APPENDIX F

WestConnex

NOISE BARRIER LOCATION AND DESIGN SUB-PLAN

Project:
WestConnex New M5
Urban Design and Landscape Plan

Document Number:

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Appendix F: Noise Barrier Location and Design Sub-plan

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PREPARED FOR CPB CONTRACTORS | DRAGADOS | SAMSUNG C&T BY HASSELL

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F1 Introduction

This Urban Design and Landscape Plan has been prepared by HASSELL for CDS to satisfy the Ministers Condition of Approval B62 (SSI6788). The plan provides a comprehensive outline of the Urban Design and Landscape strategies for the WestConnex New M5 Project.

The requirement for noise walls and headlights screens provides an opportunity to reduce noise and amenity impacts on local receivers, enhance the driver experience and contribute to a considered and choreographed journey along the overall WestConnex project.

F1.1 Ministers condition of approval

An Environmental Impact Statement (EIS) for the Project was submitted on 23 November 2015 for public exhibition and comment. On 4 March 2016, a Submissions Report was prepared in response to submissions received during the EIS exhibition period. The Plan was considered by the Department of Planning and Environment (DP&E) and informed the Minister for Planning, in the projects approval assessment.

On 20 April 2016, planning approval for the WestConnex New M5 project was received from the Minister for Planning. The approval was subject to Conditions of Approval, including B34, B35, B36, B38, B60, B61, B62 and B63 which are specific to Urban and Landscape Design.

The Minister's Conditions of Approval relevant to MCoA B62(f) are listed below along with a reference to where each condition is addressed within this Plan.

Table 01 Conditions of approval

Condition of approval		Reference
B62(f)	**Noise Barrier Location and Design Sub-plan**	
	Identification and confirmation of all noise barrier locations associated with the Project including new, relocated or modified barriers.	**Refer Section F3.**
	The consultation and decision making process for all new, relocated or modified noise barriers associated with the Project.	**Refer Section F6 for the consultation process.** **Refer Section F6 for the decision making process.**
	Assessment of the potential impacts of the barriers including visual amenity, overshadowing, heritage impacts, connectivity and community cohesion.	**Refer Section F8 for potential impacts of noise barriers**
	Consideration of safer by design principles, the WestConnex Urban Design Framework, RMS Design Guidelines.	**Refer Section F1.3 for consideration of WestConnex Urban Design Framework and RMS Design Guidelines.** **Refer Section F1.5 for consideration of safer by design principles.**
	Adjacent property owner concerns and preferences regarding barrier design and location, and	**Refer Section F7.**
	Justification for the final design of new, relocated or modified barriers.	**Refer Section F7.**
	The permanent barrier design options must be developed in consultation with the UDRP and presented to landowners adjacent to the barriers for consultation prior to the adoption of a final design.	**Refer Section F7 for evidence of landowners adjacent to the barriers for consultation prior to the adoption of a final design.**

F1.2 Revised Environmental Management Measures

This section of the sub-plan addresses issues raised during the consultation process and the Revised Environmental Management Measures (REMM) raised in the Submissions and Preferred Infrastructure Report (SPIR) listed below.

Table 02 Revised Environmental Management Measures

Ref #	REMM	Response
Operation - Landscaping		
OpV07	The design of the noise attenuation at the western surface works would be confirmed during detailed design and in consultation with the local community. This may consist of noise mounds and barriers (or a combination of both) and with consideration to the provision of accessible open space at Beverly Grove Park and a landscaped outlook.	As a result of consultation with the local community, the existing noise mound will be reinstated within Beverly Grove Park between Rosebank Avenue and Gareema Circuit to the north of the eastbound New M5 alignment. In all other locations where the project is not adjacent residents, non-transparent noise walls will be implemented. Where noise walls are required and not adjacent residents, then transparent walls will be implemented to allow views out from the Motorway. Details of noise barrier locations and treatments are covered in this sub-plan.

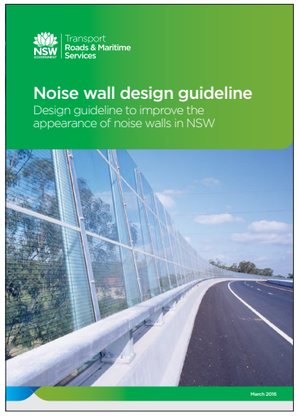
F1.3 Urban Design policy

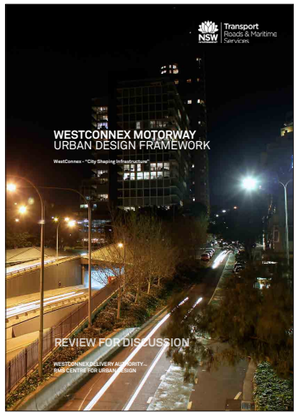
Work leading to the presentation of the Urban and Landscape Design has been an iterative process and has included:

- A thorough review of briefing materials and associated working papers including the WestConnex Urban Design Framework
- Inspections of the route and its environs
- Numerous design workshops and meetings involving the project design team members. Consultation with the Urban Design Review Panel, including councils and residents adjacent to the proposed structures; and
- A review of current WestConnex and RMS design standards and industry construction methods.

The Urban and Landscape Design proposals for the project has been prepared in reference to the objectives and design principles of:

- RMS Noise Wall design guidelines - Design guidelines to improve the appearance of noise walls in NSW
- WestConnex Urban Design Framework
- RMS Beyond the Pavement
- SWTC Appendix B.11 - Urban Design and Landscaping, Section 8.2 Requirements for Noise Walls and Headlight Screens; and
- A review of current WestConnex and RMS design standards and industry construction methods.





F1.4 Design philosophy

The design of noise walls and headlight screens is characterised by the following:

- Simple, uncomplicated and consistent treatments
- Well resolved detailing that integrate the various road elements; rail, noise barrier, wall, topography, etc
- Calm and gradual transitions
- Consistent alignment with tops generally running parallel with the road alignment, without stepping
- Providing sufficient space for screen planting to both sides where possible
- A fine detail that is integral to the screen rather than explicitly applied
- Durable
- Ease and simplicity of construction
- A design complementary to existing noise barriers; and
- A consistent design approach similarly applied to other road elements, a considered palette of design elements, materials and colour.

A landscape element

The intent is to treat the noise walls as a landscape element. An element that provides a sequence of subtle changes to the spatial experience, calm but stimulating. As a landscape element they also reinforce and tie into to the natural environments through which they pass, maximising views and responding to natural patterns.

Balance between motorists and resident views

To comply with the EIS, the Project is required to balance the needs and impacts for both motorists and adjacent residents. As such, the extent of transparent noise panels along the westbound carriageway have been reviewed and considered through the consultation process.

Where the location of transparent panels may impact residents of Elouera and Kirrang Streets regarding motorway views and headlight issues, non-transparent walls were considered and adopted in lieu of transparent noise panels.

Within a portion of Beverly Grove Park, the Project has implemented a design of reinstating a large fill mound between Kindilan Underpass and Gareema Circuit adjacent the carriageway, as a revegetated noise mound.

F1.5 Safer by design

The Legislative requirement for Safer by Design principles has been incorporated during development of the noise barrier design. Consideration has been given to safety during the construction, operation, maintenance and replacement phases of the noise wall assets. The noise barriers have been designed in accordance with the relevant requirements of the Australian Standards and RMS specifications. The design of the noise mound at Kingsgrove takes into consideration the safety of the M5 Linear Park users and maintenance workers as follows:

- Public access to the noise mound from the M5 Linear Park is restricted by a boundary fence. Public access is restricted as the mound slope is considered too steep for safe access.
- Safe access grades are provided longitudinally on the mound to access the crest for the purposes of maintenance of the half height noise walls; and
- Consideration has been given to a planned landscape design to facilitate natural surveillance in areas bordering the toe of the mound which are publicly accessible.

F1.6 Urban Design Review Panel

An Urban Design Review Panel (UDRP) was been established to provide advice and guidance during detailed design and the preparation of the Urban Design and Landscape Plan and its component sub-plans as required by Planning Approval conditions B60, B61 and B62, respectively.

UDRP sessions in which noise walls have been discussed are as follows:

- 06-02-2017 – Western Precinct Meeting (M5AT Offices)
- 13-04-2017 – Western Precinct Meeting (M5AT Offices)
- 15-09-2017 – Western Precinct Meeting (M5AT Offices)

Feedback obtained from these sessions which has included endorsement of adjustments made to the project following consultation with adjacent landowners are summarised below:

- A 175m long section of NW01 has been changed from acrylic transparent panels to acrylic non transparent panels,
- The section of noise barrier NW06, NW07 and NW08 consists of a combination of noise walls and noise mound. Grades on the noise mound have been selected to minimise the loss of accessible public space in the adjacent M5 Linear Park. There are two areas within the mound where the acoustic crest height cannot be achieved and these have been augmented with varying height noise walls,
- The noise wall paint colour selection is based on matching the KGRIU colour palette in the west and the existing M5 colour palette in the east. The acrylic transparent panel colour has been selected to match that used in the KGRIU; and

Notes of the meeting sessions are to be confirmed in the final issue of this Plan.

F2 Western Interchange and portals

2.1 Context

Based on the EIS and Project requirements, noise walls are only required within the Western Interchange and Portals precinct within the Project, therefore the basis of the report is based on this location.

Existing Western Interchange and Portals noise walls

Within the Western Interchange and Portals, there are a number of variable motorway infrastructure elements constructed as part of the original M5 East, the original M5 and the recent M5 widening works and the King Georges Road Interchange Upgrade (KGRIU).

Existing noise walls along the M5 East Motorway are generally comprised of two types. The first is the plain, precast concrete panel, and the second type is again a precast concrete panel with 'light' and 'heavy' texturing.

Existing noise wall posts are also a visually dominant element and poorly detailed, with fixings and jointing highly visible to the motorist or adjacent parkland users.

As the Project will require noise walls along both sides of the motorway, and to minimise clutter and maximise visual consistency, noise wall detailing will be consistent with the detailing adopted by RMS for the KGRIU.

King Georges Road Interchange Upgrade (KGRIU) noise walls

New noise walls were required throughout the KGRIU works at the western tie-in with the Project. These walls generally fall within three categories:

- New regular noise walls
- Feature walls
- Transparent walls

New regular noise walls with precast concrete panels, supported by steel posts off-form with a light vertical texture or no texture and have been designed to be simple and recessive elements without unnecessary decoration or embellishment.

Feature walls with precast concrete panels, supported by steel posts off-form with a heavy texture to integrate with the established noise wall arrangement of the M5 East Motorway design.

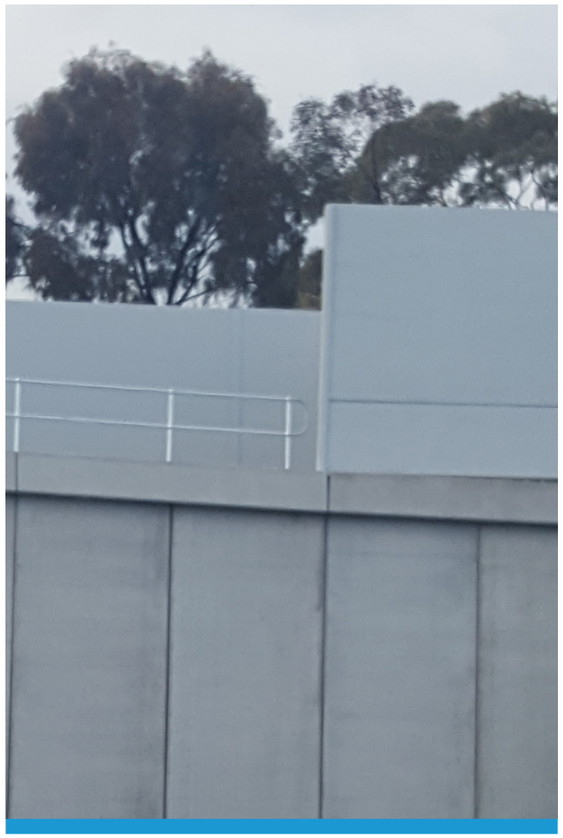
Transparent acrylic panels have been integrated into the KGRIU noise wall design at Cooloongatta Road Overbridge to provide safe sight line distances, and at the bridge over Penshurst Road to provide views to the broader landscape setting. A similar approach has been adopted throughout the Western Interchange and Portals precinct which will continue the theme throughout the wider M5 corridor.



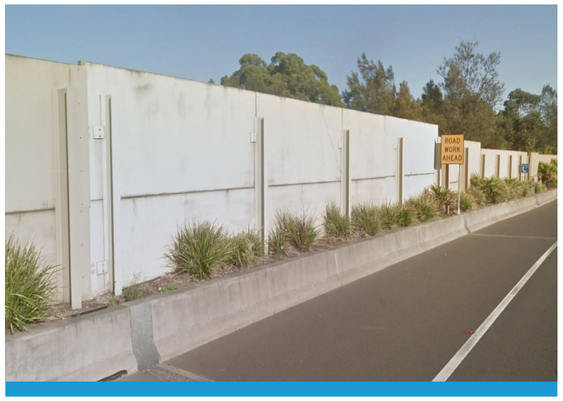
Existing M5 East noise walls adjacent shared path



Existing M5 East noise wall above Kindilan Underpass



KGRIU noise wall / retaining wall details



Existing M5 East noise walls from Motorway (Source: Google)



KGRIU transparent noise wall

2.2 Design Approach

A key consideration that has guided urban design outcomes at this location is to seamlessly integrate and achieve visual consistency with already constructed motorway elements as part of the original M5 East, the original M5, recent M5 widening works and KGRIU.

The most visually significant elements along this section of the motorway are the noise walls. There is a high degree of variation in urban design treatments which creates an inconsistent and visually cluttered driver experience, particularly with respect to the large extent of non-transparent noise walls that line the existing motorway.

As the Project will require noise walls along both sides of the motorway, noise wall detailing will be consistent with the detailing adopted for the KGRIU and wider Project retaining walls in order to minimise clutter and maximise visual consistency.

With the new alignment being elevated alongside Canterbury Golf Course and Beverly Grove Park, a transparent noise wall will be provided along the northern edge of the alignment to allow views over the existing golf course and parkland, providing relief from the 'canyon' effect of the existing non-transparent noise walls along the eastbound approach to the portals. The final extent of transparent panels has been minimised due to outcomes from the consultation process and the need to reduce impacts to adjacent residents and is explained further is section F6.

The use of transparent walls in this section of the Project will also have some additional safety benefits for the shared path and linear parkland which lies directly adjacent to the north of the alignment in this location. This transparent wall will reduce the amount of overshadowing and sense of enclosure for the adjacent shared path users.

As a result of the consultation process, the design of the noise attenuation in the area of Beverly Grove Park will comprise a combination of noise mound and non-transparent / transparent barriers with consideration to the provision of accessible open space at Beverly Grove Park and a landscaped outlook which is achieved in both scenarios.

2.3 Noise barrier locations

The locations nominated below are consistent with those below and are consistent with those identified in the EIS.

The following key plan highlights where the proposed noise barriers for the Project are located.

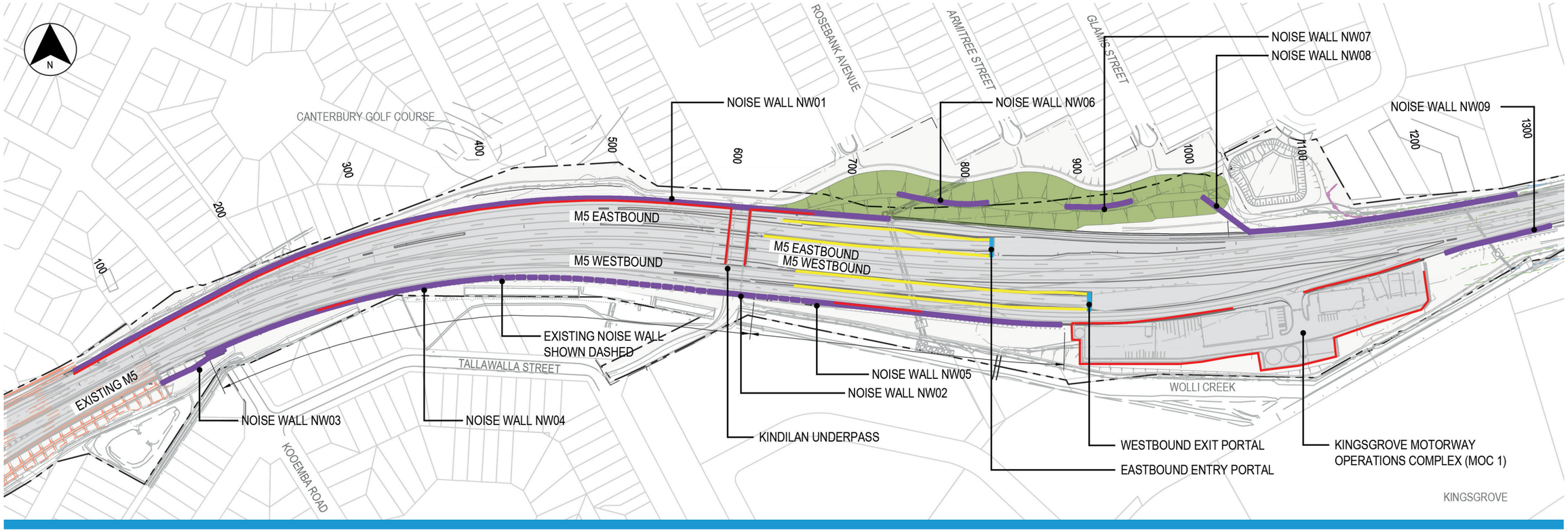


Figure 06-1 - Western Interchange and Portals - Noise Walls - Key plan



Figure 06-2 - Western Interchange and Portals - Noise Barrier Locations

F3 Noise wall schedule

Noise wall modelling and assessment to confirm location and height of noise walls has been completed. The locations and heights as shown below remain generally consistent with those identified in the EIS. The final noise wall designs were presented to stakeholders on 25 October 2017.

The adjacent Table lists the number, location, length, height, requirements and wall type treatment for all proposed noise walls and headlight screens proposed for the Western Interchange and portals (including MOC1) precinct of the Project.

Table 03 Noise wall schedule

No.	Location	Length (m)	Maximum height (m)	Description	Panel finish	Steel post finish
NW01	Eastbound carriageway between KGRIU tie-in and and tie-in with noise mound	718m	5m (646m) 6.5m (72m)	Type 1A - Coloured acrylic transparent noise wall fixed to top of barrier (543m) Type 1C - Coloured acrylic non-transparent noise wall fixed to top of barrier (175m)	Type 1A - Acrylic transparent panels: Evonik XT Birdgaurd Smoky Brown with horizontal or vertical anti bird strike lines Type 1C - Acrylic non-transparent panels: Evonik Plexiglass Soundstop Light Grey or approved equivalent	Type 1A - Painted: Dulux Fairoaks Type 1C - Painted: Colour match Evonik Plexiglass Soundstop light grey
NW02	Westbound carriageway atop existing Kindilan Underpass	20m	4m	Type 1B - Coloured acrylic transparent noise wall on structure	Type 1C - Acrylic transparent panels: Evonik XT Birdgaurd Smoky Brown with horizontal or vertical anti bird strike lines	Type 1A - Painted: Dulux Fairoaks
NW03	Westbound carriageway extending from existing KGRIU noise wall	59m	4m	Type 2A - Non-transparent precast concrete panel noise wall with texture	Precast concrete - Painted Colorbond Shale Grey	Painted - Colorbond Shale Grey
NW04	Westbound carriageway extending to Kindilan Underpass	469m	4m	Type 2B - Non-transparent precast concrete panel noise wall	Precast concrete - Painted Colorbond Shale Grey 'Light texture' to match KGRIU to residential side	Painted - Colorbond Shale Grey
NW05	Westbound carriageway extending from Kindilan Underpass to MOC1	263m	4m	Type 2B - Non-transparent precast concrete panel noise wall	Precast concrete - Painted Colorbond Shale Grey	Painted - Colorbond Shale Grey
NW06	Eastbound carriageway atop noise mound	70m	1.85m	Type 2C - Non-transparent precast concrete panel noise wall	Precast concrete - Painted Dulux Fairoaks	Painted - Dulux Fairoaks
NW07	Eastbound carriageway atop noise mound	53m	1.5m	Type 2C - Non-transparent precast concrete panel noise wall	Precast concrete - Painted Dulux Fairoaks	Painted - Dulux Fairoaks
NW08	Eastbound carriageway from eastern end of noise mound to tie-in with existing M5 East noise wall	276m	6.5m	Type 2B - Non-transparent precast concrete panel noise wall	Precast concrete - Painted to suit existing M5 East noise walls	Painted - To suit existing M5 East noise walls
NW09	Westbound carriageway replacement section of existing M5 East noise wall	95m	4m	Type 2B - Non-transparent precast concrete panel noise wall	Precast concrete - Painted to suit existing M5 East noise walls	Painted - To suit existing M5 East noise walls

F4 Noise Barrier details

The main noise barrier construction types represented in this section are listed below and described in this section:

- Type 1 - Coloured acrylic noise walls (transparent & non-transparent)
- Type 2 - Concrete panel walls
- Type 3 - Noise Mound

F4.1 Type 1 - Coloured acrylic noise walls

Both non-transparent and transparent noise walls are proposed throughout the Western Surface Works to the northern edge of the corridor. These noise walls tie into the proposed KGRIU and run adjacent to Beverly Grove Park. They also run the length of works adjacent to the eastbound bypass ramp and sit across both ends of Kindilan underpass.

Transparent noise wall panelling in shades of a smoky brown colour (to match with the design for the existing KGRIU Project), will provide the road user with views of existing bushland, Canterbury Golf Course and the surrounding built environment.

These areas are intended as place marking points to be noticed and enjoyed. They also improve the Project's legibility and environment, providing motorists with a sense of space and location — punctuating an often monotonous journey with a splash of colour and interest.

The walls are comprised of inclined posts and transparent acrylic panels to be supported to the back of the traffic barrier walls.

The height of noise wall panels to be used is nominally 5m and 6.5m segments. Location of differing height panels is included in Section F3 and F5.

Typical transparent wall details (Type 1A and 1B) are included in this section.

From the western end of the Project, a 175m section of non-transparent noise wall is required, and the design will tie in with the existing wall colours constructed as pasrt of the KGRIU Project.

Typical non-transparent wall details (Type 1C) are included in this section.



KGRIU Coloured transparent noise wall detail



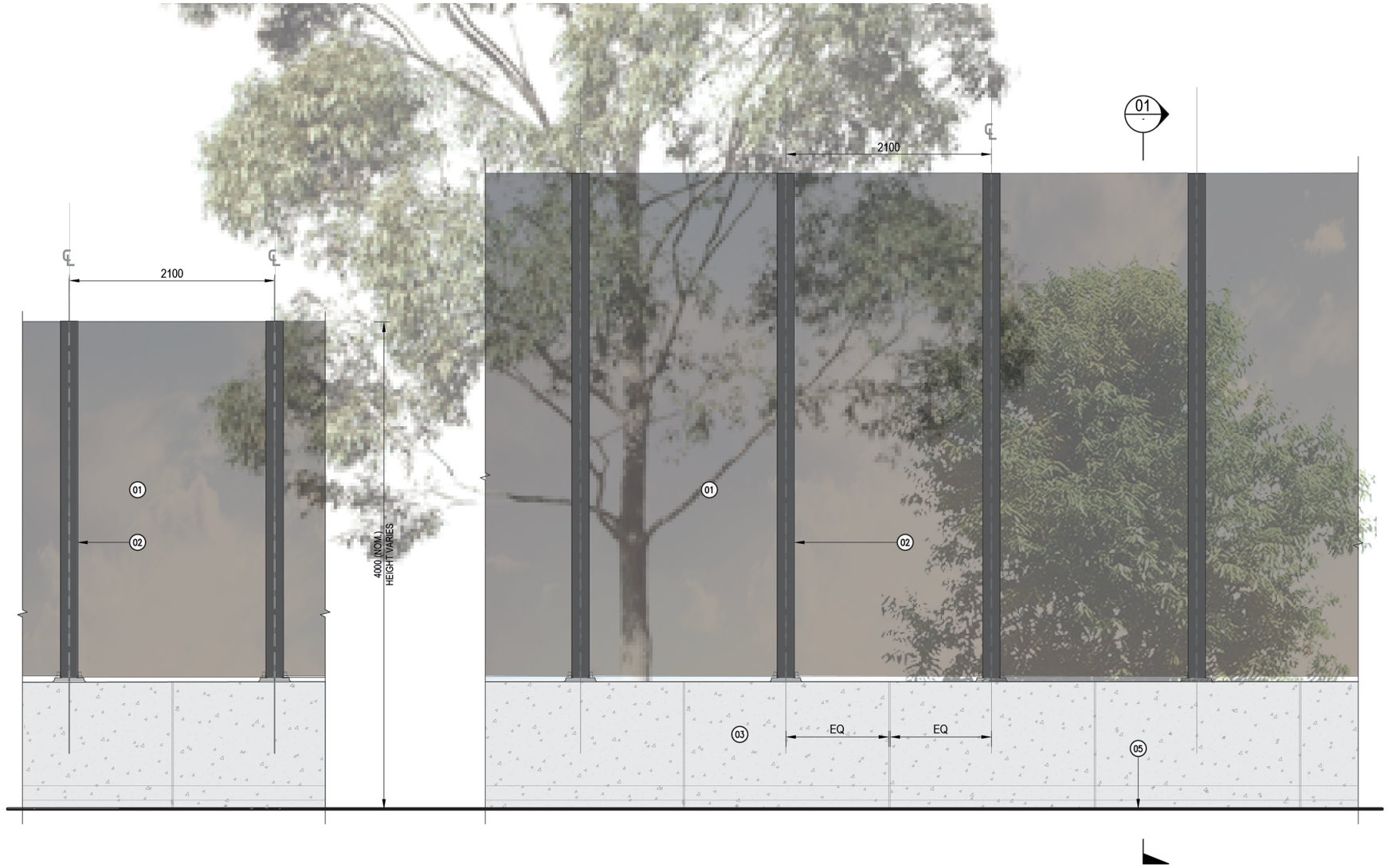
KGRIU Coloured transparent noise wall



KGRIU Coloured transparent noise wall



Eastlink coloured transparent noise wall, Victoria

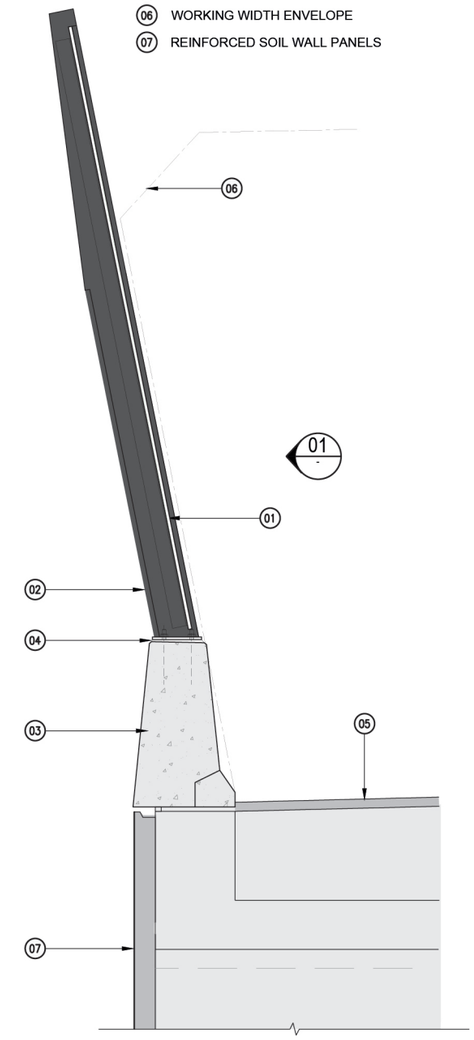


TYPICAL ELEVATION - ROAD USERS PERSPECTIVE (BEVERLY GROVE PARK USERS VIEW SIMILAR)

01 NOISE WALL TYPE 1: TRANSPARENT NOISE PANEL FIXED TO TOP OF BARRIER
1:50

LEGEND

01 SMOKY BROWN COLOURED TRANSPARENT ACRYL SHEET, ANTI BIRD STRIKE MARKING, NO HORIZONT JOINTS
02 STEEL POST AT 2.1m CENTRES POWDERCOATED BLACK TO MATCH KGRIU (DULUX FAIROAKS)
03 ROAD BARRIER. JOINTS AT 2.1m CENTRES
04 BASE PLATE CONNECTION
05 ROAD PAVEMENT LEVEL
06 WORKING WIDTH ENVELOPE
07 REINFORCED SOIL WALL PANELS

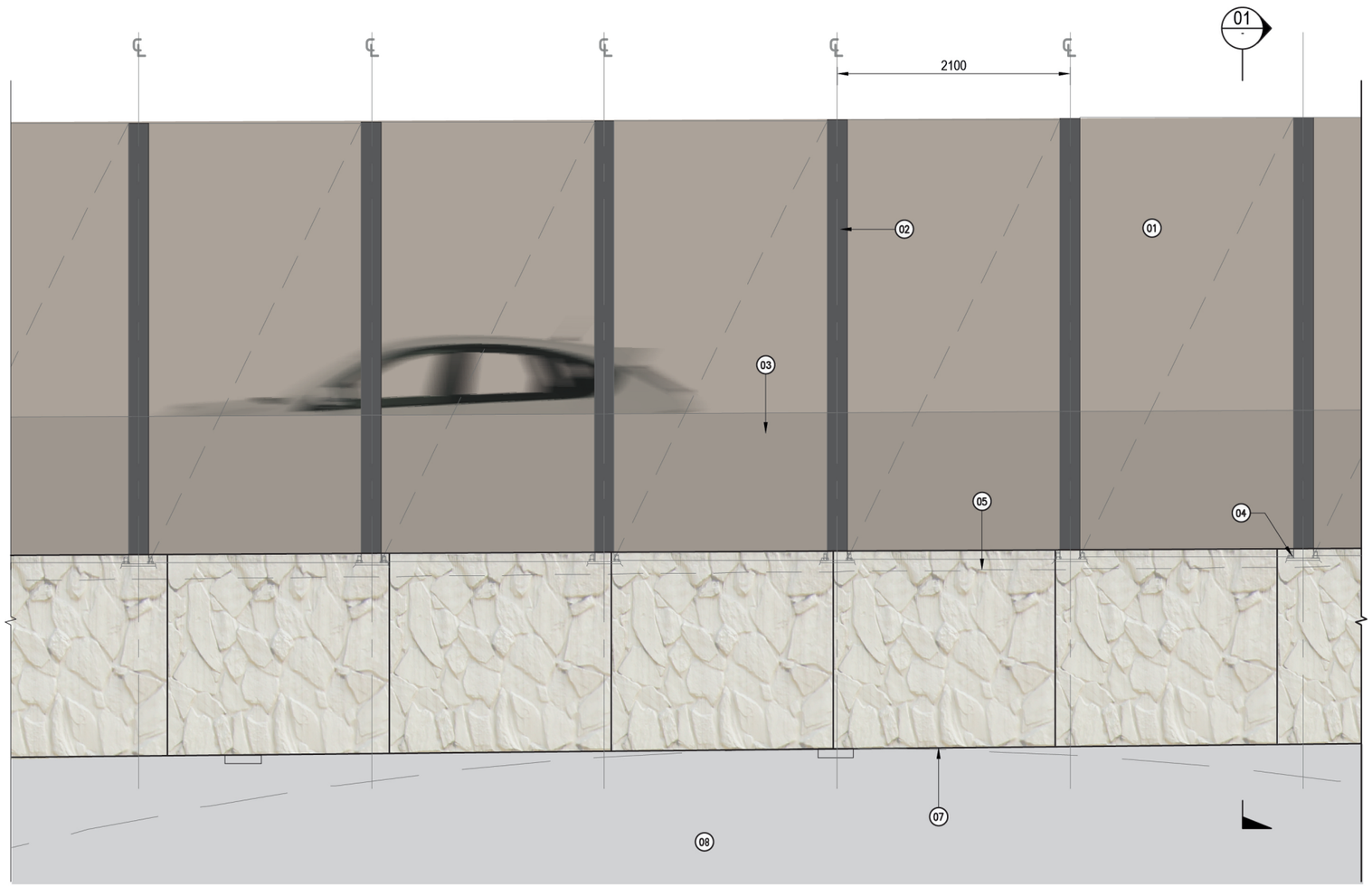


TYPICAL SECTION

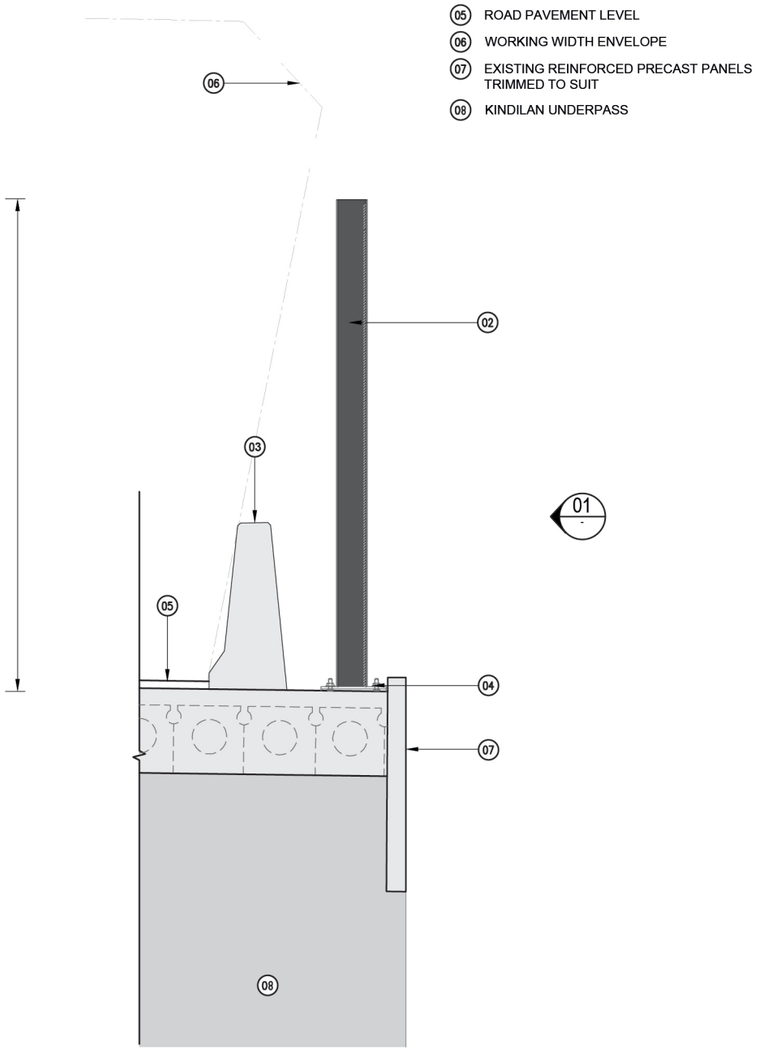
Figure 06-3 - Noise Walls - Typical details - Coloured acrylic transparent noise wall fixed to top of barrier - Type 1A

LEGEND

01 COLOURED TRANSPARENT ACRYLIC SHEET, NO HORIZONTAL JOINTS
02 EXISTING POST TO BE RETAINED, PAINTED BLACK TO MATCH KGRIU
03 ROAD BARRIER
04 BASE PLATE CONNECTION
05 ROAD PAVEMENT LEVEL
06 WORKING WIDTH ENVELOPE
07 EXISTING REINFORCED PRECAST PANELS TRIMMED TO SUIT
08 KINDILAN UNDERPASS



TYPICAL ELEVATION - BEVERLY GROVE PARK USERS VIEW (ROAD USERS PERSPECTIVE SIMILAR)



TYPICAL SECTION

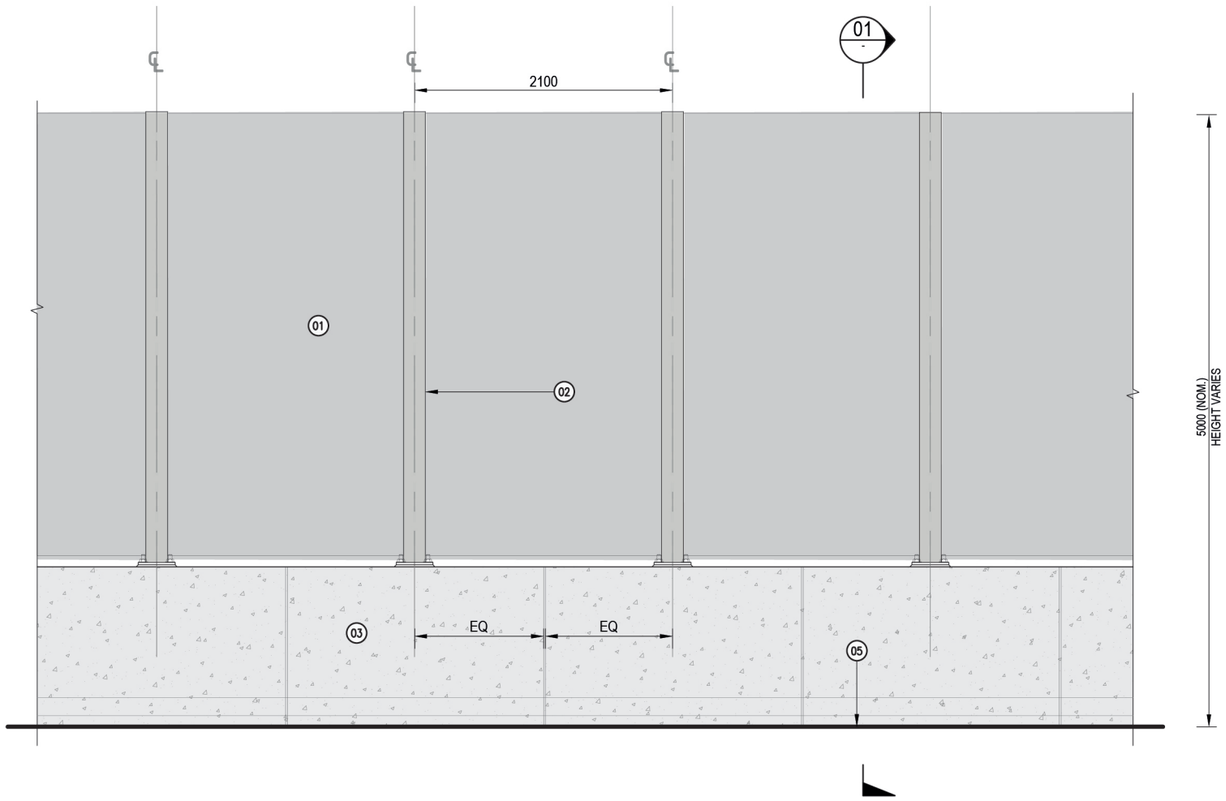
01 NOISE WALL TYPE 1B: COLOURED ACRYLIC TRANSPARENT NOISE WALL ON STRUCTURE
1:50

0 0.5 1 2m
1:50

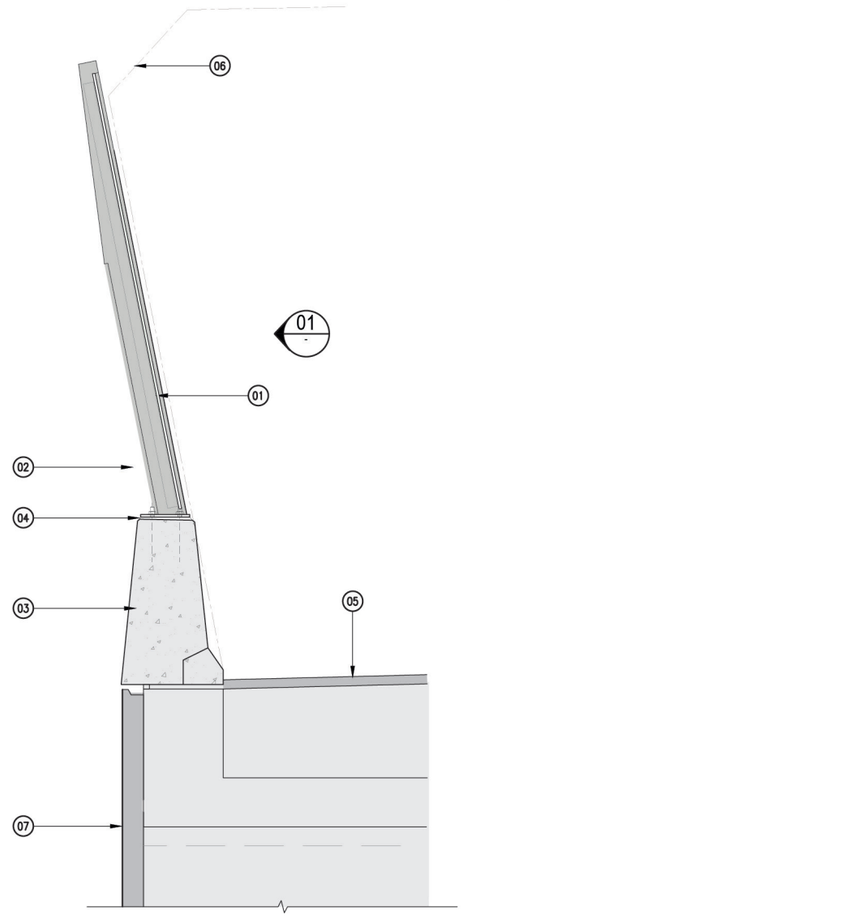
Figure 06-4 - Noise Walls - Typical details - Coloured acrylic transparent noise wall on structure - Type 1B

LEGEND

01 LIGHT GREY COLOURED ACRYLIC SHEET, NO HORIZONTAL JOINTS
02 STEEL POST AT 2.1m CENTRES POWDERCOATED TO MATCH KGRIU (COLOURBOND SHALE GREY)
03 ROAD BARRIER. JOINTS AT 2.1m CENTRES
04 BASE PLATE CONNECTION
05 ROAD PAVEMENT LEVEL
06 WORKING WIDTH ENVELOPE
07 REINFORCED SOIL WALL PANELS



TYPICAL ELEVATION - ROAD USERS PERSPECTIVE (BEVERLY GROVE PARK USERS VIEW SIMILAR)



TYPICAL SECTION

01 NOISE WALL TYPE 1C: NON-TRANSPARENT NOISE PANEL FIXED TO TOP OF BARRIER
1:50

0 0.5 1 2m
1:50

Figure 06-5 - Noise Walls - Typical details - Coloured acrylic non-transparent noise wall fixed to top of barrier - Type 1C

F4.2 Type 2 - Concrete panel walls

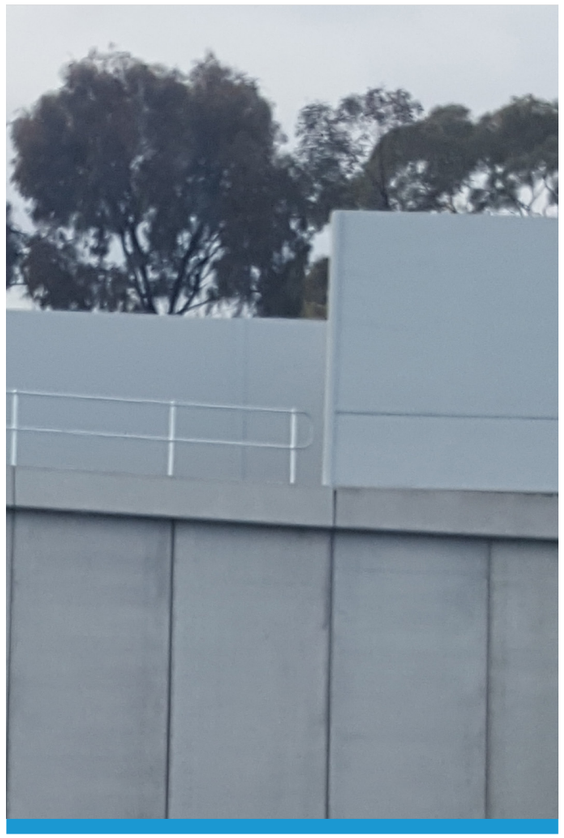
Vertical concrete panel walls are located throughout the Western Surface Works to the southern edge of the corridor. These panels tie into the proposed KGRIU and run adjacent to Beverly Grove Park to an approximate point near the westbound tunnel exit portal.

The walls are comprised of vertical precast concrete wall panels, to be supported on cast-in-place piles behind the road safety barriers. These will be supported on the existing culverts or piled retaining walls, with Class 2 patterned finish to both sides of the panels. The panels will be painted to match the existing noise wall treatments proposed at the KGRIU. Screen planting will also be provided at locations where space permits.

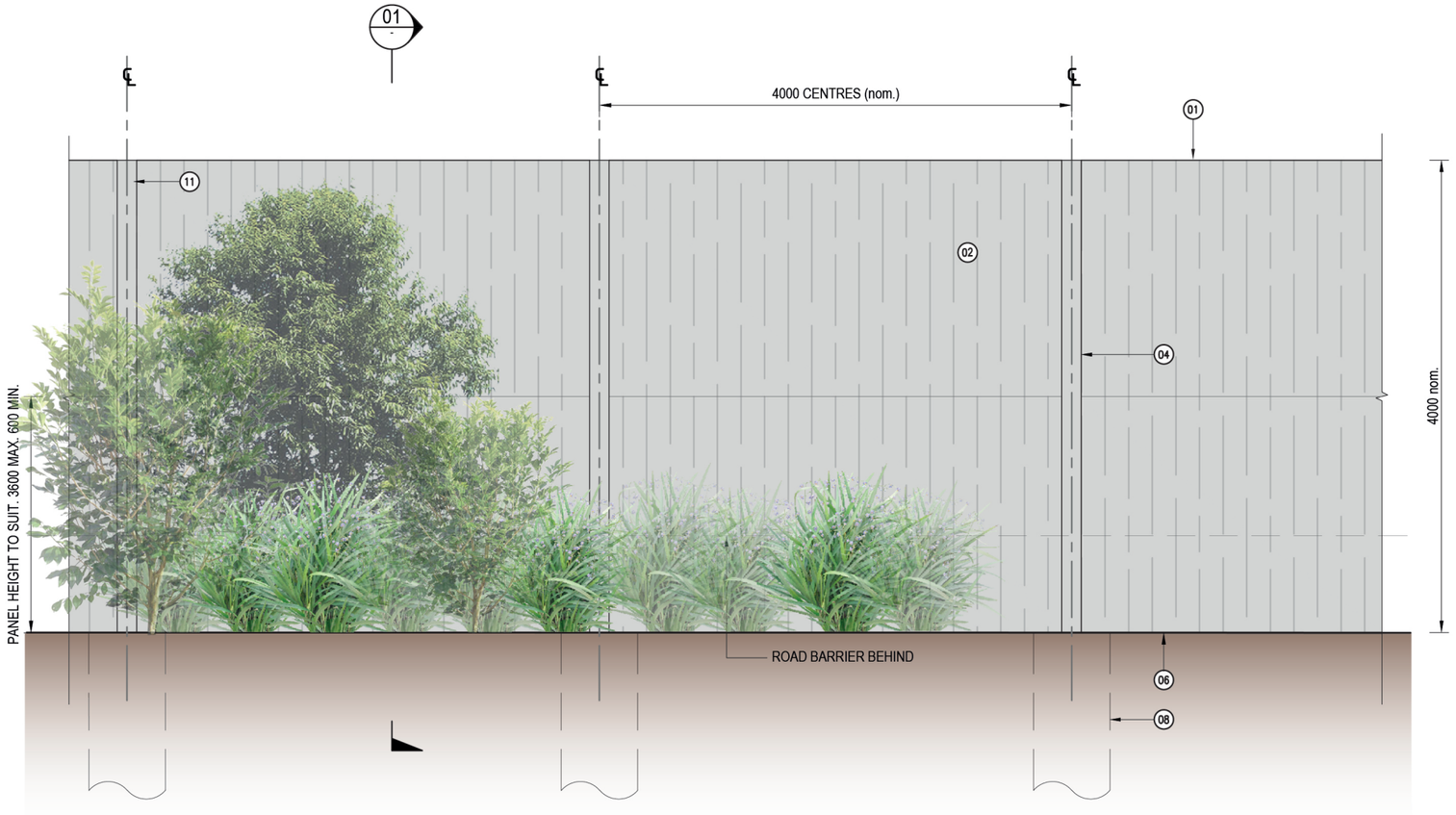
Typical details (Type 2A, 2B and 2C) are included in this section.



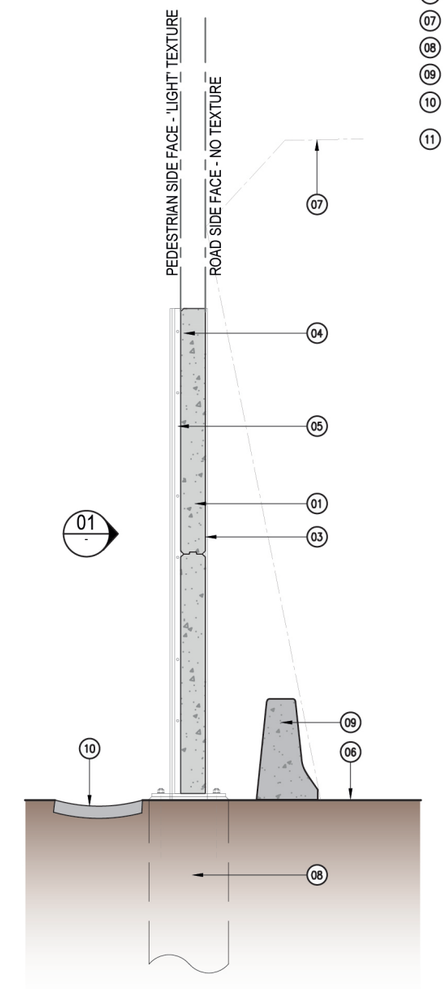
Banora Point Upgrade precast vertical patterned noise wall



KGRIU retaining wall / noise wall view from motorway



TYPICAL ELEVATION - VIEW FROM PEDESTRIAN SIDE



TYPICAL SECTION

LEGEND

01 PRECAST COLOURED CONCRETE PANEL TO MATCH KGRIU WORKS
02 'LIGHTLY' TEXTURED PANEL FACE - PEDESTRIAN SIDE
03 NO TEXTURE TO PANEL FACE - ROAD SIDE
04 STEEL UC POST
05 ANGLED FIXING PLATE
06 PAVEMENT / GROUND LEVEL
07 WORKING WIDTH ENVELOPE
08 CONCRETE FOOTING
09 EDGE BARRIER
10 CONCRETE DISH DRAIN FOR OVERLAND DRAINAGE FLOW (WHERE REQUIRED)
11 PAINTED STEEL POST TO MATCH KGRIU WORKS

01 NOISE WALL TYPE 2A: PRECAST CONCRETE PANEL TO MATCH KGRIU
1:50

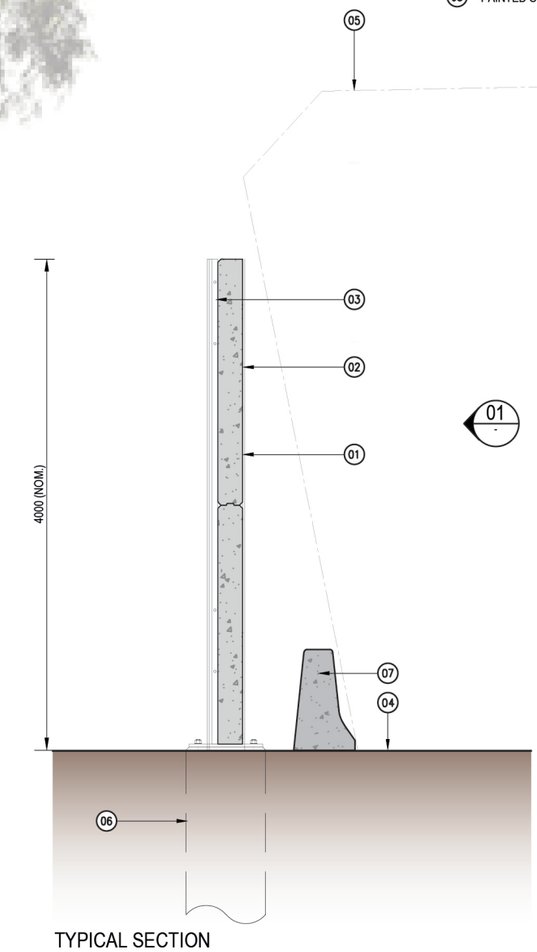
Figure 06-6 - Noise Walls - Typical details - Precast concrete panel to match KGRIU - Type 2A



TYPICAL ELEVATION - VIEW FROM MOTORISTS SIDE

LEGEND

01 2m HIGH PRECAST INTEGRALLY COLOURED CONCRETE PANEL. COLOUR TO MATCH KGRIU WITH COLORBOND SHALE GREY
02 STEEL UC POST
03 ANGLED FIXING PLATE
04 PAVEMENT LEVEL
05 WORKING WIDTH ENVELOPE
06 REINFORCED CONCRETE WALL AND POST FOOTING
07 EDGE BARRIER
08 PAINTED STEEL POST TO MATCH KGRIU WORKS



TYPICAL SECTION

01 NOISE WALL TYPE 2B: PRECAST CONCRETE PANEL
1:50

Figure 06-7 - Noise Walls - Typical details - Precast concrete panel - Type 2B

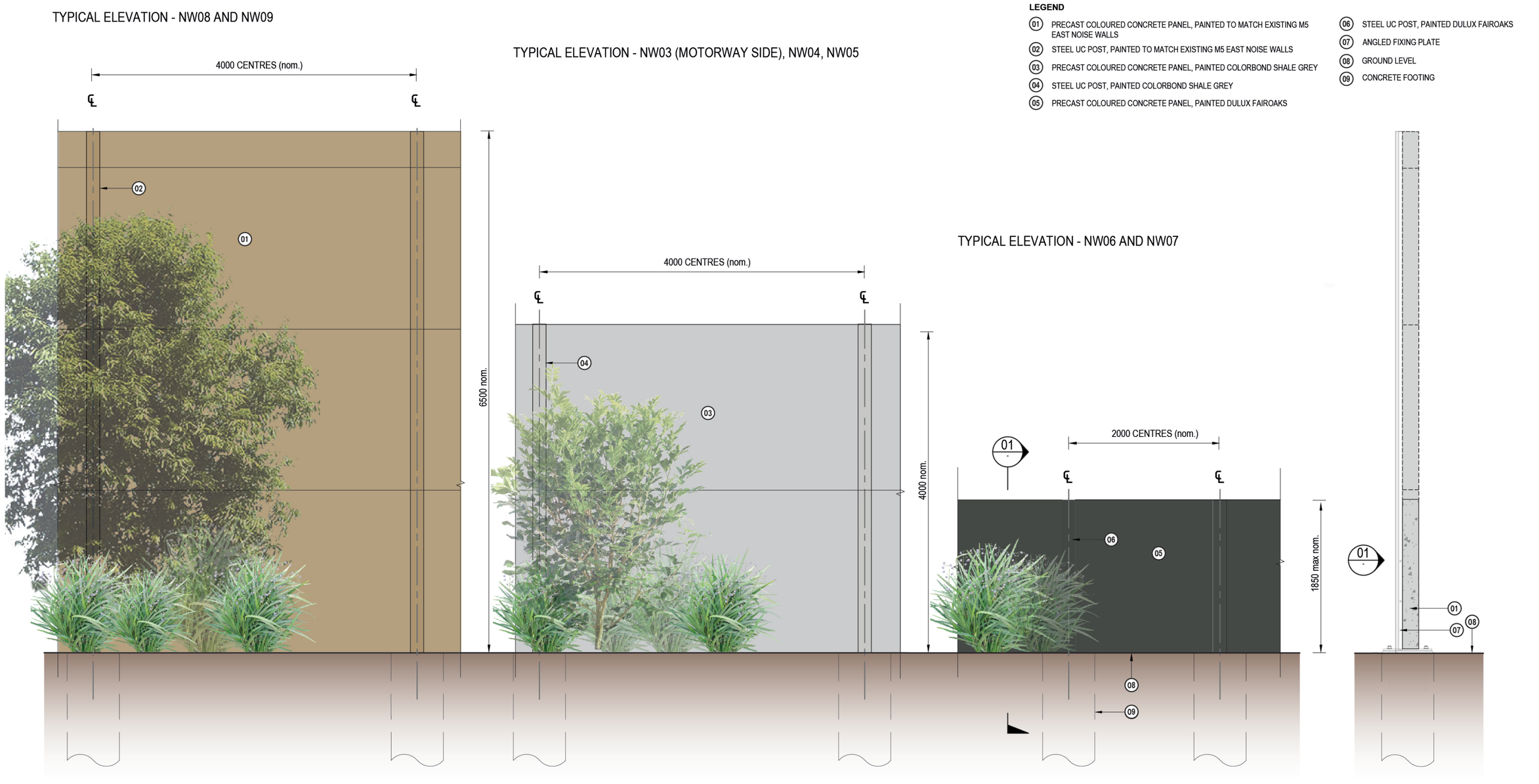


Figure 06-8 - Noise Walls - Typical details - Precast concrete panel - Type 2B

F4.3 Type 3 - Noise Mound

The noise mound will be reinstated in the area north of the Motorway within Beverly Grove Park between Kindilan Underpass and Garema Circuit. It has been implemented to fulfil the EIS requirement to balance the needs and impacts to motorists, adjacent residents and users of public open spaces.

The design of the noise attenuation is this area will be a combination of noise mound, transparent and non-transparent barriers with key considerations giving to the following:

- The slope of the noise mound will be made as steep as possible (2v:1h) to minimise the loss of public open space whilst allowing for landscaping requirements and safe access grades for maintenance,
- Safe access grades are provided longitudinally on the mound to access the crest for the purposes of maintenance only, in particular, providing access to the half height noise walls,
- Public access to the noise mound will be restricted by a boundary fence due to the slopes being considered too steep for public safe access,
- A planned landscape design will on the mound will provide a landscaped outlook to both residents, park users and motorists; and
- Maintain passive surveillance within the residual publicly accessible parkland in accordance with CPTED principles and ensure key sight lines to Kindilan underpass and connecting streets are retained.

The mound will vary in height (between 7m to 10m) along its length in order to minimise loss to public open space. Where the 10m acoustic crest height cannot be achieved, these have been augmented with varying height non-transparent noise walls (NW06 & NW07).These walls will be painted in a charcoal colour to be visually recessive and will eventually be heavily obscured by landscaping once established. Typical details for these noise walls are provided in this section.

The landscape design on the mound will feature native plants that will thrive in the exposed conditions on steep batters to create a dense, landscaped backdrop.

Large trees will be planted on flat areas only (where space permits), taking advantage of the moisture collection at the base of the batters.

The boundary fence will be setback 2-3m away from the shared path to maintain a sense of openness. Planting in these areas bordering the path will be low to improve passive surveillance.

Further illustrations of the noise mound are provided in Section F5 of this plan.

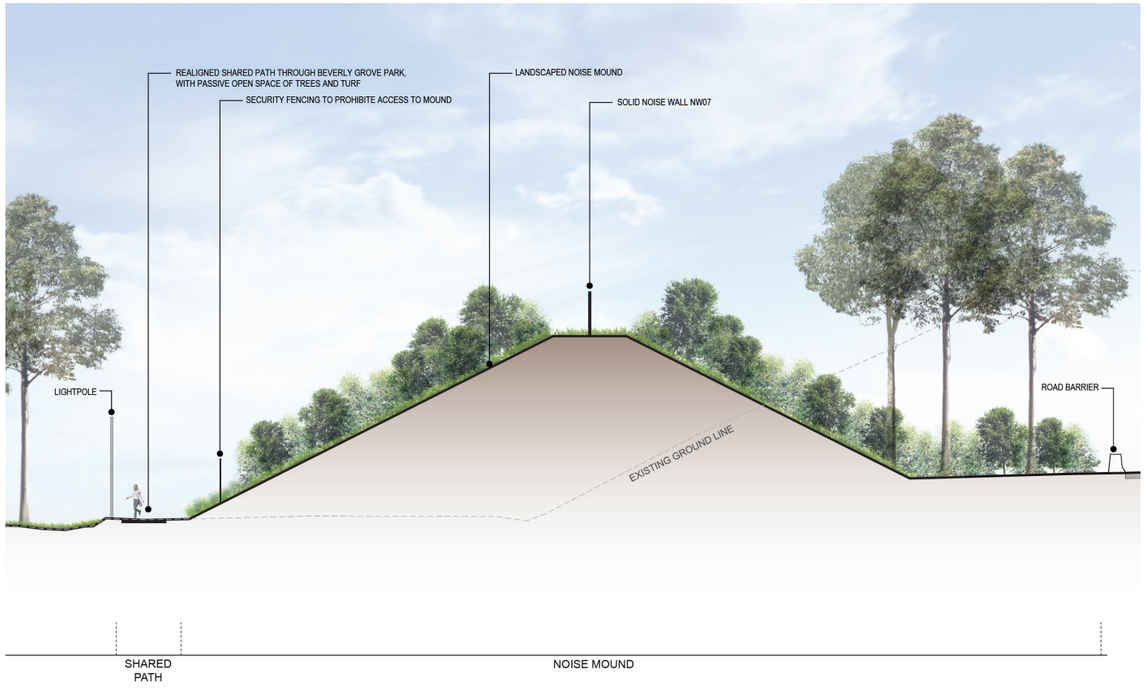


Figure 06-10 - Noise Walls - Typical Details - Mound Cross Section

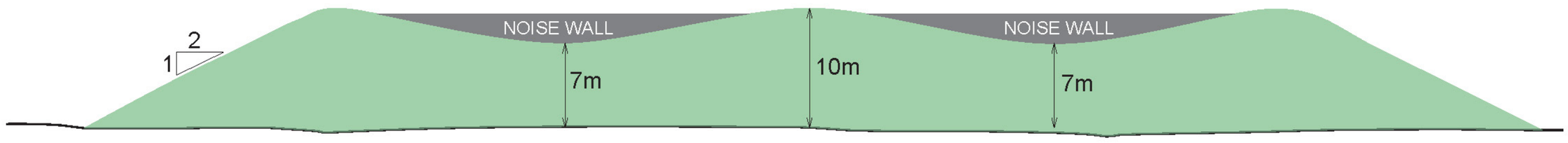


Figure 06-9 - Noise Walls - Typical Details - Noise Mound Diagrammatic Elevation (residents view)

LEGEND

01 PRECAST CONCRETE PANEL. PAINTED WITH DULUX ACRATHANE IFWITH INTERNAL ANTI GRAFFITI COATING. COLOUR TO MATCH DULUX 'MONUMENT' OR APPROVED EQUIVELANT

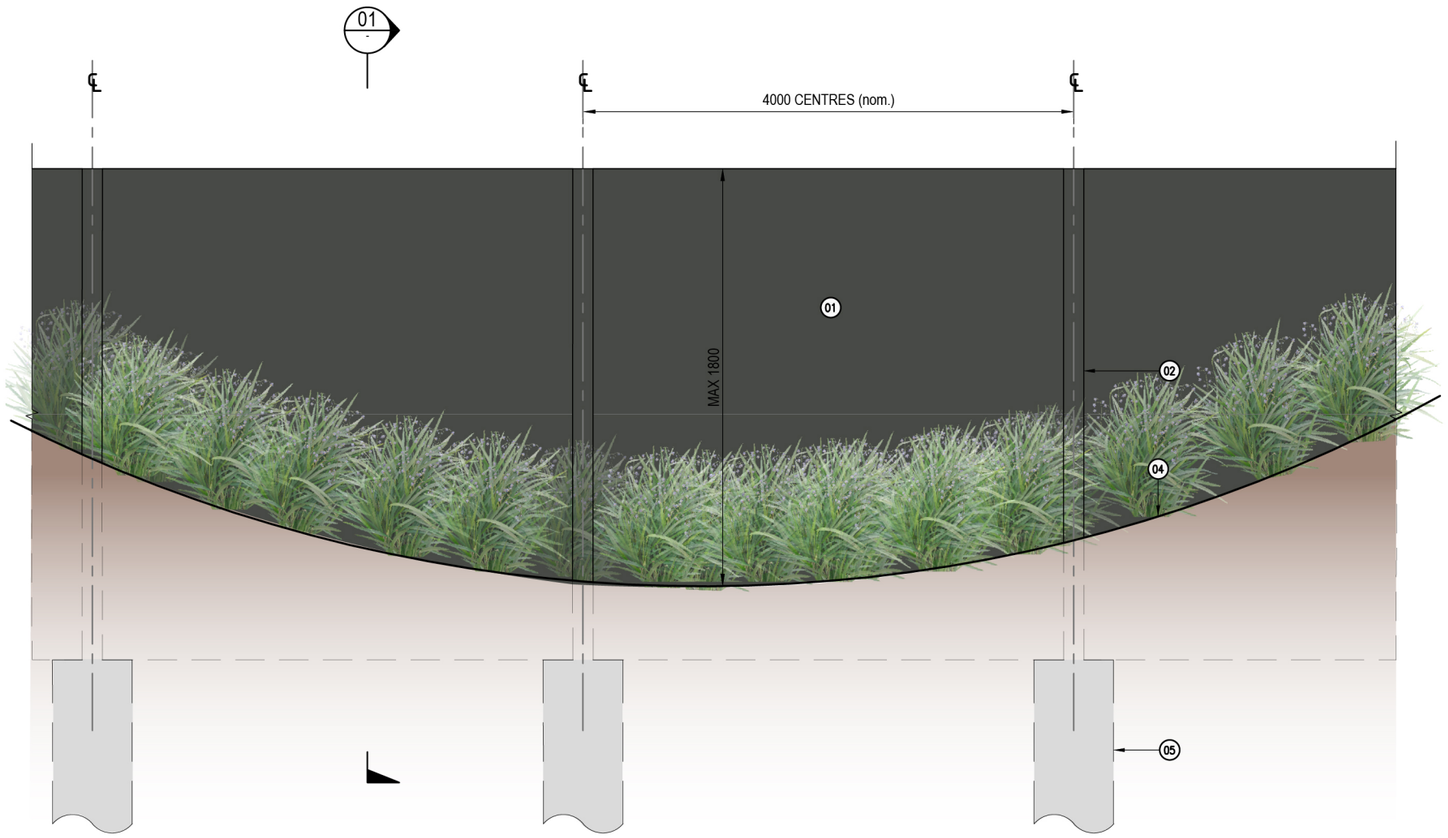
02 STEEL UC POST. PAINTED TO MATCH PANEL

03 ANGLED FIXING PLATE

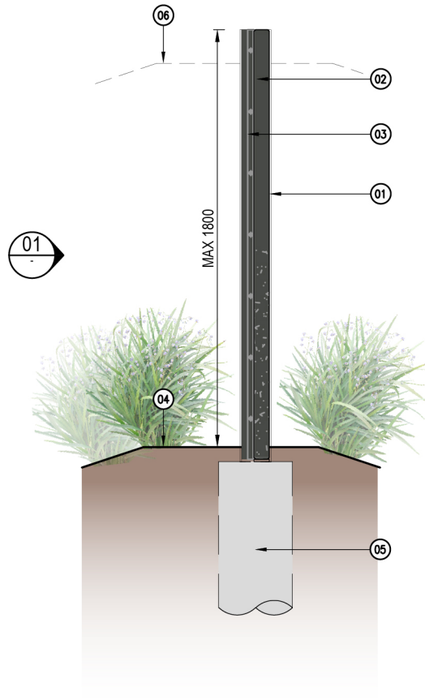
04 GROUND LEVEL VARIES

05 CONCRETE FOOTING

06 LANDFORM LEVEL BEHIND



TYPICAL ELEVATION - VIEW FROM PEDESTRIAN SIDE



TYPICAL SECTION

Figure 06-11 - Noise Walls - Typical details - Precast concrete panel - Type 2C

F5 Urban Design concept plan

F5.1 Concept Plans

A series of 1:1000 plans showing the location of the proposed noise walls within the context of an aerial photo and proposed urban design and landscape treatments are located within this section, as well as typical cross sections within the Western Interchange and Portals precinct where noise walls are proposed.

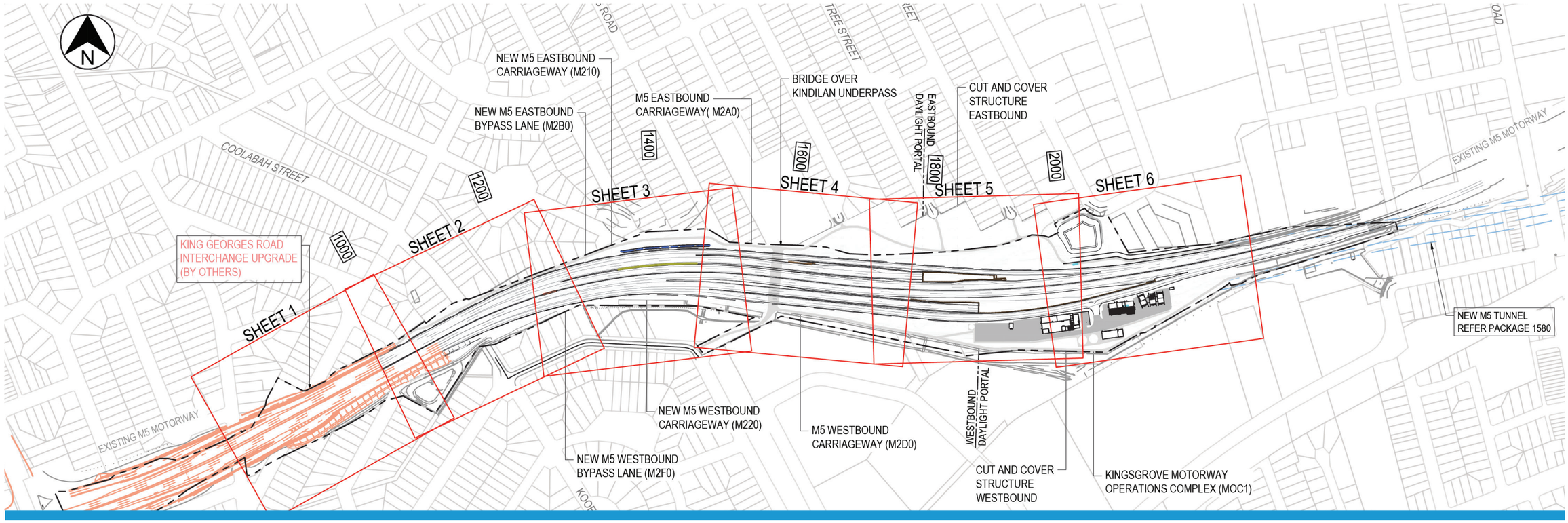


Figure 06-12 - Western Interchange - Urban Design concept plans - Key plan



LEGEND

BOUNDARIES
- PERMANENT WORKS BOUNDARY
- PROPOSED PERMANENT WORKS BOUNDARY
- EXISTING CADASTRAL

EXISTING FEATURES
- CONTOURS (1m INTERVAL)
- EXISTING TREES TO BE RETAINED
- EXISTING VEGETATION TO BE RETAINED

GROUND TREATMENT
- EDGING
- GRAVEL PAVING

PLANTING AREAS
- MASSED PLANTING
- MASSED PLANTING ON STRUCTURE
- UNDERPLANTING AND WEED ERADICATION
- TURF
- TURF ON STRUCTURE
- MULCH ONLY AREA (NO PLANTING)
- WATER QUALITY BASIN / SWALE PLANTING

TREE PLANTING
- TREE PLANTING (75 LITRE)
- SMALL TREE GROVE PLANTING

ROAD GEOMETRY
- CYCLEWAY/PATH
- DRIVEWAY/PARKING BAY

ROAD FURNITURE
- RIGID SAFETY BARRIER
- EXISTING FENCE TO BE RETAINED
- BOUNDARY FENCE
- BALUSTRADE
- RETAINING WALL
- NOISE WALL
- EXISTING NOISE WALL
- GATE
- ROAD LIGHT
- GANTRY STRUCTURE

DRAINAGE
- DETENTION BASIN
- STORMWATER PIT
- CONCRETE DRAINAGE CHANNEL
- GRASS DRAINAGE CHANNEL

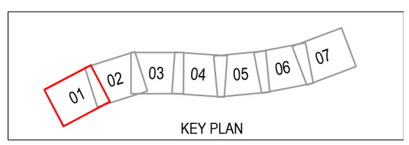


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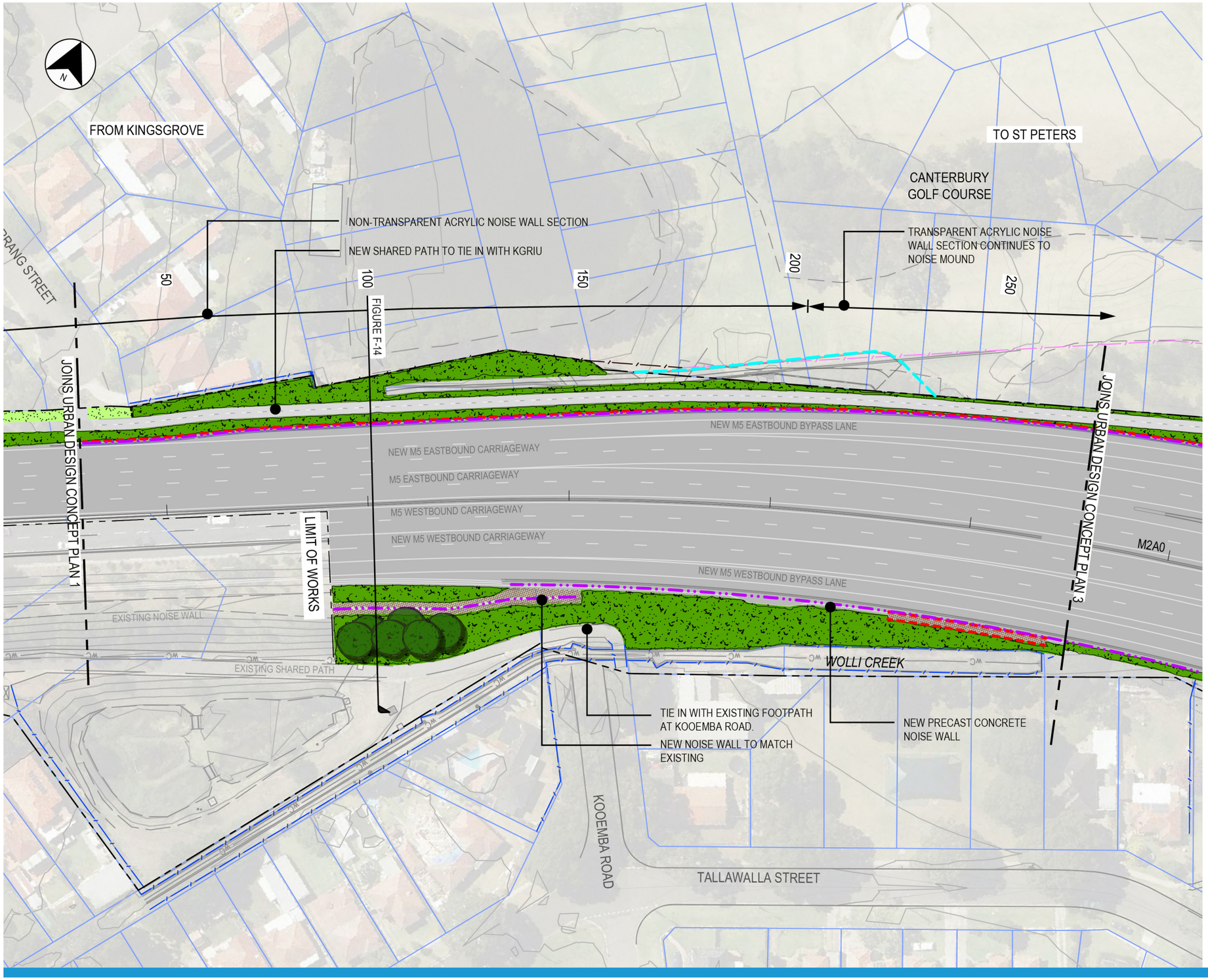
Figure 06-13 - Western Interchange and Portals - Urban Design Concept Plan - Sheet 1 of 7 - 1:1000



LEGEND

BOUNDARIES
- PERMANENT WORKS BOUNDARY
- PROPOSED PERMANENT WORKS BOUNDARY
- EXISTING CADASTRAL

EXISTING FEATURES
- CONTOURS (1m INTERVAL)
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GROUND TREATMENT
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- GRAVEL PAVING

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DRAINAGE
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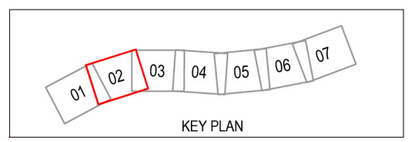

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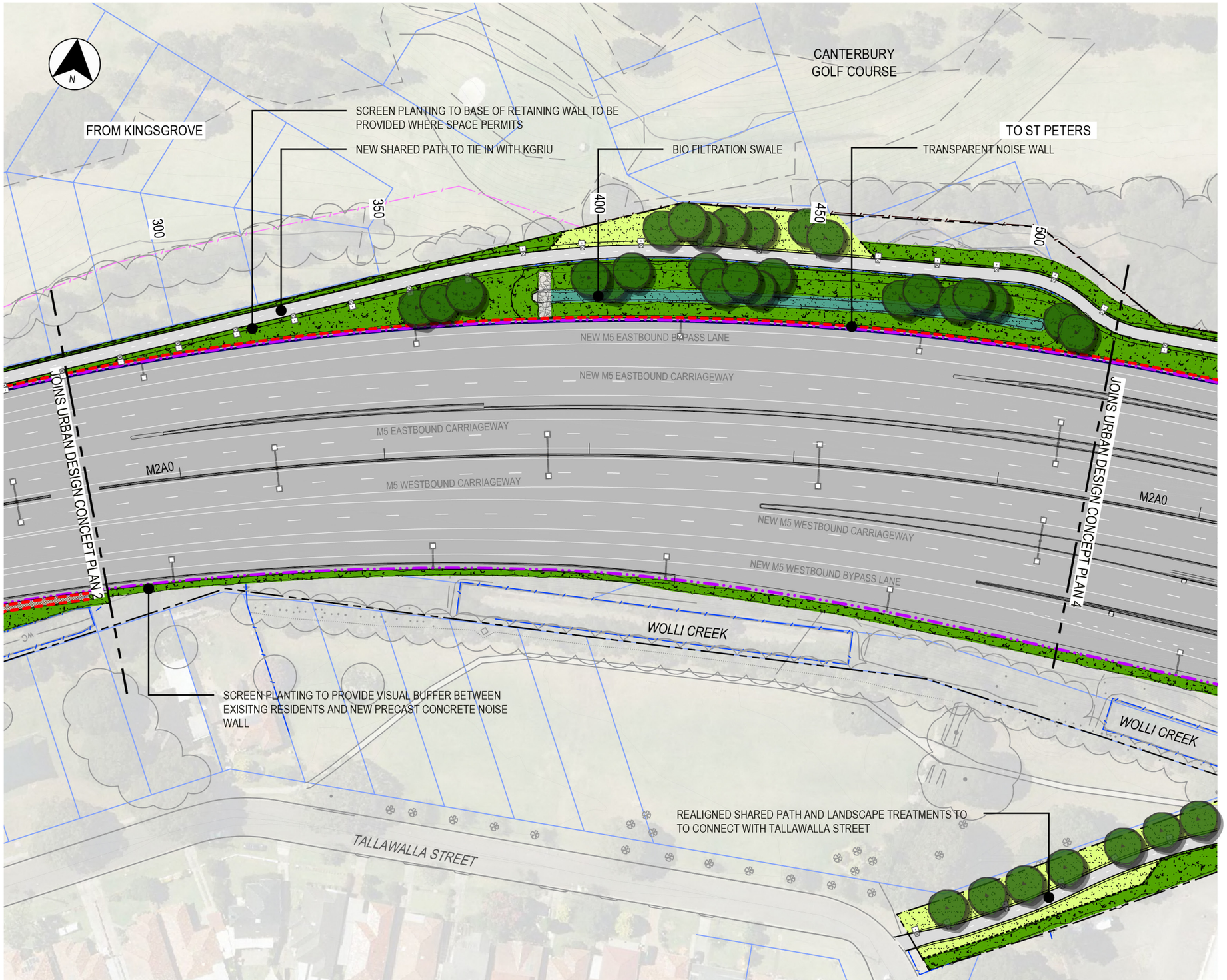
Figure 06-14 - Western Interchange and Portals - Urban Design Concept Plan - Sheet 2 of 7 - 1:1000



LEGEND

BOUNDARIES
- PERMANENT WORKS BOUNDARY
- PROPOSED PERMANENT WORKS BOUNDARY
- EXISTING CADASTRAL

EXISTING FEATURES
- CONTOURS (1m INTERVAL)
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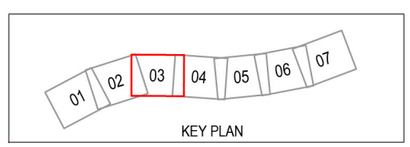

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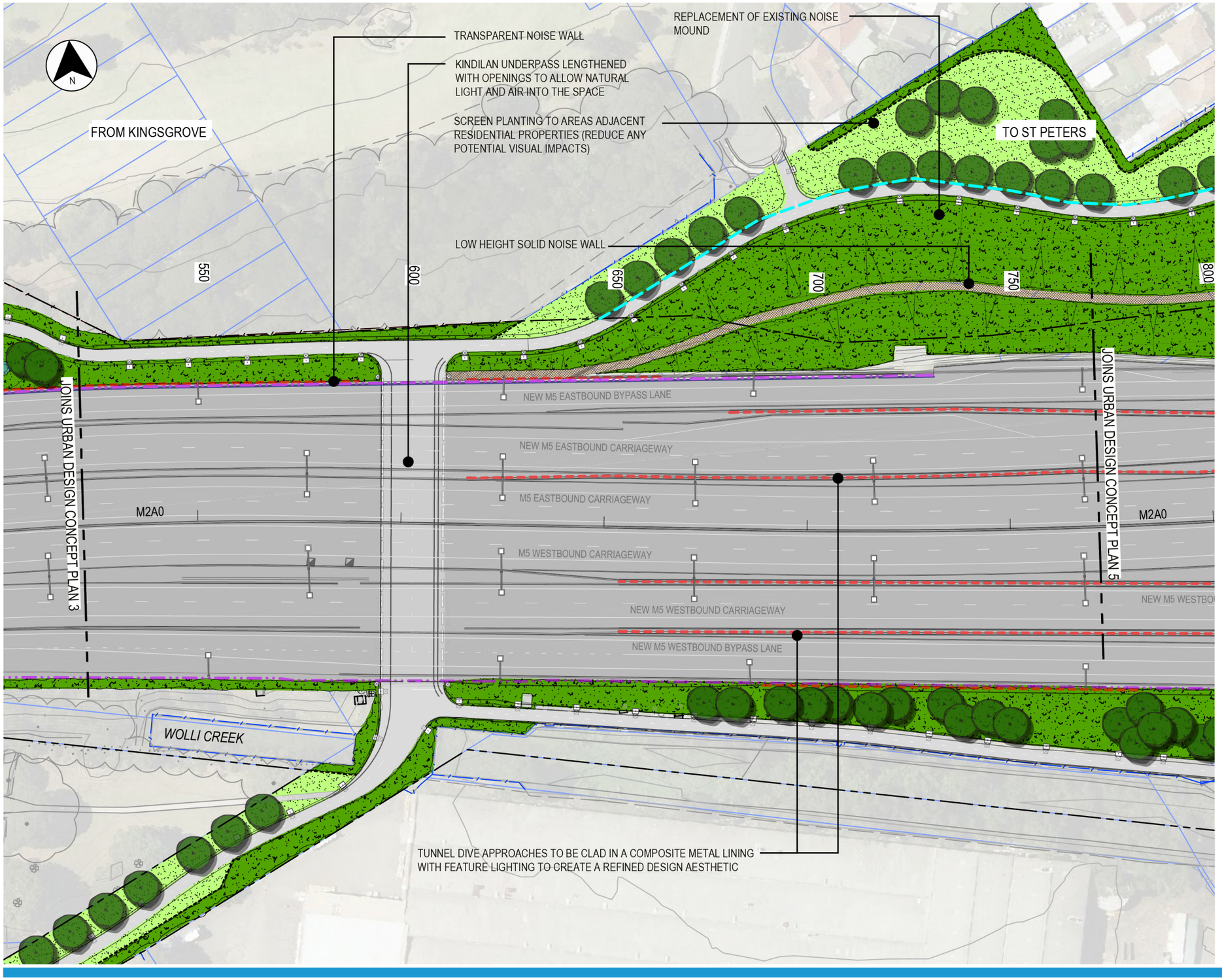
Figure 06-15 - Western Interchange and Portals - Urban Design Concept Plan - Sheet 3 of 7 - 1:1000



LEGEND

BOUNDARIES
- PERMANENT WORKS BOUNDARY
- PROPOSED PERMANENT WORKS BOUNDA
- EXISTING CADASTRAL

EXISTING FEATURES
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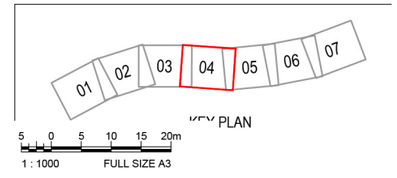
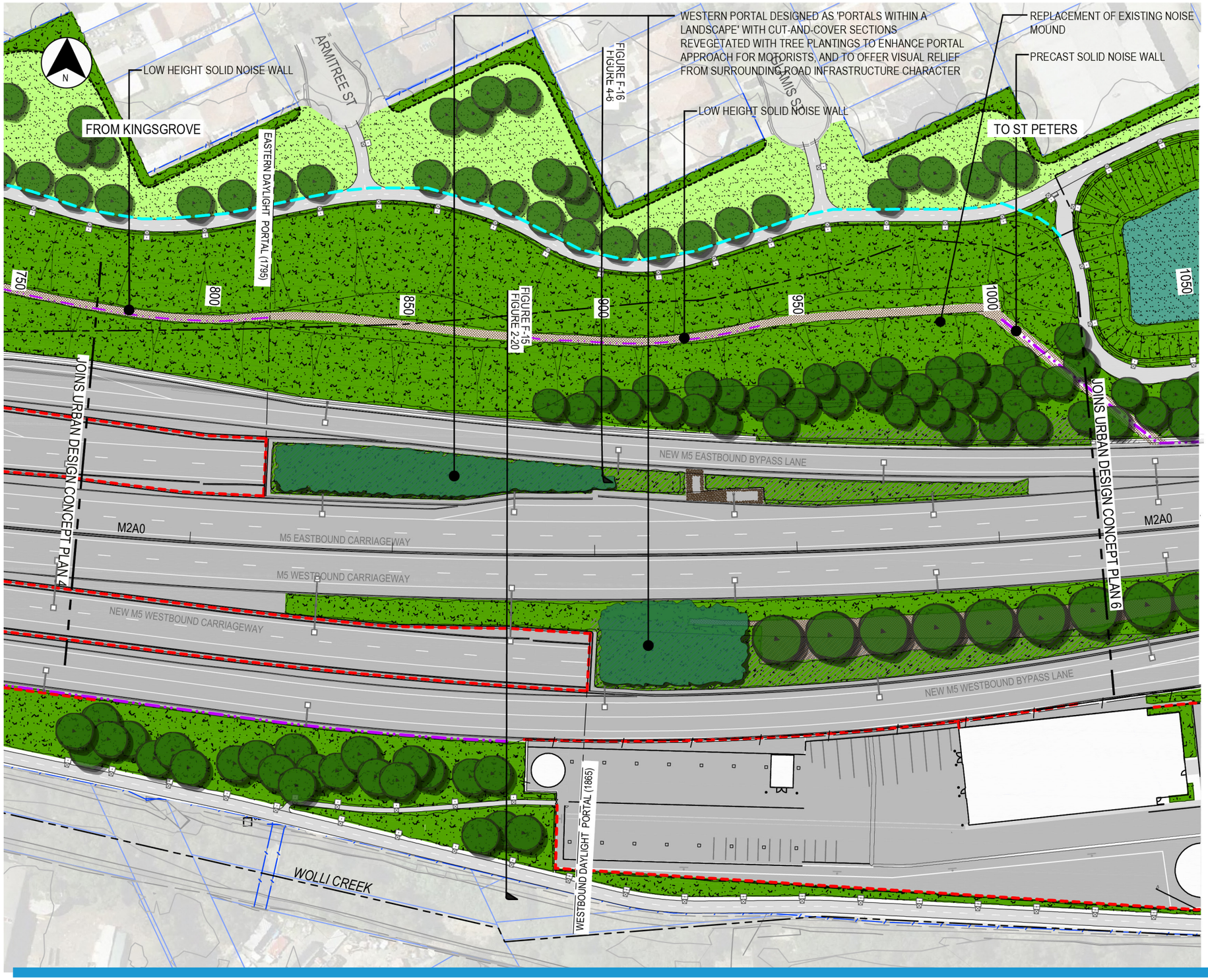


Figure 06-16 - Western Interchange and Portals - Urban Design Concept Plan - Sheet 4 of 7 - 1:1000



LEGEND

BOUNDARIES
- PERMANENT WORKS BOUNDARY
- PROPOSED PERMANENT WORKS BOUNDARY
- EXISTING CADASTRAL

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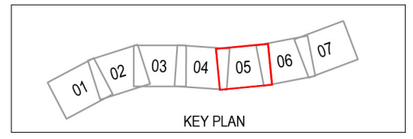

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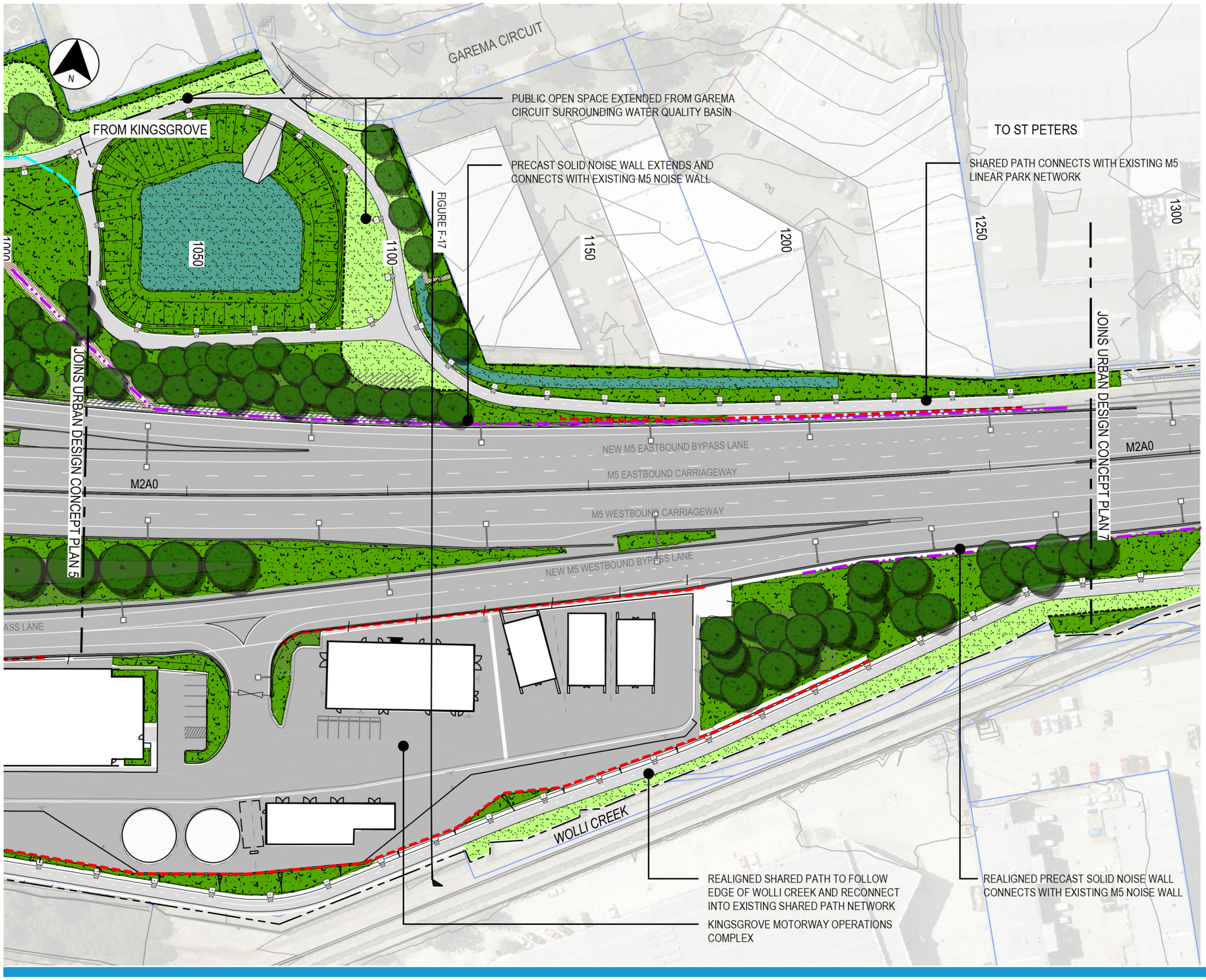
Figure 06-17 - Western Interchange and Portals - Urban Design Concept Plan - Sheet 5 of 7 - 1:1000



LEGEND

BOUNDARIES
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- PROPOSED PERMANENT WORKS BOUNDARY
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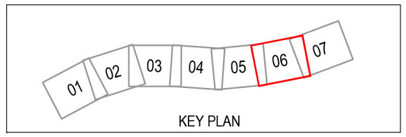

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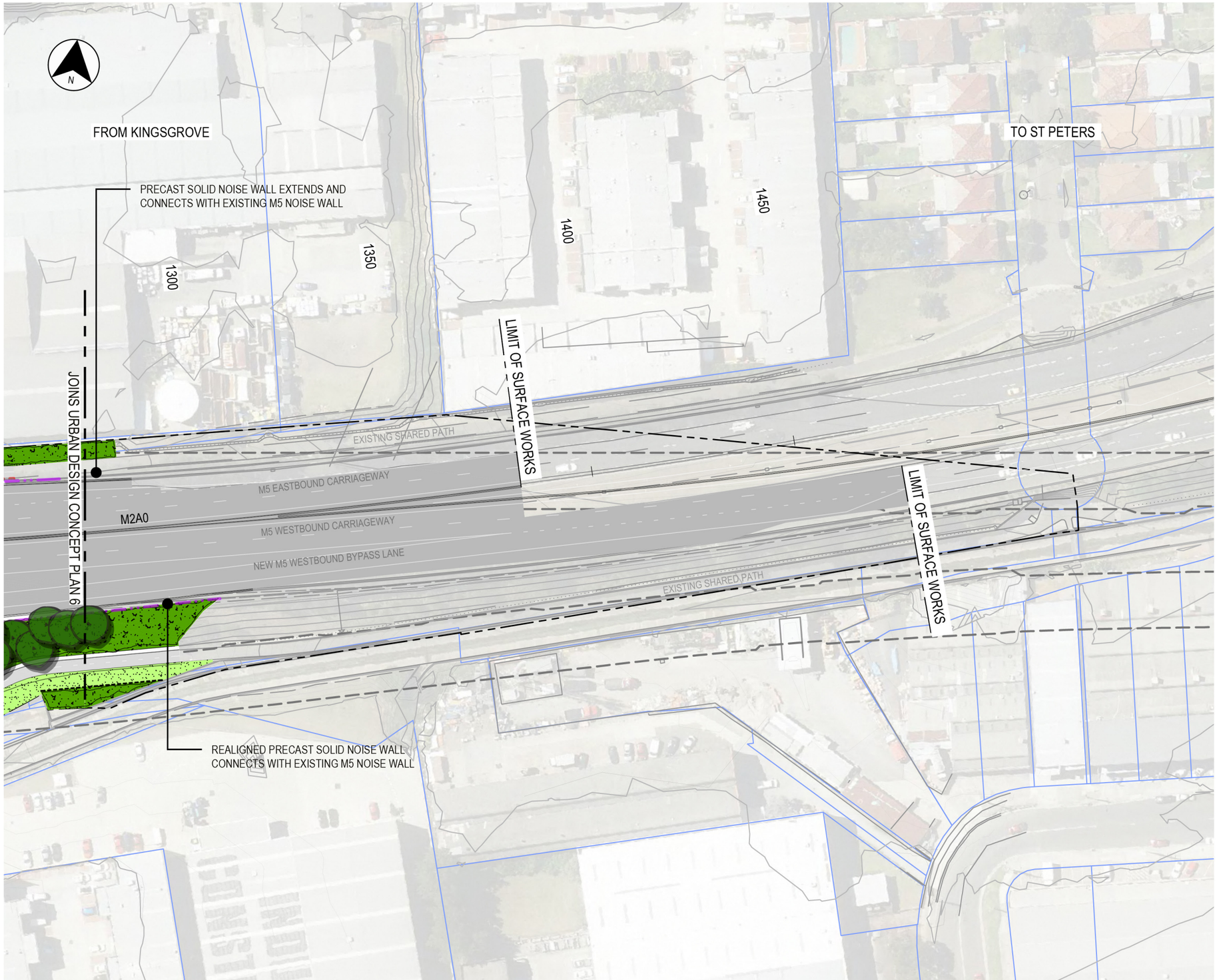
Figure 06-18 - Western Interchange and Portals - Urban Design Concept Plan - Sheet 6 of 7 - 1:1000



LEGEND

BOUNDARIES
- PERMANENT WORKS BOUNDARY
- PROPOSED PERMANENT WORKS BOUNDARY
- EXISTING CADASTRAL

EXISTING FEATURES
- CONTOURS (1m INTERVAL)
- EXISTING TREES TO BE RETAINED
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PLANTING AREAS
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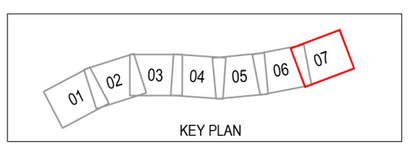
DRAINAGE
- DETENTION BASIN
- STORMWATER PIT
- CONCRETE DRAINAGE CHANNEL
- GRASS DRAINAGE CHANNEL



5 0 5 10 15 20m
1 : 1000 FULL SIZE A3

Figure 06-19 - Western Interchange and Portals - Urban Design Concept Plan - Sheet 7 of 7 - 1:1000

F5.2 Cross sections

The following cross sections are included within this section to illustrate and describe the Urban Design and Landscaping intent and extent across the Project:

- Western Interchange and Portals CH100 (M2A0) - 1:400
- Western Interchange and Portals CH875 (M2A0) - 1:400
- Western Interchange and Portals CH900 (M2A0) - 1:250
- Western Interchange and Portals CH1100 (M2A0) - 1:400.

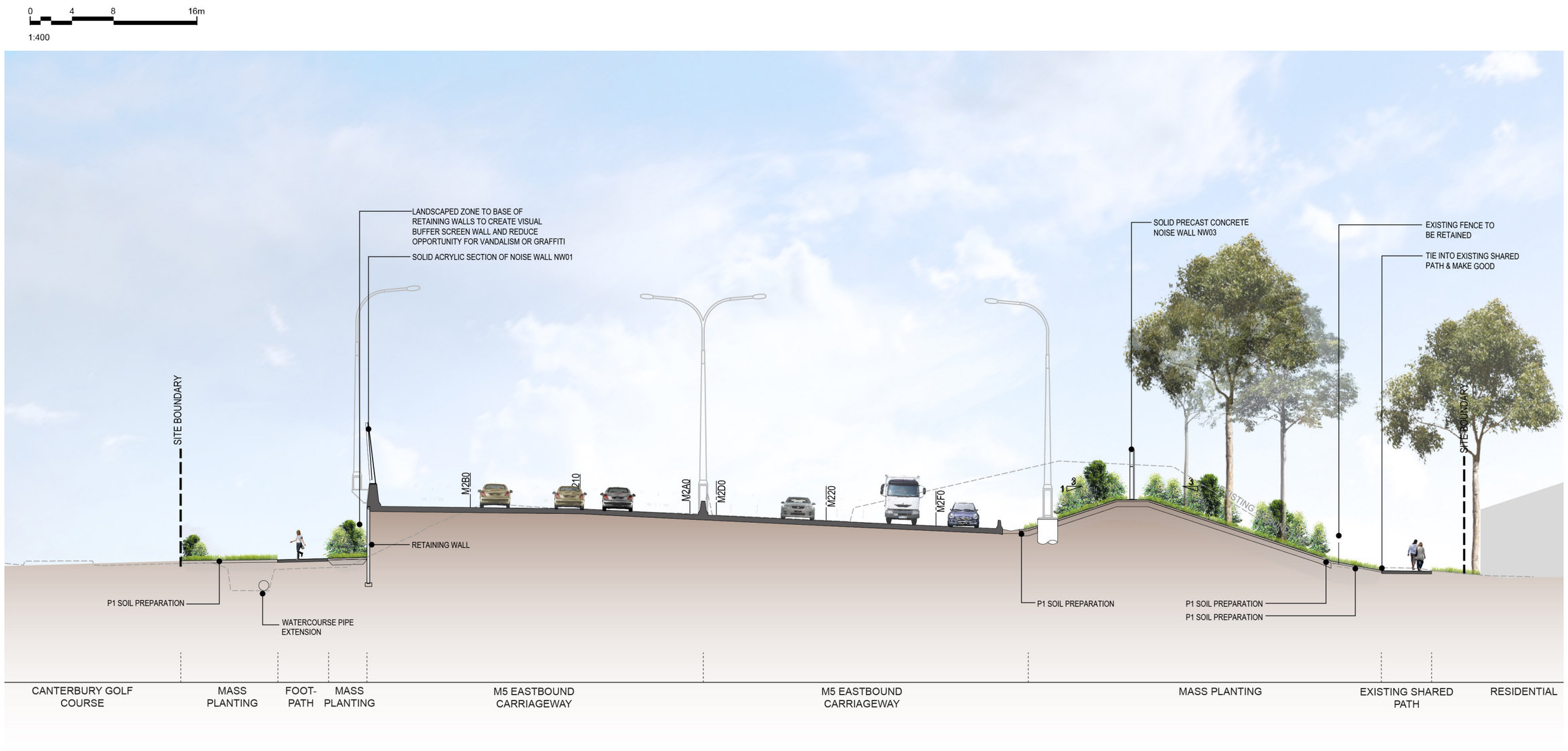


Figure 06-20 - Western Interchange and Portals - Typical Cross Section CH100 (M2A0) - 1:400

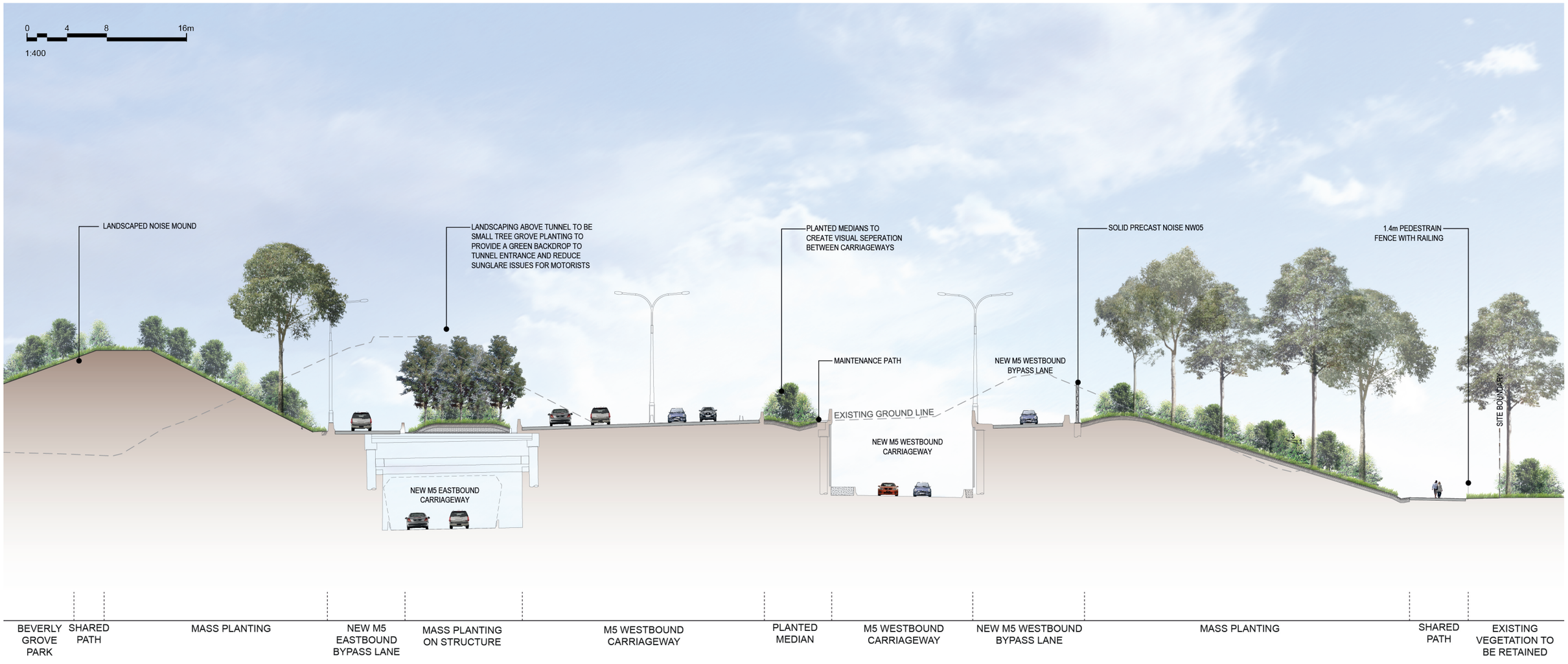


Figure 06-21 - Western Interchange and Portals - Typical Cross Section - CH875 (M2A0) - 1:400

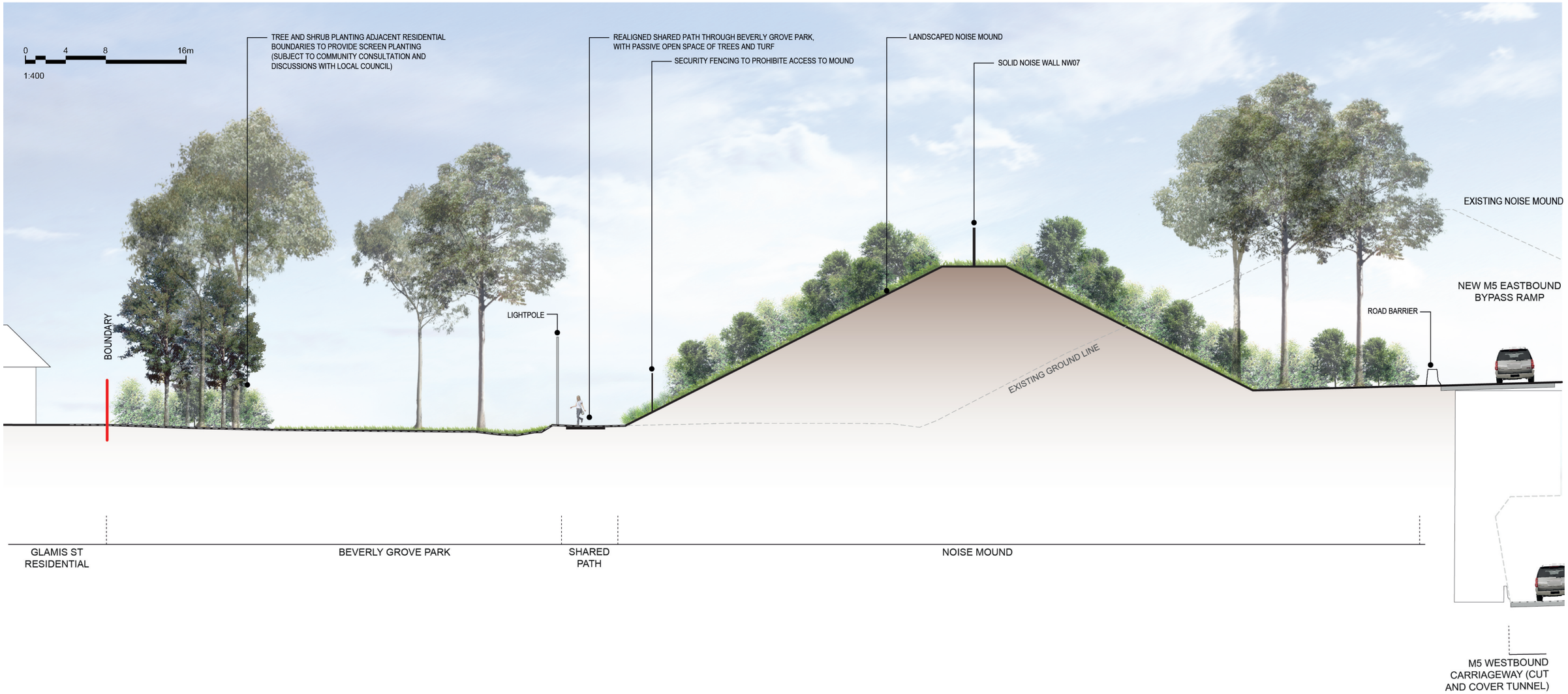


Figure 06-22 - Typical Cross Section - CH900 (M2A0) - 1:250

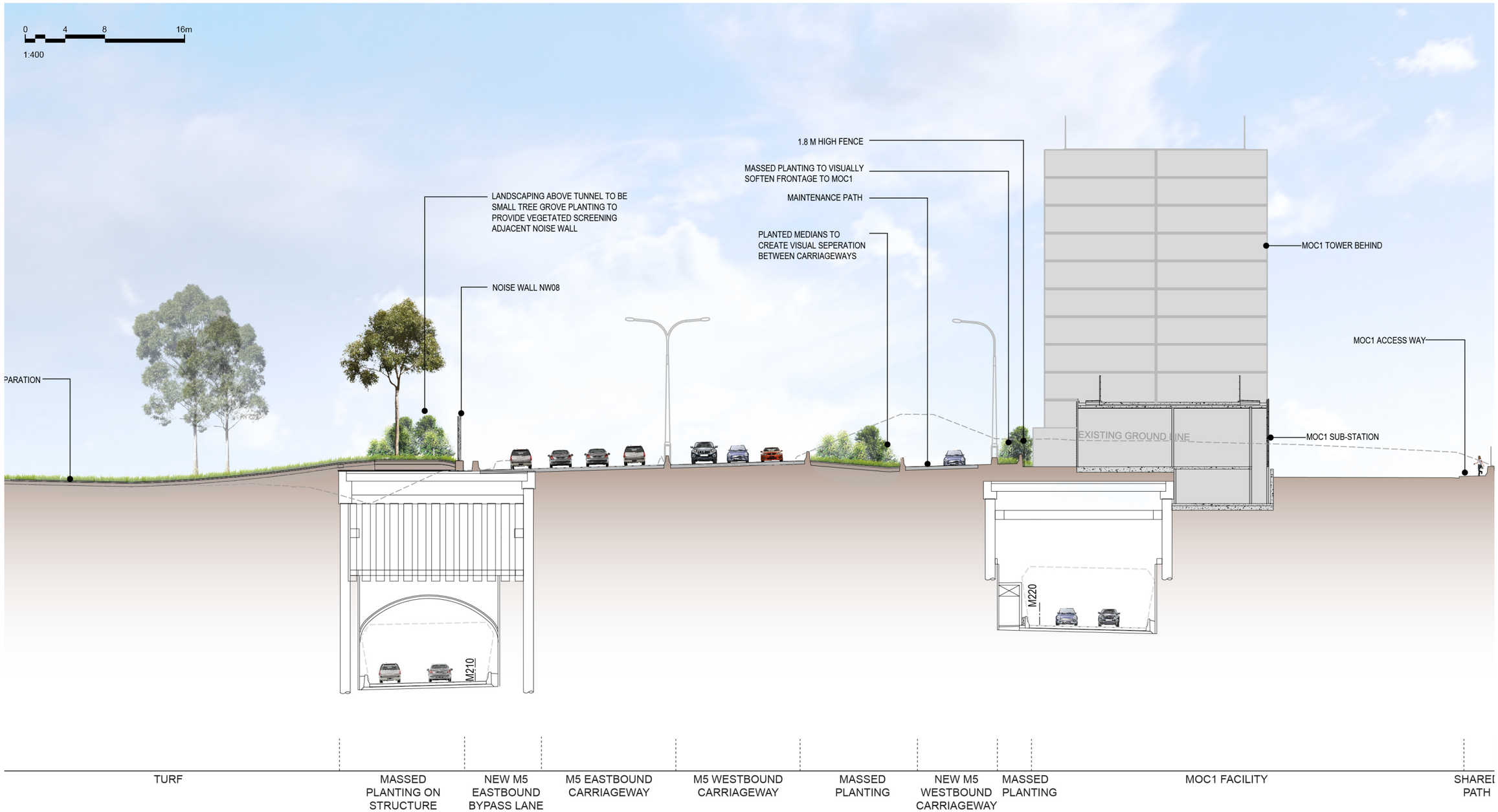
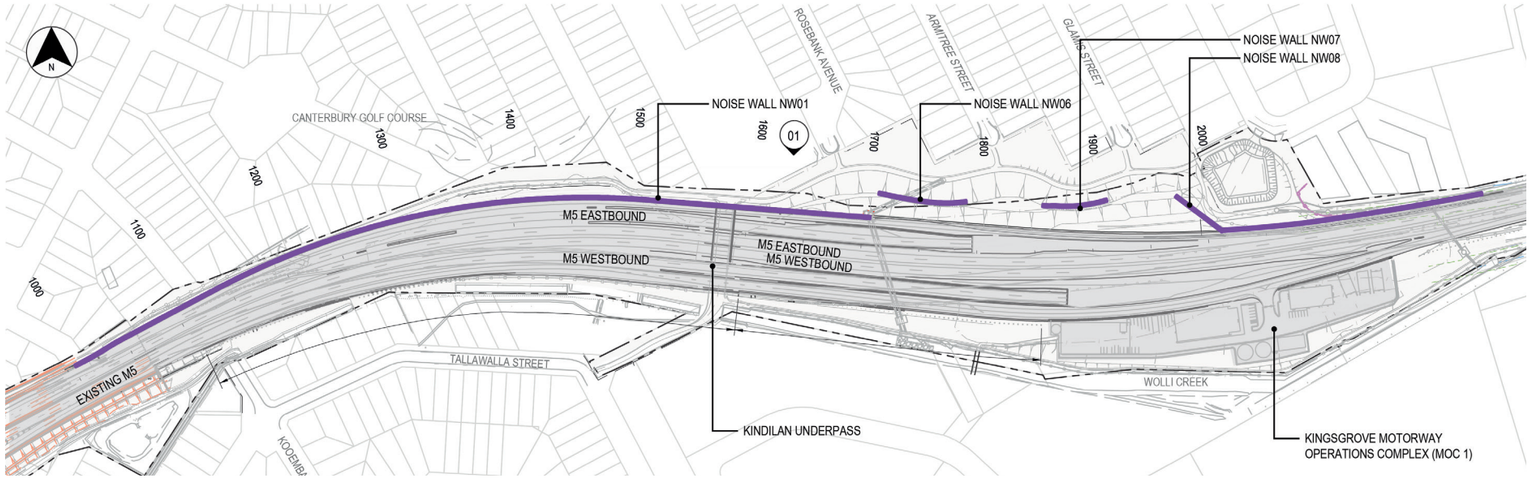


Figure 06-23 - Western Interchange and Portals - Typical Cross Section CH1100 (M2A0) - 1:400

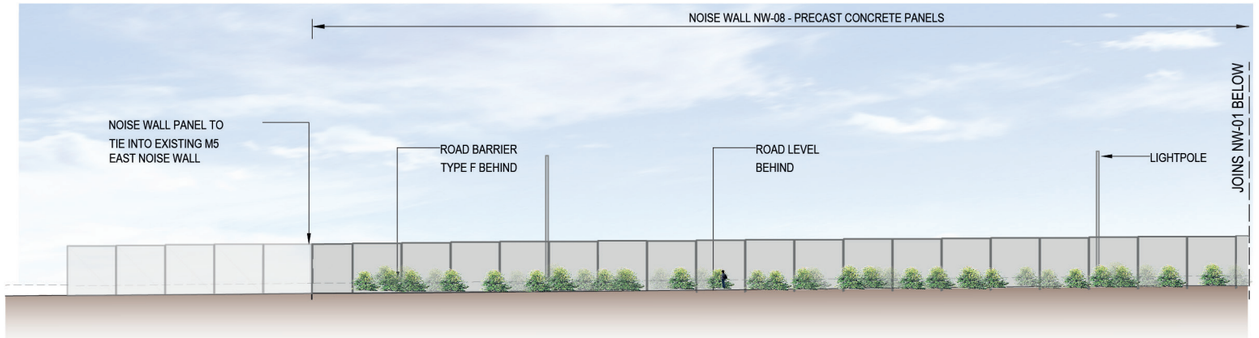
F5.3 Elevations

The following noise wall elevations are included within this section to illustrate and describe the Urban Design and Landscaping intent and extent across the Project:

- Western Interchange and Portals Noise wall NW01, NW06, NW07, and NW08 - 1:500 (Sheet 01 of 03)
- Western Interchange and Portals Noise wall NW01, NW06, NW07, and NW08 - 1:500 - 1:500 (Sheet 02 of 03)
- Western Interchange and Portals Noise wall NW01, NW06, NW07, and NW08 - 1:500 - 1:500 (Sheet 03 of 03)
- Western Interchange and Portals Noise wall NW02 - 1:250
- Western Interchange and Portals Noise wall NW03 - 1:500
- Western Interchange and Portals Noise wall NW04 - 1:500
- Western Interchange and Portals Noise wall NW05 - 1:500
- Western Interchange and Portals Noise wall NW09 - 1:250



LOCATION PLAN

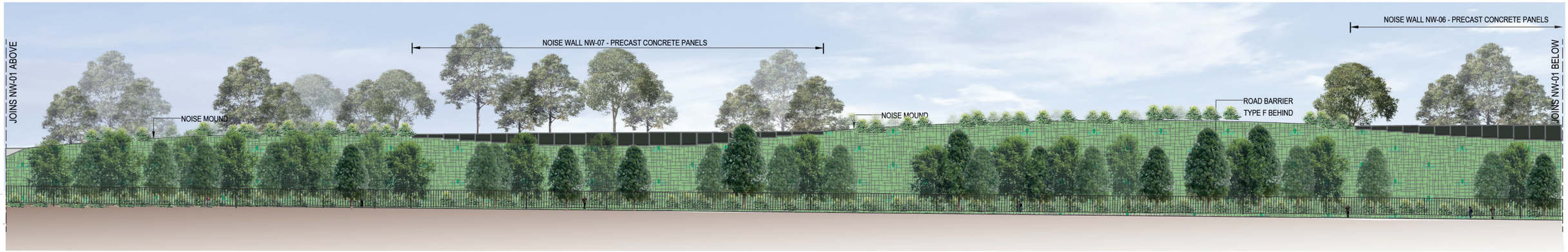


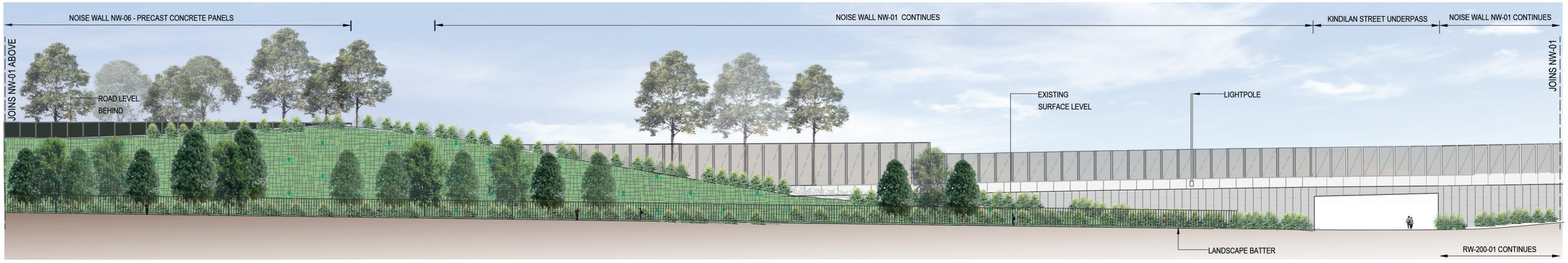


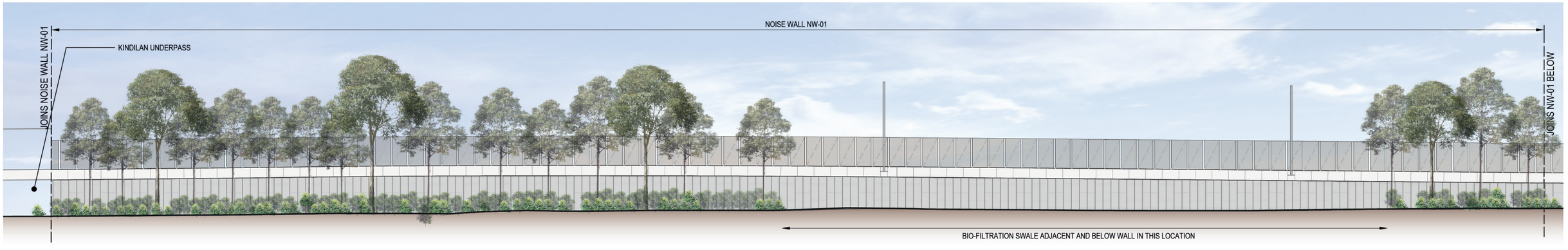
01 ELEVATION- NOISE WALL NW-01, NW-06, NW-07, AND NW-08
1:500

0 5 10 20m
1:500

Figure 06-24 - Noise Walls - NW-01 - Elevation - Sheet 01 of 03



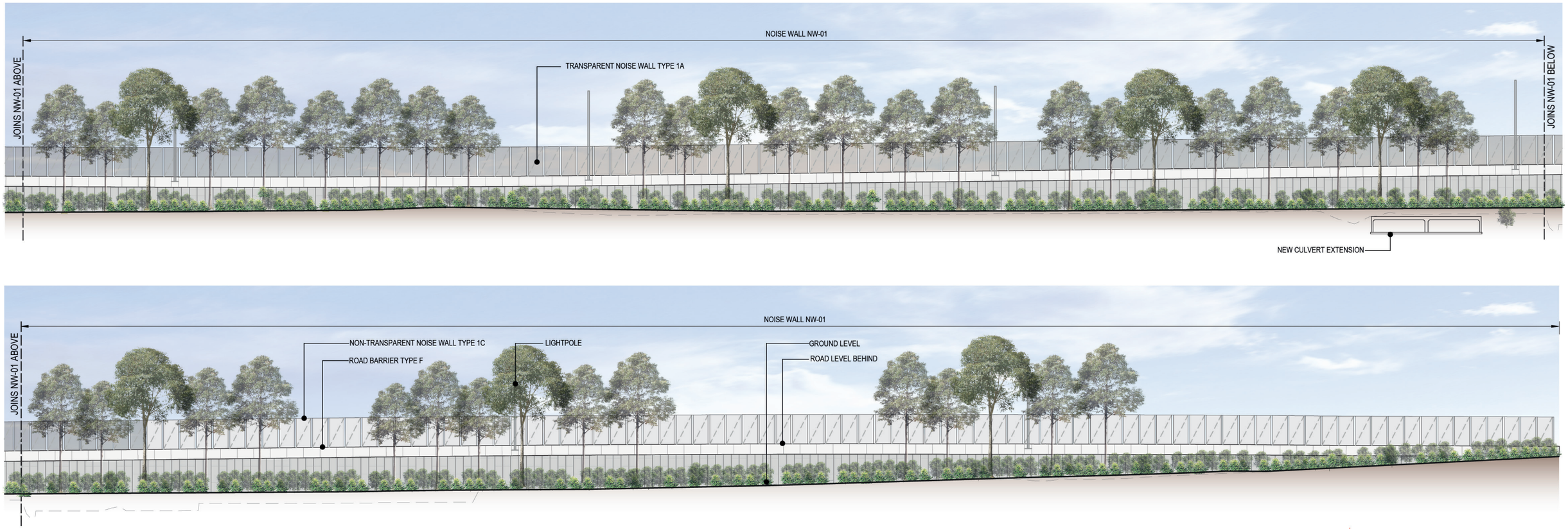




01 ELEVATION (CONTINUED) - NOISE WALL NW01, NW-06, NW-07, AND NW-08
1:500

0 5 10 20m
1:500

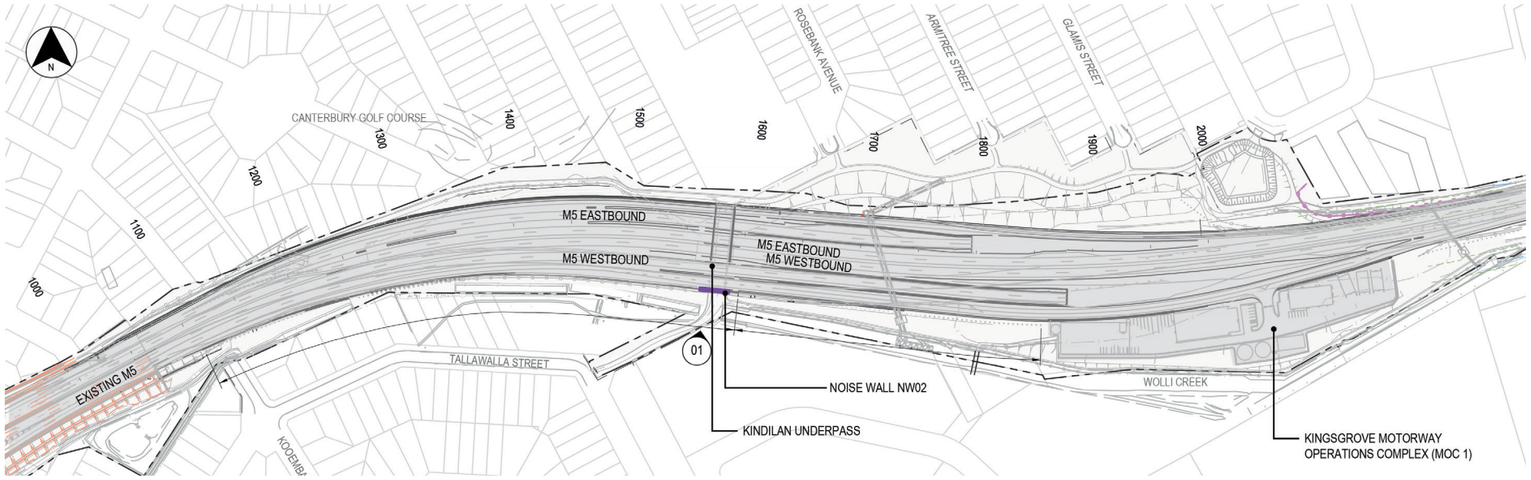
Figure 06-25 - Noise Walls - NW-01 - Elevation - Sheet 02 of 03



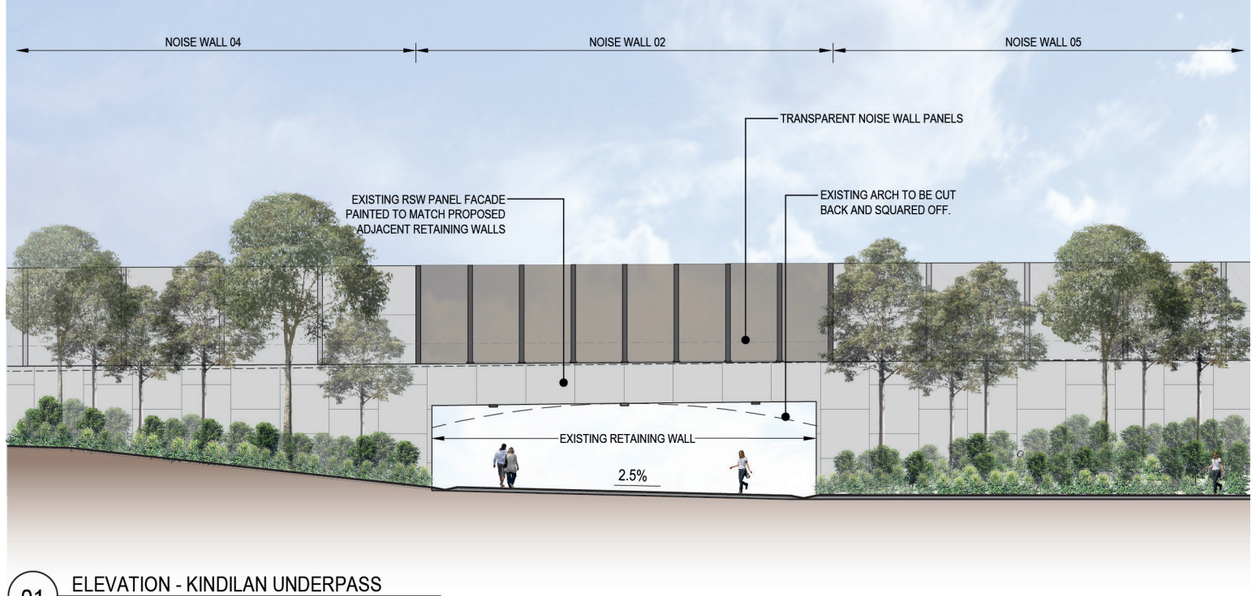
01 ELEVATION (CONTINUED) - NOISE WALL NW01, NW-06, NW-07, AND NW-08
1:500

0 5 10 20m
1:500

Figure 06-26 - Noise Walls - NW-01 - Elevation - Sheet 03 of 03



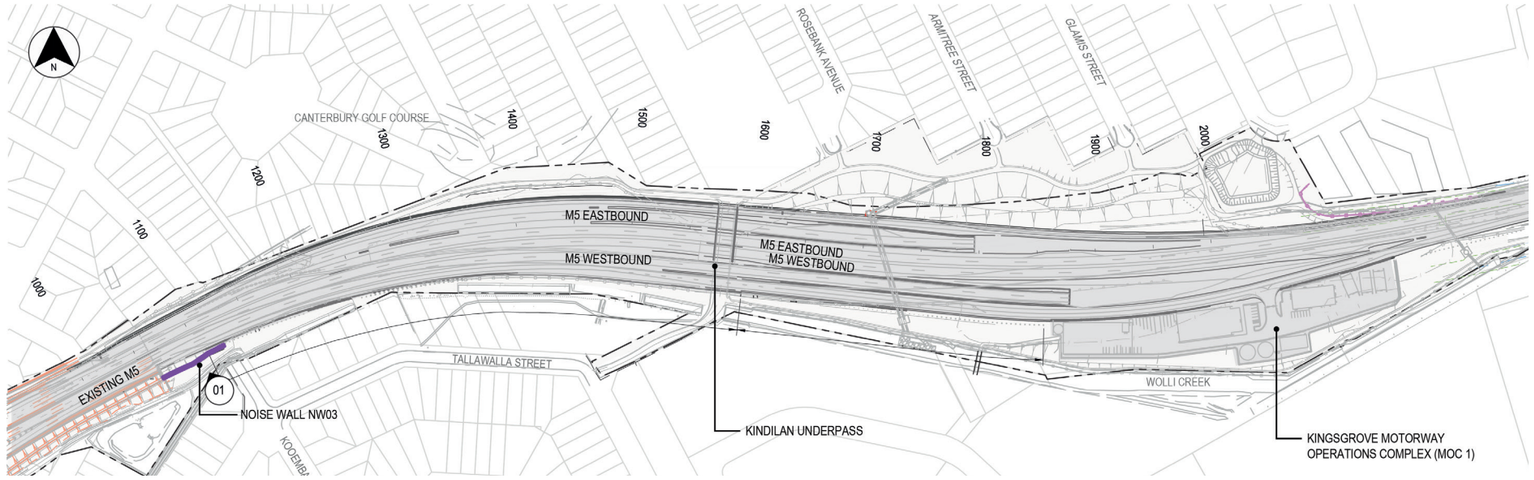
LOCATION PLAN



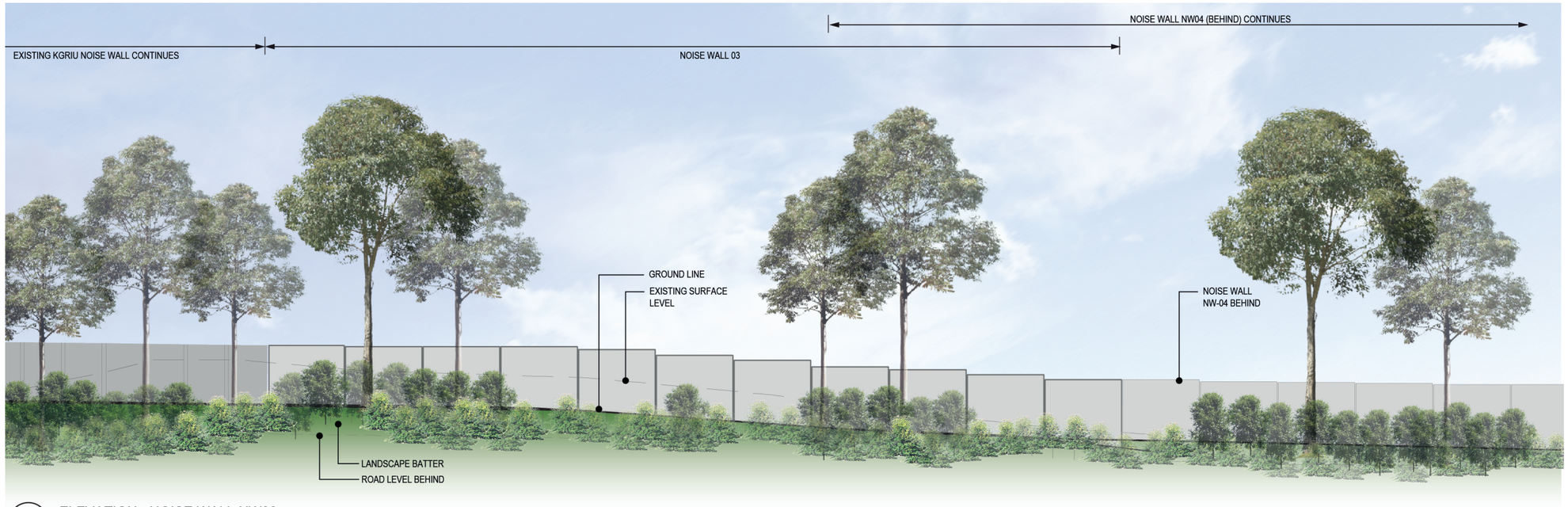
01 ELEVATION - KINDILAN UNDERPASS
1:250

0 2.5 5 10m
1:250

Figure 06-27 - Noise Walls - NW02 - Elevation



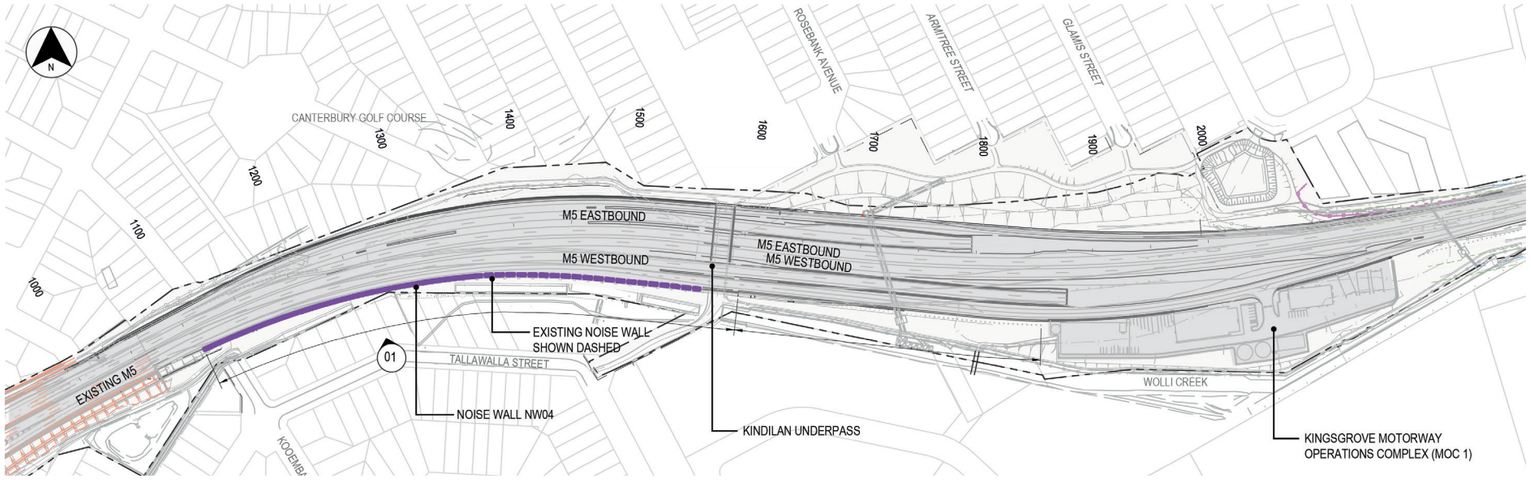
LOCATION PLAN



01 ELEVATION - NOISE WALL NW03
1:250

0 2.5 5 10m
1:250

Figure 06-28 - Noise Walls - NW03 - Elevation



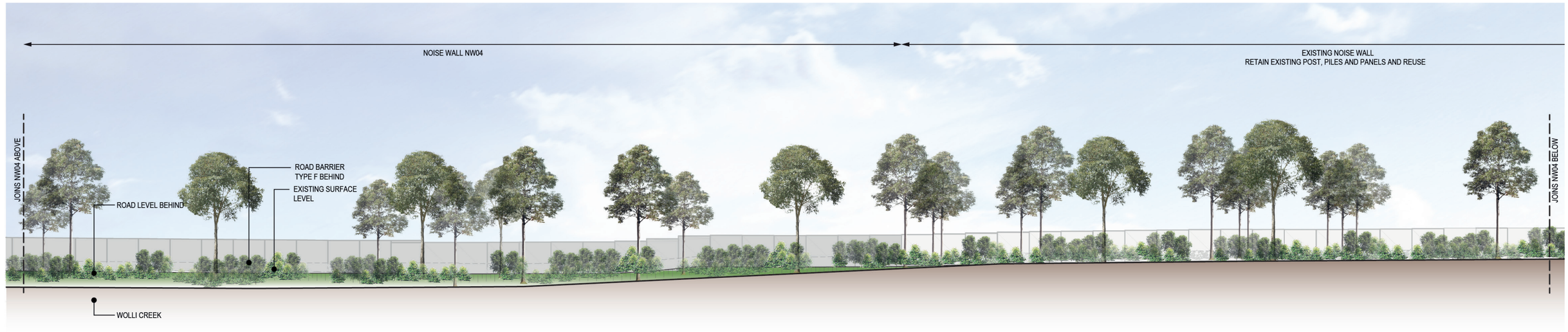
LOCATION PLAN

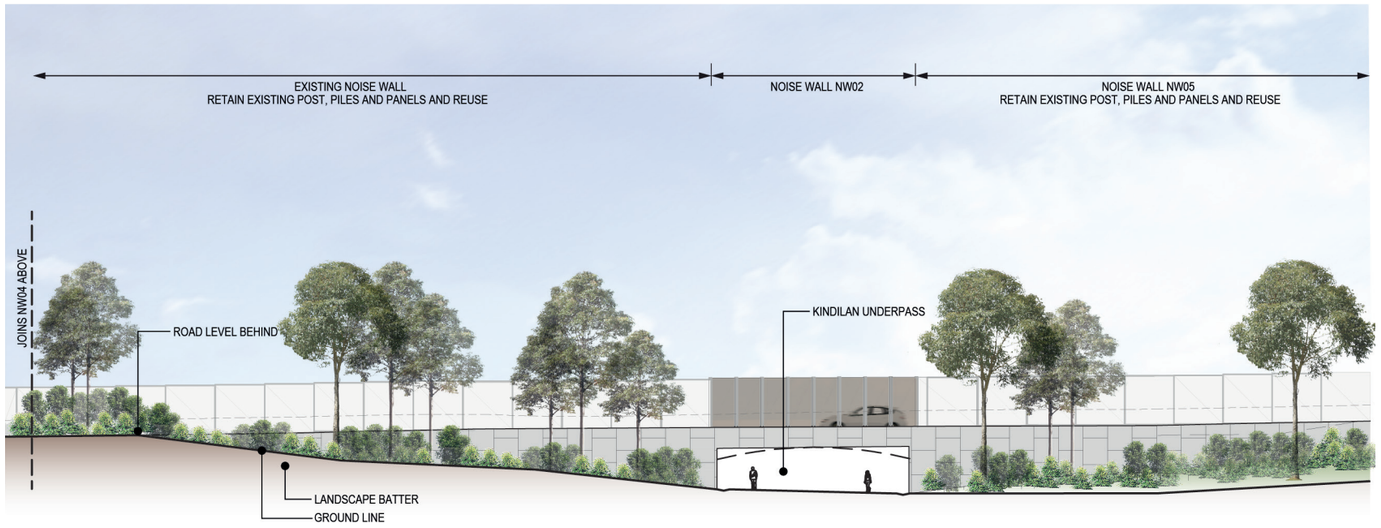


01 WESTBOUND ELEVATION - NOISE WALL NW04
1:500

0 5 10 20m
1:500

Figure 06-29 - Noise Walls - NW04 - Elevation

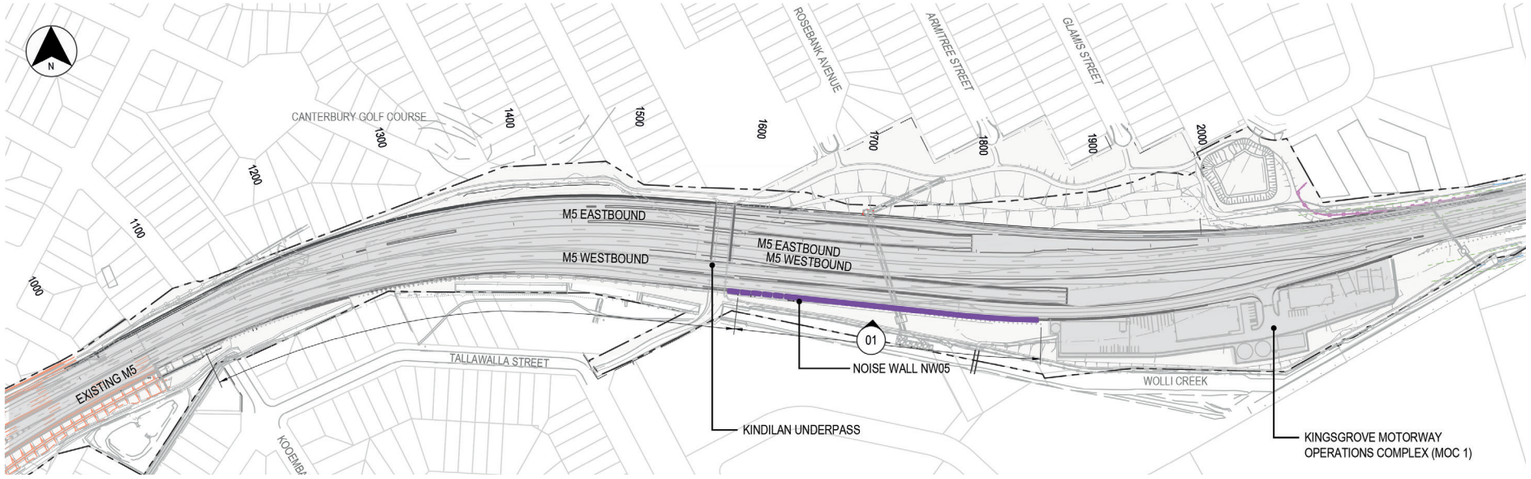




01 WESTBOUND ELEVATION - NOISE WALL NW04
1:500

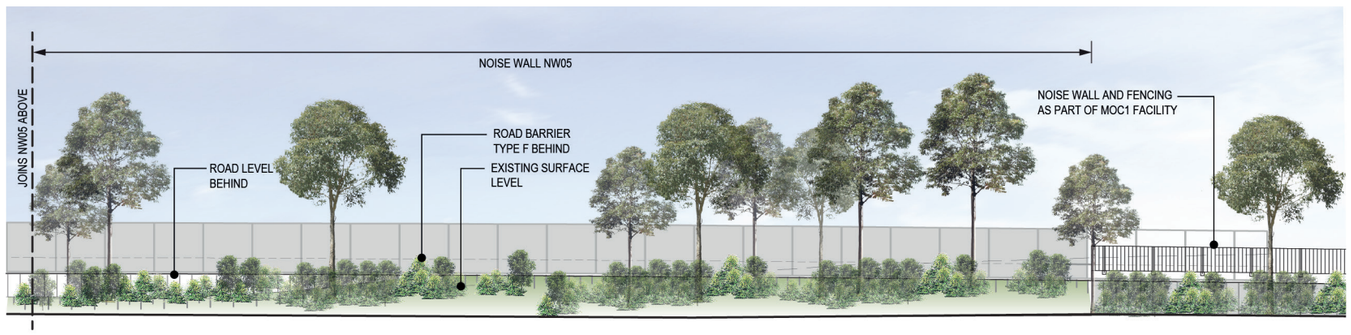
0 5 10 20m
1:500

Figure 06-30 - Noise Walls - NW04 - Elevation



LOCATION PLAN

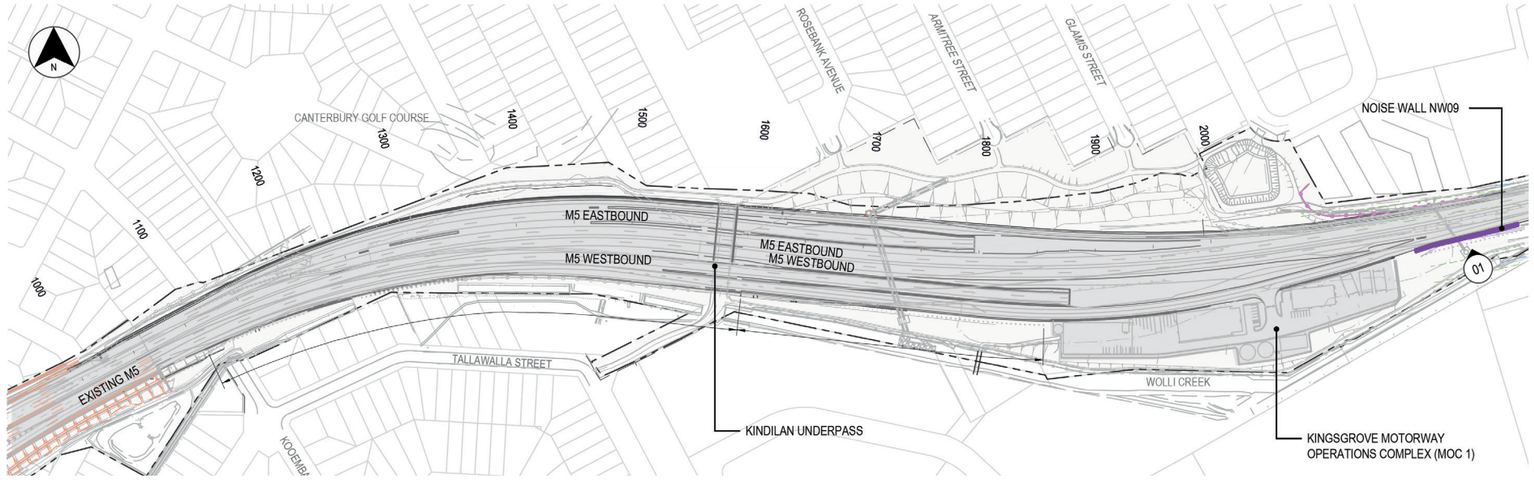




01 WESTBOUND ELEVATION - NOISE WALL NW05
1:500

0 5 10 20m
1:500

Figure 06-31 - Noise Walls - NW05 - Elevation



LOCATION PLAN



Figure 06-32 - Noise Walls - NW09 - Elevation

F6 Consultation and decision making process

F6.1 Consultation strategy

Consultation was based on the principles and processes outlined in the approved Community Communication Strategy (CCS).

The Noise Barrier Design Consultation Report (dated 15/12/2016) and main Urban Design and Landscape Plan Consultation Report (dated 10/07/2017) provide a summary of the consultation undertaken on the noise mound and noise barrier options proposed at Kingsgrove. Refer Section F7 of this Plan for the Noise Barrier Design Consultation Report.

In summary, the following stakeholders have been specifically consulted in regards to noise mound and barriers at Kingsgrove:

- Surrounding residents and community
- City of Canterbury-Bankstown Council
- Georges River Council
- Kingsgrove North Community Group
- Beverly Hills North Progress Association
- SMC
- RMS; and
- Urban Design Review Panel.

The overall aim of the consultation strategy was to ensure that key stakeholder feedback, including highly affected landowner feedback, was incorporated into the desired outcomes for designing a number of noise mound options. It was considered critical that those affected by the noise mound gained an understanding of those options, allowing them to make an informed decision to nominate their preferred option through a formal survey. In summary consultation included:

- Georges River Council meeting 14/12/2016. SMC and RMS representatives also in attendance.
- Canterbury Bankstown Council meetings to present noise barrier options 29/09/2016 and 6/12/2016. SMC and RMS representatives also in attendance
- Regular monthly interface meetings with Councils
- One on one briefings with key community representatives
- Construction updates advising of community information session (5000 recipients)
- Specific notifications (11/11/2016) containing noise barrier options and survey with reply paid envelope (2700 recipients)
- Door knocks for key affected residents (over 40 residents)
- Community information session (19/11/2016)
- Public exhibition of the Main UDLP (4th – 30th April 2017)
- Door knock and further survey of residents directly adjacent to the noise walls at Kirrang St (June 2017)
- UDRP Meetings in which noise walls were discussed as follows:
  - Western Precinct Meeting 6/2/2017
  - Western Precinct Meeting 13/4/2017
  - Western Precinct Meeting 15/9/2017

The community, Councils and the UDRP were consulted during the design development of the noise walls. The consultation included detailed drawings and elevations of the noise walls and options for a combination of a noise mound and noise walls adjacent to Rosebank avenue, Armitree and Glamis streets Kingsrove.

The height and location of the noise walls have been confirmed during detailed design to be consistent with the EIS. Acoustic design information can be found in the ONVR.

F6.2 Consultation outcomes

Adjustments have been made to the approved project following consultation with adjacent landowners. These adjustments have been endorsed by the UDRP and are detailed below:

- A 175m long section of NW01 has been changed from acrylic transparent panels to acrylic non transparent panels
- The section of noise barrier NW06, NW07 and NW08 consists of a combination of noise walls and noise mound. Grades on the noise mound have been selected to minimise the loss of accessible public space in the adjacent M5 Linear Park. There are two areas within the mound where the acoustic crest height cannot be achieved and these have been augmented with varying height noise walls
- The noise wall paint colour selection is based on matching the King Georges Road Upgrade colour palette in the west and the existing M5 colour palette in the east. The acrylic transparent panel colour has been selected to match that used in the King Georges Road Upgrade. Refer to the noise wall schedule for further details.

Final designs including non-transparent and transparent sections of walls and colour treatments were presented to stakeholders on 25 October 2017.

F7 Noise Barrier Design Consultation Report

During the development of the noise barrier design the project developed an Noise Barrier Design Consultation Report.

The strategy outlines the process, communication activities and tools that will be employed to undertake targeted consultation with adjacent property owners regarding the proposed permanent noise barriers.

The Noise Barrier Design Consultation Report. is outlined in this section.

WestConnex New M5

CPB CONTRACTORS | DRAGADOS | SAMSUNG C&T

Noise Barrier Design Consultation Report

Project Name: WestConnex New M5

Project number:	15.7020.2597
Document number:	M5N-CN-RPT-WSW-0001
Revision date:	15/12/2016
Revision:	01

Document Approval

Rev.	Date	Prepared by	Reviewed by	Approved by
01	15/12/2016	Diana Vincent	Brett Watkins	Steve Clark 15/12/16
Signature:				

Noise Barrier Design Consultation Report - Kingsgrove

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Noise Barrier Design Consultation Report - Kingsgrove

1. Introduction

The Environmental Impact Assessment (EIS) for the New M5 was exhibited by the Proponent (Road and Maritime Services – RMS) to the public in late 2015. The EIS included at that time the projects design which included the removal of the existing noise mound in the vicinity of Beverly Grove Park. The removed noise mound would be subsequently replaced by a new noise wall of approximately 6.5m in height. The new noise wall would provide noise attenuation in accordance with Environmental Protection Authority (EPA) Road Noise Policy.

During the EIS exhibition and submission period it became evident that the public, especially the local community, preferred the earth noise mound concept rather than the proposed new noise wall. Further and as part of CDS JV's consultation with the community during site establishment works, the community's desire for a replacement noise mound was again raised and reiterated.

In response to public submissions during the EIS submission period, the Proponent committed to undertaking a review and give further consideration to replacing the proposed noise wall design with a noise earth mound at the same location during the detailed design phase of the project.

This Noise Barrier Design Consultation Report (The Report) provides a summary of the community and key stakeholder preferences regarding the potential reinstatement of a noise mound. Further and through consultation with both the local community and key stakeholders, including Canterbury Bankstown Council, two noise mound options were developed and tabled to the community as potential alternatives to the EIS solution.

The Report details the consultation undertaken and the key findings from that consultation. The key findings now form the basis of a proposed solution. The proposed solution will be taken through detailed design for further development. This will be subject to Sydney Motorway Corporation (SMC), RMS and Department of Environment and Planning (DPE) Approval.

2. Background

During the construction of the M5 East, a volume of fill was placed along both the north (into a noise mound) and south of the M5 motorway. The fill was subsequently landscaped. The mound on the north side of the M5, located in the vicinity of Beverly Grove Park has served as a valued noise barrier and has the added bonus of being a natural visual mitigation feature for local residents located to the north of the M5, especially those on Glamis Street, Armitree Street and Rosebank Avenue.

The New M5 EIS, proposed to replace the existing noise mound with a transparent noise wall to account for the New M5 alignment. The proposed new noise wall was approximately 6.5m high to achieve noise attenuation in accordance with Environmental Protection Authority (EPA) Road Noise Policy.

In response to this EIS proposal and during the exhibition and submission period, a Group Submission was made (Appendix A) which was signed by both a number of residents and submitted by the Kingsgrove North Community Group. The main component of this submission was a request to consider the retention or reinstatement of a noise mound. The submission stated the following:

*"Retention of large earth mound; During the build of the original M5, in consultation with the local residents, a large earth mound was constructed, starting at the end of Garema Circuit, for over 350 meters past Rosebank Avenue. The residents of Glamis Street, Armitree Street and Rosebank Avenue have been lobbying to keep this earth mound since the time that we knew about this project. This earth mound does not only provide superior delineation and noise suppression from the current M5, but with the trees now established, provides a home for many birds and other wildlife, which have taken over 15 years since the end of the first stage of the M5 to return. It also provides that intangible value of being able to look down the end of the street and just see parkland and a tree lined hill, instead of a barrier wall and the M5. This cannot be underestimated". (*Group Submission, 2016)

The submission above was considered and subsequently triggered further investigations into the feasibility of a mound in this location.

Further, and in the lead up to site establishment, the issue was raised with the CDS-JV team during the development of design solutions for a Temporary Noise Barrier Strategy (TNBS) in the vicinity of Beverly Grove Park. One common request from those consulted with during consultation on the TNB was the retention of the existing or re-establish of a new noise mound. A map showing residents who expressed a desire to have the noise mound kept or reinstated during consultation on the TNBS is attached as Appendix B.

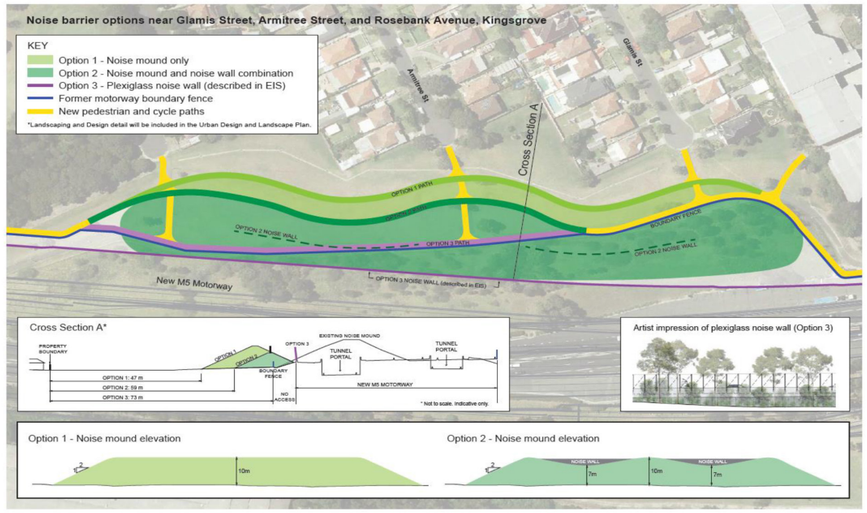
In response to the these submissions the CDS-JV project team developed a number of noise mound options. The options where developed after taking into account feedback received from the community and key stakeholders, including Canterbury Bankstown Council. The following options listed below and shown in Figure 1 formed the basis of further consultation outlined within this report;

Option 1: Constructing a noise mound, similar to the existing mound
Option 2: Constructing a noise mound and noise wall combination
Option 3: Constructing a noise wall made from transparent plexiglass (as described in the New M5 EIS)

All options comply with the EPA's Road Noise Policy, whilst Options 1 and 2 result in a reduction in open space within Beverly Grove Park directly adjacent to Glamis Street, Armitree Street and Rosebank Avenue.

Noise Barrier Design Consultation Report - Kingsgrove

Figure 1 – Noise Barrier Options



2.1. Consultation Strategy

CDS-JV has adopted a well-coordinated, targeted and personalised approach to consult with affected stakeholders and following the principles and processes outlined in the Community Communication Strategy. Consultation has been carried out with key stakeholders, which includes the local community, and residential receivers directly adjacent to the location of the proposed mound options at Glamis Street, Armitree Street and Rosebank Avenue.

The overall aim of the consultation strategy was to ensure that key stakeholder feedback, including highly affected landowner feedback, was incorporated into the options. It was considered critical that those affected by the options gained an understanding of those options, allowing them to make an informed decision to nominate their preferred option through a formal survey.

Communication and consultation activities, provided in detailed below, have been completed and will continue as required. Consultation to date has confirmed and achieved the following;

- Confirmed highly effected resident's perspectives and preferences regarding option development
- Identification of impacts on open park space within Beverly Grove Park
- Explaining the purpose of mound design consultation and justification for the change to a new or modified design
- Presenting each of the mound options in greater detail to highly affected landowners to develop understanding of the impacts associated with the location of the mound and shared path alignment in relation to specific property boundaries
- Provided an opportunity for community and stakeholders to provide feedback on the proposed options

2.2. Engaged and included Councils in the development of proposed mound options, including presentations to City of Canterbury Bankstown CouncilAffected stakeholders

Stakeholders were identified via desktop analysis and verified by site assessments. Identified residents were consulted and feedback provided officially via the survey. Direct consultation was also undertaken with residential properties located directly adjacent to proposed noise barrier options at Glamis Street, Armitree Street and Rosebank Avenue.

In additional to consulting with nearby residents and the local community, CDS-JV also engaged with a number of additional key Stakeholder. These included:

- City of Canterbury-Bankstown Council
- Group submissions coordinator for Kingsgrove North Association
- Community representative for Beverly Hills North Progress Association
- SMC, and
- RMS

2.3. Communication and Consultation Activities

The consultation strategy utilises a suite of specific and targeted communications and engagement activities . These include but are not limited to council meetings, one-on-one briefings, a specific community information session, survey, notifications, door knocks and email distributions.

City of Canterbury Bankstown Council Consultation

CDS JV has ensured that Council has been continually informed and updated on the noise mound. This has included updates via recurring monthly interface meetings, including the provision of updates on community feedback on reinstatement of a mound.

On Thursday 29th September, the mound design options were presented at a joint meeting with City of Canterbury Bankstown Council which also included representatives from SMC , RMS along with members of the project and design team from CDS-JV. The meeting was called to enable Council Representatives an opportunity to provide valued feedback. A presentation was given to facilitate Council's understanding of the proposed mound options, associated impacts on open park space and the consultation strategy to be implemented with the Community.

The feedback received from Council, and integrated into consultation and design, included the following:

- An additional option to take into account community members which may wish to reduce the impact around the loss of open space whilst still meeting the visual amenity and mitigation criteria for the community.
- Extending the local distribution area that received an invitation to attend the community information session and participate in the survey.
- An additional mound option was developed in line with Councils feedback, namely Option 2.This option provided a balance of noise mound options for consideration by the community, being a combination approach which integrated a noise mound and noise wall which ultimately has a smaller effect on open space in Beverly Grove Park as compared to Option 1.

Further, and in addition to meeting on 29 September, regular interface meetings were held with City of Canterbury Bankstown Council. These forums have been organised to enable Councils to be kept informed and engaged on a one-on-one basis covering a range of project matters, including the proposed noise mound design options.

One-on-one briefings with Key Community Representatives

Briefings were conducted with key community representative. This also included the submissions coordinator (submission to the EIS) for Kingsgrove North as well as the Beverly Hills Progress Association. The purpose of these briefings were to inform active members of the community about the noise mound design options, the consultation approach undertaken and a background on the development of the options.

These briefings were held at the site office of 30 Garema Circuit, Kingsgrove and undertaken by the Community Relations Team representatives and Construction Manager for the area.

The following tools were used during these briefings to facilitate stakeholder's understanding of the proposed mound options:

- Presentation with maps and conceptual plans including aerials and cross sections to illustrate proposed mound design options
- Project alignment map

Following the distribution of communication materials, further individual briefings were offered to residents who requested clarification on the proposed options, especially those who were unable to attend the community information session or were interested in viewing the detailed drawings again.

Notification and Survey

Construction updates were issued from the 1st of November 2016 which contained initial information about the community information session to be held on the 19th November 2016 and the purpose of this forum. The construction updates were mailed to over 5,000 residents of the Beverly Hills, Kingsgrove and Bexley area.

On 11th November approximately 2700 notifications were mailed to residents in Kingsgrove and Beverly Hills which contained information specific to the noise barrier design options and the community information session (refer Appendix C for distribution area).

A diagram of the three options, a survey and a reply paid envelope were also delivered along with the notification.

The survey provided an opportunity for the community to have their say and note comments on the noise mound options as well as permanent noise wall treatments. This feedback was sought through two key multiple choice questions as below as well as providing an opportunity for further feedback or comments;

Extract from Survey (refer to Appendix D)

Which noise barrier design do you prefer? (pick ONE only)

- ☐ Option 1: Noise mound, similar to the existing mound.
- ☐ Option 2: Noise mound and noise wall combination.
- ☐ Option 3: Noise wall only, as described in the EIS.

NOISE WALL

If a noise wall was built, which noise wall treatment would you prefer? (pick ONE only)

- ☐ Transparent material such as plexiglass
- ☐ Non-transparent material such as concrete

COMMENTS

Any other comments?

.....

.....

.....

.....

The survey requested for a street name and suburb to assist in mapping local feedback. Community were able to participate in the survey through submission of the entry via email, post or through an online platform, (refer to Appendix D for the notification and survey that was delivered to the community).

Community Information Session and Presentation

On 10th November 2016, an email was issued to subscribers from the Beverly Hills, Kingsgrove, Bexley North, Bexley, Bardwell Valley about the Kingsgrove information session to be held on 19 November. A copy of the email and associated statistics are provided in Appendix E.

The session took place on 19 November 2016 at 30 Garema Circuit, Kingsgrove. It provided an opportunity for residents and stakeholders to meet the project team, receive an update on construction, as well as provide feedback on the proposed mound design options near Glamis Street, Armitree Street and Rosebank Avenue.

The event was structured into two parts which involved a presentation and discussion from 10 am to 11:30 am. The presentation was delivered by the Construction Manager followed by a drop in session until 1 pm.

The following tools were used during the information session to facilitate stakeholder's understanding of the proposed mound options:

- Power point presentation with maps and conceptual plans including aerials and cross sections to illustrate each of the mound design options in detail throughout slides (reference appendix F for presentation slides)

- Large scale project map reflecting the NewM5 alignment from Kingsgrove to St Peters Interchange
- Display panel graphics containing images of construction on site, examples of environmental measures, artist impressions
- Multiple posters with the aerial of the noise barrier options reflecting distances from property boundaries and combined cross sections
- Copies of community contact cards, construction updates for all project sites and notification related to the mound options as well as the associated survey.

Approximately 70 community members were in attendance, including newly elected State local member Sophie Cotisis. Community engagement around the mound options presented was proactive, with several questions raised and addressed throughout the presentation and session. Key commentary surrounded the reduction of open park space, difference in the noise attenuation ability between the options, visual amenity criteria and the development of the Urban Design and Landscape Plan.

Attendees were also advised that the project team would provide an update on the results of feedback received via the have your say survey sometime during the first quarter 2017.

Community Forum Session



Door knocks

Over 40 residents on Glamis Street, Armitree Street, and Rosebank Avenue were directly engaged through door-knocks by the Community Relations Team and Construction Manager

leading up to the community forum for the purpose of briefing highly impacted stakeholders about the options in relation to their properties. A map reflecting the location of the adjoining receivers that were door knocked is attached as Appendix G.

2.4. Data Assessment Criteria

CDS-JV have identified that the residents who are most affected by the results of the feedback and changes in the design for the local area are residential property owners and/or tenants located adjacent or in close proximity to the proposed mound changes. This included residents in Glamis and Armitree Streets as well as Rosebank Avenue who back onto Beverly Grove Park.

To address the considerations of highly affected stakeholders and ensure that the input received from other respondents has been taken into account, an assessment criteria was developed. Data collected from survey respondents has been weighted considering residential location and proximity to the proposed mound. Data has been presented in two formats, raw and as weighted inline with the below principles. Further to this, as identified in MCoA B61, the UDLP must present an integrated urban and landscape design for the SSI, and must include, but not be limited to identification of design objectives, principles and standards based on prioritising the visual amenity and values of adjoining receivers over the road user experience [CofA B61 (a) (vi)]. To meet this criteria, the data collected from the survey relating to permanent noise wall treatment preferences will also be assigned weights to ensure that visual amenity of residents directly adjacent take precedent over the road user experience. See tables 1 and 2 below for weightings.

Table 1: *Noise Mound Options (1, 2 & 3)*

Scale	Respondent Location	Weighting
High	Directly impacted or in line of sight at Glamis Street, Armitree Street and Rosebank Avenue, Kingsgrove.	75 %
Medium	Potential users of the space from the suburb of Kingsgrove and Beverly Hills though not directly impacted.	20 %
Low/ Negligible	Not from the local area (outside of Kingsgrove and Beverly Hills) or have not provided residential location.	5 %

Table 2: *Noise Wall Preference by Adjoining Receivers (Transparent or Non-Transparent)*

Respondent Location	Weighting
Local Streets	90%
External Streets	10%

2.5. Consultation Data Analysis

Data was collected through the parameters set in the community survey which identified respondent preferences through two key multiple choice questions as detailed earlier within this report.

The survey also requested for a street name and suburb to assist in mapping local feedback.

A total of 156 survey responses were received, out of these 130 were validated. The 26 surveys that have not been validated have been removed for reasons such as a response had already been received from the same property, no options were selected or response had been photocopied (refer Appendix H for complete data collated in a spreadsheet).

Mound Analysis

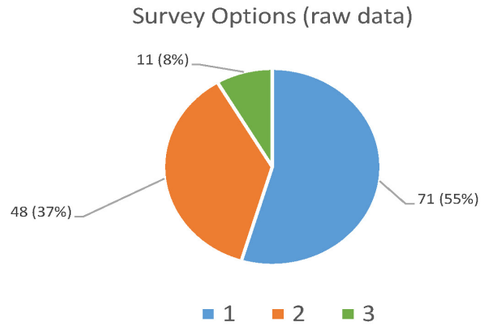
Out of the 130 surveys that were validated, 71 respondents selected Option 1, 48 respondents selected Option 2 and 11 respondents selected Option 3. The data collected demonstrates that 92% of those that responded are in favour of a mound of some kind being reinstated. Out of the mound options proposed 55% selected Option 1 and 37% selected Option 2.

The data in its raw form clearly demonstrates that there is an overwhelming majority within the local community which want to see a mound reinstated and the preferred mound option was Option 1. See Table 3 below which shows the spread of data collected.

Table 3: Data Summary

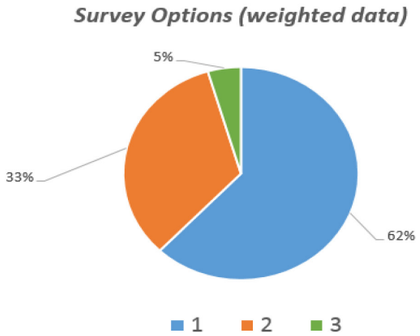
Survey feedback received via	Area	Option 1	Option 2	Option 3	Total received		
					High	Medium	Low/ negligible
Online	High	16	6	0	22		
	Medium	3	5	1		9	
	Low/negligible	0	0	1			1
Post	High	25	13	2	40		
	Medium	15	17	4		36	
	Low/negligible	2	2	2			6
Info Session	High	4	3	1	8		
	Medium	0	0	0		0	
	Low/negligible	1	1	0			2
Email	High	1	0	0	1		
	Medium	0	0	0		0	
	Low/negligible	0	0	0			0
In person	High	4	1	0	5		
	Medium	0	0	0		0	
	Low/negligible	0	0	0			0
Totals	High	50	23	3	**76**		
	Medium	18	22	5		**45**	
	Low/negligible	3	3	3			**9**
	Overall Totals	**71**	**48**	**11**			

Figure 2: Validated Survey Results (raw data)



As detailed earlier within the report to address the considerations of highly affected stakeholders located in Glamis Street, Armitree Street and Rosebank Avenue, data collected from respondents in these streets has been weighted. Applying the weightings detailed in Table 1 the outcome determined considering the raw data is further reinforced. Weighted data demonstrates that 95% of those that responded are in favour of a mound being reinstated. Out of the mound options proposed 62% selected Option 1 and 33% selected Option 2.

Figure 2: Weighted Data (based on respondent location)

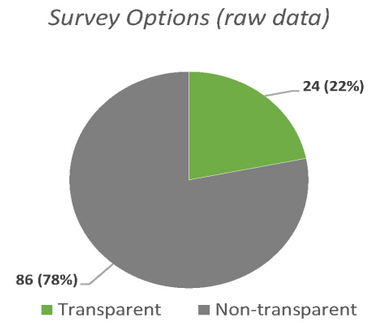


Noise Wall Treatment Analysis

Out of the 130 surveys that were validated, 110 respondents made a selection on the preferred noise wall treatment. In total, 86 out of 110 respondents preferred a non-transparent noise wall and 24 respondents selected the transparent noise wall material. The data collected demonstrates that 78% of those that responded are in favour of non-transparent noise wall treatments, with the remaining 22% in favour of transparent treatments.

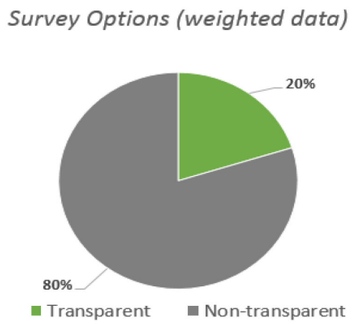
The data collected clearly demonstrates that there is an overwhelming majority within the local community which want to see a non-transparent treatments utilised within noise walls. See Figure 3 below which shows the spread of data collected.

Figure 3: Validated Survey Results (raw data)



As detailed earlier, to address the considerations of highly affected stakeholders located in Glamis Street, Armitree Street and Rosebank Avenue, data collected from respondents in these streets has been weighted to ensure that visual amenity of residents directly adjacent take precedent over the road user experience. Applying the weightings detailed in Table 2, the outcome determined utilising the raw data is further reinforced. Weighted data demonstrates that 80% of those that responded are in favour of non-transparent noise wall treatments, with the remainder of 20% preferring transparent treatments. See Figure 4 below which shows the spread of data collected.

Figure 4: Weighted Data (based on respondent location)



2.6. Monitoring and reporting

All stakeholder interactions regarding the consultation associated with the details within this report have been recorded in the project's community contact database and included in monthly and quarterly progress reports.

3. Conclusion

CDS-JV has developed three noise mound design alternatives in response to community and stakeholder feedback received during the EIS and subsequently received during project site establishment.

The data received as a result of consultation with both the community and Council has demonstrated that there is an overwhelming desire for a noise earth mound similar to the existing one and that the reinstated should be in line with survey Option 1. Further, the consultation process has also identified that there is also an overwhelming desire from the local community for non-transparent noise wall treatments to be utilised in the final design where noise walls are identified along the M5 Motorway.

The preferred solutions will be developed further through the detailed design process and addressed in the UDLP development process. This process will include noise assessments and further considerations around community impacts. The preferred options will be presented to stakeholders prior to the adoption of a final design and integrated into the Urban Design and Landscape Plan for the Prioject.

Appendices

Noise Barrier Design Consultation Report - Kingsgrove

WestConnex New M5

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Appendix A – Joint submission by Kingsgrove North on EIS.

PCU063881

8561

GROUP SUBMISSION – KINGSGROVE NORTH (C1)

Background on this submission:

This submission has been put together to show both the Department of Planning and Environment & the Proponent 'Westconnex' this community's main local issues with the project 'Westconnex New M5' (SSI 6788).

This submission is the end result of several local meetings. There were many other issues raised by this community, but our idea was to pinpoint the four (4) most important ones and try to give you an understanding of these issues, as well as trying to give you alternatives. In saying this, none of us are major project planners and as such, are hoping that you, as the Government body controlling the planning of this project, will give due thought and understanding of the importance, to all points brought up in the attached documentation.

We, as residents of this area, have not tried to 'clog up' your system with the many other items in the EIS that need to be looked at, along the entire construction length of the New M5. Instead, we have kept this submission specific to our local area (even just to our side of the M5) and as such, want to make sure you understand that point also.

We also want to add that we haven't used words like 'I object' or' I agree' in this submission. This does not mean that we do agree or don't with this project. Our reason behind this is we have taken the approach that phrases like those can pigeon hole responses and we would like to be treated as a group that is willing to work with your Department & the Proponent, as long as we are seen as sensible and that the responses we get back are also of a sensible and thought-out nature to our issues.

And finally, the number of signed documents that are attached to this covering letter represent as many residents as we could find home over this holiday period. Having this M5 EIS exhibition over December/January has been very difficult, as people have been away for a lot of that time due to Xmas holidays. Unfortunately, we have found many that are still away and as such, were not able to add to the submissions in this group. An important statistic to keep in mind though, is that only two properties out of all the streets that we door knocked did not sign our group submission, and that was because both of them were putting in their own ones and wanted to add more points. That alone should show you the importance and relevance of this submission to our area.

We as a group, truly hope you understand how much thought we have put into this… trying to make sure we get our important points across to you in the most efficient manner possible, in the short time we have had to pull this together.

Please ensure this submission gets the attention it deserves.

Signed

Steve Castle

Group Submission Coordinator for Kingsgrove North

Department of Planning
Received
2 9 JAN 2016
Scanning Room

*ATTACHMENTS ONLY ON THIS SUBMISSION. *

Name Printed: STEVE CASTLE

Address: 93 GLAMIS STREET
KINGSGROVE

Date: 25TH JANUARY 2016

Westconnex New M5 (SSI 6788)

Planning Services

Department of Planning and Environment

GPO Box 39, SYDNEY NSW 2001

Attention: Director - Transport Assessments,

Please accept this submission in response to the Environmental Impact Statement for the Westconnex New M5 Application No: SSI 6788

POINT 1 - Retention of large earth mound: (PRIORITY ONE)

During the build of the original M5, in consultation with the local residents, a large earth mound was constructed, starting at the end of Garema Circuit, for over 350 metres past Rosebank Ave (*see attached photos 1,2,3 & 4*). The residents of Glamis Street, Armitree Street & Rosebank Ave have been lobbying to keep this earth mound since the time that we knew about this project. This earth mound does not only provide superior delineation and noise suppression from the current M5, but with the trees now established, provides a home for many birds and other wildlife, which have taken over 15 years since the end of the first stage of the M5 to return.
It also provides that intangible value of being able to look down the end of the street and just see parkland and a tree lined hill, instead of a barrier wall and the M5.

<u>This cannot be underestimated</u>.

Behind it is Beverley Grove Park, a large open space area that is used for many different passive recreational activities. Over the last few years, many young families have moved into these three streets and this is the only open space area that is walking distance for these young families to allow their kids to play & picnic in a safe, car free area. The next closest area is up on busy Moorefields Road (Clemton Park). This is not an option for most families as it is also an official sporting ground and as such, has many bookings by sporting bodies who obviously have precedence over passive recreation.
These two landscape items together make up our entire greenspace for this local community.
I believe that if there is a way of retaining both these important local community assets, then it should be put on the top of your list of priorities.
We strongly urge you to investigate this first point....

POINT 2 -Current proposed use of Beverley Grove Park during construction:

At a site meeting back in November with representatives of Westconnex (and later confirmed at the Kingsgrove RSL community consultation), the green space area mentioned above has been pencilled in to be a 'workers car park/site shed /spoil storage' area. (*see attached figure 6-6*)
Looking at the entire area for use during construction, we believe that Westconnex could accommodate a lot of this in Garema Circuit (see attached 'garema circuit (google earth)'). This light industrial area already has a large car park that remains unused on a daily basis. We would hope that Westconnex could find a way to fit their operations around this one area, instead of spreading into our residential green open space. We believe if this can be arranged, construction wouldn't need to build fences up against private properties, but more so, where the current chainwire

fence exists, (*see attached 'chainwire fence')* which in turn would allow the use of the major part of the open space during this long construction process.

POINT 3 - Construction Traffic Movements around Kingsgrove North Construction Site (C1):

In 'New M5 EIS_Vol 1B_Chapter 09_Traffic and Transport_Part 1' it states that both sides of Garema Circuit will/could be used for both heavy & light traffic. We discussed this fact with the Westconnex engineers at the December meeting at Kingsgrove RSL. It was also discussed at length with the builder at another community information day at Bexley RSL on 16th January 2016. Both times it was agreed that it would be possible to use only the eastern side of Garema Circuit to mitigate the noise issues from using this access road up to 24 hours a day to haul large volumes of soil from the tunnel construction point. (see attachment – truck movements figure 9-10). Due to the proximity to private housing on the west side (compared to several layers of commercial buildings on the other), I believe the noise from these vehicles could be significantly reduced to local residents by pushing all heavy vehicle traffic to the east side. This would free up the west side for access to parking as per point 2 above for light vehicles.

POINT 4 - The Use of Transparent Noise Barriers between Garema Circuit & Canterbury Golf Course:

In 'New M5 EIS Vol 1B Chapter 14 Visual Impact & Urban Design' it states that we are to receive a "transparent noise barrier around 4 metres high". This is completely unacceptable. We do not want to see traffic passing by our houses & parkland. This approach removes all of our current amenity value of the area.
As stated in Point 1 above, our priority is to keep the current noise mound.
However, if this cannot be accommodated, then we want another noise mound put in its place at the end of the construction period. It could be retained on the motorway side easily, removing the need for noise barriers completely. Not only will this give us a much greater amenity value (similar to what we have now) than ugly noise barriers, it will remove the need for ongoing maintenance such as vandalism and graffiti.

Yours sincerely,

Attachments:

Point 1 - Photo's of noise mound (1,2,3 &4)

Point 2 – Figure 6-6

Point 2 – Garema Circuit (Google Earth)

Point 2 – chainwire fence

Point 3 – truck movements figure 9-10

I ~~have~~/have not made any reportable political donations in the previous two years. ☑

I do not want my name published on any website ☐


Photo 1


Photo 2


Photo 3





Figure 6-6 Kingsgrove North (C1) and Kingsgrove South (C2) construction compound layouts



Figure 9-10 Kingsgrove North (C1), Kingsgrove South (C2) and Commercial Road (C3) construction compound vehicle routes


Kingsgrove North High School
Australia Post - Kingsgrove Business Hub
Forrester St
Garema Circuit
Garema Circuit
Clemton Park
Glamis St
Armitree St
Glamis St
Moorefields Rd

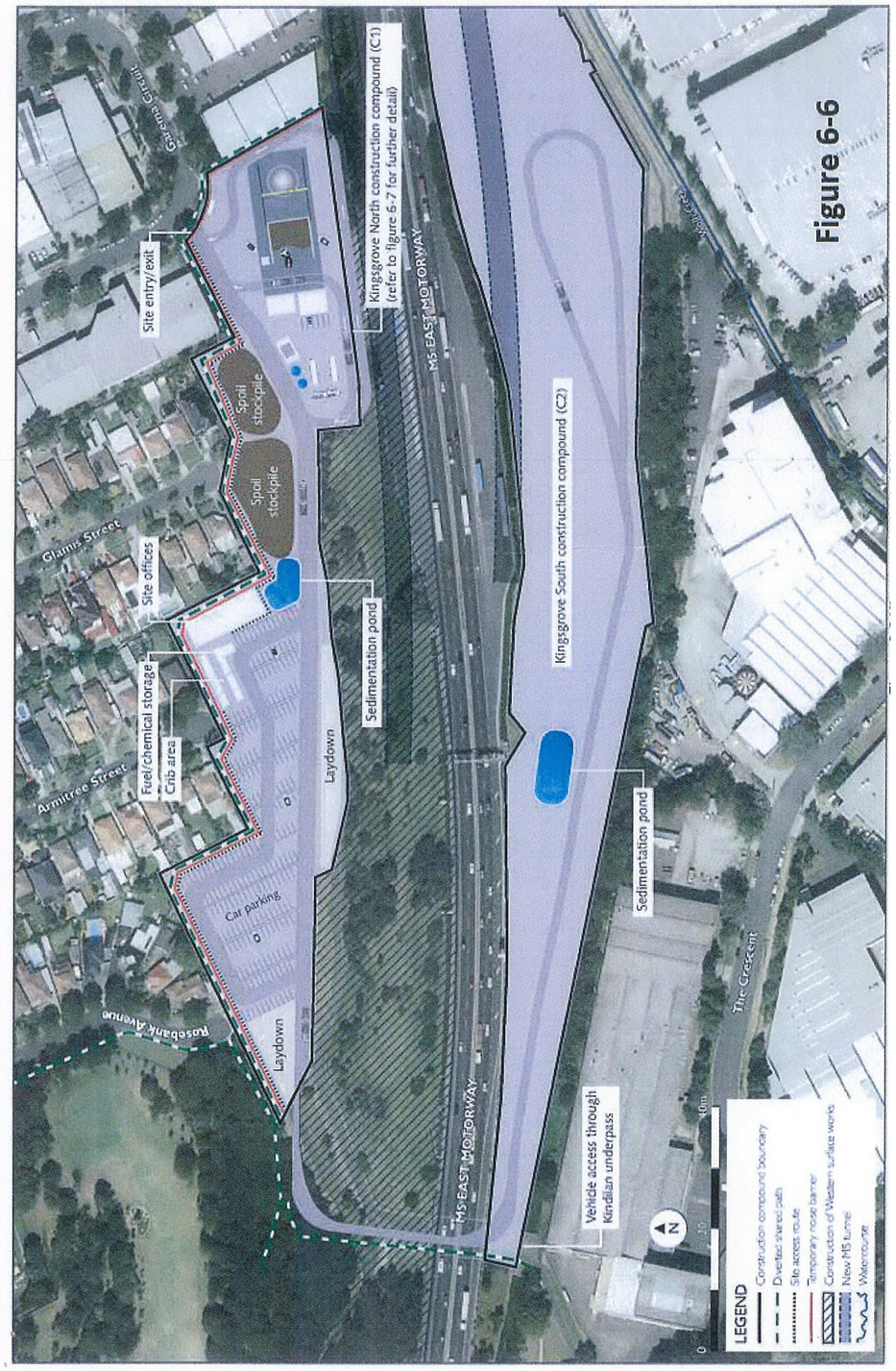


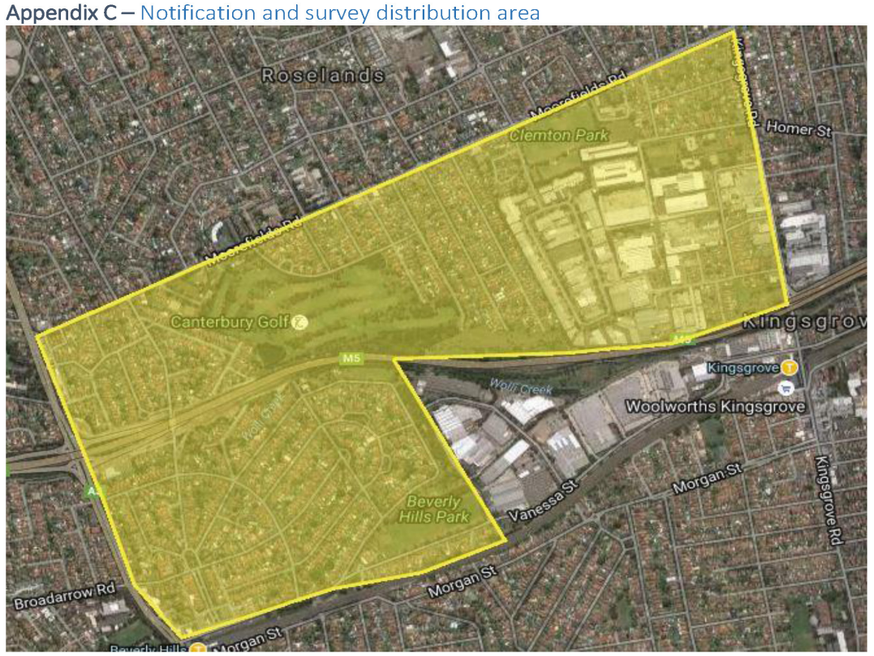
Figure 6-6
Site entry/exit
Kingsgrove North construction compound (C1)
(refer to figure 6-7 for further detail)
M5 EAST MOTORWAY
Spoil stockpile
Spoil stockpile
Glamis Street
Site offices
Kingsgrove South construction compound (C2)
Sedimentation pond
Fuel/chemical storage
Crib area
Armitree Street
Laydown
Car parking
Laydown
Rosebank Avenue
Sedimentation pond
The Crescent
M5 EAST MOTORWAY
Vehicle access through Kindilan underpass
LEGEND
Construction compound boundary
Diverted shared path
Site access route
Temporary noise barrier
Construction of Western surface works
New M5 tunnel
Watercourse

Appendix B – Community members supporting reinstatement during Temporary Noise



Barrier consultation (D19).

Appendix C – Notification and survey distribution area



Noise Barrier Design Consultation Report - Kingsgrove

WestConnex New M5

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Appendix D – Specific notification and survey

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New M5 | **Kingsgrove noise barrier update** | **November 2016**

Have your say: Design options for the noise barrier near Glamis Street, Armitree Street, and Rosebank Avenue, Kingsgrove.

Construction is progressing at the New M5 Kingsgrove sites and work to finalise the design of a noise barrier near Glamis Street, Armitree Street, and Rosebank Avenue is underway.

The New M5 Environmental Impact Statement (EIS), exhibited late 2015 proposed replacing the existing noise mound with a plexiglass noise wall, approximately 10 metres high.

During the exhibition of the New M5 EIS we received submissions from Kingsgrove residents asking us to consider keeping the existing noise mound (or rebuilding a similar one), instead of replacing the noise mound with a noise wall.

In response to community feedback received during the EIS, the following noise barrier options are proposed:

- **Option 1**: Constructing a noise mound, similar to the existing mound
- **Option 2**: Constructing a noise mound and noise wall combination
- **Option 3**: Constructing a noise wall made from transparent plexiglass (as described in the New M5 EIS)

Initial designs for the three options are shown over the page.

All options meet the minimum traffic noise reduction requirements. Options 1 and 2 would involve reducing some of the flat open space adjacent to Glamis Street, Armitree Street and Rosebank Avenue.

We invite you to provide feedback on your preferred noise barrier option. You can do this by completing the attached survey and sending it back to us by:

- Posting the completed survey in the reply paid envelope provided
- emailing a scanned copy of the completed survey to info@newm5.com.au

You can also complete and submit the survey online at https://www.surveymonkey.com/r/WestConnexNewM5Kingsgrove.

Please provide your feedback by **5pm on Friday, 2 December 2016**.

Community Information Session

The information session will include a presentation on the proposed noise barrier design options at 10am. Following the presentation, community members can drop in during the session to meet the project team and find out about the work underway, ask questions and provide feedback.

Date: Saturday, 19 November 2016

Presentation on proposed noise barrier design options: 10 am to 11 am

Drop in session: 11 am to 1 pm

Venue: 30 Garema Circuit, Kingsgrove (parking is available on Garema Circuit Council Car Park, 200 metres from venue)

If you would like further information about the noise barrier options or the information session, please call 1800 660 248 and ask to speak to a member of the New M5 community engagement team.

Notification No 168

For more information
info@newm5.com.au
1800 660 248
westconnex.com.au

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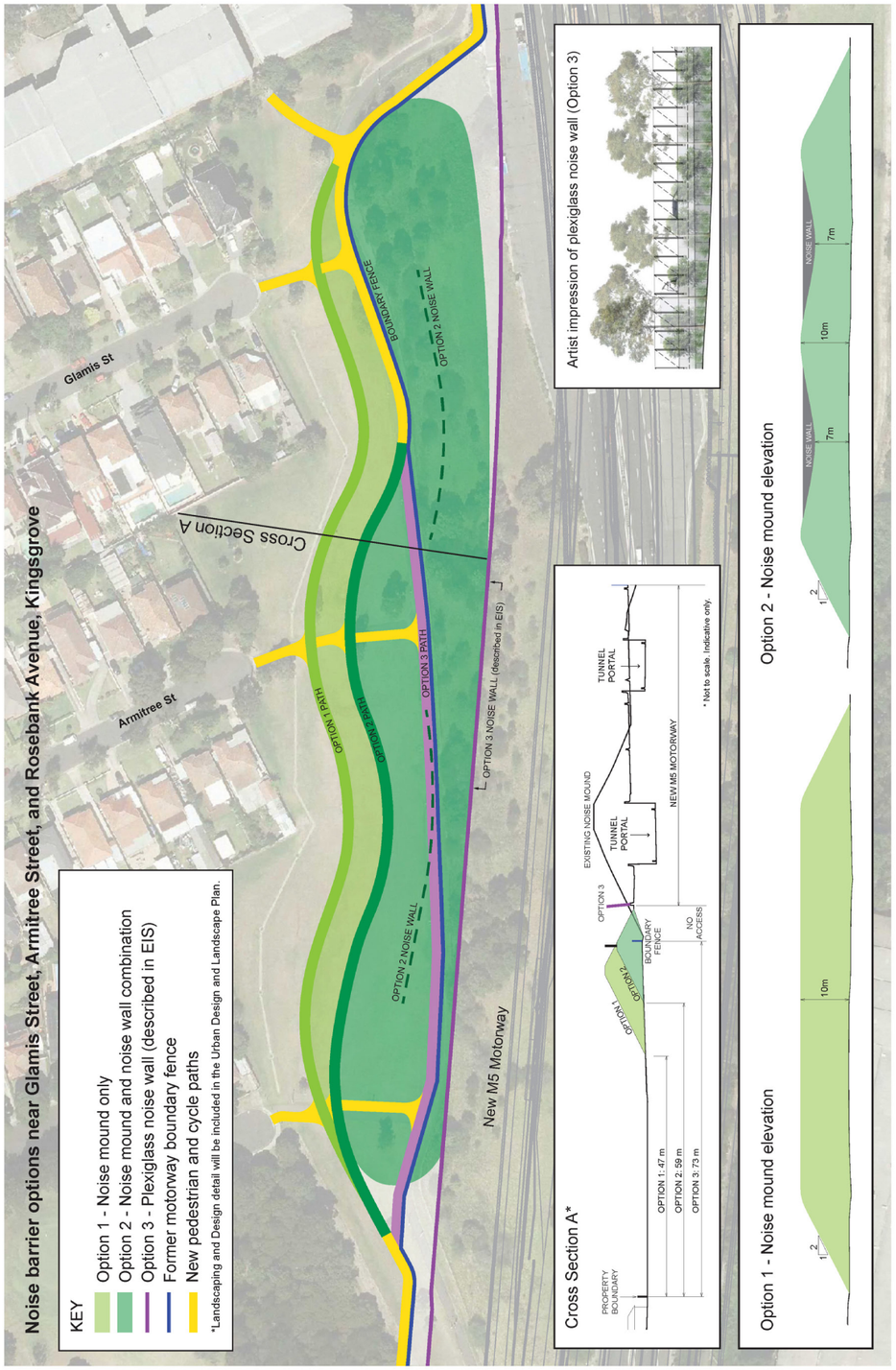

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New M5 | **Noise barrier survey** | **November 2016**

Have your say: Design options for noise barrier near Glamis Street, Armitree Street, and Rosebank Avenue, Kingsgrove.

In response to community feedback received during the New M5 Environmental Impact Statement, the following noise barrier options are proposed:

- **Option 1**: Constructing a noise mound, similar to the existing mound
- **Option 2**: Constructing a noise mound and noise wall combination
- **Option 3**: Constructing a noise wall made from transparent plexiglass (as described in the New M5 EIS)

Initial designs for the three options are shown on the notification.

If you would like to provide feedback on these noise barrier options, please complete this survey and return it in the reply paid envelope provided or scan and email the survey to info@newm5.com.au.

You can also complete and submit the survey online at https://www.surveymonkey.com/r/WestConnexNewM5Kingsgrove.

Please provide your feedback by **5pm on Friday, 2 December 2016**.

If you would like more information about the noise barrier options before providing your feedback, please call 1800 660 248 and ask to speak to a member of the New M5 team.

DESIGN OPTION

Which noise barrier design do you prefer?
(pick ONE only)

- ☐ Option 1: Noise mound, similar to the existing mound.
- ☐ Option 2: Noise mound and noise wall combination.
- ☐ Option 3: Noise wall only, as described in the EIS.

NOISE WALL

If a noise wall was built, which noise wall treatment would you prefer?
(pick ONE only)

- ☐ Transparent material such as plexiglass
- ☐ Non-transparent material such as concrete

COMMENTS

Any other comments?

……

……

……

For more information
info@newm5.com.au
1800 660 248
westconnex.com.au

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Easing congestion | Creating jobs | Connecting communities

CONTACT DETAILS

Providing your street name and suburb helps us map local feedback.

Name (optional): ……

Street name: ……

Suburb: ……

Postcode: ☐ ☐ ☐ ☐

Contact number (optional): ……

Would you like to receive project information by email?

☐ Yes
☐ No

Email: ……

Community Information Session

The information session will include a presentation on the proposed noise barrier design options at 10am. Following the presentation, community members can drop in during the session to meet the project team and find out about the work underway, ask questions and provide feedback.

Date: Saturday 19 November, 2016

Presentation on proposed noise barrier design options: 10 am to 11 am

Drop in session: 11 am to 1 pm

Venue: 30 Garema Circuit, Kingsgrove (parking is available on Garema Circuit Council Car Park, 200 metres from venue)

YOUR PRIVACY

Information you provide here is being collected by CPBDS-JV solely for the purpose of conducting this survey and keeping you informed about the New M5 work activities. Information provided is voluntary and you can choose to unsubscribe from project email updates at anytime. You also have the right of access to, and correction of, information provided by you. To view the full privacy policy please, visit www.westconnex.com.au.

We speak your language

ENGLISH
To learn more, simply visit westconnex.com.au/yourlanguage. Need an interpreter? Call the Translating and Interpreting Service on **131 450**.

ARABIC
لمعرفة المزيد، ما عليك سوى زيارة westconnex.com.au/yourlanguage. بحاجة إلى مترجم؟ اتصل بخدمة الترجمة الكتابية والترجمة الشفوية على الرقم **131450**.

CHINESE
如需了解更多详情，请访问westconnex.com.au/yourlanguage。如需翻译，请拨打翻译与口译热线**131 450**

GREEK
Για να μάθετε περισσότερα, απλά επισκεφθείτε το westconnex.com.au/yourlanguage. Χρειάζεστε διερμηνέα; Καλέστε την Υπηρεσία Μεταφραστών και Διερμηνέων στο **131 450**.

HINDI
अधिक जानने के लिए केवल westconnex.com.au/yourlanguage पर देखें। क्या आपको दुभाषिए की ज़रूरत है? अनुवाद व दुभाषिया सेवा को **131 450** पर फ़ोन करें।

ITALIAN
Per saperne di più, vai semplicemente al sito westconnex.com.au/yourlanguage. Hai bisogno di un interprete? Chiama il servizio d'interpretazione e traduzione al numero **131 450**.

KOREAN
더 자세히 알고 싶으시면, 바로 westconnex.com.au/yourlanguage를 방문하시면 됩니다. 통역사가 필요하십니까? 번역 및 통역 서비스에**131 450**으로 연락하십시오.

VIETNAMESE
Để biết thêm, chỉ cần tới trang mạng westconnex.com.au/yourlanguage. Cần thông dịch viên? Hãy điện thoại cho Dịch vụ Thông Phiên Dịch ở số **131 450**.

1800 660 248 | info@newm5.com.au | westconnex.com.au

Noise Barrier Design Consultation Report - Kingsgrove

WestConnex New M5

Appendix E – Email circulation

View online version Like Tweet

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10 November 2016

New M5 community information session



WestConnex will run a community information session to provide information about the **New M5 construction work at the Kingsgrove and Bexley sites**.

At this session you will be able to meet the project team, find out more about upcoming construction activities, ask questions and provide feedback.

This is an opportunity for you to receive information about a range of topics including:

- Construction activities
- Tunnelling
- Out-of-hours works
- Environmental management
- Noise mitigation measures.

Date: Saturday, 19 November 2016

New M5 Community Information Session

19 November 2016

WestConnex New M5

CPB CONTRACTORS | DRAGADOS | SAMSUNG C&T

About WestConnex and the New M5

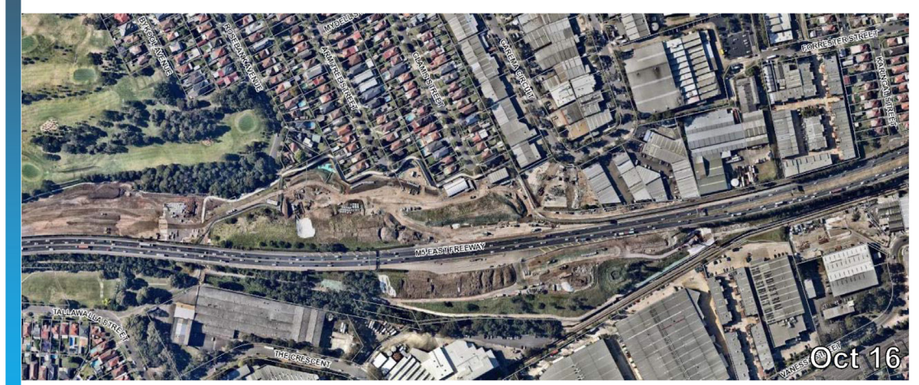


What is Happening Today?

- Opportunity to meet the team
- Receive an update on construction at Kingsgrove
- Learn more about the project
- Opportunity to have your say on the noise barrier options at Kingsgrove



Kingsgrove Construction Update



Kingsgrove Construction Update (cont.)

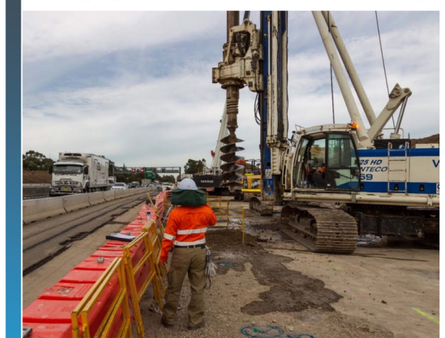


Stormwater installation at Kingsgrove construction site south of the M5 Motorway, Oct 16



Excavation in the Kingsgrove north construction site, Oct 16

Kingsgrove Construction Update (cont.)



Bored piling off the M5 East Motorway, Oct 16



Site preparation near Kindilan underpass, Oct 16

Bexley Construction Update

Bexley North construction site:

- Excavating the shaft
- Installing the acoustic shed, completed early 2017



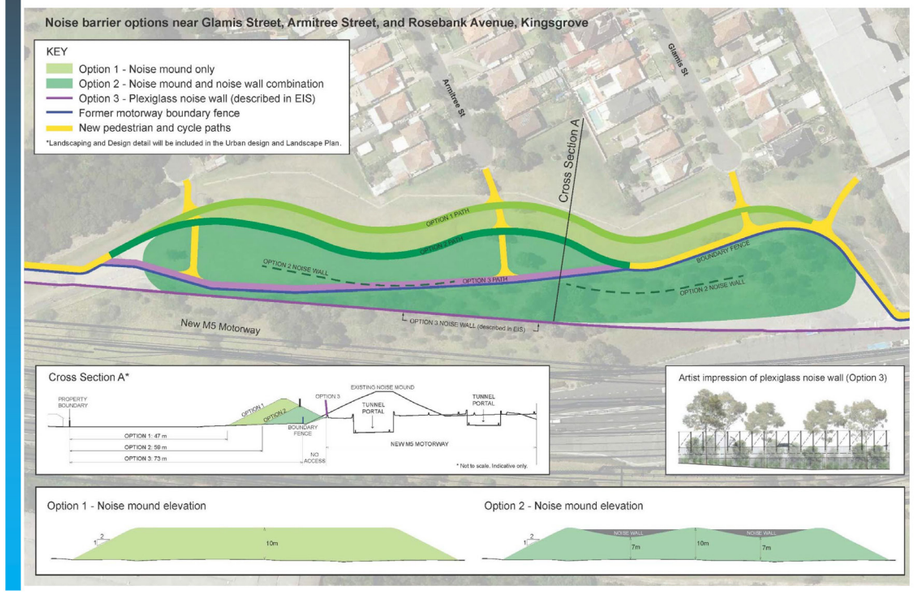
Bexley South construction site:

- Pilling pad for a permanent shaft ongoing
- Concrete works for the shed commenced

Noise barrier design options near Glamis Street, Armitree Street, and Rosebank Avenue, Kingsgrove

- Community feedback and EIS submission
- Noise barrier options have been developed for your review including:
  - ❑ Noise wall as described in the New M5 EIS (Option 3)
  - ❑ Noise mound, similar to the existing mound (Option 1)
  - ❑ Noise mound and noise wall combination (Option 2)
- Opportunity to have your say

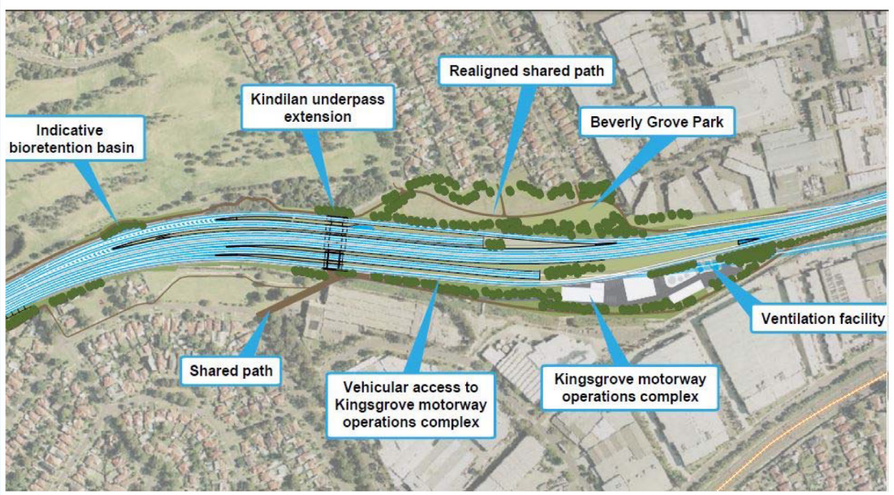
Noise barrier designs combined (options 1, 2, & 3)



Artist Impression from the New M5 EIS (option 3)



Noise wall as described in the New M5 EIS (option 3)

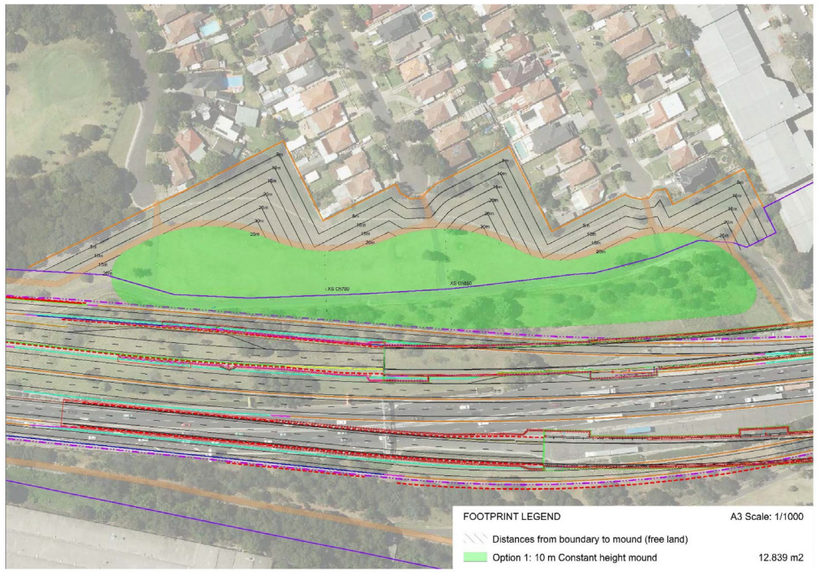


Artist Impression from the New M5 EIS (option 3)



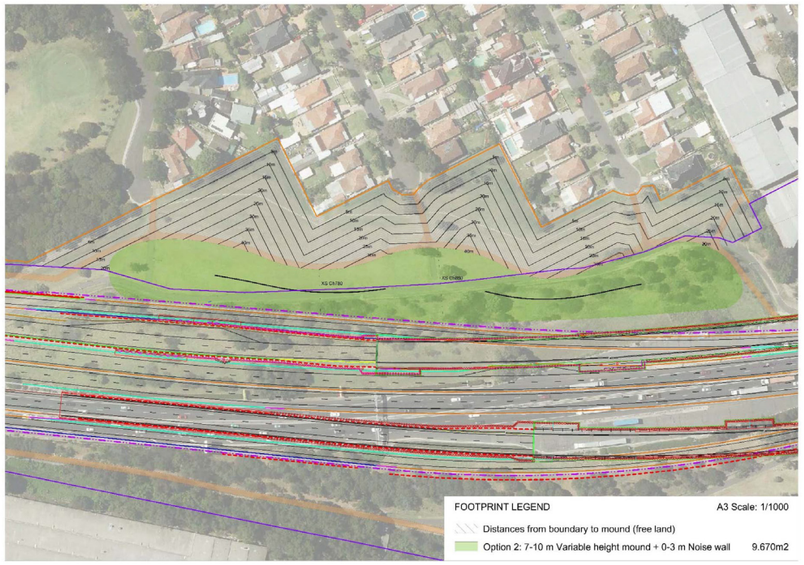
A noise mound, similar to the existing mound (option 1)

Aerial view – distance from property boundaries

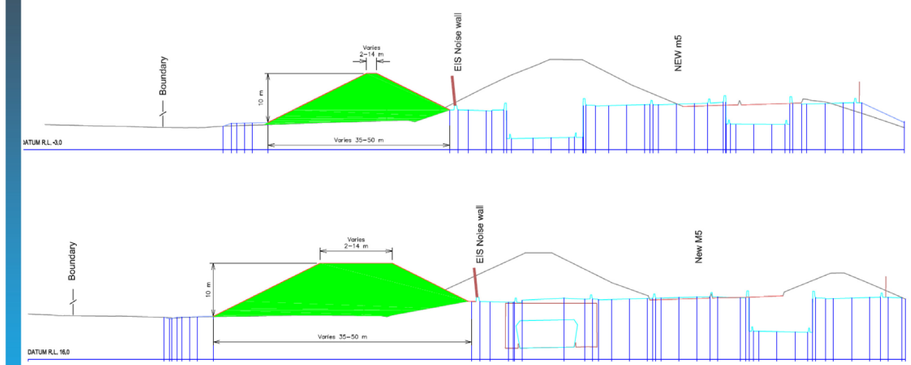


A noise mound and noise wall combination (option 2)

Aerial view – distance from property boundaries



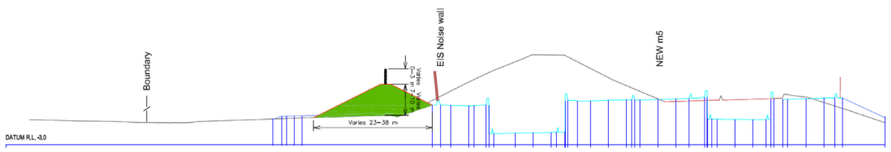
Cross section - option 1



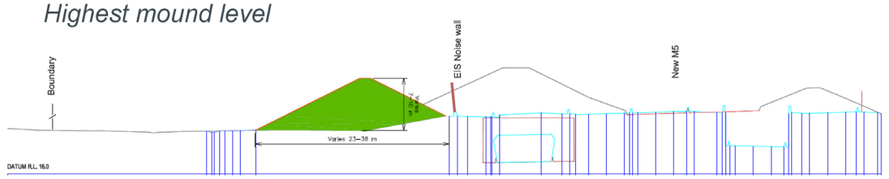
Option 1: 10 m Constant height mound

Cross section - option 2

Lowest mound level + Noise wall



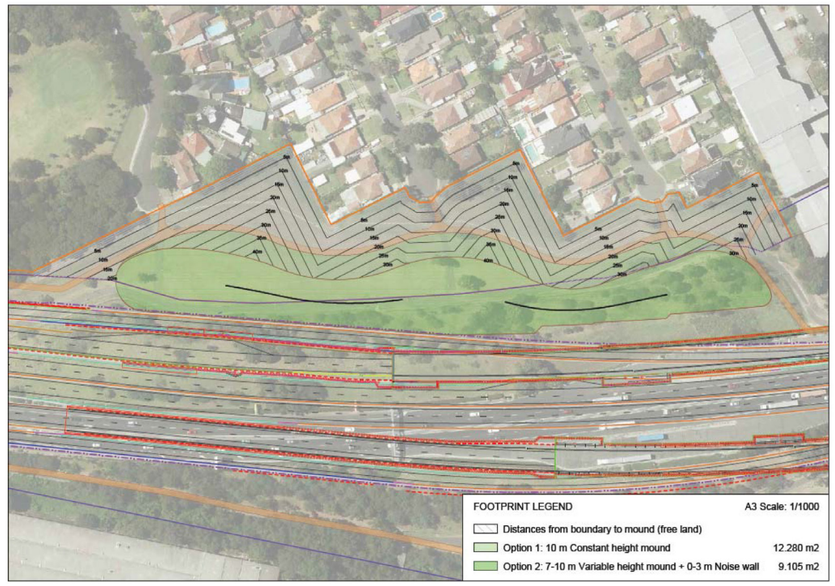
Highest mound level



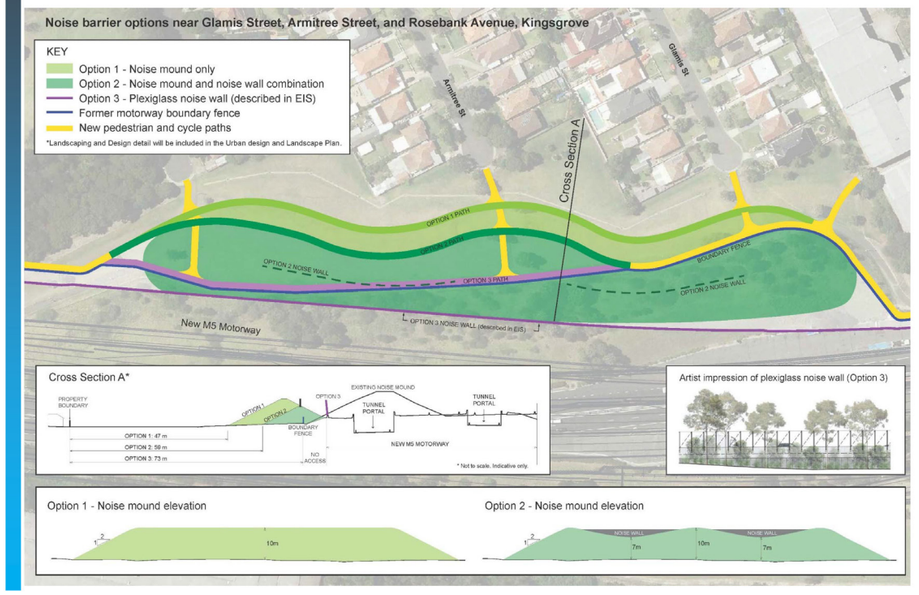
Option 2: 7-10 m Variable height mound + 0-3 m Noise wall

All options (option 1, 2 and 3)

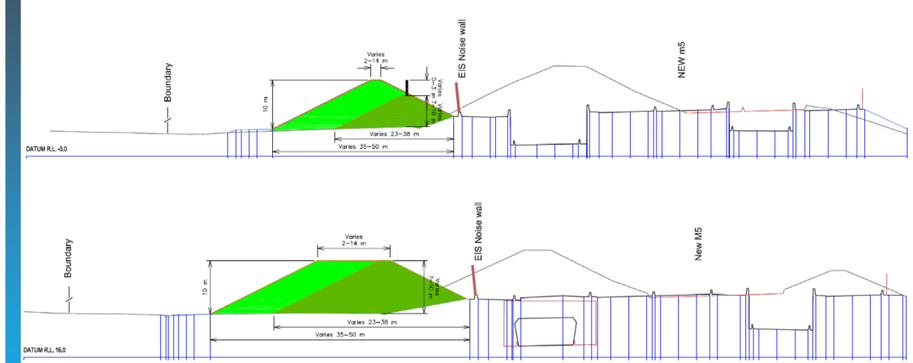
Aerial view – distance from property boundaries



Recap: Noise barrier design options 1, 2, & 3



Cross section – Option 1, 2 and 3



Option 1: 10 m Constant height mound

Option 2: 7-10 m Variable height mound + 0-3 m Noise wall

Your feedback is invited

We invite you to provide feedback on which noise barrier option you prefer.

You can do this by:

- filling in the questionnaire today and dropping it in the box provided
- mailing or emailing the questionnaire to us
- filling in the questionnaire online

Please provide your feedback by 5pm on Friday, 2 December 2016.

Next steps…

- **Nov 15 – Jan 16**
  - EIS feedback sought from the community, submission received
- **Feb 16 – Oct 16**
  - Further feedback received from the community
  - Consultation with Canterbury Bankstown Council
- **Nov 16 – Dec 16**
  - Community feedback sought on alternative designs

We are here

- **Jan 2016**
  - Preferred solution selected based on consultation
  - Feedback to community about decision
- **Early 2017**
  - Development of the detailed design for the preferred solution
- **Mid-2017**
  - Finalise design and commence construction when possible
  - Exhibition of Urban Design and Landscape Plan

Questions and Discussion

WestConnex New M5

CPB CONTRACTORS | DRAGADOS | SAMSUNG C&T

New M5 Community Information Centre

The New M5 community information centre will be open in December 2016, you can visit us at **27 Burrows Road, St Peters**

You can also contact a member of the New M5 Community Team on:

- **1800 660 248**
- **info@newm5.com.au**

Appendix G – Properties door knocked between 15th & 17th November 2016.



Noise Barrier Design Consultation Report - Kingsgrove

Appendix H – Survey data

Rating Category A

Noise Barrier Options 1, 2, 3 based on respondent location

Raw Data Analysis					Weighted Analysis		
Option	Scale	Raw data	Raw % based on options tally	Raw % based on respondent location	Weighting (raw score x weight)	Weighted % based on respondent location	Raw % Weighted
1	High	50	55%	70%	38	91%	62%
1	Medium	18		25%	4	9%	
1	Low	3		4%	0	0%	
	Total Option 1	**71**			41		
2	High	23	37%	48%	17	79%	33%
2	Medium	22		46%	4	20%	
2	Low	3		6%	0	1%	
	Total Option 2	**48**			22		
3	High	3	8%	27%	2	66%	5%
3	Medium	5		45%	1	29%	
3	Low	3		27%	0	4%	
	Total Option 3	**11**	100%		**3**		100%
	Total responses	**130**			**66**		

Rating Category B

Preferred noise wall treatment by adjoining receivers (Glamis St, Armitree St, Rosebank Ave)

		Raw data analysis			Weighted analysis		
Preferred treatment	Scale	Raw data	Raw % based on o	Raw % based on respondent location	Weighting (raw score x weight)	Weighted % based on respondent location	Raw % Weighted
Transparent	Local streets	13	22%	54%	11.70	91%	20%
	External streets	11		46%	1.10	9%	
	Total for transparent	24			12.80		
Non-transparent	Local streets	53	78%	62%	47.7	94%	80%
	External streets	33		38%	3.3	6%	
	Total for non-transpa	86			51		100%
	Total local	66			63.80		
	Total external	44					
	Total responses	110					

Mound Analysis Summary Data

Survey feedback received via	Area	Option 1	Option 2	Option 3	Total received		
					High	Medium	Low/ negligible
Online	High	16	6	0	22		
	Medium	3	5	1		9	
	Low/negligible	0	0	1			1
Post	High	25	13	2	40		
	Medium	15	17	4		36	
	Low/negligible	2	2	2			6
Info Session	High	4	3	1	8		
	Medium	0	0	0		0	
	Low/negligible	1	1	0			2
Email	High	1	0	0	1		
	Medium	0	0	0		0	
	Low/negligible	0	0	0			0
In person	High	4	1	0	5		
	Medium	0	0	0		0	
	Low/negligible	0	0	0			0
Totals	High	50	23	3	**76**		
	Medium	18	22	5		**45**	
	Low/negligible	3	3	3			**9**
	Overall Totals	**71**	**48**	**11**			

F8 Potential impacts of permanent noise barriers

The noise barriers to be constructed as part of the New M5 will not introduce a particularly new visual element to the areas described in this plan, as similar noise barriers already exist from the original M5 East project since completion in 2001. However, some new noise barriers will be placed closer to neighbouring properties due to the expansion of the motorway corridor. This section provides an assessment of the potential impacts of the New M5 Project works in relation to the noise walls described in this plan.

F8.1 Visual amenity

A Visual Impact Assessment was undertaken for the New M5 EIS which evaluated the impacts during construction and operation of the project on receiver views.

In relation to noise barriers, it identified that views to permanent noise walls would generally be setback behind landscaped batters such that sensitive receivers are unlikely to have substantial visibility of project elements, generally resulting in minimal impact during operation. However, the following impacts to visual amenity were identified:

- The removal of the existing noise mound and the use of transparent noise barriers adjacent to Beverly Grove Park North would affect adjoining properties and recreational users of the park. The transparent noise barriers and traffic would remain visible until screening vegetation had matured.
- Increased height to noise barriers on the southern side of the motorway may cause impact overshadowing impacts to residents along Tallawalla Street (refer to Section F8.2 for overshadowing assessment).

Consequently, the New M5 Project team has sought to address these impacts in the design of the noise barriers and the consultation and decision making process as detailed in Section F6.

As a result of this process, the following key design changes were implemented, leading to improvements in visual amenity:

- Reinstatement of the vegetated noise mound in Beverly Grove Park North based on community preference for the mound. Planting opportunities will be maximised on the slopes of the noise mound as this area will not be publicly accessible. As vegetation matures, the area will become more akin to the environ which the local community has grown accustomed to following the completion of the original M5 East Project.
- A 175m long section of non-transparent (acrylic) noise wall NW01 has been implemented near Kirrang Street based on residents views adjacent to the northern side of the motorway becoming susceptible to headlight glare due to their close proximity to the motorway and limited space for screen planting.
- No increase in height (from that of the existing M5 East heights of 4m) to noise barriers NW02 and NW05 on the southern side of the motorway based on determinations received from the Operational Noise and Vibration Review (ONVR) as required under MCoA E37

In addition, the final design of all other noise barriers locations and heights remain generally consistent with the requirements of the EIS. Noise barriers have been designed to match in with existing barriers and located to provide the maximum amount of landscape screening to reduce visual impacts to residents, while allowing views out from the Motorway corridor where possible.

Illustrative sections, elevations and details of noise barrier types are provided in section F4 and F5 of this plan. Refer Section 10 of the UDLP which details the proposed planting arrangement for sections of the linear park impacted by the project works.



Figure 06-33 - Western Interchange and Portals - Noise Barrier Locations

F8.2 Overshadowing

An assessment of overshadowing impacts to residential properties caused by the New M5 Project has been undertaken through the The Solar Access and Overshadowing Report as required by MCoA B65. The purpose of the report is to:

- Identify potentially affected properties,
- Assess compliance at each potentially affected property, and
- Detail how potential impacts and mitigation measures have been discussed and negotiated with the affected property owners in the event that compliance with this condition is not achieved.

Outcomes from assessments made within The Solar Access and Overshadowing Report have determined that there are no existing residential properties or approved developments that would receive less than the required amount of solar access as required under MCoA B65.

F8.3 Heritage

The New M5 EIS undertook an extensive assessment of heritage impacts associated with the operation of the New M5. In relation to noise walls it identified that:

- No sites of cultural sensitivity were identified within the project area and would not significantly detract from the broader landscape as impacts are defined to the corridor.
- No direct or indirect impacts to known Aboriginal heritage items or the Wolli Creek Landscape Area are anticipated as a result of the project,
- No direct or indirect impacts to Pallamanda Parade Urban Conservation Area as there will be no demolition of houses and landscaping would provide screening of the project from the heritage conservation area, once established,
- No impacts to Kingsgrove East Urban Conservation Area as works would be obscured by distance and by screening effect of surrounding industrial developments.

As most noise barriers (except for the reinstated noise mound) and locations remain generally consistent with those assessed in the EIS, there will be no impacts to items of heritage value as part of the project works.

It is also envisioned that there will be no further adverse impacts as a result of the reinstatement of this noise mound due to works being localised to specific areas already associated with major transport infrastructure (already disturbed areas) and the mound will replicate the condition of the existing mound constructed as part of the original M5 East, providing effective screening in line with the EIS assessment.

F8.4 Connectivity

The Ministers Condition of Approval B50 required the preparation of a Pedestrian and Cyclist Network Review to identify existing active transport network (ATN) route plans, existing ATN routes and the proposed ATN routes as part of the New M5. A requirement of this Condition was that there is no reduced level of cycle and pedestrian infrastructure as a result of the operation of the New M5 and to ensure:

- there is a similar level of pedestrian and cycling infrastructure in Kingsgrove / Bexley North after the reinstatement of shared paths as part of the M5 Linear Park Enhancement Sub-plan (MCoA B62d), and
- the existing level of cyclist and pedestrian amenity will be maintained after the reinstatement of paths to the same standards as existing shared paths.

As mentioned earlier, as a result of the consultation undertaken for the Noise Barrier Design sub-plan and New M5 UDLP, a noise mound will be reinstated at Beverly Grove Park in lieu of the EIS proposal for transparent noise walls through this locale. This will result in the realignment of shared paths to follow the base of the mound and will not reduce the overall level of connectivity in this area.

The Pedestrian and Cyclist Implementation Strategy required by MCoA B51 confirms that the existing level of cyclist and pedestrian infrastructure will be maintained after the reinstatement of shared paths through the Kingsrove area.

All other noise walls remain consistent with the locations identified in the EIS and do not impact connectivity.

F8.5 Community Cohesion

There are potential impacts to community cohesion in the area as a result of the noise barriers for the New M5. As detailed in the Community Cohesion Plan, required under MCoA B66, community cohesion or sense of community is defined through various provisions to:

- engage and involve the community,
- enhance open space and recreation areas
- support for local community initiatives and programmes

The Project team has supported and encouraged community involvement by developing a design which reflects the requests from various stakeholders consulted during the preparation of this plan as outlined in Section F6. Through active engagement and involvement, substantial changes have been implemented from the initial EIS concept design, reflective of consultation outcomes.

Although the reinstatement of the noise mound will not impact connectivity, it will lead to a reduction in open space in Beverly Grove Park. The impact of this reduction has been effectively mitigated by minimising the footprint of the mound with a noise mound and noise wall hybrid solution as described in Section F4.3. The extent of reductions to open space were communicated to the community during the various consultation activities undertaken during the preparation of this plan. Since the majority of the community members supported the reinstatement of the mound, it is considered that greater emphasis has been placed on visual amenity than access to open space. The community support for the mound therefore justifies the subsequent reductions in publicly accessible open space.

Furthermore, it is considered that the Linear Park Enhancement Sub-plan (MCoA B62d) addresses the provision and indeed enhancement of recreations spaces in the vicinity of the New M5 noise barriers.