design as identified in *Technical Paper 10* is to

- Provide a well vegetated road corridor that aims to integrate the proposed bypass with the surrounding landscape
- Provide motorists with a sense of place along the journey.

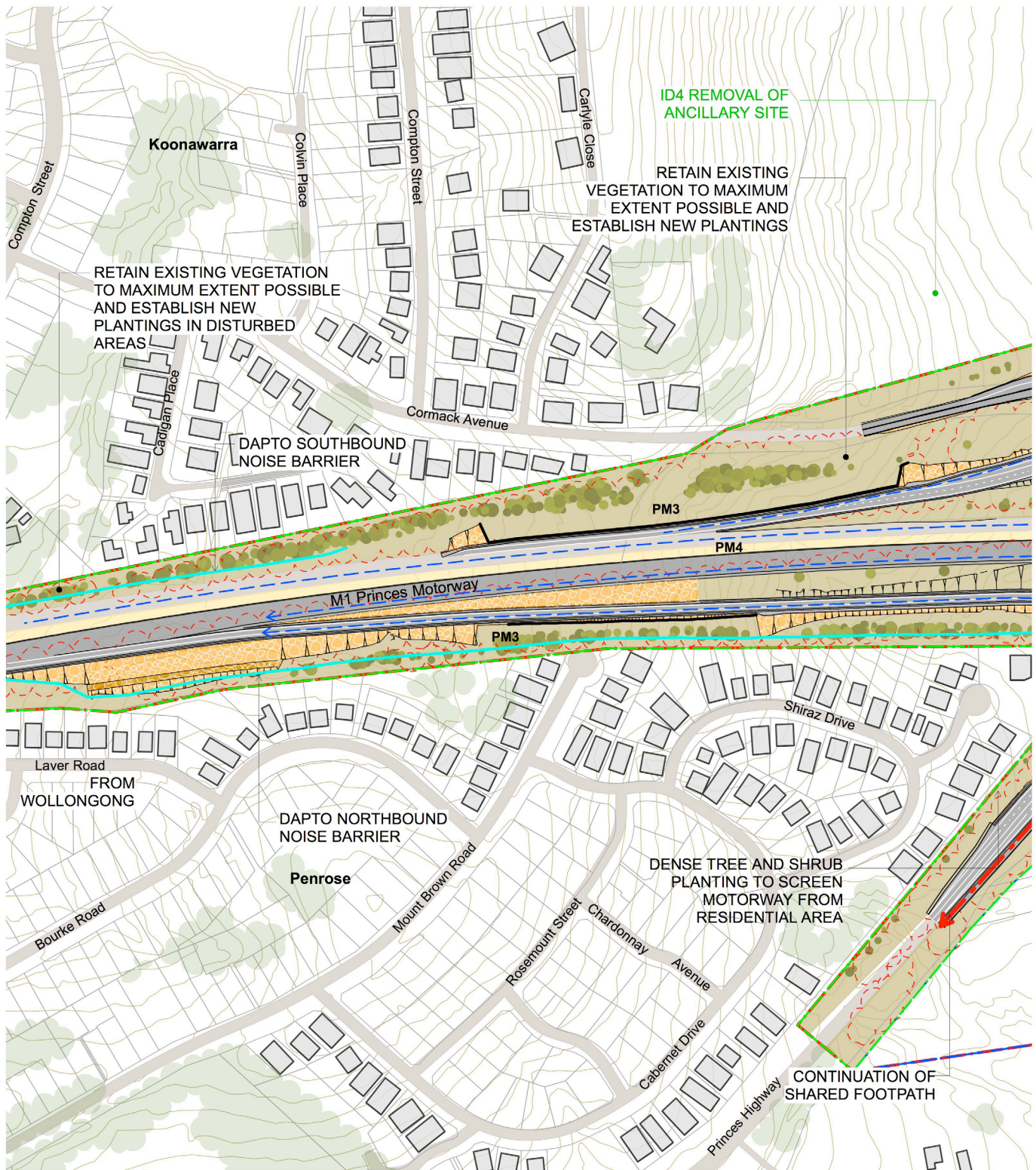
In order to achieve this, the design of vegetation along the bypass must strike a balance between screening the bypass from sensitive views and maintaining key views for motorists from the bypass to the surrounding landscape.

In addition, the landscape design aims to minimise the potential ecological impacts of the proposed bypass by stabilising earthworks to prevent erosion and by reinforcing existing habitats and ecological corridors through integration of endemic species.

The following pages present the concept design for the Albion Park Rail bypass as revised in response to feedback from stakeholder consultation and EIS exhibition. The drawings reflect the design refinements made including

- Reconfiguration of the central interchange
- Reduction in the project footprint within agricultural land,
- Refinements to intersection arrangements in response to further detailed traffic modelling
- Integration of additional noise barriers.

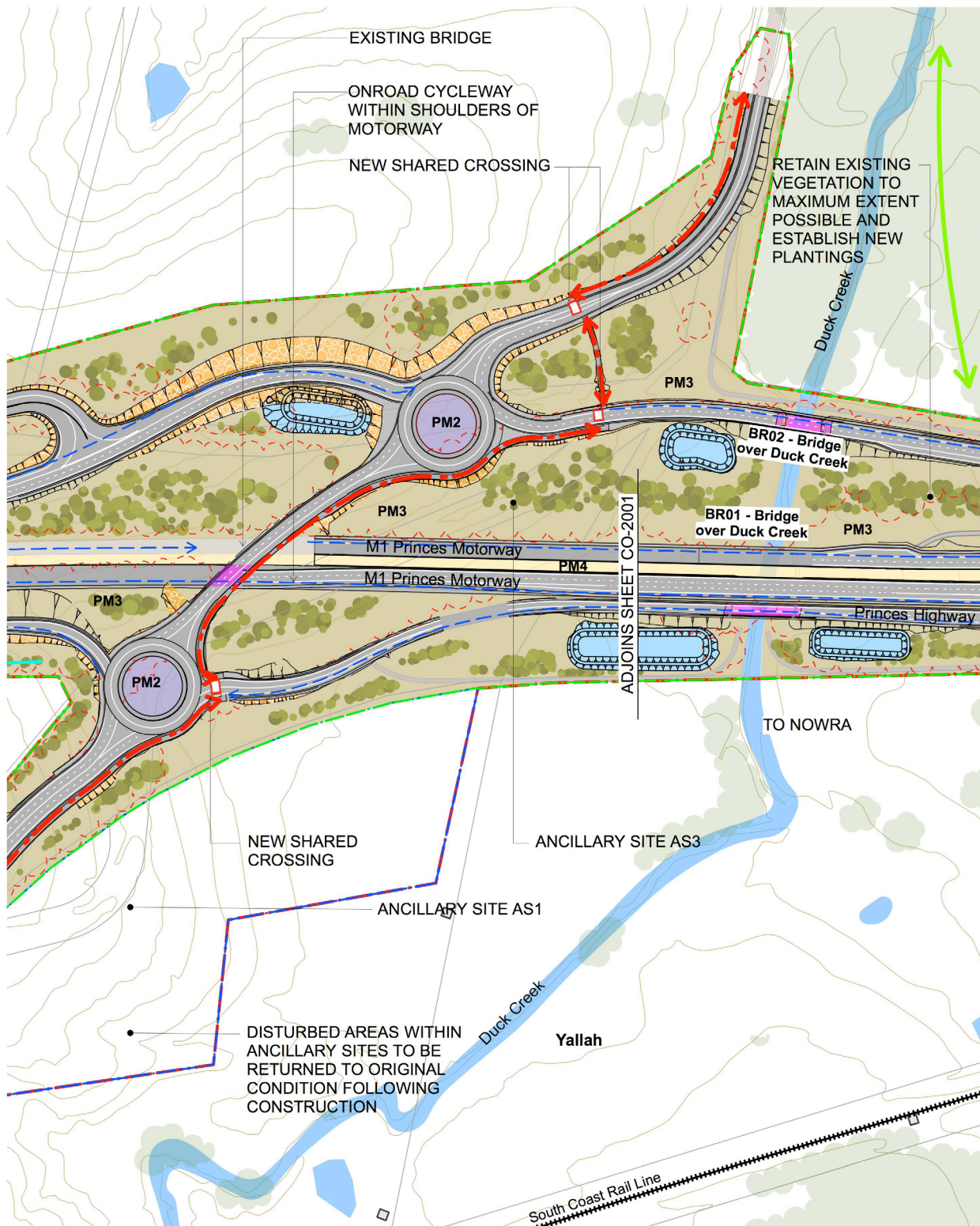
The revised road design does not alter the landscape design strategy, the aims of which as per *Technical Paper 10*. As a result of the revised road design some adjustments to the landscape design are required. They primarily involve a reduction in feature planting and vegetated areas due to the smaller footprint relative to the EIS design and to suit the surrounding rural landscape character.



LEGEND

- | | | |
|---|---|--|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | ↔ POTENTIAL VEGETATION CORRIDOR | EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | ↔ ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |

CO-1001



CUT BATTERS TO BE REVEGETATED USING COMPOST BLANKET WHERE EXPOSED ROCK IS NOT PRESENT

PROPOSED BRIDGE LOCATIONS

PROPOSED WATER QUALITY BASINS DESIGNED TO INTEGRATE INTO THE LANDSCAPE

NEW TREE PLANTING WITHIN SITE BOUNDARY

POSSIBLE ADDITIONAL VEGETATION SCREENING OUTSIDE OF BOUNDARY PENDING DISCUSSIONS WITH LAND OWNERS

PM1 SWAMP FOREST/FLOODPLAIN

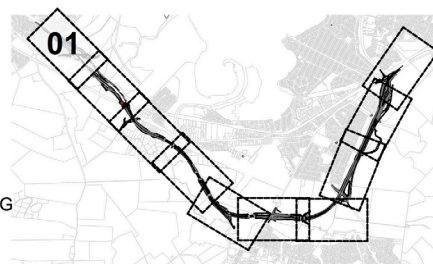
PM2 FEATURE PLANTING

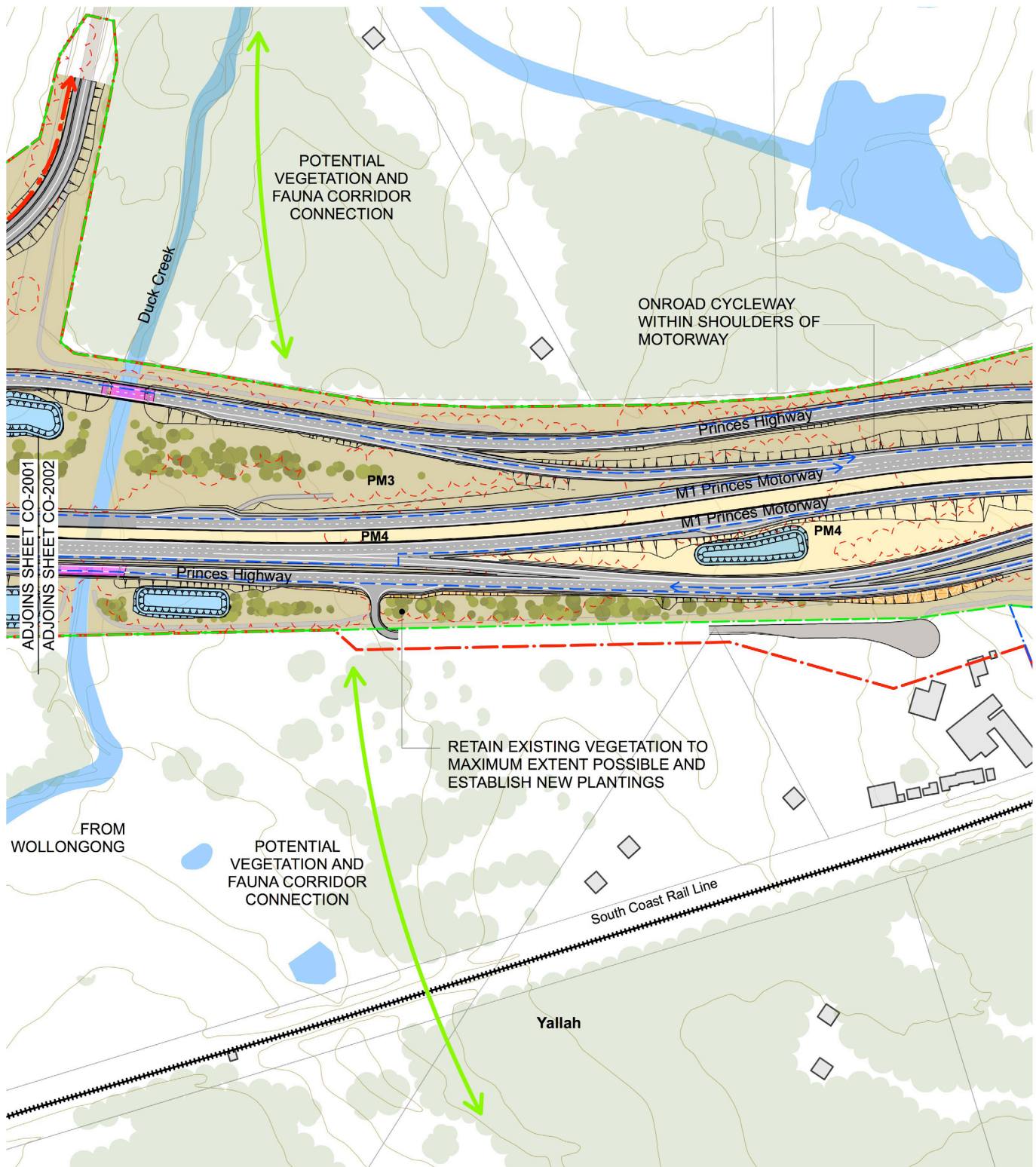
PM3 WOODLAND

PM4 PASTURE GRASSES

EEC EEC LOCAL SPECIES PLANTING

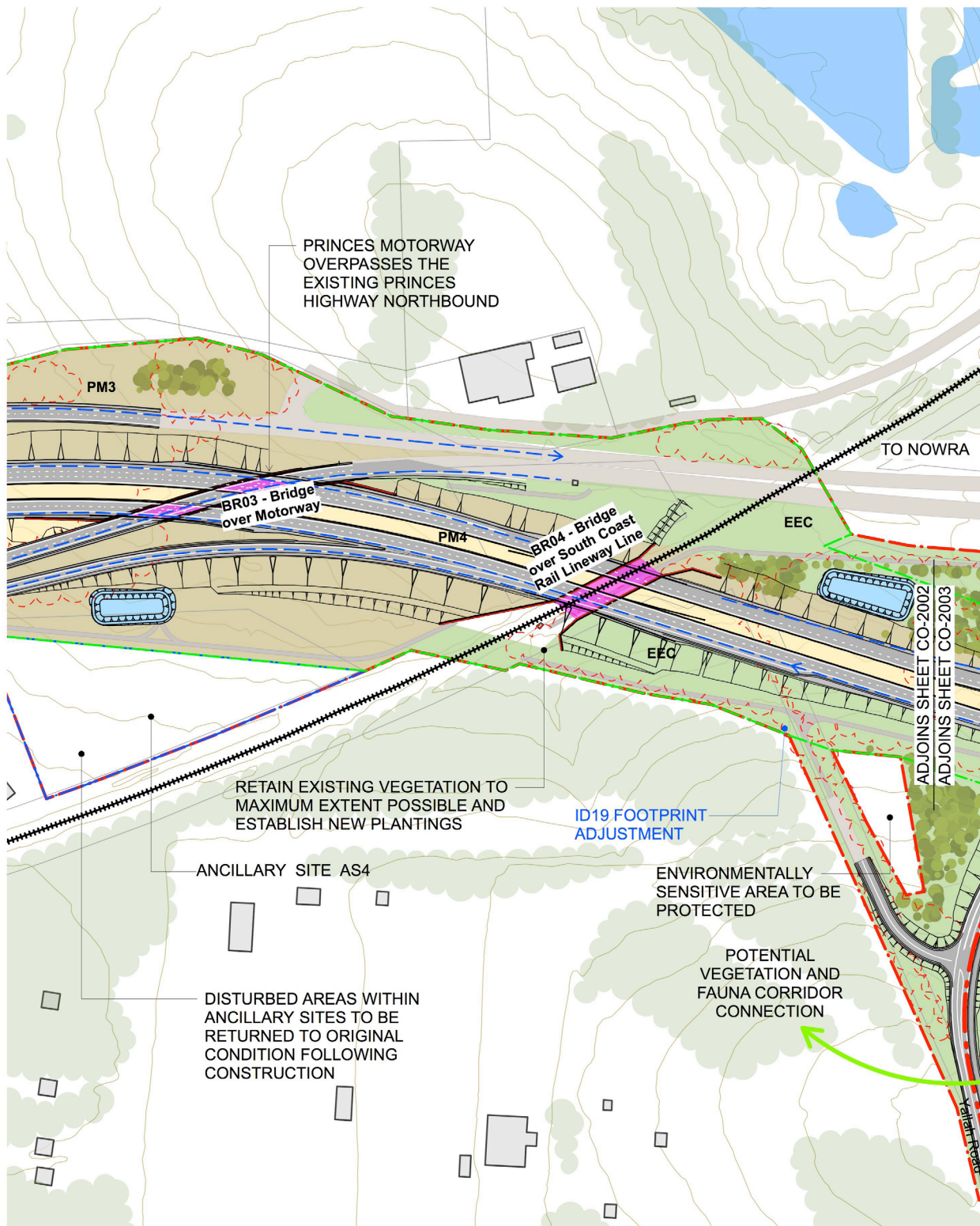
0 30 60 90 120 M





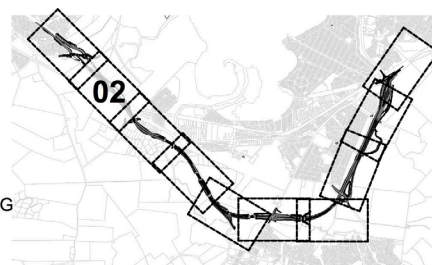
LEGEND

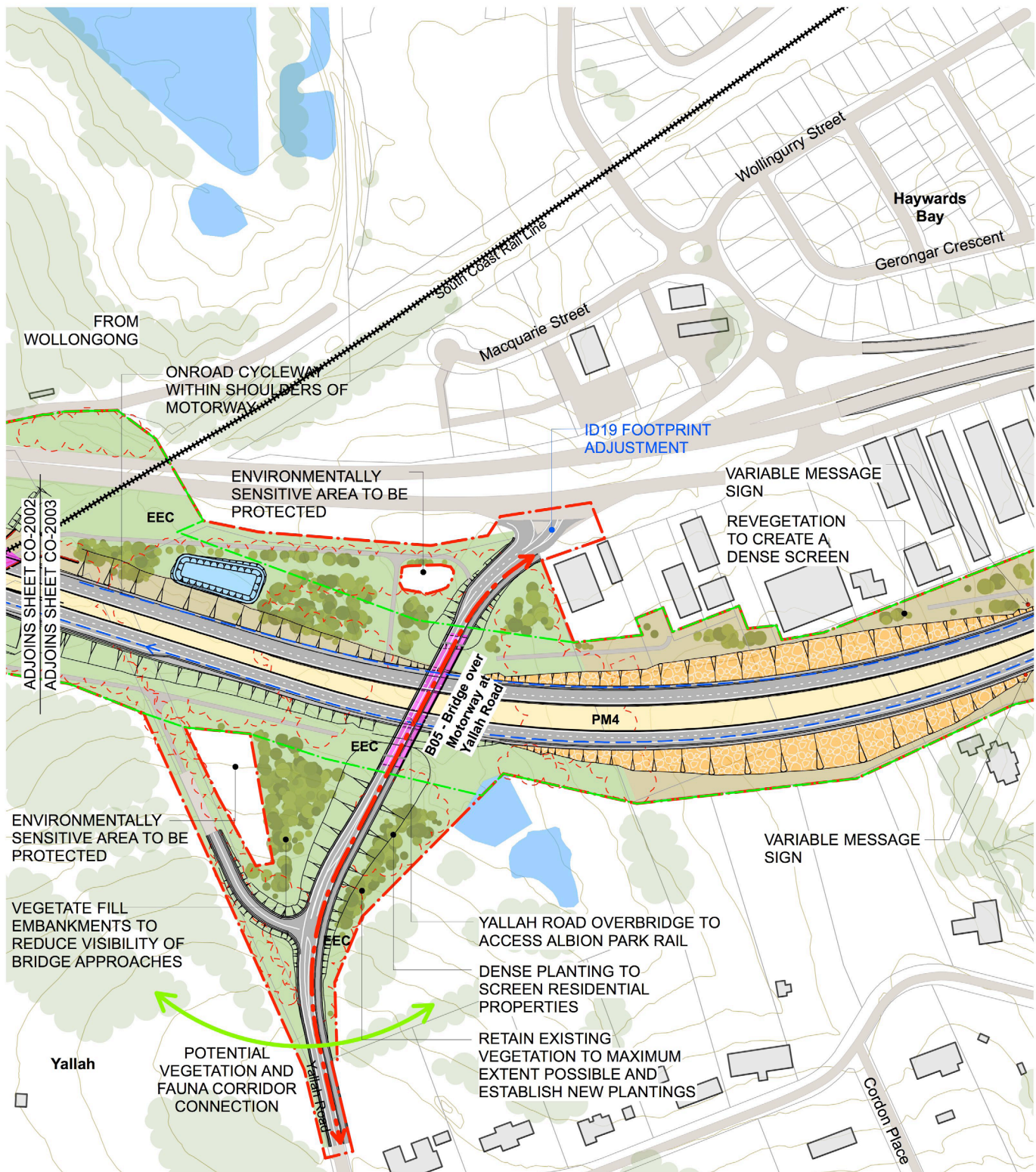
- | | | |
|---|---|--|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | --- PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | ↔ POTENTIAL VEGETATION CORRIDOR | □ EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | □ EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | ↔ ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | □ EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | □ EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |



- | | | | |
|--|---|---|--------------------------------|
|  | CUT BATTERS TO BE REVEGETATED USING COMPOST BLANKET WHERE EXPOSED ROCK IS NOT PRESENT |  | PM1 SWAMP FOREST/FLOODPLAIN |
|  | PROPOSED BRIDGE LOCATIONS |  | PM2 FEATURE PLANTING |
|  | PROPOSED WATER QUALITY BASINS DESIGNED TO INTEGRATE INTO THE LANDSCAPE |  | PM3 WOODLAND |
|  | NEW TREE PLANTING WITHIN SITE BOUNDARY |  | PM4 PASTURE GRASSES |
|  | POSSIBLE ADDITIONAL VEGETATION SCREENING OUTSIDE OF BOUNDARY PENDING DISCUSSIONS WITH LAND OWNERS |  | EEC EEC LOCAL SPECIES PLANTING |

0 30 60 90 120 M

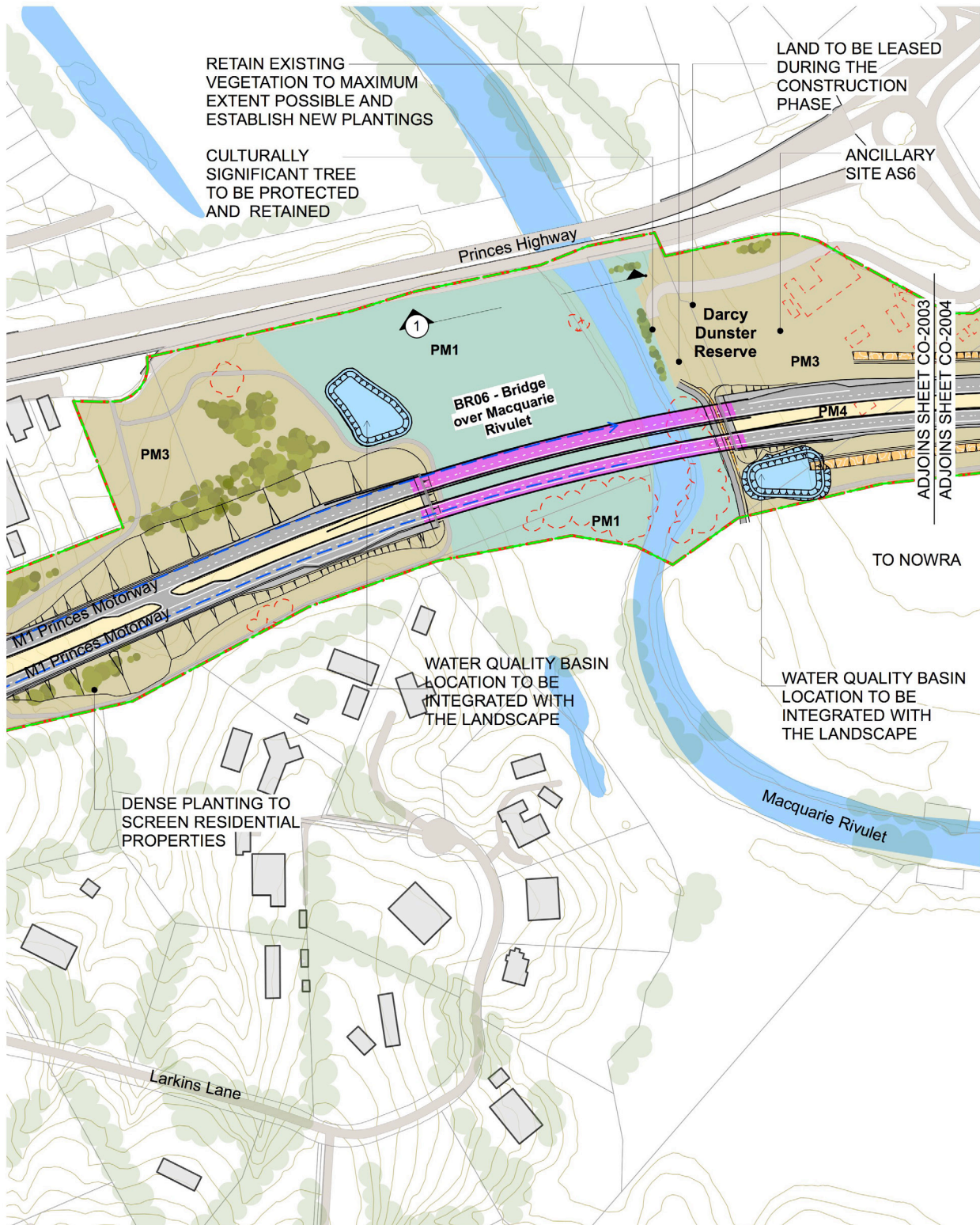




LEGEND

- | | | |
|---|---|---|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | --- PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | ↔ POTENTIAL VEGETATION CORRIDOR | EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | --- ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |

CO-1003



CUT BATTERS TO BE REVEGETATED USING COMPOST BLANKET WHERE EXPOSED ROCK IS NOT PRESENT

PROPOSED BRIDGE LOCATIONS

PROPOSED WATER QUALITY BASINS DESIGNED TO INTEGRATE INTO THE LANDSCAPE

NEW TREE PLANTING WITHIN SITE BOUNDARY

POSSIBLE ADDITIONAL VEGETATION SCREENING OUTSIDE OF BOUNDARY PENDING DISCUSSIONS WITH LAND OWNERS

PM1 SWAMP FOREST/FLOODPLAIN

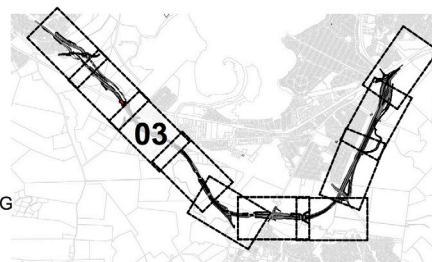
PM2 FEATURE PLANTING

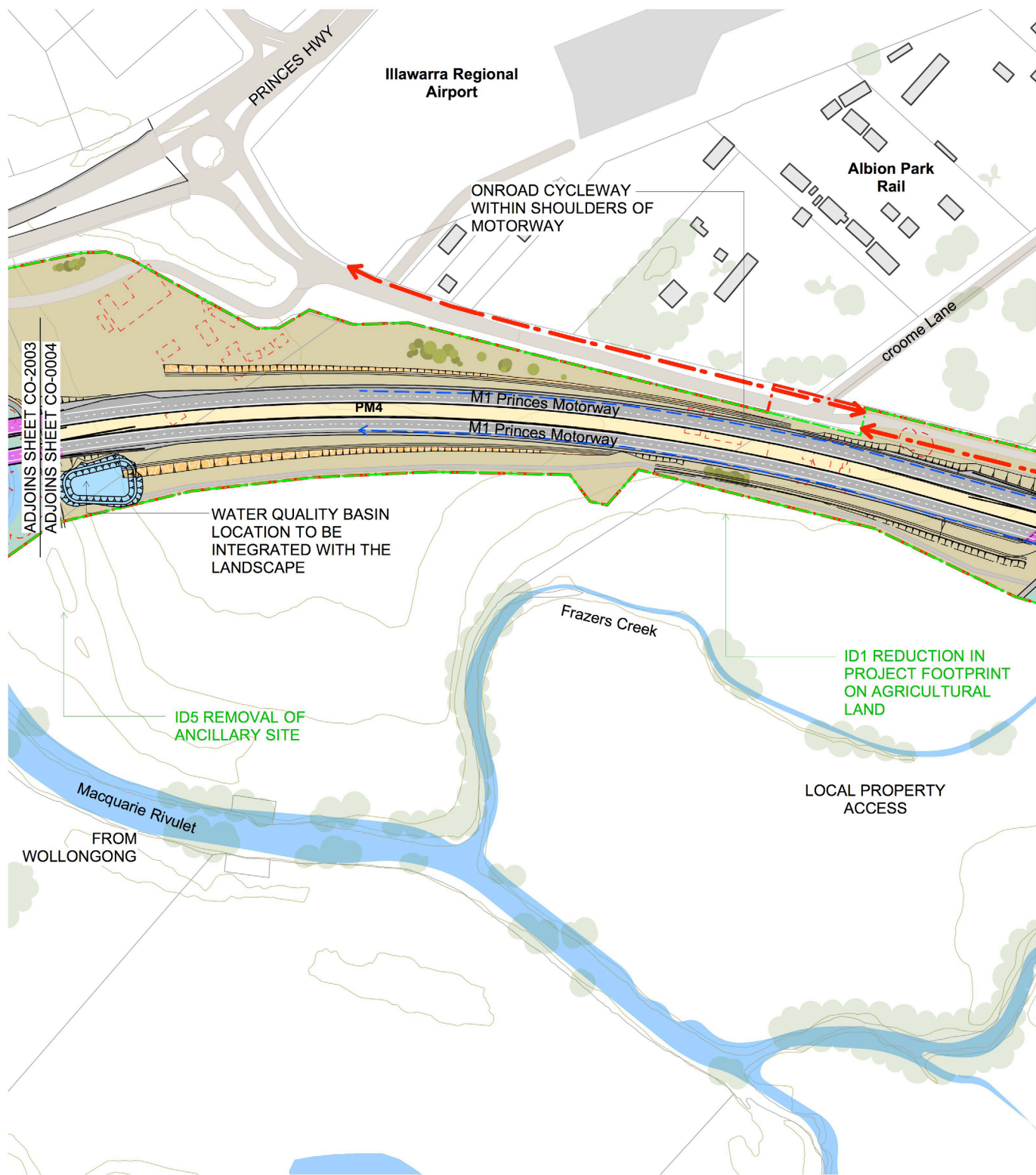
PM3 WOODLAND

PM4 PASTURE GRASSES

EEC EEC LOCAL SPECIES PLANTING

0 30 60 90 120 M

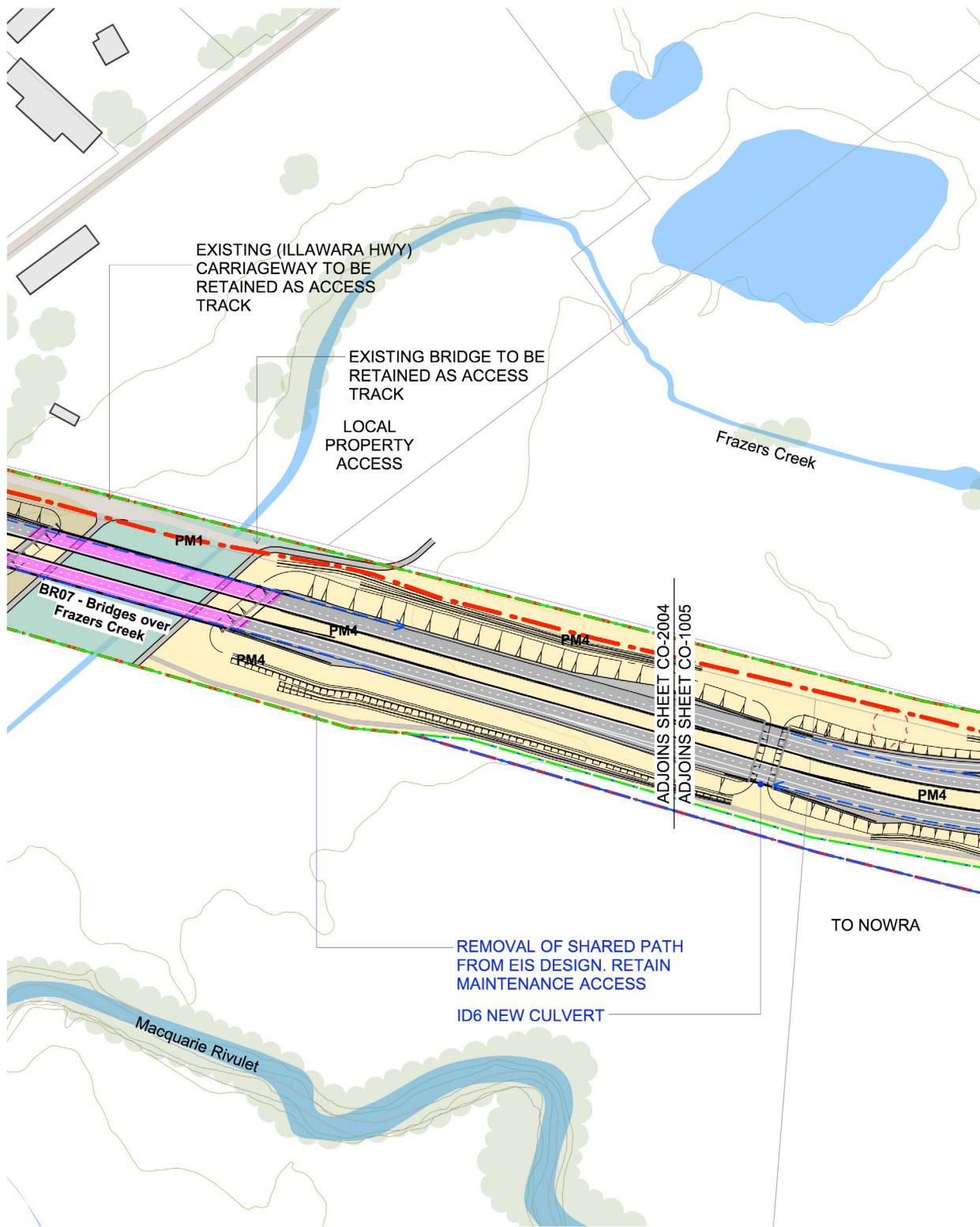




LEGEND

- | | | |
|---|---|---|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | ↔ POTENTIAL VEGETATION CORRIDOR | EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | ↔ ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |

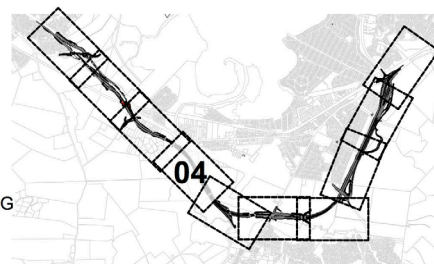
CO-1004

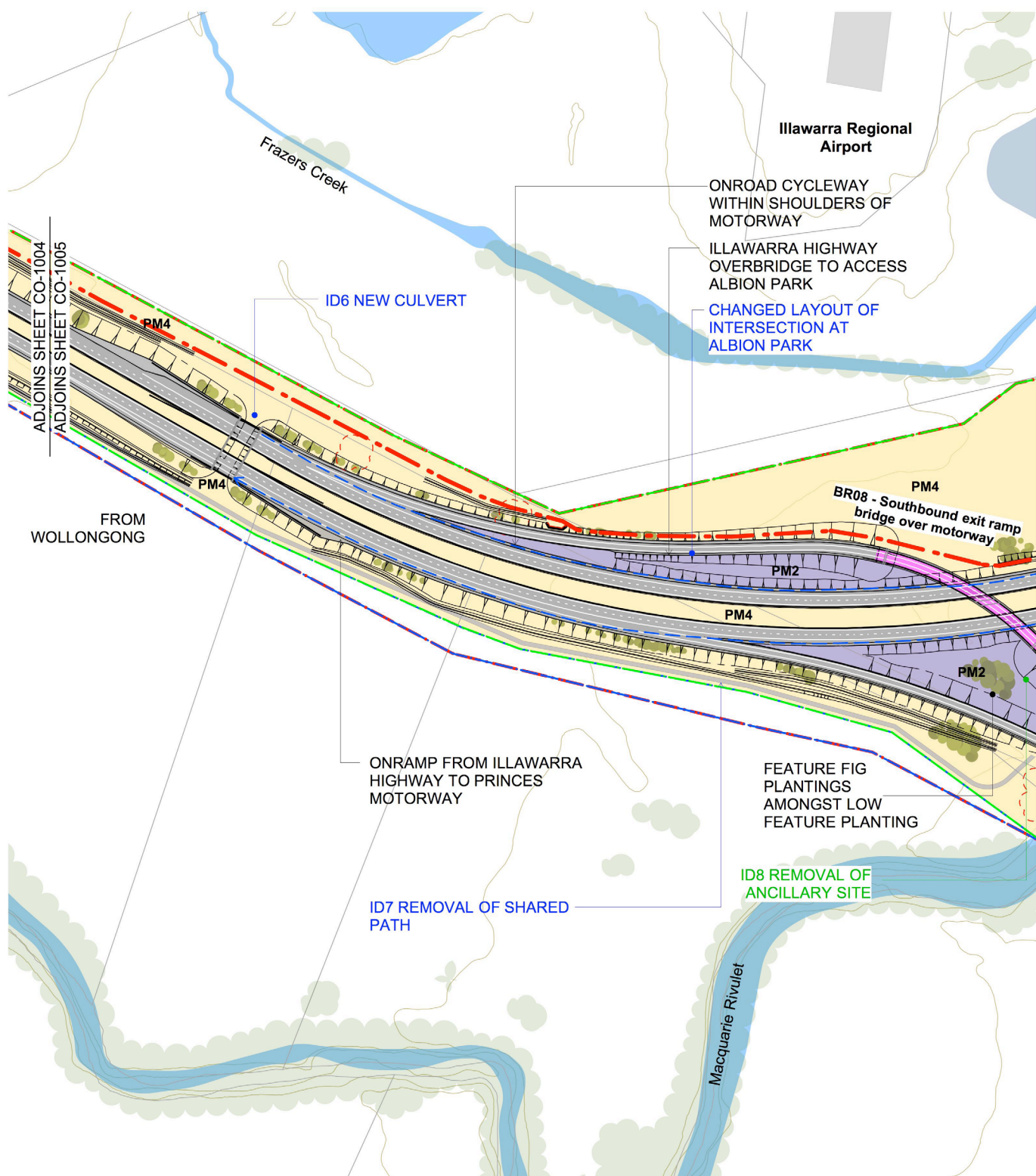


-  CUT BATTERS TO BE REVEGETATED USING COMPOST BLANKET WHERE EXPOSED ROCK IS NOT PRESENT
-  PROPOSED BRIDGE LOCATIONS
-  PROPOSED WATER QUALITY BASINS DESIGNED TO INTEGRATE INTO THE LANDSCAPE
-  NEW TREE PLANTING WITHIN SITE BOUNDARY
-  POSSIBLE ADDITIONAL VEGETATION SCREENING OUTSIDE OF BOUNDARY PENDING DISCUSSIONS WITH LAND OWNERS

-  PM1 SWAMP FOREST/FLOODPLAIN
-  PM2 FEATURE PLANTING
-  PM3 WOODLAND
-  PM4 PASTURE GRASSES
-  EEC EEC LOCAL SPECIES PLANTING

0 30 60 90 120 M

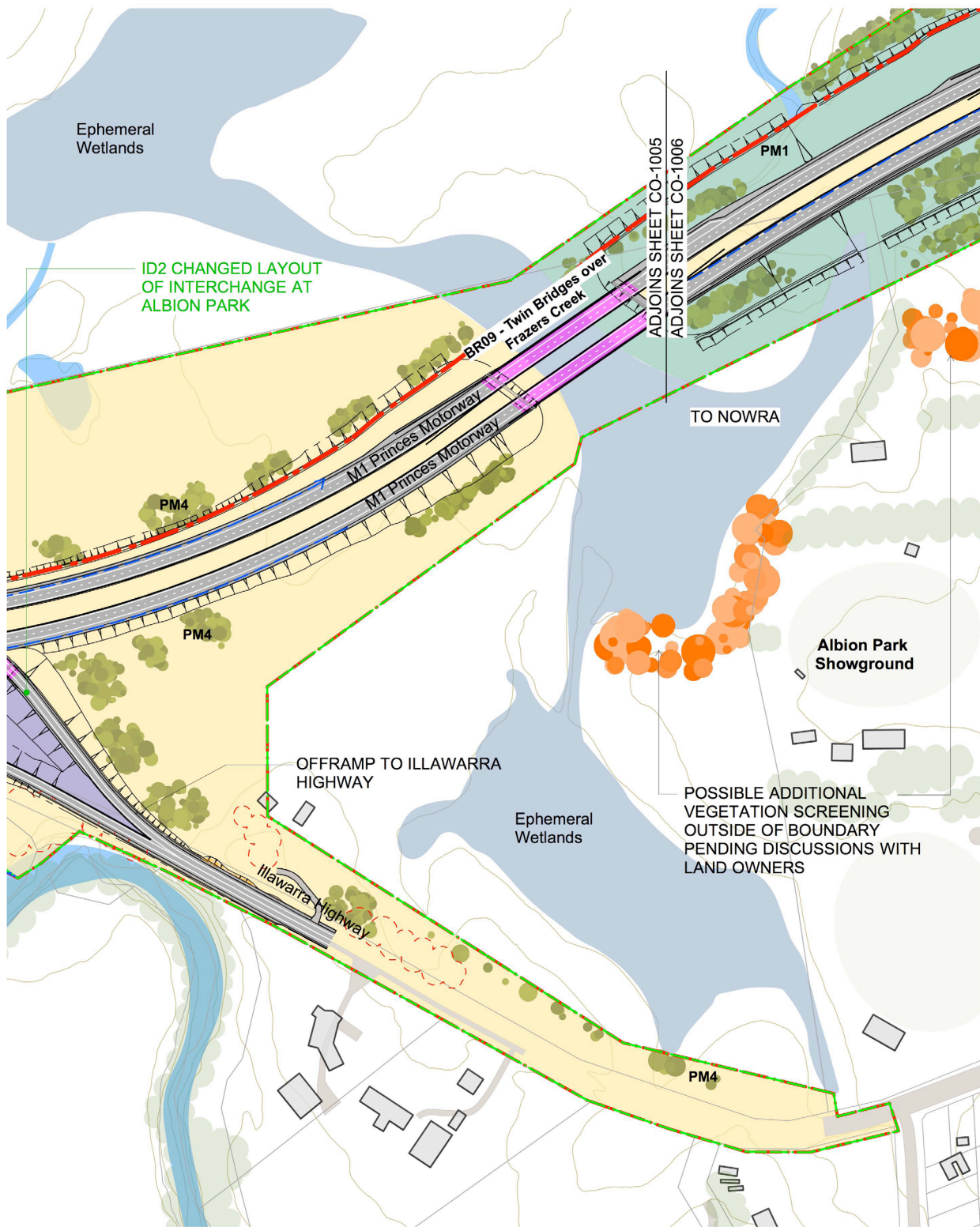




LEGEND

- | | | |
|---|---|---|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | POTENTIAL VEGETATION CORRIDOR | EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | --- ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |

CO-1005



0 30 60 90 120 M



CUT BATTERS TO BE REVEGETATED USING COMPOST BLANKET WHERE EXPOSED ROCK IS NOT PRESENT

PROPOSED BRIDGE LOCATIONS

PROPOSED WATER QUALITY BASINS DESIGNED TO INTEGRATE INTO THE LANDSCAPE

NEW TREE PLANTING WITHIN SITE BOUNDARY

POSSIBLE ADDITIONAL VEGETATION SCREENING OUTSIDE OF BOUNDARY PENDING DISCUSSIONS WITH LAND OWNERS

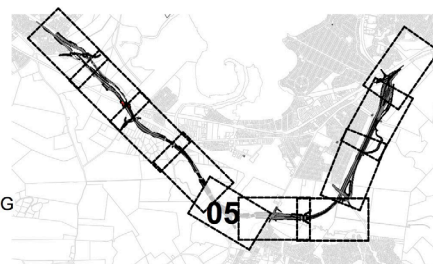
PM1 SWAMP FOREST/FLOODPLAIN

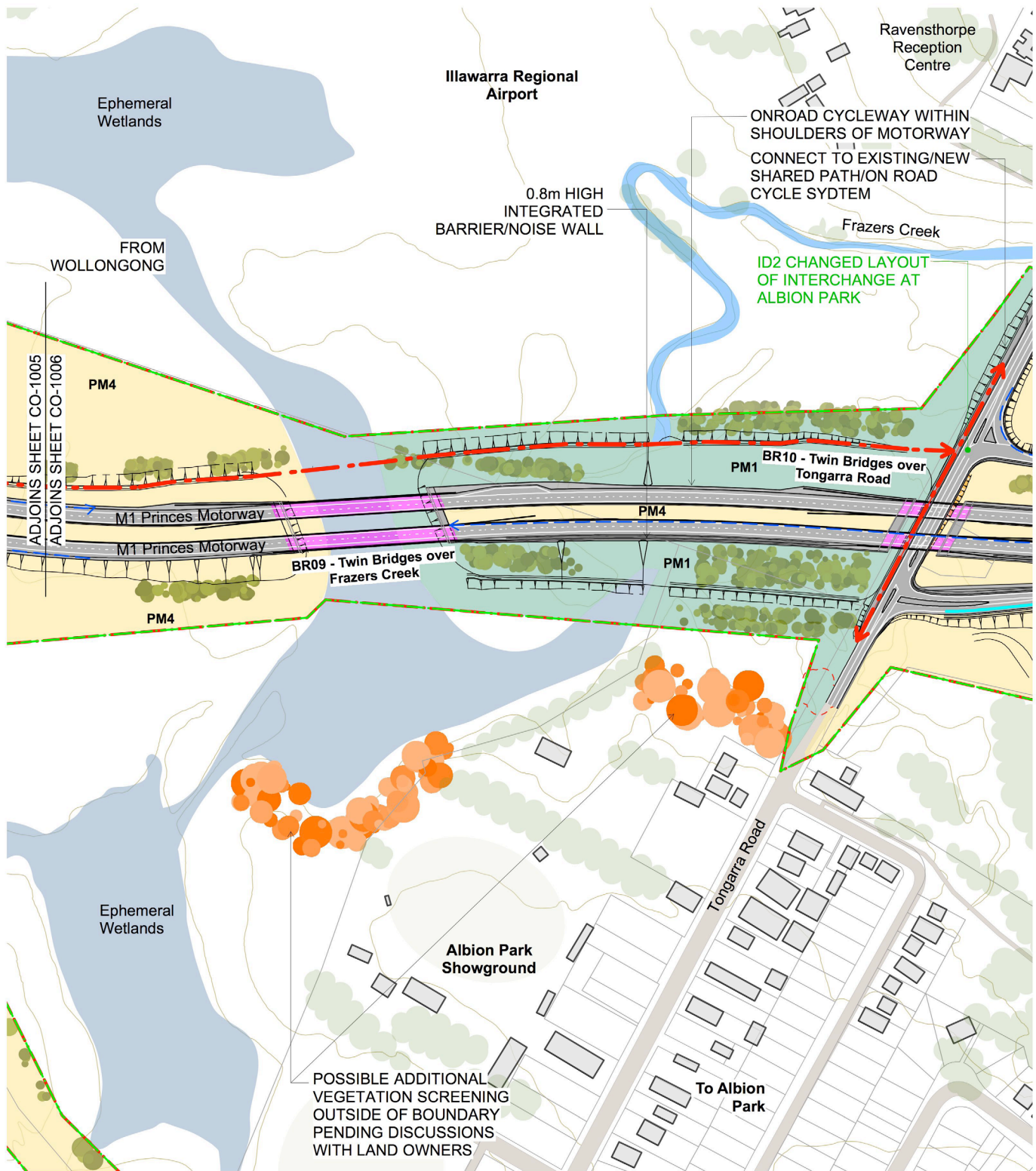
PM2 FEATURE PLANTING

PM3 WOODLAND

PM4 PASTURE GRASSES

EEC EEC LOCAL SPECIES PLANTING

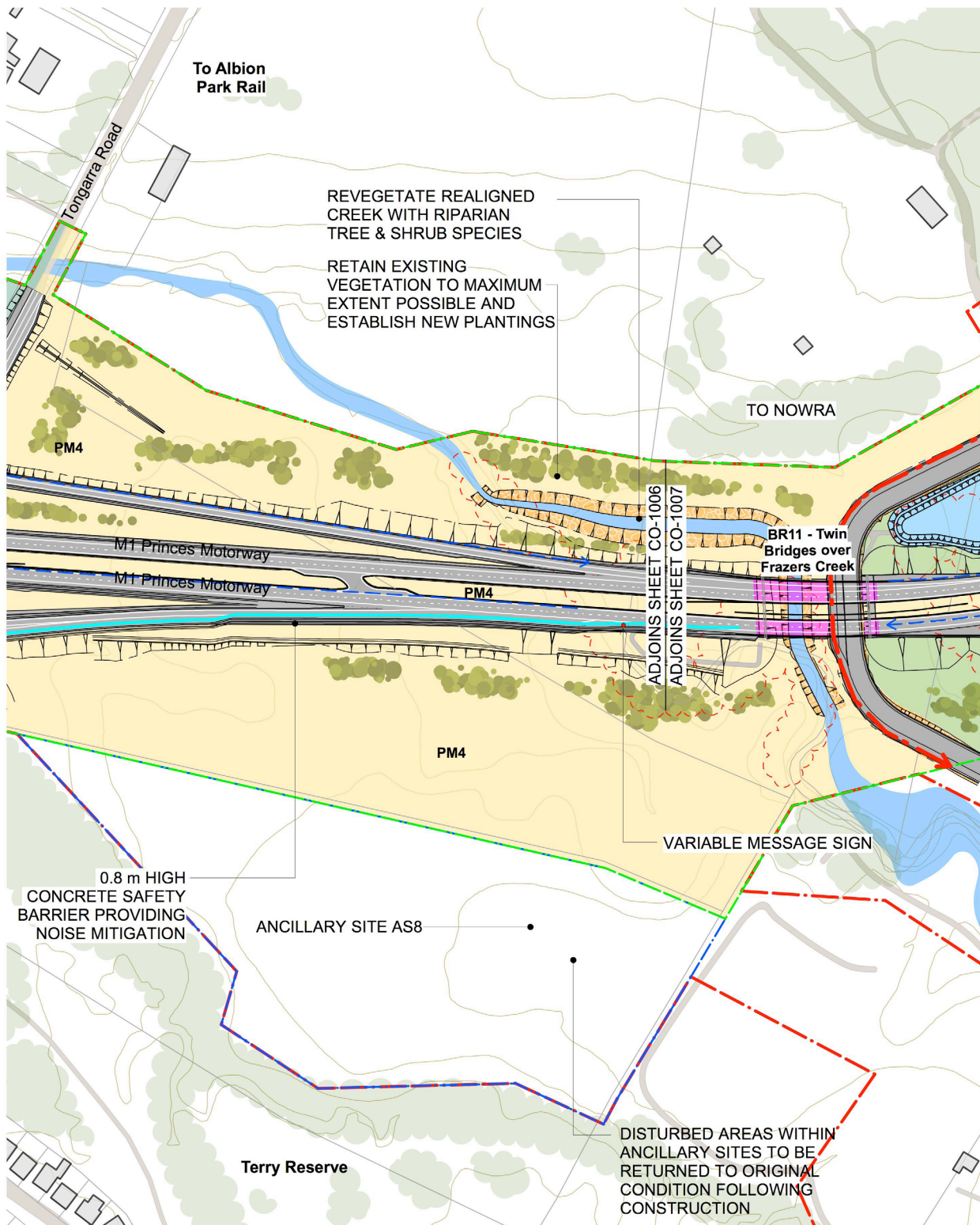




LEGEND

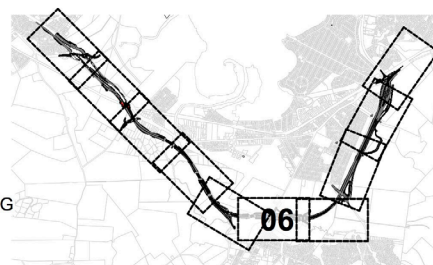
- | | | |
|---|---|---|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | ↔ POTENTIAL VEGETATION CORRIDOR | EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | ↔ ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | ● EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | ● EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |

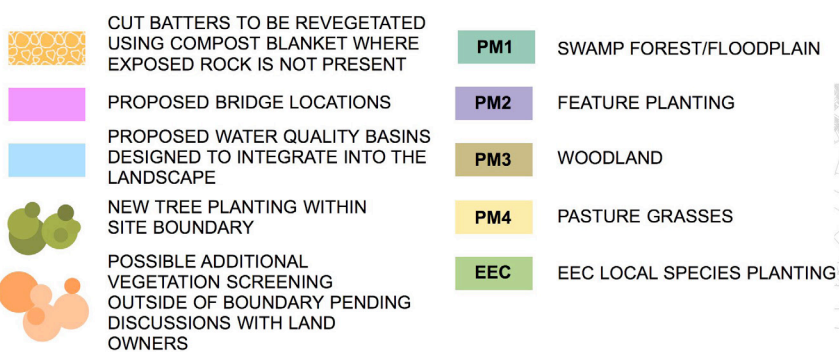
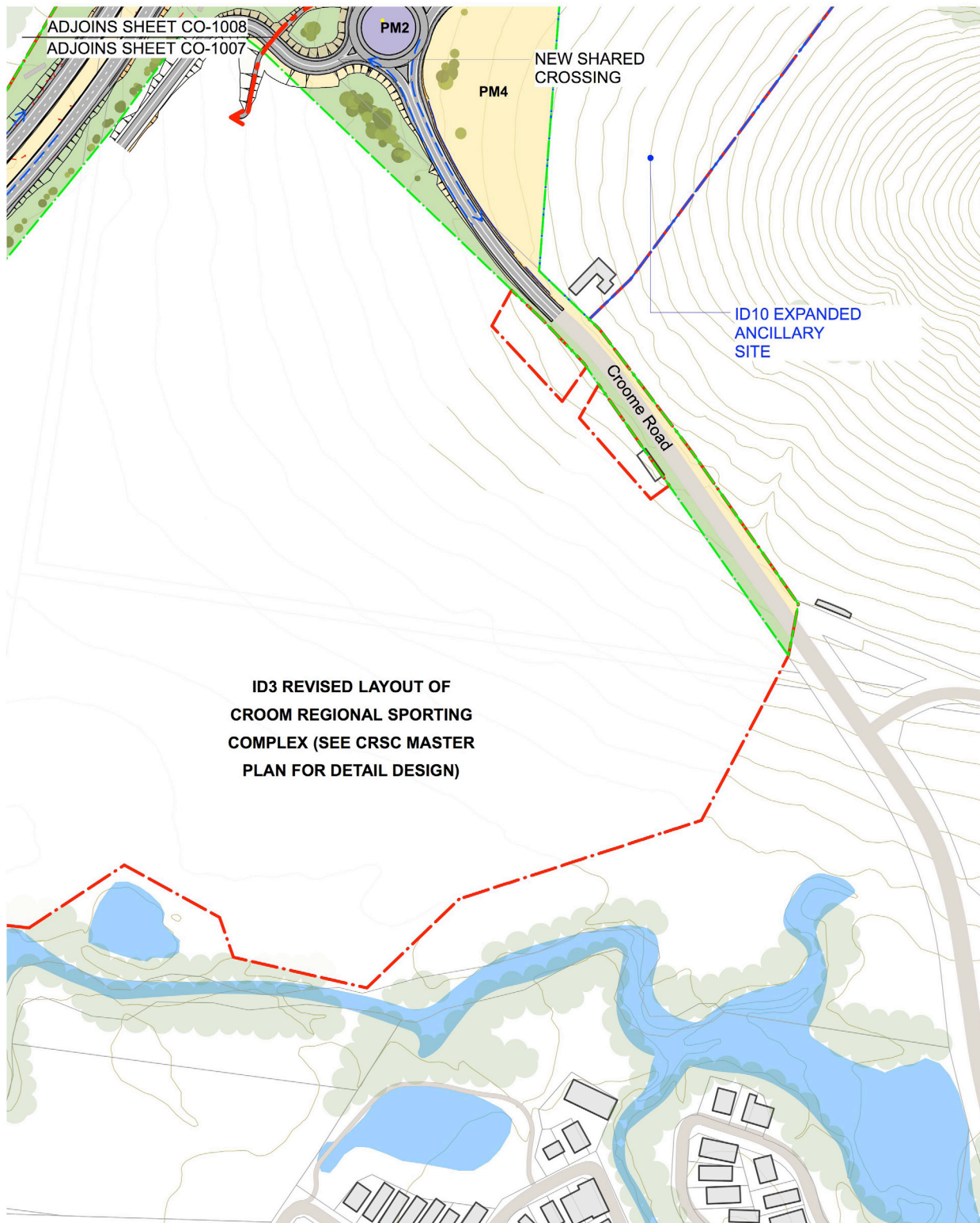
CO-1006

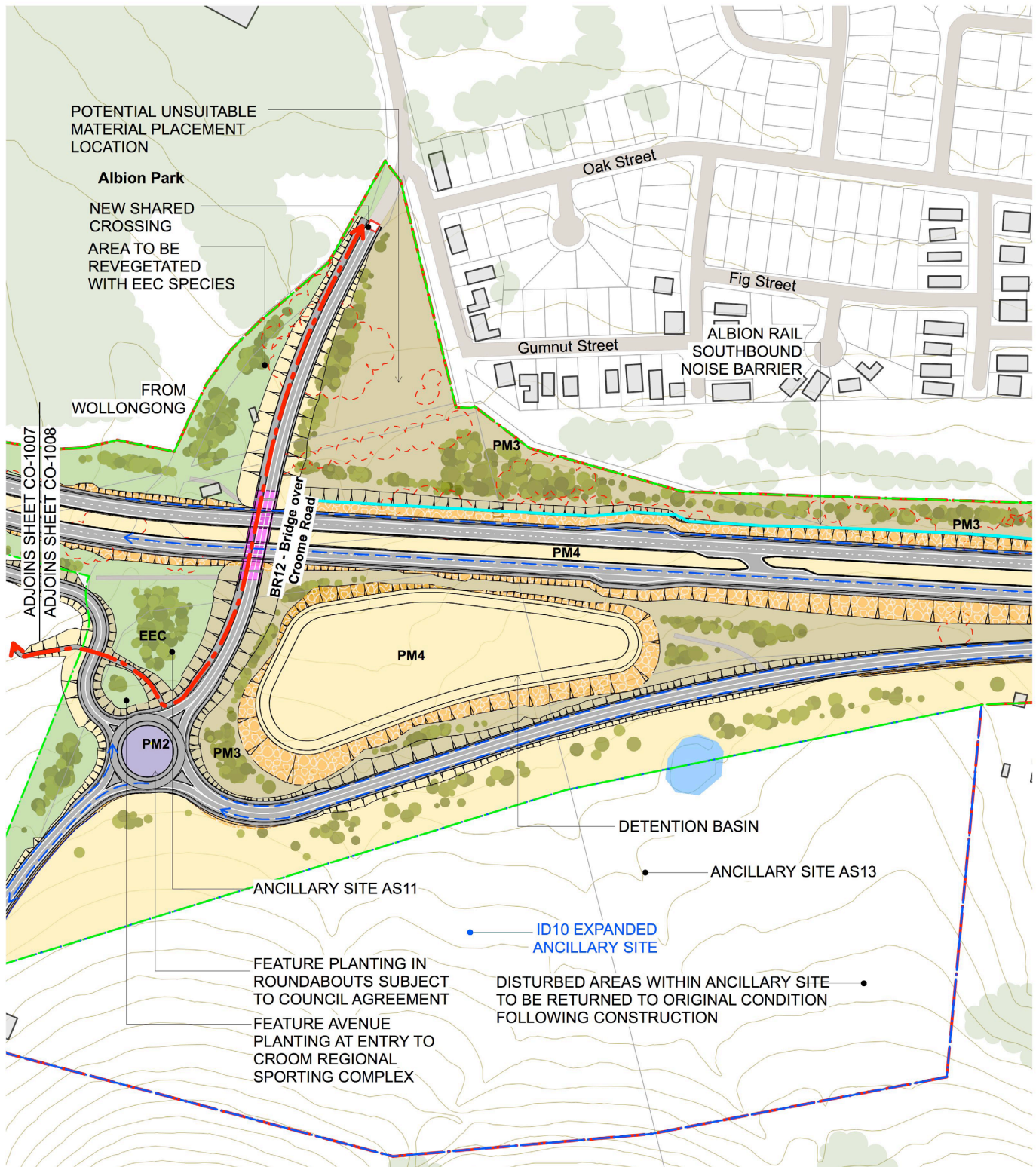


-  CUT BATTERS TO BE REVEGETATED USING COMPOST BLANKET WHERE EXPOSED ROCK IS NOT PRESENT
-  PROPOSED BRIDGE LOCATIONS
-  PROPOSED WATER QUALITY BASINS DESIGNED TO INTEGRATE INTO THE LANDSCAPE
-  NEW TREE PLANTING WITHIN SITE BOUNDARY
-  POSSIBLE ADDITIONAL VEGETATION SCREENING OUTSIDE OF BOUNDARY PENDING DISCUSSIONS WITH LAND OWNERS
-  PM1 SWAMP FOREST/FLOODPLAIN
-  PM2 FEATURE PLANTING
-  PM3 WOODLAND
-  PM4 PASTURE GRASSES
-  EEC EEC LOCAL SPECIES PLANTING

0 30 60 90 120 M

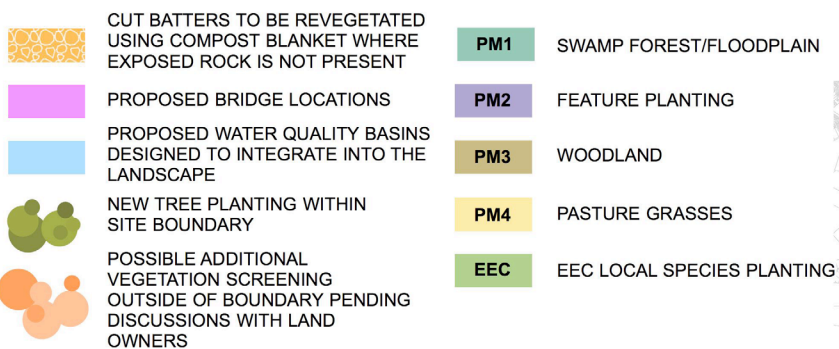


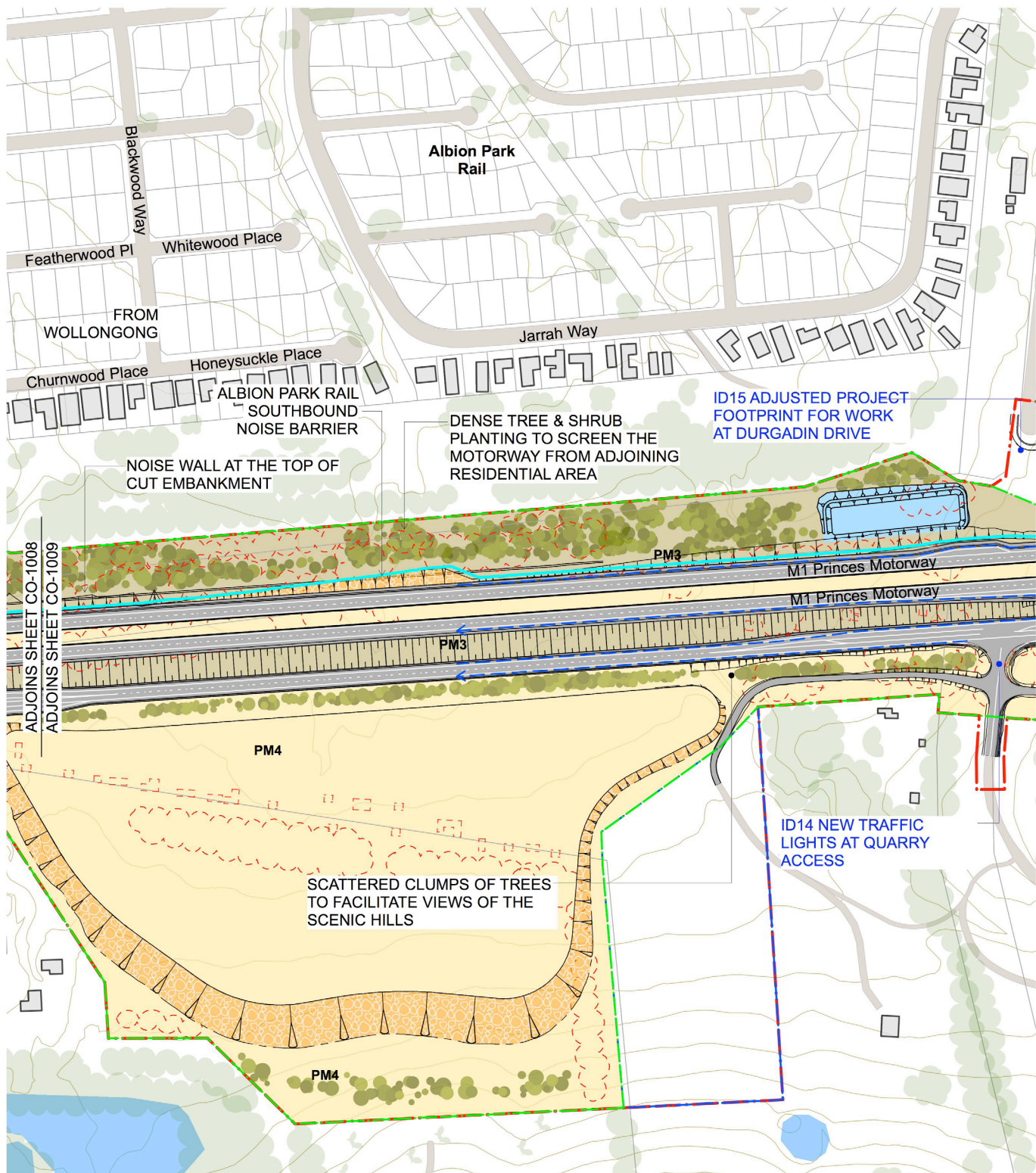




LEGEND

- | | | |
|---|---|--|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | ↔ POTENTIAL VEGETATION CORRIDOR | EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | --- ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |

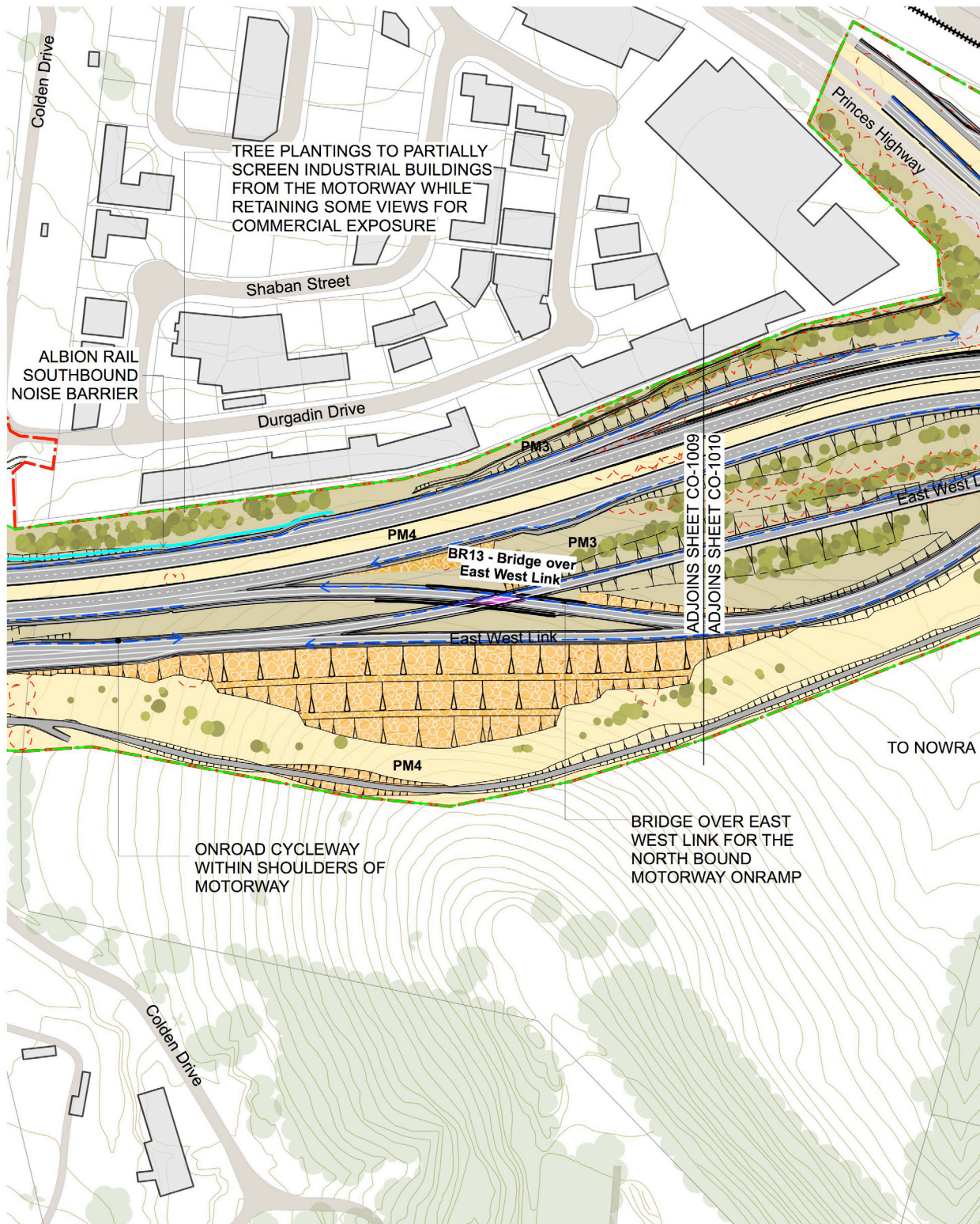




LEGEND

- | | | |
|---|---|---|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | ↔ POTENTIAL VEGETATION CORRIDOR | EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | ↔ ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |

CO-0009



CUT BATTERS TO BE REVEGETATED USING COMPOST BLANKET WHERE EXPOSED ROCK IS NOT PRESENT

PROPOSED BRIDGE LOCATIONS

PROPOSED WATER QUALITY BASINS DESIGNED TO INTEGRATE INTO THE LANDSCAPE

NEW TREE PLANTING WITHIN SITE BOUNDARY

POSSIBLE ADDITIONAL VEGETATION SCREENING OUTSIDE OF BOUNDARY PENDING DISCUSSIONS WITH LAND OWNERS

PM1 SWAMP FOREST/FLOODPLAIN

PM2 FEATURE PLANTING

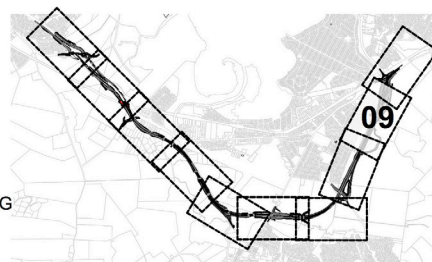
PM3 WOODLAND

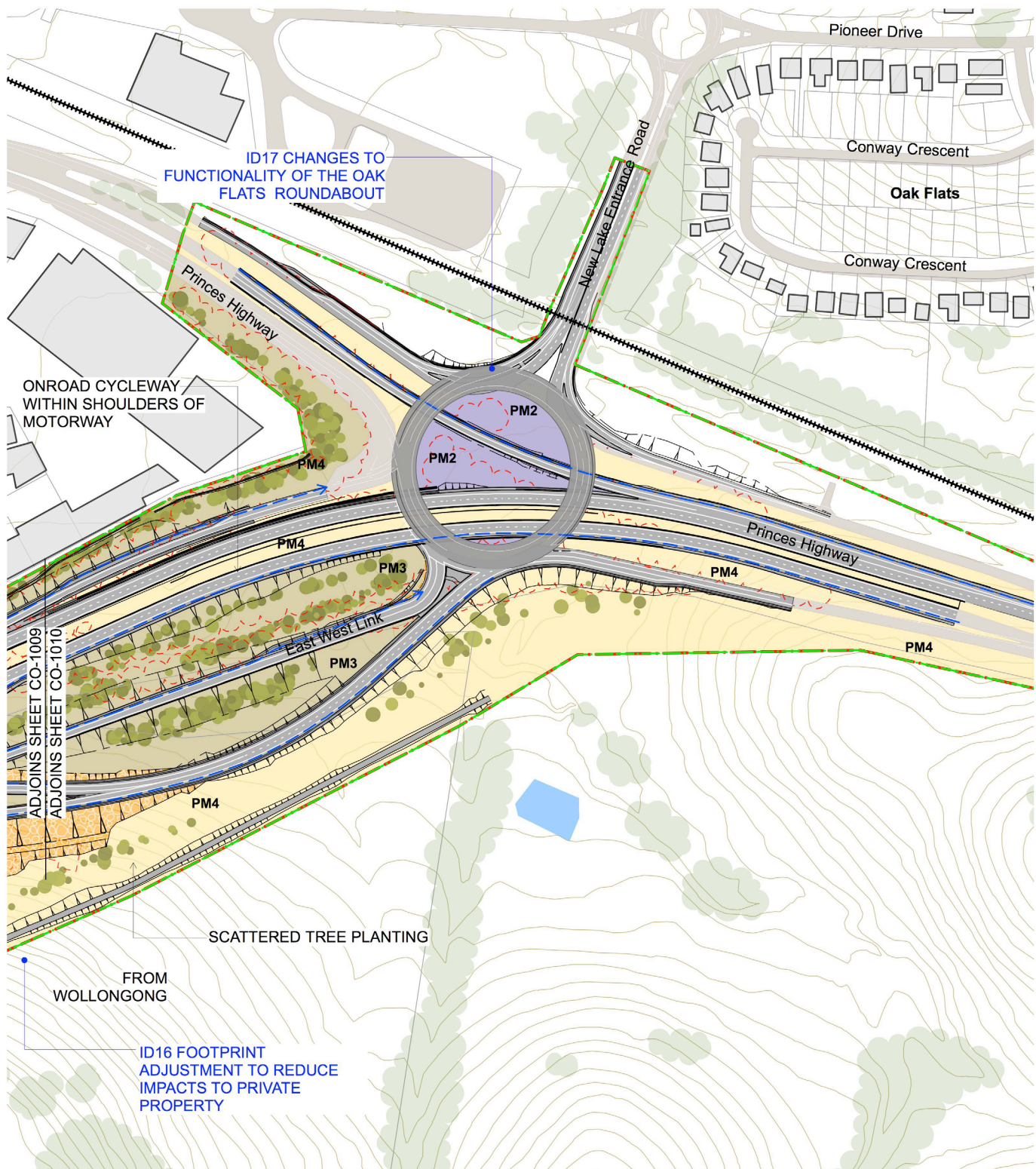
PM4 PASTURE GRASSES

EEC EEC LOCAL SPECIES PLANTING

0 30 60 90 120 M

N

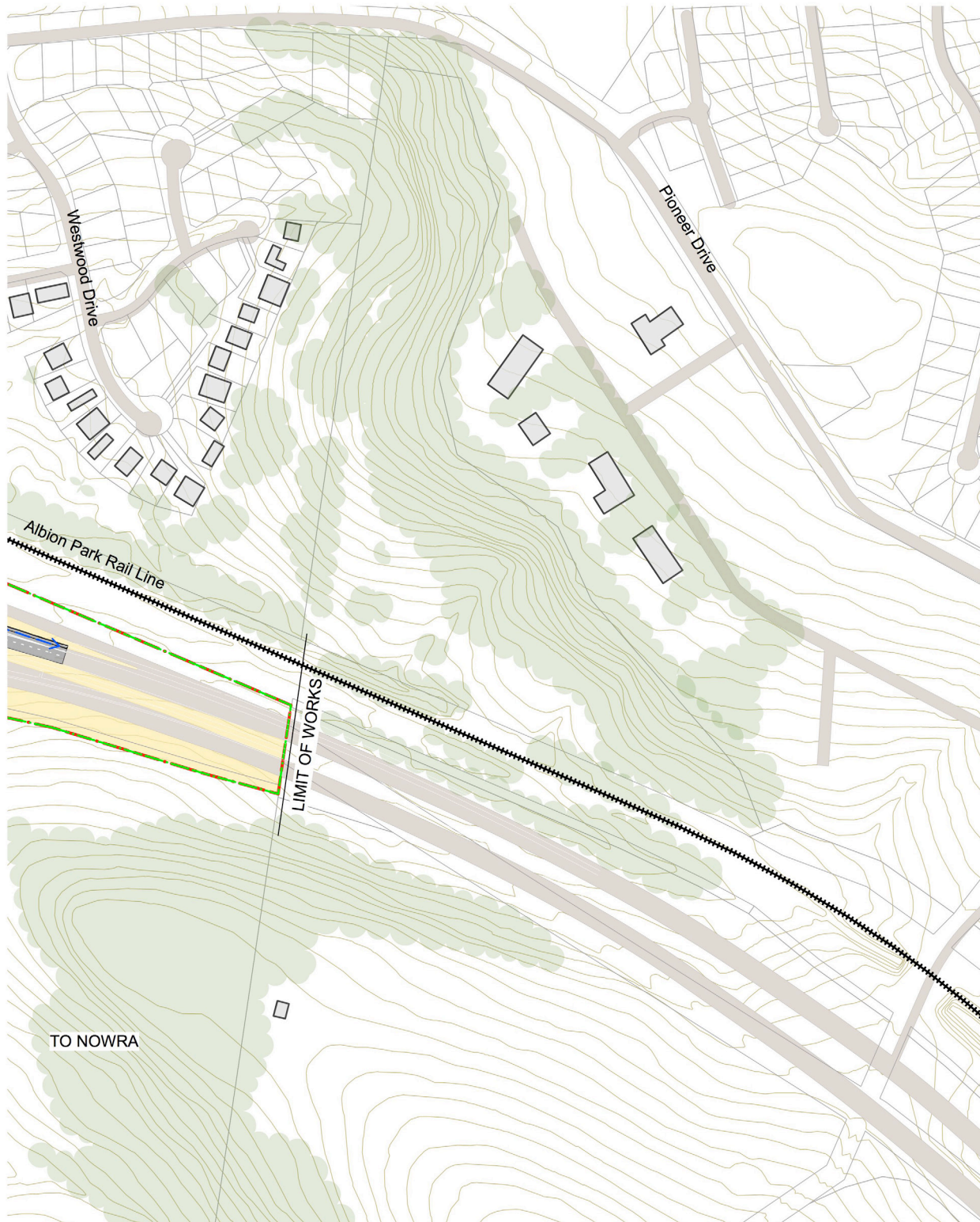




LEGEND

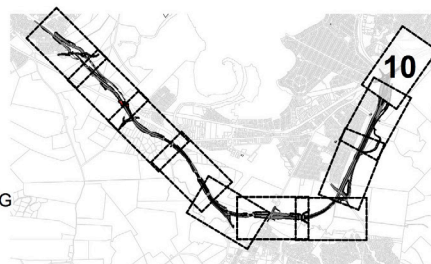
- | | | |
|---|---|---|
| --- PROJECT FOOTPRINT | --- PROPOSED NOISE BARRIER | PROPOSED ACCESS MAINTENANCE TRACK |
| --- PERMANENT ROAD BOUNDARY | POTENTIAL VEGETATION CORRIDOR | EXISTING BUILDINGS |
| --- TEMPORARY WORKS AREA | --- OFF ROAD PEDESTRIAN AND CYCLIST LINKS | EXISTING BUILDINGS TO BE REMOVED |
| --- PROPOSED ROAD BARRIERS | --- ON ROAD/SHOULDER CYCLIST LINKS ALONG THE MOTORWAY | EXISTING VEGETATION TO BE RETAINED OUTSIDE THE ROAD CORRIDOR BOUNDARY |
| --- PROPOSED RETAINING WALLS | | EXISTING VEGETATION TO BE REMOVED |
| --- CADASTRAL BOUNDARIES | | |

CO-1010



- | | | | |
|--|---|---|--------------------------------|
|  | CUT BATTERS TO BE REVEGETATED USING COMPOST BLANKET WHERE EXPOSED ROCK IS NOT PRESENT |  | PM1 SWAMP FOREST/FLOODPLAIN |
|  | PROPOSED BRIDGE LOCATIONS |  | PM2 FEATURE PLANTING |
|  | PROPOSED WATER QUALITY BASINS DESIGNED TO INTEGRATE INTO THE LANDSCAPE |  | PM3 WOODLAND |
|  | NEW TREE PLANTING WITHIN SITE BOUNDARY |  | PM4 PASTURE GRASSES |
|  | POSSIBLE ADDITIONAL VEGETATION SCREENING OUTSIDE OF BOUNDARY PENDING DISCUSSIONS WITH LAND OWNERS |  | EEC EEC LOCAL SPECIES PLANTING |

0 30 60 90 120 M



5. CONCLUSION

The revised road design including the adjusted project boundary remains substantially the same as presented in the EIS, with minor amendments and realignments that do not affect the urban and landscape design strategies identified in *Technical Paper 10*. The most notable change from an urban design, landscape character and visual point of view is the introduction of an additional two noise barriers in southern Dapto. Yet, landscape character and visual impacts remain substantially the same, as summarised in the following section.

5.1 LANDSCAPE CHARACTER IMPACTS OF THE REVISED DESIGN

For the purposes of the landscape character assessment *Technical Paper 10* distinguished twelve landscape character zones (LCZs). This Addendum found that the changes to the design and project boundary adjustments would not alter the landscape character impacts as identified in the EIS and *Technical Paper 10*.

5.2 VISUAL IMPACT OF THE REVISED DESIGN

A total of 39 viewpoints were used in *Technical Paper 10* to assess the visual impact of the proposed bypass on views in the project area. This Addendum found that while more than one third of these viewpoints would potentially be affected by the design changes made since the EIS, there is only one viewpoint where the visual impact would differ from that identified in the EIS.

South of the Illawarra Regional Airport the likely visual impact on viewpoint 14 would be reduced relative to the EIS design due to modifications to the interchange that have relocated the northbound exit to south of Tongarra Road, reducing the magnitude of the proposed bypass in this view.

In southern Dapto two new viewpoints were introduced to assess the visual impact of the proposed changes to noise mitigation measures on motorists and residents. The proposed noise barriers under the revised design would be large built elements that were not anticipated in the EIS design. The assessment has found that there is an increase in visual impact as a result of the noise barriers. The revised design would result in a moderate-high visual impact for motorists along the Princes Motorway (new viewpoint 40) and a high visual impact for residents in southern Dapto (new viewpoint 41).

In summary, out of the 41 viewpoints used to assess the revised design, the range of visual impact ratings would therefore be as follows:

- Ten viewpoints, or about one quarter, would have High visual impact
- Fifteen viewpoints would have High to Moderate visual impact
- Nine viewpoints would have Moderate visual impact
- Five viewpoints would have Moderate to Low visual impact
- Two viewpoints would have Low visual impact.

In order to mitigate some of these impacts, the management measures described in the EIS would remain valid for integration into future design stages. In addition to these, and in response to the additional impacts identified in this Addendum, the following modified management measure is proposed for inclusion in the project approval:

The need for operational phase noise management measures, including low noise pavement, noise barriers or architectural treatments, will be confirmed during detailed design. The chosen noise barrier design will be selected following investigations into engineering feasibility of the proposed mitigation measures and community consultation with residents from properties identified as exceeding, without mitigation, the Noise Criteria Guideline (Roads and Maritime, 2015) in the adjoining noise catchment area. The mitigation measures will be provided as early as practicable in the construction program to reduce potential noise impacts associated with construction.

Where noise barriers are found to be the preferred noise management strategy during future detailed design studies and consultation, the design of the barriers should seek to minimise the identified visual and amenity impacts, and be developed in accordance with the Roads and Maritime *Noise wall design guideline* to refine both the design and alignment of the barrier to maximise urban design and visual outcomes.

SPACKMAN MOSSOP ^{AND} MICHAELS

PO Box 880 Darlinghurst, NSW 1300

P (02) 9361 4549 F (02) 9361 4569

www.sm2group.com.au

ABN 65 065 578 985