PENINSULA LINK

Noise Wall Urban Design Principles

PREPARED FOR
ABI GROUP
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ARM

Contents

1.0 Introduction

The urban design strategy for Peninsula Link combines landscape, architectural elements and public art to provide a memorable journey for road users as well as an attractive environment for residents of each locality. The design responds to the dichotomy between the fast moving experience of the motorist, who experiences Peninsula Link in twenty minutes, and the local user, who interacts over long periods of time.

The urban design is grounded in this concept of the static 'slow' side informing the dynamic 'fast' side, by using the characteristics of each locality to inform the linear experience of the road user. This provides a level of authenticity to the integrated design, contributing to an experience where the frequent road user realises there is more to the journey than may be initially apparent. Key to this is the design of the noise walls, whereby the road user begins to associate particular details and arrangements with destinations along the freeway.

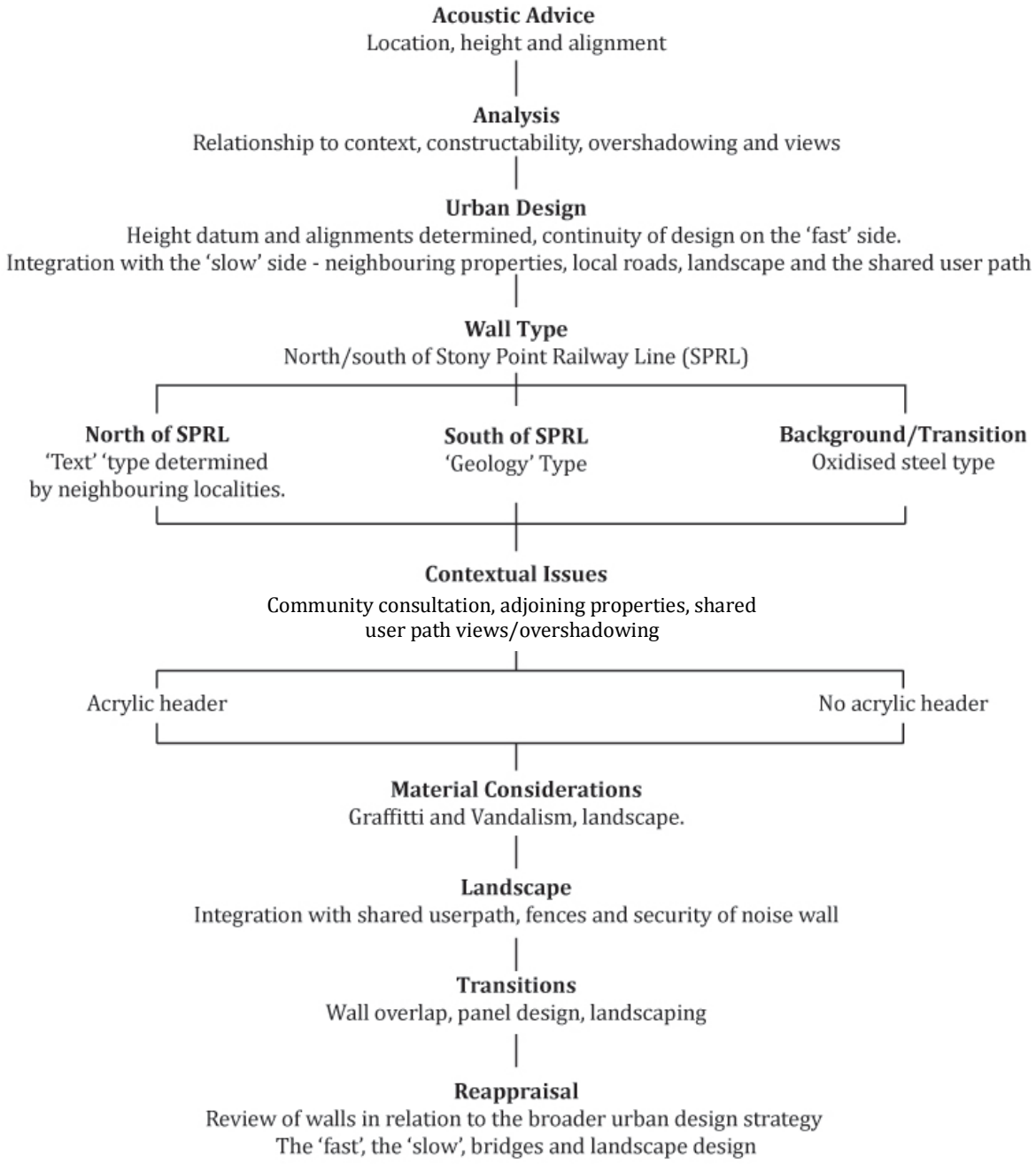
The design also ensures that the 'slow' side, where the community interacts with the design in detail, has a positive influence on the local character rather than detracts from it. Embedded in our concept design is a clear strategy where freeway structures and particularly noise walls, are designed for both sides – the freeway experience and the environs beyond.

This report outlines the design principles and analysis undertaken to ensure the final noise wall and landscape design are coordinated and provide a high quality result for both the freeway user and the local residents.

2.0 Design Strategy

Following acoustic analysis to determine the location of noise walls, thorough urban design issues analysis is undertaken. Key issues include horizontal alignment, noise wall height and transitions. Selection of noise wall type and finish are of paramount importance. Constructability and graffiti/vandalism resistance are a primary consideration.

Typically the design process undertaken is;



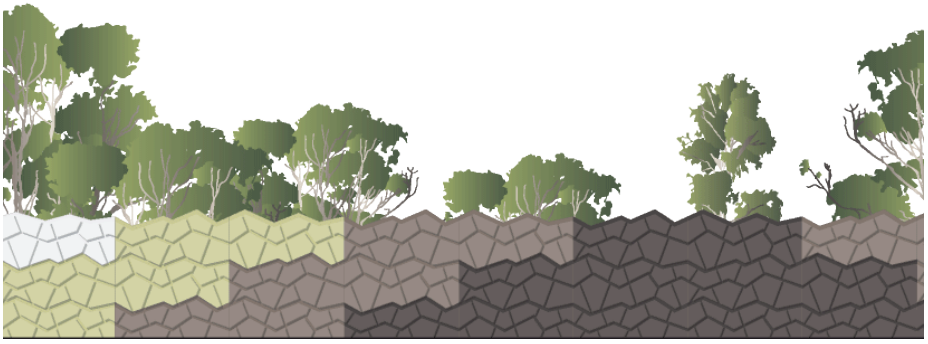
3.0 Freeway Noise Wall Types – The 'Fast Side'

Noise walls are integral to the curation of the journey along Peninsula Link, from the 'urban' northern, to the 'rural' southern sections.

The nature of the immediate context is reflected in the selection of the noise wall types. The 'urban' sections occur to the north of the Stony Point Railway and are defined by the 'Text' type. Whilst to the south the 'rural' interface is defined by the 'Geology' type noise wall, with the 'Geology' pattern also occurring on retaining walls and bridge parapets. A continuous 'background' effect is derived from the application of a third oxidised steel wall type, which provides the transition between the wall types.

3.1' Text' Type Wall
The 'Text' type is defined by the individual localities Peninsula Link visits. At certain key moments, the name of the immediate locality is revealed, notably at exit/entry ramps where slower speed allows a closer reading. As the wall continues the name is distorted by a 'camouflage' of place names from Peninsula link, before the name of the next locality is revealed.

3.2 'Geology' Type Wall
The 'Geology' type noise wall is based upon an abstraction of rock formations or tyre tracks in sand, with the patterns bleeding out at the wall transitions and at selected points along the wall alignment, creating a rhythm. The coloured concrete panels create a variegated pattern, sympathetic with the local landscape. Located to the south of the Stony Point Railway the 'geology' type wall defines the transition of the landscape from the 'urban' to the 'rural' qualities of the Moorooduc Plains.



3.3 Oxidised Steel Wall
Oxidised Steel is used as a consistent background for the noise walls along the Peninsula Link alignment. Oxidised steel provides the transition between the two concrete wall types and more importantly to the Oxidised Light Spill Walls of the Pines. Visual relief is provided through the intermittent use of black micaceous oxide steel panels, mimicking the trunks of roadside trees.

4.0 Community interface - The 'Slow' Side

The noise walls along the Peninsula Link occur to the north of Baxter, a predominately residential area of the alignment. The location of noise walls has potential for the significant impact on the adjoining residential properties.

As the road reserve predates most development along the alignment, the residential addresses tend to be oriented away from the Peninsula Link reserve. The main interface between the residential properties and the road alignment are the rear fences and backyards of these properties, as well as some local reserves.

In order to minimise any impact on neighbouring properties the location and alignment of the noise walls has been carefully considered. Generally, a buffer of open space, landscape and at times the shared user path is provided between the noise walls and residential fences. Acrylic headers mitigate any overshadowing and view impacts on the property.

4.1 Shared path/existing residential properties

Where the shared path runs between the noise wall and existing residential properties, planting buffers will be provided, screening both the wall and the fence.

4.2 Maintenance path/existing residential properties

Where noise walls are located closer to an existing residential boundary planting will be provided to screen the back of the wall. Taller species will be place to the road side with lower species against the fence, thus minimising overshadowing.

4.3 Reserves
Where the noise walls abut a reserve, planting will be provided to shield the wall. Other landscape elements such as mounding will add visual interest, as well as providing a further separation element.

4.4 Reverse side of wall
The noise walls interact closely with the 'slow' side, along the shared user path or at key areas of the existing public realm such as reserves, parks and local streets. At these points, selected panels are rotated to invert the 'fast' and the 'slow' sides. This provides additional visual texture to the landscape and planting. In the case of the 'text' type wall imbues the local context with a particular sense of place. The colours of the panels themselves reflect the colours of the local environs.

4.5 Walls on Structure/fill
Every effort has been made to avoid this situation. Where it cannot be avoided, particularly at interchanges, the walls are placed along the exit/entry ramps to minimise visual impact and height.

4.6 Walls on Road Cuttings.
Where Peninsula Link runs through road cuttings, the walls are placed at the top of the cut, along the existing ground line. This minimises the height of the wall whilst obscuring the visual impact of the cut itself, any existing views will be preserved through the application of acrylic headers.

4.7 Acrylic Headers
Where it is determined that an acrylic header is required, a minimum height requirement is set, usually 3.0 metres above ground level, in order to mitigate vandalism and graffiti. In turn, the extent of the acrylic header is adjusted to maintain the design integrity, when viewed from the 'fast' side of the given length of wall. A minimum height of 1.0 metre acrylic header will be used.

5.0 Overshadowing and View Impacts

5.1 View Impact
Generally, due to the flat nature of the terrain along the Peninsula Link alignment, the impact on existing views will be minimal. The long standing nature of the freeway alignment means that subsequent development is generally oriented away from the road reserve. Where views occur, they are local in nature and are either preserved through the application of acrylic headers to the noise walls or the obscuring of the noise walls themselves through planting.

5.2 Over Shadowing
The noise walls of Peninsula Link have been designed in respect to the ResCode provisions within the Victorian Building Regulations to assess potential overshadowing impacts from noise walls. VicRoads has used ResCode on arrange of projects throughout Victoria.

Under the ResCode provisions:

- *No habitable room window of a dwelling is to be overshadowed for more than an hour between the hours of 9am to 3pm when measured at the Autumn or Spring equinox (21 March or 22 September)*
- *At least 75% or 40 square metres with minimum dimensions of 3 metres (whichever is the lesser area) of secluded private open spaces (side or rear of a dwelling intended for outdoor recreational Activities) should receive a minimum of five hours of sunlight between the hours of 9am and 3pm on 22 September. If existing sunlight to the secluded private open space of a dwelling is already less than the requirements of the code, then the amount of sunlight should not be further reduced.*
- *Computer shadow analysis modelling of the noise walls along the Peninsula Link alignment determining the impacts of shadowing at 9am, 12noon and 3pm on the 22nd of September has been undertaken. Where over shadowing of adjoining properties occurred the noise walls have been modified by either adjusting its distance of the boundary or the addition of acrylic header panels.*

6.0 Details of Analysis Undertaken

During the bid stage of Peninsula Link analysis was undertaken on the impacts of the new road, including noise walls. Subsequently this has been reanalysed as the noise walls alignments and height of the walls has changed due to more detailed and developed acoustic advice. Examples of the analytical processes include;

- Analysis of cadastral maps, aerial photographs, roadwork designs and computer modelling of terrain changes.
- Site inspections and documentation along the road corridor and from local roads and open spaces.

As design development continues further investigation will be undertaken from individual properties where concerns have a risen wether from analysis or the residents themselves.

6.1 Potential areas of greatest impact.
Along the Peninsula Llink alignment there are a series of places where the location and height of noise walls could have a significantly greater impact on local amenity and context. These locations will need a greater deal of consideration, namely with wall alignment, height, termination, acrylic headers and landscape integration. These areas include;

- **Belvedere Reserve (CH 13250 -13450).** Noise walls abut a recreation reserve. Wall terminates midway along the reserve boundary.
- **Ballarto Road north east (CH 14400).** Noise wall separates remnant bushland and public tracks that cross the boundary of the road alignment and adjacent reserve. The wall terminates at the new Ballarto Road overpass approach ramp embankment, creating a pinch point to the reserve.
- **Skye Road North East(CH 17650).** Termination of wall and entrance to maintenance path.
- **Manorwoods drive (CH 18150).** Unoccupied land used as informal access to shared user path. Community side of wall visible from court bowl.
- **Willow Road SUP bridge (CH 20200 – 20300).** Noise wall between Willow road SUP bridge and Stony Point Railway Bridge. This area has a high level of community interaction and has a close proximity to major infrastructure and shared user path.
- **Noise walls (CH 20450 – 21250).** Long run of wall with close proximity to adjacent residential fences and shared user path. Peninsula Link is in cut in this section, restricting space for noise wall and shared user path.

Close proximity to adjoining properties and the elevated terrain in this area could impact on views across the freeway alignment to the Langwarrin Flora and Fauna Reserve.

- **Robinsons Park (CH 21250).** Termination of long run of wall into relatively open park/sporting reserve.
- **Stornoway Drive (CH 23650).** Pinch point on shared user between adjoin properties and noise walls.
- **Baxter (CH 23900 – 25500).** Road passing through town on structure/fill. Noise walls have potential to impact on visual bulk of the freeway and general amenity of the township. Noise walls are placed close to natural ground level on the entry/exit ramp as opposed to on the embankment of the Peninsula Link overpass.

7.0 Landscape and Urban Design Integration

The landscape design for Peninsula Link is low maintenance and designed to protect and enhance the environmental values of the corridor. The structure, layout and proportion of mulched planting beds and grassing has been carefully designed to achieve the urban and landscape design vision as well as to ensure efficient maintenance over the life-cycle of the planting.

Access for maintenance vehicles and personnel to the noise walls has been integrated into the design. Where possible, maintenance access is provided by the shared use path to avoid the need for additional access tracks.

Planting has been designed to minimise the risk of vandalism, in particular graffiti on the rear side of noise barriers. The landscape design incorporates screen planting alongside walls where possible, thereby discouraging graffiti attack.

Co-location of noise walls with property boundaries has occurred wherever possible to avoid narrow, difficult to maintain or unsafe public areas. Security fencing has been integrated with noise barriers and proposed planting to reduce maintenance requirements along fence lines.

8.0 Protecting the Environment

8.1 Wildlife

The use of tinted acrylic in a variety of sympathetic colours will assist in mitigating bird strike. The use of large clear areas of panels presents a problem for birds which often fly at a few metres above ground level.

8.2 Cleaning

Roadside and general pollution builds up on noise wall panels and is only partially cleaned by rain. To counter this problem tinted panels have been utilised to disguise or reduce the visual impact or grime build up. Where views are required to be protected for residences the tint gets lighter at the top where natural cleaning process (rain wash) is most likely to occur.

8.3 Vandalism

Graffiti vandalism is not just unsightly, it gives the impression that no one cares about the neighbourhood. This, in turn, creates an open invitation for littering, loitering and further vandalism.

Clear sightlines have been provided to target areas, maintaining passive surveillance over the precinct. The materials of the noise walls have been selected for their durability and ease of cleaning and maintenance. To reduce the risk of 'keying' and breakage, the use of acrylic has been limited to 3.0 metres above ground level. Formlined concrete profiles have been developed to reduce the available 'canvas'. Porous surfaces in accessible areas will be sealed with anti-graffiti protective coatings to minimise the damage caused by graffiti paint and make removal easier.

Research shows that graffiti removal within 24 to 48 hours significantly reduces the chance of graffiti reoccurring. Southern Way's maintenance regime includes removing graffiti quickly to send a clear message that graffiti won't last long on Peninsula Link.

9.0 Summary

This report outlines the analytical and design process undertaken to date to address issues of experience and amenity for all users of Peninsula Link. The rigorous and quantifiable process undertaken will be utilised to finalise the noise wall and landscape design packages.