

## 9.6 Urban design and visual assessment

An assessment of the landscape, urban design and visual impacts associated with the project has been undertaken and is presented below. This assessment is supported by *Technical Paper 4 – Urban design, visual and landscape* (Volume 2).

| Director-General's Requirements  | Where addressed   |
|--|---|
| <p><i>Urban design and landscaping issues:</i></p> <p><i>The environmental assessment must include consideration of the urban design and landscape implications of the project, including identification of urban design and landscaping objectives to enhance the current road corridor and to demonstrate how the proposed urban design elements of the project would be consistent with the existing (and desired) character of the area.</i></p> | <p><i>Sections 9.6.2, 9.6.3, 6.5.2, Technical Paper 4</i></p> |

This section and Technical Paper 4 have been prepared by RTA registered urban designers HBO+EMBT in accordance with the RTA Urban Design Policy, *Beyond the Pavement*. Key urban and landscape design objectives for the upgrade of the M2 Motorway were considered throughout the phases of the project, and used to inform design decisions and to evaluate the success of design proposals.

The vision for the urban and landscape design of the M2 Motorway is that

‘The vegetated landscape and the uniqueness of the topography in this part of Sydney should inspire the design of the future upgrade and development of the M2 Motorway. The project should reflect the corridor’s role as an important north-west route linking Ryde, Blacktown and the M7 Motorway. Its design should be simple, well considered, elegant, refined, and robust, reflect the natural and cultural qualities of the region through which it passes and establish a clear and recognisable identity for the M2 Motorway.’

### 9.6.1 Existing environment

An analysis of the physical context of the M2 Motorway was documented to assist in understanding the environment surrounding the M2 Motorway and the existing conditions of the natural and urban setting. This analysis took the form of field surveys and a desktop study and was used to establish the key attributes of the M2 Motorway which in turn determine the urban and landscape character precincts and specific site constraints and opportunities. These were used to generate objectives and principles which form the urban and landscape design framework for the M2 Upgrade project.

Both the M7 Motorway and the Lane Cove Tunnel are recent high quality additions to the Sydney Orbital network. These links contrast strongly with the older M2 Motorway character which has a lower quality of urban and landscape design reflected not only in the appearance of the bridges, noise walls and retaining walls, but also in the vehicular travel experience due to the uneven road surface.

## Existing M2 Motorway Character

The distribution and frequency of key visual qualities, built elements and vegetation along the M2 corridor define the different character experiences. When combined with the adjoining land uses these form distinct precincts with specific visual qualities. The following five precincts have been identified through the contextual analysis (west to east, refer to Figure 32):

- Precinct 1: Cumberland Plains – Old Windsor Road to Windsor Road interchange.
- Precinct 2: Bushland Interface – Windsor Road to Pennant Hills Road.
- Precinct 3: Suburban Forest Interface – Pennant Hills Road to Beecroft Road / Devlins Creek.
- Precinct 4: Suburban Bushland Interface – Beecroft Road / Devlins Creek to Terrys Creek.
- Precinct 5: Urban Bushland Interface – Terrys Creek to Lane Cove Tunnel.

Each precinct has defining features that have been used to guide the urban design treatments for each Motorway section.

The M2 Motorway passes (from west to east) through the Local Government areas (LGAs) of the Hills Shire (Precincts 1 and 2), Hornsby (Precinct 3) and Ryde (Precincts 4 and 5), and is in close proximity to Blacktown and Parramatta LGAs. The M2 Motorway passes through the urban development of the north-western suburbs of Sydney (Precincts 1, 2, and 3) and the expanding commercial area around Macquarie Shopping Centre, Macquarie University and Macquarie Business Park (Precinct 5).

The topography of the site varies as the road traverses both ridges and valleys as the route heads east towards the centre of Sydney. The current road alignment is generally not responsive to the landform through which it passes. The alignment slicing through the landscape, with cuttings, tunnels, high embankments, retaining walls and bridges used to achieve the road design requirements (refer to Figure 33). This to some extent removes the road user from the contextual experience. Despite this there are a number of key topographical characteristics which remain evident and inform the user of their journey's context.

The vegetation of the M2 corridor is a mix of stands of remnant vegetation, weeds and re-vegetation works that were undertaken as part of the original development. The natural vegetation of the region is preserved in National Park or Reserves along with isolated remnant stands within the urban fabric of the adjoining residential areas.

The M2 Motorway travels through a highly populated area of metropolitan Sydney with motorway built elements, such as noise walls, dominating most of the M2 corridor. Along many lengths of the M2 Motorway the views are confined to the road corridor, opening up only occasionally. In most cases, the motorist is unaware of the residential housing outside the road corridor as noise walls interrupt the flow of the landscape and restrict views from the M2 Motorway. The noise walls, despite efforts to camouflage the structures by painting them green, are visually dominant along much of the route.

The six major intersections create decision points for the motorists. These intersections are defined by large bridge infrastructure overpasses crossing the M2 Motorway, with on-ramps and off-ramps and increased directional signage and road furniture, such as street lighting. The man-made built structures dominate, with large cuttings and retaining walls visually limiting the M2 Motorway views.

Towards Pennant Hills Road (Precinct 2), the M2 Motorway alignment descends into the low lying landform of the creek valley. The Pennant Hills Road intersection is a strong, hard-edged built form. The M2 Motorway passes beneath the wide bridge resulting in high vertical retaining walls with finishes consisting of shotcrete and exposed rock bolts. Planting on top of the bridge structure softens and greens the wide expanse of asphalt.

The overbridge structures along the M2 Motorway are generally poorly resolved with the overall structural form and pier/headstock detailing creating a solid and overly bulky visual impression. At Beecroft Road intersection (Precincts 3 and 4), visual complexity is created with the additional crossing of the Northern Rail Line, the overpass structure for buses and a series of messy, complicated noise walls and cuttings.

Large sandstone cuttings run parallel to the M2 Motorway, where the road is lower than the surrounding topography. The natural sandstone is attractive and warmly coloured enriching the visual travel experience. The cuttings also create a hard edge, restricting the motorist views of the M2 Motorway. In multiple locations the cuttings have been stabilised with shotcrete creating a dull, colourless vertical or near-vertical wall. Often vegetation is visible at the top of the cuttings, softening the overall effect.

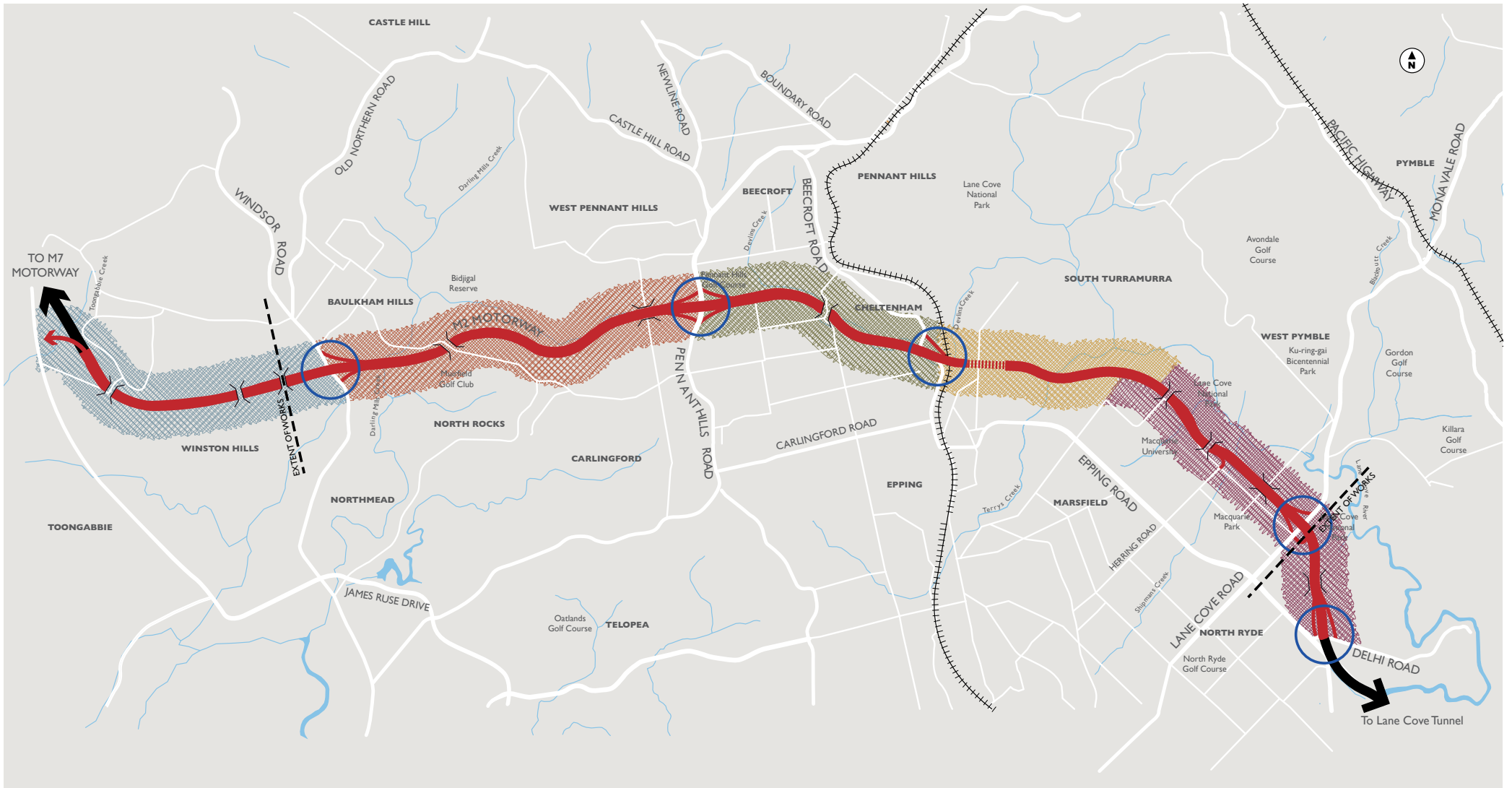


Figure 32 – Contextual analysis showing location of five precincts along M2 Motorway route

Source: HBO+EMTB

- M2 Motorway
- Norfolk Tunnel
- Overpass / Underpass
- Major Intersection
- Precinct 1: Old Windsor Road - Windsor Road Interchange: Cumberland Plain
- Precinct 2: Windsor Road - Pennant Hills Road: Bushland Interface
- Precinct 3: Pennant Hills Road - Beecroft Road: Suburban - Forest Interface
- Precinct 4: Beecroft Road/Devilins Creek - Terrys Creek/Crimea Road: Suburban Bushland Interface
- Precinct 5: Terrys Creek/Crimea Road - Delhi Road: Urban Bushland Interface

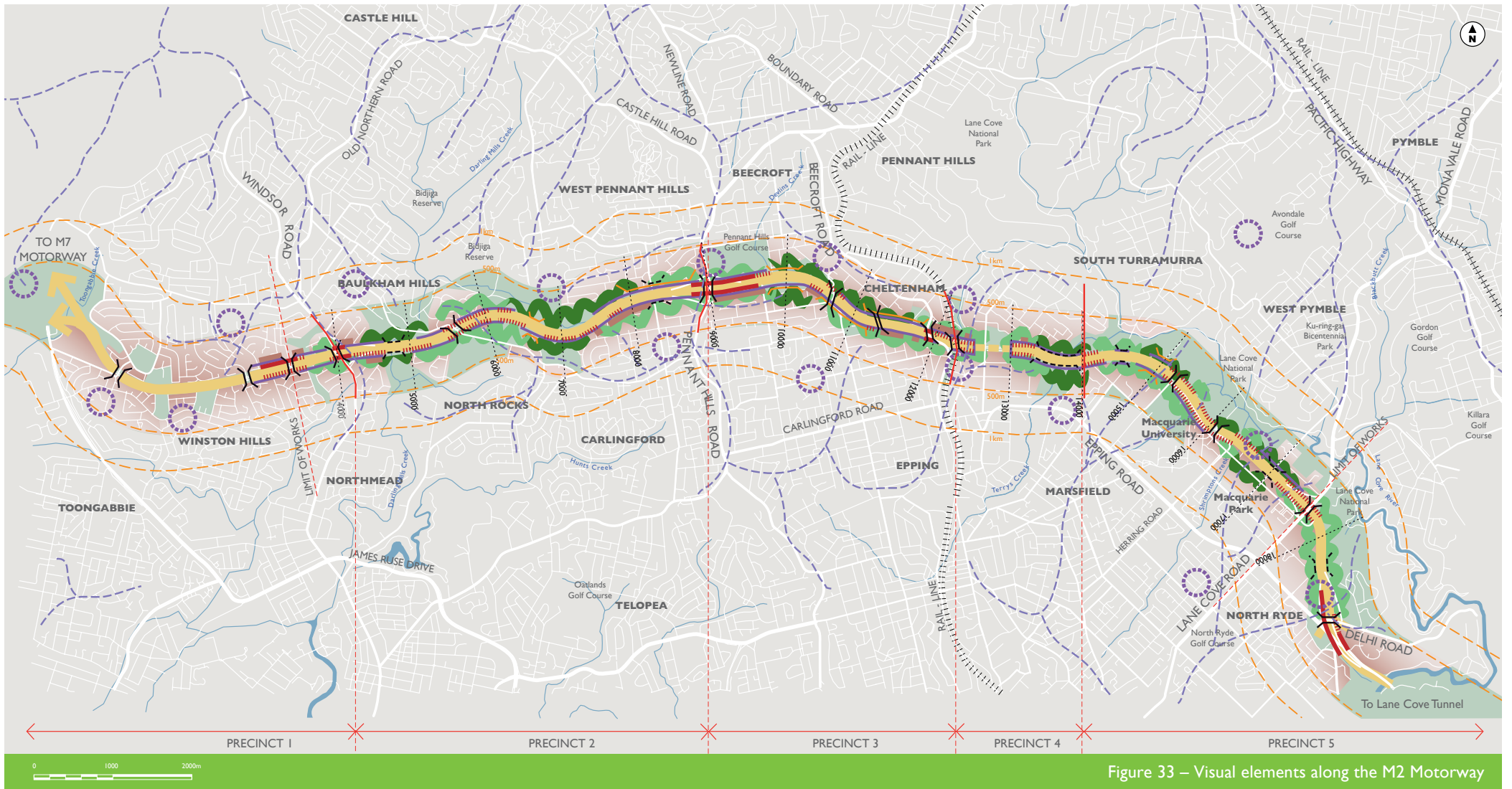


Figure 33 – Visual elements along the M2 Motorway

Source: HBO+EMTB

- |  |   |
|--|---|
| M2 Motorway  | Underpass   |
| M2 Tunnel  | Embankments (fill)                                  |
| Properties immediately adjoining M2 corridor with minimal buffer | Cuttings  |
| Properties potentially overlooking corridor                      | Retaining walls                                     |
| Parklands, golf courses and open spaces                          | Noise walls   |
| Low density vegetation   | Ridge lines   |
| Bridge overpass  | Views of M2 Motorway from local road or over-Bridge |
|  | High points   |

## 9.6.2 Impact assessment

The undertaking of the visual assessment, landscape and urban design concept involved an iterative process in which preliminary information was provided to highlight key issues and constraints. Critical issues were then integrated into the engineering design. This process enabled the road designs to be refined as they develop, thereby minimising the potential visual impact.

As the works are an upgrade of an existing facility, rather than new infrastructure element, the visual impact of the upgrade is limited. The impacts are largely restricted to the immediate M2 Motorway neighbours, where the scale of change is most evident.

The road context is associated with natural communities, including the Lane Cove National Park, Devlins Creek Valley or the Darling Mills Creek Valley. The suburban development adjacent to the M2 corridor is also an environment in which trees are dominant native and exotic species. The upgrade nature of this project means that to some extent the ability to substantially influence the degree of change is minimal. As the general alignment is a given, the primary impacts are already experienced and the extents to which modifications can occur are limited.

### Visual Assessment

Visual impacts are assessed in two ways, from the perspective of:

- The M2 Motorway viewer – the M2 corridor’s neighbours.
- The M2 Motorway user – those travelling along the road.

The road viewer has been the primary consideration in terms of the assessment due to the permanent nature of the impacts experienced by this viewer. Visual impacts experienced as a result of the upgrade are associated with the following areas:

- Construction and/or realignment of noise walls, resulting in potential increases in scale, visual bulk of the structures when viewed from both within and outside the corridor.
- Changes to cutting profiles and their treatment.
- Changes to bridges involving the widening of existing structures and the support structures needed to facilitate this.
- Widening of pavement extents increase the expanse of road pavement, visible primarily from within the M2 corridor by the road user.
- Construction of retaining walls to fill embankments, minimising vegetation loss but introducing a built element.
- Loss of vegetation cover, potentially revealing more of the road and its structures to the adjoining residences which have become accustomed to the vegetative buffer.

In addition to these direct impacts there are short term indirect impacts caused by the need for construction compound sites both within and or adjoining the road corridor. Construction compound sites include the construction of temporary site sheds and amenities, provision of lay down areas for storage of structures such as bridge girders, culverts, car parking and the like.

Visual impacts associated with such facilities include:

- Clearing of lands of existing screening vegetation.
- Construction of temporary structures with potential to overlook or be overlooked by adjacent properties.

The visual assessment methodology comprised of three distinct parts, which are:

- Understanding of context, setting, and key view field – acknowledging the key physical attributes of the area and understanding the relationship of the M2 corridor to the nearby properties.
- Assessment of the proposed concept – visual sensitivity and visual magnitude are assessed using a rating system then combined to form an overall rating.
- Recommendations of opportunities/treatments to address impacts. Having identified the issue and the level of visual impact, designs were undertaken to avoid, reduce, and where possible remedy or offset, significant negative or adverse effects on the landscape.

The visual impact assessment summary is presented in Tables 87 to 96.

The following key was used in the assessment of impacts:

- Visual Sensitivity: Ne = Negligible; VL = Very Low; L = Low; ML = Medium Low; M = Medium; MH = Medium High; H = High; VH = Very High.
- Nature of Impact: A = Adverse; N = Neutral; B = Beneficial.
- Station: EB – East Bound – Works widened beyond east bound carriageway. WB – West Bound - Works widened beyond east bound carriageway.

PRECINCT 1 – Old Windsor Road to Windsor Road Windsor Road interchange

Table 87 Precinct 1 visual impact assessment summary

| Station        | Location  | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments  |
|----------------|---|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|---|
|                |   | A                | N | B |                    |                                     |                                  |   |   |
| 3550–3640 (EB) | Windsor Road EB Off-Ramp (No. 14–22 Craig Avenue to 22 Livingstone Avenue)  |                  |   |   | HM                 | H                                   | H                                | <ul style="list-style-type: none"> <li>An existing 4–7 metre high wall would increase to 7–11 metres high + 4 metre noise wall along property boundaries.</li> <li>Loss of existing embankment and screen planting above retaining wall.</li> </ul>   | <ul style="list-style-type: none"> <li>Design treatment of noise walls and retaining walls may consider use of texture, materials and colour to reduce mass of new walls.</li> <li>Offset from boundary to be maximised to allow revegetation/ screen planting to occur.</li> </ul> |
| 3600 EB/WB     | Entry/exit to off ramps (M2 Motorway viewer)                                |                  |   |   | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Construction of Toll gantry may result in light spill beyond the corridor.</li> </ul>  | <ul style="list-style-type: none"> <li>Design gantry and associated lighting so that gantry is simple, clean structure and lighting is focused and is of a cut off type that minimises light spill.</li> </ul>  |
|                | (M2 Motorway user)  |                  |   |   | M                  | L                                   | ML                               | <ul style="list-style-type: none"> <li>Structure may be visually obtrusive within the corridor</li> </ul>   | <ul style="list-style-type: none"> <li>Design gantry so that a simple, clean light profile is achieved.</li> </ul>  |
| 3640–3770 (EB) | Windsor Road EB Off-Ramp (No. 12–20 Livingstone Avenue to 3 Horwood Avenue) |                  |   |   | H                  | HM                                  | H                                | <ul style="list-style-type: none"> <li>Between stations 3640–3770 the existing walls range between 0–7 metres high and would increase to 8.5–11 metres high + 4 metre noise wall, leaving a 3.5–4 metre wide green corridor behind noise wall.</li> <li>Loss of existing embankment and screen planting behind noise wall.</li> </ul> | <ul style="list-style-type: none"> <li>Design treatment of noise walls and retaining walls may consider use of texture, materials and colour to reduce mass of new walls.</li> <li>Offset from boundary to be maximised to allow revegetation/ screen planting.</li> </ul>          |

| Station          | Location   | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments  |
|------------------|--|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|---|
|                  |  | A                | N | B |                    |                                     |                                  |   |   |
| 3700 (WB)        | Windsor Road WB On-Ramp (Junction Road and Goodin Road)                      |                  |   |   | HM                 | H                                   | H                                | <ul style="list-style-type: none"> <li>An existing 6 metre high wall would increase to 10 metres high + 4 metre noise wall.</li> <li>Loss of existing embankment and screen planting behind noise wall but potential to retain verge planting.</li> <li>There is no opportunity for additional screen planting to top of wall in current proposal.</li> </ul> | <ul style="list-style-type: none"> <li>Acrylic noise walls may be considered where solar access is reduced to adjacent properties (subject to other project priorities).</li> <li>Potential to widen the verge, on the north side of Junction Road to allow the establishment of screen planting at the base of the retaining wall to be reviewed with agencies.</li> </ul> |
| 3730 (WB)        | Windsor Road WB On-Ramp (Junction Road)                                      |                  |   |   | H                  | H                                   | H                                | <ul style="list-style-type: none"> <li>A new 3.5 metre high wall + 4 metre noise wall would move closer to adjacent properties.</li> <li>Loss of existing embankment planting behind noise wall.</li> </ul>   | <ul style="list-style-type: none"> <li>Provide additional vegetation behind noise wall for screening.</li> <li>Potential to widen verge, on north side of Junction Road to allow the establishment of screen planting at the base of the retaining wall to be reviewed with agencies.</li> </ul>  |
| 3770–3820 (EB)   | Windsor Road EB Off-Ramp – 3 Horwood Ave to 8 Livingstone Ave Baulkham Hills |                  |   |   | H                  | H                                   | H                                | <ul style="list-style-type: none"> <li>A new 6–7 metre high wall + 4 metre noise wall would be introduced, leaving a 0–3.5 metre wide green corridor behind wall.</li> <li>Loss of existing embankment planting behind noise wall.</li> </ul>   | <ul style="list-style-type: none"> <li>Design treatment of noise walls and retaining walls may consider use of texture, materials and colour to reduce mass of new walls.</li> <li>Provide additional vegetation behind noise wall for screening.</li> </ul>  |
| 3700– 4000 EB/WB | Adjacent on/off ramps (M2 Motorway user)                                     |                  |   |   | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Construction of new retaining walls adjacent the main alignment both east and west bound.</li> <li>Expansion of M2 Motorway footprint.</li> </ul>  | <ul style="list-style-type: none"> <li>New alignment would see revisions to the existing shotcrete abutment which would improve the visual appearance of the abutment integrating it with the bridge.</li> <li>Landscape can be incorporated adjacent walls to create a distinct interchange character.</li> </ul>  |

| Station               | Location  | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments  |
|-----------------------|---|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|---|
|                       |   | A                | N | B |                    |                                     |                                  |   |   |
| 3820-3880 (EB)        | Windsor Road EB Off-Ramp – No. 2 to 8 Livingstone Avenue Baulkham Hills Model Farms |                  |   |   | H                  | H                                   | H                                | <ul style="list-style-type: none"> <li>A new 7-7.5 metre high wall + 4m noise wall would be introduced along property boundary.</li> <li>Loss of green buffer zone between M2 Motorway.</li> </ul>  | <ul style="list-style-type: none"> <li>Design treatment of noise walls and retaining walls may consider use of texture, materials and colour to reduce mass of new walls.</li> <li>Potential to provide screen planting as part of property adjustments to minimise impacts.</li> </ul>   |
| 3550-4000 (EB and WB) | Verge of Motorway Corridor (M2 Motorway user)                                       |                  |   |   | ML                 | M                                   | M                                | <ul style="list-style-type: none"> <li>Construction of new noise wall and removal of patchy landscape</li> </ul>  | <ul style="list-style-type: none"> <li>Enhance noise wall treatment and simplification of landscape and barrier treatments would improve visual appearance.</li> </ul>  |
| 3900 (WB)             | Windsor Road WB On-Ramp – Junction Road (Murrills Crescent) Model Farms             |                  |   |   | H                  | H                                   | H                                | <ul style="list-style-type: none"> <li>Existing embankment and screen planting would have to be removed.</li> <li>A new 3.5 metre high wall + 4 metre high noise wall would have potentially significant visual impact along Junction Road.</li> </ul>  | <ul style="list-style-type: none"> <li>Acrylic noise walls may be considered where solar access is reduced to adjacent properties (subject to other project priorities).</li> <li>Potential to widen verge, on north side of Junction Road to allow the establishment of screen planting at the base of the retaining wall to be reviewed with agencies.</li> </ul> |
| 3900 (EB)             | Windsor Road EB Off-Ramp  |                  |   |   | HM                 | H                                   | H                                | <ul style="list-style-type: none"> <li>A new 3.5 metre high wall + 4 metre noise wall would have potentially significant visual impact to properties on Livingstone Avenue.</li> <li>Existing corridor for screen planting visible from adjacent open space would be lost.</li> <li>Large level difference between off-ramp and adjacent land.</li> </ul> | <ul style="list-style-type: none"> <li>Review grading to minimise scale of wall and provide usable space on adjoining land.</li> </ul>  |
| 4000 (WB)             | Windsor Road On-Ramp/ Vacant Land Model Farms                                       |                  |   |   | H                  | H                                   | H                                | <ul style="list-style-type: none"> <li>Road alignment of on-ramp would be closer to adjacent properties.</li> <li>A new 2 metre high wall (approximately) + 4 metre noise wall have potentially significant impact to adjacent property.</li> </ul>   | <ul style="list-style-type: none"> <li>Provide additional planting for screening at base of new wall.</li> <li>Opportunity for surplus land to be used for noise wall housing or similar as a show case for housing adjoining arterial roads.</li> </ul>  |

| Station   | Location                     | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues   | Opportunities/Potential treatments  |
|-----------|------------------------------|------------------|---|---|--------------------|-------------------------------------|----------------------------------|--|---|
|           |                              | A                | N | B |                    |                                     |                                  |  |   |
| 4000 (EB) | Windsor Road Bridge widening |                  |   |   | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Increase in scale, width of the existing bridge.</li> </ul> | <ul style="list-style-type: none"> <li>Provide a structure that is consistent with the proportions of the existing structure and its elements.</li> <li>Provides a smooth clean transition between the old and new structures.</li> </ul> |

Table 88 Precinct 1 site compounds – temporary construction activities

| Station   | Location             | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|-----------|----------------------|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|--|
|           |                      | A                | N | B |                    |                                     |                                  |   |  |
| 4000 (WB) | Windsor Road (north) |                  |   |   | M                  | M                                   | M                                | <p>Site compound to be established for duration of works, including: team office and lay down area.</p> | <p>Siting of buildings to consider impact of overlooking of adjacent properties.</p> <p>Siting of noise generating activities (lay down area) to be sited as far from adjoining residences as possible.</p> <p>Temporary screening to minimise dust and noise impacts.</p> |

*Visual Sensitivity*

*Ne = Negligible; VL = Very Low; L = Low; ML = Medium Low; M = Medium; MH = Medium High; H = High; VH = Very High*

*Nature of Impact*

*A = Adverse; N = Neutral; B = Beneficial*

*Station*

*EB – Eastbound – Works widened beyond east bound carriageway.*

*WB – Westbound – Works widened beyond east bound carriageway.*

PRECINCT 2 – Windsor Road to Pennant Hills Road – bushland interface

Table 89 Precinct 2 visual impact assessment summary

| Station          | Location   | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues   | Opportunities/Potential treatments   |
|------------------|--|------------------|---|---|--------------------|-------------------------------------|----------------------------------|--|--|
|                  |  | A                | N | B |                    |                                     |                                  |  |  |
| 4100–4500 (WB)   | 257 Windsor Road Northmead                       |                  |   |   | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Existing noise walls replaced and increased in height.</li> </ul>   | <ul style="list-style-type: none"> <li>Alignment and supports to be considered in relation to adjoining residences. A simple, smooth, even alignment would be adopted and the impacts of the supports minimised.</li> <li>Potential to integrate design with the interchange character to be considered.</li> </ul>              |
| 4550 – 4750 (EB) | Darling Mills Creek Bridge (M2 Motorway Viewer)  |                  |   |   | M                  | L                                   | ML                               | <ul style="list-style-type: none"> <li>Construction of bridge widening would conflict with existing vegetation under bridge.</li> <li>The EB widening, poses a low visual impact due to sufficient screening provided by the surrounding bushland from adjoining residences.</li> <li>Visual amenity under bridge would consider existing walking tracks.</li> </ul> | <ul style="list-style-type: none"> <li>Care needs to be taken with the design of the bridge structure so that it does not detract from the natural environment and is consistent in character with the existing.</li> <li>Clearing for construction access would be limited and mature trees retained where practical</li> </ul> |
|                  | (M2 Motorway User)                               |                  |   |   | M                  | L                                   | ML                               | <ul style="list-style-type: none"> <li>Pavement area increased</li> </ul>  | <ul style="list-style-type: none"> <li>Detailing of existing bridge parapets retained to maintain visual character of existing structure.</li> </ul>   |
| 4850–4950 (EB)   | Retaining wall                                   |                  |   |   | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Construction of retaining walls in relatively steep and inaccessible terrain may result in loss of vegetation cover beyond work footprint.</li> </ul>   | <ul style="list-style-type: none"> <li>Design of retaining wall may consider use of texture and materials to reduce the scale of retaining wall.</li> <li>Vegetation to be reinstated where damaged by works.</li> </ul>   |
| 5100–5400 (EB)   | Darling Mills Forest/ Renown Road Baulkham Hills |                  |   |   | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Existing retaining and noise walls are to be relocated approximately 3.5 metres closer to residential properties.</li> </ul>  | <ul style="list-style-type: none"> <li>Improve design treatment of noise walls</li> <li>Reinstate cleared vegetation behind noise wall to provide screening from residences.</li> </ul>  |

| Station        | Location   | Nature of impact |   |   | Visual sensitivity                        | Scale or magnitude of visual impact       | Overall ranking of visual impact          | Issues   | Opportunities/Potential treatments   |
|----------------|--|------------------|---|---|---|---|---|--|--|
|                |  | A                | N | B |   |   |   |  |  |
| 5400–5700 (EB) | Renown Road/ Mill Drive Baulkham Hills                 |                  |   |   | L (others)<br><br>HM (Property No. 27–31) | L (others)<br><br>HM (Property No. 27–31) | L (others)<br><br>HM (Property No. 27–31) | <ul style="list-style-type: none"> <li>Existing noise walls are at least 15m away from adjacent properties. The noise walls are being relocated closer to adjoining properties. No.27–31 Mill Drive are most impacted.</li> <li>Loss of buffer vegetation along embankment.</li> </ul> | <ul style="list-style-type: none"> <li>Alignment and supports to be considered in relation to adjoining residences. A simple, smooth, even alignment would be adopted and the impacts of the supports minimised.</li> <li>Provide vegetation behind noise wall to provide screening to adjacent residences where space permits.</li> </ul> |
| 5500           | Barclay Road Bridge (M2 Motorway User)                 |                  |   |   | M   | L   | ML  | <ul style="list-style-type: none"> <li>–Bridge is to be lengthened, requiring removal of existing abutment, and alteration to spans resulting in uneven spans.</li> </ul>  | <ul style="list-style-type: none"> <li>Structural detailing to consider the form of the leading edge of the new structure so that a consistent edge line is created.</li> <li>Bridge design is to integrate with that of the existing structures including, rails, throw screens parapets etc.</li> </ul>                                  |
| 5700–5950 (EB) | Mill Drive Baulkham Hills                              |                  |   |   | L   | L   | L   | <ul style="list-style-type: none"> <li>Existing noise walls are being relocated up to 4 metres closer to adjacent property.</li> </ul>   | <ul style="list-style-type: none"> <li>Alignment and supports to be considered in relation to adjoining residences. A simple, smooth, even alignment would be adopted and the impacts of the supports minimised.</li> </ul>  |
| 5900–6230 (WB) | Dale Place/Muirfield High School North Rocks           |                  |   |   | L   | L   | L   | <ul style="list-style-type: none"> <li>Existing noise wall is being relocated up to 3 metres closer to adjacent property.</li> </ul>   | <ul style="list-style-type: none"> <li>Reinstate cleared vegetation behind noise wall to provide screening to adjacent residences.</li> </ul>  |
| 6220–6560 (WB) | Muirfield High School North Rocks (M2 Motorway viewer) |                  |   |   | L   | NE  | L   | <ul style="list-style-type: none"> <li>New embankment is being proposed up to 5 metres closer to adjacent property.</li> </ul>   | <ul style="list-style-type: none"> <li>Provide additional vegetation along top of embankment.</li> </ul>   |
|                | (M2 Motorway user)                                     |                  |   |   | M   | ML  | ML  | <ul style="list-style-type: none"> <li>Additional carriageway and widening of cutting</li> </ul>   | <ul style="list-style-type: none"> <li>Potential to steepen lower half of cut and flatten top to enhance revegetation and screening of walls</li> </ul>  |

| Station        | Location  | Nature of impact |   |   | Visual sensitivity                  | Scale or magnitude of visual impact  | Overall ranking of visual impact    | Issues   | Opportunities/Potential treatments   |
|----------------|---|------------------|---|---|-------------------------------------|--------------------------------------|-------------------------------------|--|--|
|                |   | A                | N | B |                                     |                                      |                                     |  |  |
| 6480–6740 (WB) | Yale Close Bridge   |                  |   |   | M                                   | ML                                   | M                                   | <ul style="list-style-type: none"> <li>Retaining and noise walls, and bridge are being relocated up to 4 metres closer to adjacent properties in Yale Place.</li> </ul>  | <ul style="list-style-type: none"> <li>Reinstate cleared vegetation to provide additional screening of bridge from adjoining residences.</li> <li>Noise and retaining walls may be designed using either colour, materials or texture consistent with the existing bridge and which minimise impacts on adjacent residences</li> </ul> |
| 6700–7270 (WB) | Bidjigal Reserve/Royal Institute for Deaf and Blind Children, North Rocks |                  |   |   | L                                   | L                                    | L                                   | <ul style="list-style-type: none"> <li>Existing noise wall is being relocated along top of new embankment.</li> <li>6850 – 6920 retaining wall is being constructed with noise wall attached.</li> </ul>                   | <ul style="list-style-type: none"> <li>Reinstate cleared vegetation to provide additional screening of bridge from adjoining residences. Retaining wall /noise wall may consider use of colour, texture or materials to reduce visual bulk.</li> </ul>   |
| 7370–7640 (WB) | Wilshire Avenue/Morton Avenue/Carmen Drive Carlingford                    |                  |   |   | L                                   | VL                                   | L                                   | <ul style="list-style-type: none"> <li>3.5m lane widening with new embankment.</li> <li>Existing noise wall is being relocated up to 3.5 metres closer to adjacent property.</li> </ul>                                    | <ul style="list-style-type: none"> <li>Provide additional vegetation behind noise wall for screening.</li> </ul>   |
| 7600–7950 (EB) | Bushland  |                  |   |   | L                                   | NE                                   | L                                   | <ul style="list-style-type: none"> <li>Existing noise wall is being relocated into bushland.</li> </ul>  | <ul style="list-style-type: none"> <li>Reinstate cleared vegetation behind noise wall for screening.</li> </ul>  |
| 7630 (WB)      | Morton Avenue Carlingford   |                  |   |   | L                                   | NE                                   | L                                   | <ul style="list-style-type: none"> <li>The widening of the EB lane would have some impact to views on Morton Avenue. There are currently filtered views of the M2 Motorway traffic through existing vegetation.</li> </ul> | <ul style="list-style-type: none"> <li>Provide additional vegetation behind noise wall for screening.</li> </ul>   |
| 7700–8050 (WB) | 29–31 Carmen Drive Carlingford  |                  |   |   | H (Property No.29–31)<br>L (others) | HM (Property No.29–31)<br>L (others) | H (Property No.29–31)<br>L (others) | <ul style="list-style-type: none"> <li>Existing noise walls are being increased in height.</li> <li>Increase in wall height walls may affect solar access into property No. 29 and 31.</li> </ul>                          | <ul style="list-style-type: none"> <li>Acrylic noise walls may be considered where solar access is affected</li> <li>Provide additional vegetation behind noise wall for screening.</li> </ul>   |

Table 90 Precinct 2 site compounds – temporary construction activities

| Station | Location  | Nature of impact |  |  | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues   | Opportunities/Potential treatments   |
|---------|---|------------------|--|--|--------------------|-------------------------------------|----------------------------------|--|--|
| 4550    | Darling Mills eastern end of Windsor Road Slip Lane |                  |  |  | ML                 | M                                   | M                                | <ul style="list-style-type: none"> <li>Site compound to be established for: site sheds and lay down area.</li> <li>Impact on existing vegetation cover for construction access.</li> </ul>   | <ul style="list-style-type: none"> <li>Limit footprint to a minimum maintaining as much canopy vegetation as possible.</li> <li>Minimise earthworks to retain natural topographical features.</li> </ul> |
| 5500    | Barclay Road / Perry Street                         |                  |  |  | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Site compound to be established for: stockpile and handling area.</li> <li>Removal of existing mound and vegetation to Perry Street frontage.</li> </ul>  | <ul style="list-style-type: none"> <li>Potential to retain vegetation on periphery of site.</li> <li>Once complete area to be revegetated enhancing landscape character of area.</li> </ul>              |
| 6840    | Yale Close Bridge Compound (Duncan Place)           |                  |  |  | H                  | M                                   | MH                               | <ul style="list-style-type: none"> <li>Site Compound to be established for: stockpile and handling area.</li> <li>Access track along boundary.</li> <li>Potential loss of existing vegetation cover between property and M2 Motorway.</li> </ul> | <ul style="list-style-type: none"> <li>Potential to retain vegetation on periphery of site.</li> <li>Once complete area to be revegetated enhancing landscape character of area.</li> </ul>              |

*Visual Sensitivity*

*Ne = Negligible; VL = Very Low; L = Low; ML = Medium Low; M = Medium; MH = Medium High; H = High; VH = Very High*

*Nature of Impact*

*A = Adverse; N = Neutral; B = Beneficial*

*Station*

*EB – Eastbound – Works widened beyond east bound carriageway.*

*WB – Westbound – Works widened beyond east bound carriageway.*

PRECINCT 3 – Pennant Hills Road to Beecroft Road/ Devlins Creek – suburban forest

Table 91 Precinct 3 visual impact assessment summary

| Station                | Location                              | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|------------------------|---------------------------------------|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|--|
|                        |                                       | A                | N | B |                    |                                     |                                  |   |  |
| 9650 – 9850 (WB)       | Lamorna Avenue/Orchard Road Beecroft  |                  |   |   | H                  | M                                   | MH                               | <ul style="list-style-type: none"> <li>Existing noise wall backs onto houses with minimal offset from house wall.</li> <li>Noise wall may be relocated onto boundary potentially impacting existing screening.</li> </ul> | <ul style="list-style-type: none"> <li>Improve treatment of noise walls and provide additional screen planting behind noise wall. This may be undertaken as property adjustments.</li> </ul>   |
| 9670–10260 (WB)        | Recreation Reserve Beecroft/ Bridge   |                  |   |   | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Existing noise wall is being relocated up to 3 metres into bushland.</li> </ul>  | <ul style="list-style-type: none"> <li>Revegetate in response to disturbance to natural bushland.</li> </ul>   |
| 9850–10350 (EB)        | Chilworth Recreation Reserve Beecroft |                  |   |   | L                  | ML                                  | ML                               | <ul style="list-style-type: none"> <li>Existing noise walls are to be replaced and increased in height.</li> </ul>  | <ul style="list-style-type: none"> <li>Acrylic noise walls may be considered to allow solar access and to improve connection with adjoining environment (subject to other project priorities).</li> </ul>  |
| 9900–10100 (EB and WB) | Devlin Creek Bridge                   |                  |   |   | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Devlins Creek Bridge widening to western side including construction of new piers, girders, deck and noise wall.</li> <li>Widened in centre lane removing light well.</li> </ul>   | <ul style="list-style-type: none"> <li>Consider design of bridge to be consistent with existing.</li> <li>Potential to improve linkages with natural environment with noise wall through use of acrylic panels where noise walls are replaced on bridge (subject to other project priorities).</li> <li>Maintain access under new bridge structure.</li> </ul> |

| Station          | Location   | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|------------------|--|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|--|
|                  |  | A                | N | B |                    |                                     |                                  |   |  |
| 10260–10550 (WB) | Allerton Road to Kirkham Street Bridge Beecroft (M2 Motorway user) |                  |   |   | ML                 | M                                   | M                                | <ul style="list-style-type: none"> <li>Existing noise wall is retained and cutting steepened. Cutting has a substantial area if shotcrete which would need to be addressed in the new cutting.</li> </ul>   | <ul style="list-style-type: none"> <li>Provide additional vegetation behind noise wall for screening.</li> <li>Where structural support needs to be provided to cut face this would be undertaken in accordance with RTA Shotcrete Guidelines. Extent of shotcrete is to be minimised and integrated with cut face.</li> </ul> |
| 10550–10800      | Kirkham Street Bridge Beecroft to Meadow Close Roselea             |                  |   |   | M                  | L                                   | ML                               | <ul style="list-style-type: none"> <li>Existing noise wall is being relocated up to 2.5 metres closer to adjacent properties.</li> <li>Lane widening over open canal and embankment.</li> <li>Kirkham Street Bridge is to be lengthened, including removal and replacement of southern pier.</li> </ul> | <ul style="list-style-type: none"> <li>Design of new structure over drainage canal to be carefully considered to reduce apparent scale of structure and maintain drainage capacity.</li> <li>Bridge structure to be integrated with existing through use of common parapet and girder profile to leading edge.</li> </ul>      |
| 10800 (WB)       | 7 Meadow Close Roselea   |                  |   |   | HM                 | L                                   | M                                | <ul style="list-style-type: none"> <li>Proposed widening would move 4 metre high noise wall closer to residential properties.</li> <li>Existing noise wall and concrete drainage canal are presently visually dominant as they run past residential properties.</li> </ul>                              | <ul style="list-style-type: none"> <li>Noise wall and retaining walls may consider the use of materials, colour and/or texture to minimise scale of walls.</li> <li>Potential for improved screen planting.</li> </ul>   |
| 10800–11150 (WB) | Meadow Close to Kerry Avenue bushland Roselea                      |                  |   |   | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>New noise wall and retaining walls are being relocated up to 2.5 metres closer to adjacent properties and bushland.</li> </ul>   | <ul style="list-style-type: none"> <li>Noise wall and retaining walls to consider the use of colour and/or texture to minimise scale of walls.</li> </ul>  |
| 11150–11300 (WB) | Wycombe Street Epping  |                  |   |   | L                  | NE                                  | L                                | <ul style="list-style-type: none"> <li>Lane widening occurs within existing footprint, no change in noise wall location required.</li> </ul>  | <ul style="list-style-type: none"> <li>Potential to improve vegetation cover and remove weeds.</li> </ul>  |

| Station          | Location                                    | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|------------------|---|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|--|
|                  |   | A                | N | B |                    |                                     |                                  |   |  |
| 11300–11350 (WB) | Wycombe Street to Kent Street Bridge Epping |                  |   |   | ML                 | ML                                  | ML                               | <ul style="list-style-type: none"> <li>Existing noise wall is being relocated up to 2m closer to adjacent property.</li> <li>Existing basin cleared and improvements made.</li> </ul> | <ul style="list-style-type: none"> <li>Provide screen planting along property boundary to screen noise walls.</li> </ul> |

Table 92 Precinct 3 site compounds – temporary construction activities

| Station     | Location          | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|-------------|-------------------|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|--|
|             |                   | A                | N | B |                    |                                     |                                  |   |  |
| 9850–10200  | Devlins Ck Bridge |                  |   |   | ML                 | M                                   | M                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Site shed and lay down area.</li> <li>Loss of existing vegetation. Impacts on local pedestrian access.</li> </ul> | <ul style="list-style-type: none"> <li>Maximise retention of mature canopy trees.</li> <li>Strip and stockpile site soil to retain soil seed bank.</li> <li>Reinstate pedestrian access improving accessibility where possible.</li> </ul> |
| 11700–11800 | Barombah Road     |                  |   |   | HM                 | ML                                  | M                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Site shed and lay down area.</li> <li>Loss of existing vegetation.</li> </ul>                                     | <ul style="list-style-type: none"> <li>Maximise retention of existing vegetation along street frontage.</li> <li>Reinstate and improve vegetation cover post construction</li> </ul>   |

*Visual Sensitivity*

*Ne = Negligible; VL = Very Low; L = Low; ML = Medium Low; M = Medium; MH = Medium High; H = High; VH = Very High*

*Nature of Impact*

*A = Adverse; N = Neutral; B = Beneficial*

*Station*

*EB – Eastbound – Works widened beyond east bound carriageway.*

*WB – Westbound – Works widened beyond east bound carriageway.*

PRECINCT 4 – Beecroft Road /Devlins Creek to Terrys Creek – suburban bushland interface

Table 93 Precinct 4 visual impact assessment summary

| Station           | Location                                       | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues   | Opportunities/Potential treatments  |
|-------------------|--|------------------|---|---|--------------------|-------------------------------------|----------------------------------|--|---|
|                   |  | A                | N | B |                    |                                     |                                  |  |   |
| 12000 to 12300    | Beecroft Road interchange (M2 Motorway User)   |                  |   |   | ML                 | MH                                  | M                                | <ul style="list-style-type: none"> <li>Removal of existing busway bridge.</li> <li>Expansion of detention basin in central island.</li> </ul>      | <ul style="list-style-type: none"> <li>Potential for enhanced landscape treatments.</li> <li>Removal of bridge enhances the skyline at this point by reducing visual clutter.</li> </ul>  |
| 12440–12600 (VWB) | Somerset Street Epping (M2 Motorway Viewer)    |                  |   |   | M                  | NE                                  | NE                               | <ul style="list-style-type: none"> <li>Existing noise walls remain unchanged along Somerset Street.</li> </ul>                                     | <ul style="list-style-type: none"> <li>Maintain existing vegetation cover in front of noise wall</li> </ul>   |
|                   | (M2 Motorway User)                             |                  |   |   | ML                 | M                                   | M                                | <ul style="list-style-type: none"> <li>Rock cutting below wall is steepened.</li> </ul>  | <ul style="list-style-type: none"> <li>Stabilisation treatments to be minimised. If shotcrete is to be used treatment would be in accordance with RTA design guidelines and part of an integrated treatment to the tunnel portal.</li> </ul>                          |
| 12620–13080       | Norfolk Tunnel North Epping (M2 Motorway User) |                  |   |   | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Additional lane and cycle lane in Norfolk Tunnel requiring widening of tunnel including portals.</li> </ul> | <ul style="list-style-type: none"> <li>Rework of tunnel lining and ventilation.</li> <li>Consider potential to create and strengthen character of tunnel portals. Portals to integrate requirements for rock fall and the like with the revised structure.</li> </ul> |
| 13080–13250 (EB)  | Devon Street Epping (M2 Motorway viewer)       |                  |   |   | HM                 | NE                                  | NE                               | <ul style="list-style-type: none"> <li>Existing noise walls remain unchanged along Devon Street.</li> </ul>  | <ul style="list-style-type: none"> <li>–Enhance screening of existing wall</li> </ul>   |

| Station                                 | Location                                    | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues   | Opportunities/Potential treatments  |
|---|---|------------------|---|---|--------------------|-------------------------------------|----------------------------------|--|---|
|   |   | A                | N | B |                    |                                     |                                  |  |   |
|   | (M2 Motorway User)                          |                  |   |   | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Rock cutting below wall is steepened</li> </ul>   | <ul style="list-style-type: none"> <li>Stabilisation treatments to be minimised. If shotcrete is to be used treatment would be in accordance with RTA design guidelines and part of an integrated treatment to the tunnel portal.</li> </ul>    |
| 13080–13250 (VWB)                       | Somerset Street Epping (M2 Motorway viewer) |                  |   |   | HM                 | NE                                  | NE                               | <ul style="list-style-type: none"> <li>Existing noise walls are being retained unchanged along Somerset Street.</li> </ul>   | <ul style="list-style-type: none"> <li>–Enhance screening of existing wall</li> </ul>   |
|   | (M2 Motorway User)                          |                  |   |   | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Rock cutting below wall is steepened.</li> </ul>  | <ul style="list-style-type: none"> <li>Stabilisation treatments to be minimised. If shotcrete is to be used treatment would be in accordance with RTA design guidelines and part of an integrated treatment to the tunnel portal.</li> </ul>    |
| 13250–13460 (VWB)                       | Somerset Street Epping                      |                  |   |   | HM                 | M                                   | MH                               | <ul style="list-style-type: none"> <li>Existing noise walls are being relocated closer to properties between 62 –76 Somerset Street.</li> <li>This potentially may impact existing road carriageway width and result in the loss of street trees and screen planting within the adjacent verge.</li> </ul> | <ul style="list-style-type: none"> <li>Improve treatment of noise walls and provide additional screen planting behind noise wall.</li> <li>Potential to widen verge and reduce carriageway width to improve screening of noise wall.</li> </ul> |
| 13460–13680 (VWB)<br>13460 – 13540 (EB) | Terrys Creek Bridge approach                |                  |   |   | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>New bridge alignment would see both retaining and noise walls realigned with impacts on bushland on both side of bridge approach, due to a widened footprint.</li> </ul>  | <ul style="list-style-type: none"> <li>Revegetate bushland adjacent to bridge approaches, strengthening screen planting to reduce impact.</li> <li>Retaining walls may consider colour and/or texture to reduce mass of structure.</li> </ul>   |

| Station          | Location                     | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|------------------|------------------------------|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|--|
|                  |                              | A                | N | B |                    |                                     |                                  |   |  |
| 13540–13680 (EB) | Woodvale Avenue North Epping |                  |   |   | H                  | HM                                  | H                                | <ul style="list-style-type: none"> <li>New road alignment would require noise walls to be relocated closer to adjacent properties. Existing noise walls would move from approximately 10 metres way to 3 metres from property boundaries.</li> <li>Loss in buffer planting.</li> </ul>  | <ul style="list-style-type: none"> <li>Improve treatment of noise walls and provide additional screen planting behind noise wall.</li> </ul>   |
| 13680–13850      | Terrys Creek Bridge          |                  |   |   | ML                 | L                                   | ML                               | <ul style="list-style-type: none"> <li>Residential properties on both sides of bridge have filtered views of bridge and are almost at level with the bridge.</li> <li>Widening the bridge on the northern side would bring the bridge marginally closer to residential properties.</li> <li>Visual amenity under bridge would consider existing walking tracks and aim to minimise disturbance of bushland vegetation.</li> </ul> | <ul style="list-style-type: none"> <li>Acrylic noise walls may be considered where noise walls are adjusted on bridge to reduce visual impact of solid noise walls and improve road user experience (subject to other project considerations).</li> <li>Care needs to be taken with the design of the bridge structure so that it does not detract from the natural environment and is consistent in character with the existing.</li> </ul> |
| 13920–14250 (EB) | Bushland (M2 Motorway User)  |                  |   |   | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Road widening would create a new small embankment along edge of bushland.</li> </ul>   | <ul style="list-style-type: none"> <li>Revegetate embankment providing potential for weed removal and landscape improvement.</li> </ul>  |

Table 94 Precinct 4 site compounds – temporary construction activities

| Station           | Location  | Nature of impact |  | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|-------------------|---|------------------|--|--------------------|-------------------------------------|----------------------------------|---|--|
| 12200–12300       | Area below old bus ramp parallel to Beecroft Road |                  |  | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Site shed and lay down area.</li> <li>Loss of existing vegetation.</li> <li>Cannot be used until demolition is complete affecting staging.</li> </ul> | <ul style="list-style-type: none"> <li>Potential to enhance landscape character and vegetation cover as a result of removal of Bus over bridge.</li> </ul>   |
| 12400–12500 (EB)  | Adjoining Sutherland Road – former compound site  |                  |  | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Site shed and lay down area.</li> <li>Residential properties 30 metres plus from compound</li> </ul>  | <ul style="list-style-type: none"> <li>Potential to enhance landscape character and vegetation cover. Present area is derelict with heavy cover of grass and weeds. May be integrated with adjoining remnant of vegetation.</li> </ul> |
| 13300 – 13500(WB) | Somerset Road (Terrys Creek Approach)             |                  |  | M                  | L                                   | ML                               | <ul style="list-style-type: none"> <li>Site compound to be established for: Site shed and lay down area.</li> <li>Drainage channel which runs through site.</li> </ul>  | <ul style="list-style-type: none"> <li>Potential to enhance visual screening of M2 Motorway noise walls and improve connection with remnant bushland.</li> </ul>   |
| 13750–14050 (WB)  | Terrys Creek                                      |                  |  | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Site shed and lay down area.</li> <li>Overlooked by apartment blocks.</li> <li>Utilises former access track.</li> </ul>                               | <ul style="list-style-type: none"> <li>Potential to enhance visual screening of M2 Motorway noise walls and improve connection with remnant bushland.</li> </ul>   |

*Visual Sensitivity*

*Ne = Negligible; VL = Very Low; L = Low; ML = Medium Low; M = Medium; MH = Medium High; H = High; VH = Very High*

*Nature of Impact*

*A = Adverse; N = Neutral; B = Beneficial*

*Station*

*EB – Eastbound – Works widened beyond east bound carriageway.*

*WB – Westbound – Works widened beyond east bound carriageway.*

PRECINCT 5 – Crimea Road to Delhi Road – urban bushland interface

Table 95 Precinct 5 visual impact assessment summary

| Station          | Location                                | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|------------------|---|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|--|
|                  |   | A                | N | B |                    |                                     |                                  |   |  |
| 14090 (WB)       | Crimea Road and Waterloo Road Marsfield |                  |   |   | L                  | NE                                  | NE                               | There are existing distant views to the Norfolk Road tunnel from the corner of Crimea Road and Waterloo Road. Expansion of the road pavement and changes to tunnel portal would be visible.<br>No change in noise wall height or location is to occur here. | Handling of tunnel portal needs to be considered.  |
| 14200–14550 (EB) | Vimiera Road                            |                  |   |   | ML                 | L                                   | L                                | Retaining wall to be constructed to top of existing fill embankment, adjacent to widened East bound lanes, minimising footprint of works.   | Retaining wall may consider use of materials and/or texture to minimise mass and scale of structure.<br>Revegetation of area cleared for construction would assist in mitigating impacts, screening structure from view. |
| 14260–14400      | Vimiera Road                            |                  |   |   | M                  | M                                   | M                                | Construction of new section of noise wall 3 metres high at top of existing embankment over looked by residential apartments.  | Potential to improve vegetation cover to embankment minimising visibility of wall.   |
| 14260–14400      | Vimiera Road (M2 Motorway user)         |                  |   |   | M                  | M                                   | MH                               | Construction of close coupled noise wall reducing visual connection with context.   | Potential to achieve a consistent maintenance edge treatment.<br>Potential to provide colour and texture in wall to reduce mass and provide interest.  |
| 14550–14850 (EB) | Bushland                                |                  |   |   | L                  | L                                   | L                                | Road widening would create a small to large embankment.<br>Ensure embankment is no steeper than 1 in 2 slope to allow planting.   | Revegetate embankment.   |

| Station          | Location   | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments   |
|------------------|--|------------------|---|---|--------------------|-------------------------------------|----------------------------------|---|--|
|                  |  | A                | N | B |                    |                                     |                                  |   |  |
| 14850–15050 (EB) | Busaco Road Marsfield  |                  |   |   | M                  | L                                   | ML                               | Existing road and noise wall is being relocated closer to adjacent property.<br>Road to be supported by retaining wall due to steep topography and to minimise extent of impact.  | Retaining and noise walls may consider use of materials, colour and/or texture to minimise mass and scale of structure. Walls would be integrated with the existing bridge structure.<br>Provide additional screen planting behind noise wall.           |
| 15200–15280 (EB) | Culloden Road Bridge (M2 Motorway User)                          |                  |   |   | L                  | L                                   | L                                | Existing spill through bridge abutment to be stood vertical to widen opening under bridge   | Exposed shotcrete would be concealed by the use of cladding. Cladding is to be designed to present a smooth even abutment profile that ties in with the adjoining embankment.  |
| 15260–15400 (WB) | Talavera Road Macquarie Park (M2 Motorway user and viewer)       |                  |   |   | L                  | L                                   | L                                | Existing noise wall is being relocated closer to Talavera Road, requiring removal of some vegetation cover.<br>Cutting is to be steepened, potentially increasing visual presence and need for shotcrete type treatments. | Avoid the use of shotcrete on cutting where unavoidable use is to be in accordance with RTA design guidelines.<br>Provide additional screen planting to front and behind noise wall to minimise impacts of wall from within and outside of the corridor. |
| 15500–15700      | Main toll plaza, Talavera Road Macquarie Park (M2 Motorway user) |                  |   |   | L                  | L                                   | L                                | Existing toll awning and booths to be substantially removed with new tolling gantries to be installed.<br>Lanes through toll plaza to be rationalised to enhance user legibility.   | Tolling gantry would be a simple, functional slimline structure with lighting placement considered as part of the overall design.<br>Lighting to be cut off type lighting to minimise light spill.   |
| 15700–16070 (WB) | Talavera Road Macquarie Park                                     |                  |   |   | M                  | MH                                  | MH                               | Existing noise wall is being relocated closer to Talavera Road.<br>Large cutting for lane widening.<br>Loss in street planting and buffer vegetation along Talavera Road.   | Provide additional screen planting behind noise wall to maintain streetscape character.<br>Avoid the use of shotcrete on cutting where unavoidable use is to be in accordance with RTA design guidelines.  |

| Station          | Location                                     | Nature of impact |   |   | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues   | Opportunities/Potential treatments  |
|------------------|--|------------------|---|---|--------------------|-------------------------------------|----------------------------------|--|---|
|                  |  | A                | N | B |                    |                                     |                                  |  |   |
| 16070–16170 (EB) | Christie Road Bridge                         |                  |   |   | L                  | M                                   | ML                               | <ul style="list-style-type: none"> <li>Existing spill through bridge abutment to be stood vertical.</li> <li>Bridge is to be widened and lengthened.</li> </ul>            | <ul style="list-style-type: none"> <li>Exposed shotcrete is to be concealed by the use of cladding. Cladding is to be designed to present a smooth even abutment profile that ties in with the adjoining embankment.</li> </ul>                     |
| 16820–17100 (EB) | Khartoum Road Macquarie Park (EB)            |                  |   |   | ML                 | M                                   | M                                | <ul style="list-style-type: none"> <li>Existing noise wall is being relocated closer to adjacent properties.</li> </ul>  | <ul style="list-style-type: none"> <li>Improve treatment of noise walls and provide additional screen planting behind noise wall.</li> </ul>  |
| 16900–17140 (EB) | Khartoum Road Bridge (EB)                    |                  |   |   | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Bridge is to be widened including reconstruction of abutments perpendicular to Khartoum Road.</li> </ul>                            | <ul style="list-style-type: none"> <li>Bridge design is to present a simple, clean profile similar to existing which incorporates noise walls to parapet in an integrated fashion.</li> </ul>   |
| 17240–17650 (EB) | Fontenoy Road Macquarie Park                 |                  |   |   | ML                 | L                                   | ML                               | <ul style="list-style-type: none"> <li>New noise wall is being relocated closer to adjacent properties.</li> </ul>   | <ul style="list-style-type: none"> <li>Additional screen planting to be undertaken behind noise wall to reinstate vegetation lost as part of construction works and to minimise impact.</li> </ul>  |
| 17200–17300 (WB) | West bound on ramp from Lane Cove Road       |                  |   |   | M                  | L                                   | ML                               | <ul style="list-style-type: none"> <li>Existing shale cutting, overlooked by residential tower, to be steepened potentially requiring stabilisation treatments.</li> </ul> | <ul style="list-style-type: none"> <li>Treatment of embankment to be provided which is consistent with urban design strategy and minimises shotcrete. If shotcrete and bolting is required appropriate treatments need to be considered.</li> </ul> |
| 17600 (EB)       | EB Off-Ramp to Lane Cove Road Macquarie Park |                  |   |   | ML                 | ML                                  | ML                               | <ul style="list-style-type: none"> <li>New noise wall to be constructed</li> </ul>   | <ul style="list-style-type: none"> <li>Provide screen planting along open corridor.</li> </ul>  |

Table 96 Precinct 5 site compounds – temporary construction activities

| Station          | Location       | Nature of impact | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues  | Opportunities/Potential treatments  |
|------------------|----------------|------------------|--------------------|-------------------------------------|----------------------------------|---|---|
| 14400–14600 (WB) | Vimiera Road   |                  | ML                 | L                                   | ML                               | <ul style="list-style-type: none"> <li>Site compound to be established for: Stockpile and lay down area.</li> <li>Overlooked by a number of apartment blocks.</li> <li>Divided by access associated with Vimiera Pedestrian Underpass.</li> </ul> | <ul style="list-style-type: none"> <li>Potential to retain vegetation located on boundaries adjoining residences.</li> </ul>                                  |
| 15000 (WB)       | Busaco Road    |                  | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Stockpile and lay down area</li> <li>Parkland adjoins creekline with some large trees.</li> </ul>   | <ul style="list-style-type: none"> <li>Potential to address privet infestation of creekline and improve usability of parkland.</li> </ul>                     |
| 15400–15800 (EB) | Toll Plaza     |                  | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Stockpile and lay down area.</li> </ul>   | <ul style="list-style-type: none"> <li>Treatment of hoardings to consider site lines for safety and may address the character of the interchange.</li> </ul>  |
| 15900–16100 (WB) | Christie Road  |                  | M                  | M                                   | M                                | <ul style="list-style-type: none"> <li>Site compound to be established in informal car park for: Stockpile and lay down area.</li> <li>Some existing vegetation cover to be removed.</li> </ul>   | <ul style="list-style-type: none"> <li>Potential to maintain vegetation on perimeter of site to limit impact on street address.</li> </ul>                    |
| 16500–16900 (EB) | Macquarie Park |                  | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Stockpile and lay down area.</li> <li>Adjoins national park and is overlooked by some residences.</li> </ul>  | <ul style="list-style-type: none"> <li>Opportunities to screen and improve revegetation on previous compound area which is becoming weed infested.</li> </ul> |
| 18200–18400 (EB) | Wicks Road     |                  | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Site compound to be established for: Stockpile; lay down area; and overflow car park.</li> </ul>   | <ul style="list-style-type: none"> <li>Existing waste transfer handling site, potential to revegetate depending on owner end use.</li> </ul>                  |

| Station          | Location      | Nature of impact | Visual sensitivity | Scale or magnitude of visual impact | Overall ranking of visual impact | Issues   | Opportunities/Potential treatments   |
|------------------|---------------|------------------|--------------------|-------------------------------------|----------------------------------|--|--|
| 18700–18900 (WB) | TIDC compound |                  | L                  | L                                   | L                                | <ul style="list-style-type: none"> <li>Primary site compound including: main office; canteen; laboratory, traffic management stores, and main car park.</li> </ul> | <ul style="list-style-type: none"> <li>Existing Chatswood to Epping Rail compound provides the perfect opportunity to continue this use with no significant change in impact.</li> </ul> |

*Visual Sensitivity*

*Ne = Negligible; VL = Very Low; L = Low; ML = Medium Low; M = Medium; MH = Medium High; H = High; VH = Very High*

*Nature of Impact*

*A = Adverse; N = Neutral; B = Beneficial*

*Station*

*EB – Eastbound – Works widened beyond east bound carriageway.*

*WB – Westbound – Works widened beyond east bound carriageway.*

A number of areas are identified as having potential for significant visual change, these include:

- At the Windsor Road interchange, the addition of on-ramps and off-ramps to the west would mean higher visual impacts due to the increased height of noise and retaining walls and loss of screen planting. Mitigation measures would include design treatment of noise and retaining walls with texture and colour to reduce bulk and scale and screen planting of properties.
- The historic villa at 266 Windsor Road would lose several metres from its frontage. Property adjustment works would be required to both address the loss of curtilage and to provide a buffer between house and road. Key to this would be the establishment of screen planting to the front and the retention in some form of the side drive and turn-a-round.
- At Woodvale Road, North Epping, the new road alignment would require noise walls to be relocated closer to properties (existing is ten metres away, proposed is three metres away). Mitigation measures would include noise wall architectural design and screen planting.
- The proposed removal of the bus bridge, east of Beecroft Road, reflects the changes in the public transport system over the last decade and the implementation of better bus priority connections within the M2 corridor as a result of this upgrade. The removal of the bridge would provide an enhanced visual outcome with the loss of part of the visual clutter created within this zone by a range of elevated structures (illustrated in Figure 34).

### 9.6.3 Mitigation measures

The current M2 Motorway design does not take full advantage of its distinctive contextual setting. There is an opportunity through the functional upgrade of the M2 Motorway to capitalise on the bushland setting, through which the route passes, to improve the visual experience and provide a consistent and recognisable identity. Design solutions address the character of the existing M2 Motorway built elements and provide solutions that have been chosen to compliment and improve the visual outcome of the M2 Motorway built form.

In responding to the visual impacts, mitigation measures have been directed towards achieving an integrated and well considered design solution that reflects the desired future character and vision for the M2 Motorway.

This desired character would be applied to future works on the M2 Motorway and implemented gradually. This limited upgrade provides the opportunity to commence the process of improving the presentation of the M2 Motorway, but it is not within the scope of this project to improve the whole of the M2 Motorway. It is envisaged that as the road is developed and maintained, as part of the concession period, this design vision, objectives and principles would be progressively implemented.

Key considerations in terms of design for mitigation are to:

- Visually screen the built form entirely where possible and otherwise to whatever extent practicable.
- Reduce the apparent scale of the M2 Motorway structures, especially its noise walls.
- Add landscape elements where possible to assist the process of reducing noise impact and to obscure or reduce views from the surrounding areas towards the traffic stream.

The landscape and urban design concept for the alignment is one which builds on the existing natural assets of the alignment. In particular it strengthens the connection with the natural environment through the exposure of sandstone cuttings and strengthening of the vegetated back drop of the alignment. Built elements are handled with care so that details are simple and subtle.

The following key elements have been identified as key in enhancing the M2 road corridor character and providing a new higher quality character and identity for the M2 Motorway.

## Noise Walls

The existing noise walls lack consistency in colour, alignment and height. The same Hebel panel wall design with four metre post spacing is used for the entire length of the M2 Motorway showing no consideration of the adjacent context. The walls used in the bushland precincts are the same as those used in the more urban precinct. The green colour aims to camouflage the walls against the natural bush setting however in reality the walls contrast with the bushland.

As part of the M2 Upgrade project, noise walls would be the most visible and continuous built form elements on the M2 Motorway and provide an opportunity to create a recognisable identity for the M2 Motorway. The noise wall strategy therefore has an emphasis on both sensitivity towards integrating with the existing noise walls and also a strong focus on high quality urban design for the new noise walls. New walls would be constructed using light-weight aerated concrete panels (Hebel, or similar). The design features four different noise wall designs (Type B, Type L, Type H, and Type U).

Each of the identified precinct areas has a predominant panel pattern that is carefully designed to reflect and be sympathetic to the surrounding environment. With form and alignment playing a major role, a secondary layer of information in the form of patterns and colour on the new noise walls would reveal the changing environment for the M2 Motorway user. A better colour palette would complement the existing green walls to reference the surrounding bushland context and visually recede into that context (refer Figure 35), note different types of noise wall employed near the bridge and amongst the bush. Noise walls are also illustrated in Figure 34 and Figure 35.

Figure 34 Visual perspective of M2 looking westbound near Beecroft Road

Existing conditions



Proposed design after the M2 Upgrade project



Source: HBO+EMTB, 2010

Figure 35 Visual perspective of M2 looking eastbound near Windsor Road

Existing conditions



Proposed design after the M2 Upgrade project (Note: the location of signage would be determined during the detailed design phase)



Source: HBO+EMTB, 2010

Figure 36 Visual perspective of M2 looking west bound near Kent Street

Existing conditions



Proposed design after the M2 Upgrade project



Source: HBO+EMTB, 2010

## Bridges

Between Windsor Road and Delhi Road there are a total of 21 existing bridges and one tunnel. In order to accommodate the additional traffic lanes, the M2 Upgrade project includes the widening of eight bridges plus the lengthening of two vehicular overbridges, one pedestrian overbridge and one pedestrian underpass. Bridge widening requires adjustment to the edges of some bridges. This would require modifications to throw screens, and a general expansion of the footprint. From the M2 Motorway the changes are most evident in the structures associated with the bridge including, abutment walls, bridge girders and parapets. To minimise the impact of these elements they would be designed to present a slim consistent profile that relates to the existing structure.

Most overbridges on the current M2 Motorway are Super-T girder structures. The strategy for the bridge design, where widening or lengthening of the bridge occurs, is to match existing construction methods as closely as possible and to match the existing detailing of parapets, piers, girder type and bridge furniture. Although, the M2 Upgrade project is unable to change the appearance of such bridges, it is intended that where practicable, some consideration would be given to improving the appearance of the bridge. New bridges would be designed to improve upon the appearance of the existing bridges.

## Retaining walls

Retaining walls are proposed in locations where the M2 Motorway is built on fill. The proposed use of retaining walls minimises the extent of disturbance to existing vegetation cover, and consequently minimises impacts on views from adjacent properties. The design of new retaining walls would consider the use of colour and texture to minimise its impact. Reinstatement of vegetation cover over the disturbed footprint would assist in mitigating against the impact of the walls (refer Figure 35, note retaining walls near ramps).

The existing retaining walls lack a consistent appearance along the length of the existing M2 Motorway. In many locations where ground stabilisation was required, rock anchors and shotcrete were used. A mix of cast in-situ concrete walls and shotcrete surfaces face the M2 Motorway, while walls facing away from the M2 corridor range from patterned precast concrete panels to stacked sandstone boulders with no real distinction made between bushland and urban areas. The end result is one in which the walls, particularly those facing the M2 Motorway, are unattractive and visually dominating.

The M2 Upgrade project would result in further cuttings and construction of, new or extended walls facing the M2 Motorway and new or extended walls facing outside the M2 corridor, towards the bushland or residential neighbourhoods. Some walls would not be altered. However, new walls would be built with an emphasis on high quality urban design and sensitivity towards the existing retaining walls. Because of the variable topography of the M2 Motorway alignment, there are a large number of retaining walls proposed. The longest wall stretches for approximately 455 metres and some are over ten metres high. With the intent of minimising their perceived impacts, the proposed design would differentiate the retaining walls on the basis of their location, orientation, role and consistency with existing M2 Motorway walls. With form and alignment playing a major role, a secondary layer of information in the form of patterning and finish on the new retaining walls would create some linear identity for the M2 Motorway. Vegetation would be planted in front of retaining walls wherever possible to soften their appearance and create a greener road corridor.

## Temporary structures

Compound sites, despite being temporary structures, still have the potential to have significant impacts on the visual character of the M2 corridor in the short term. The location of these elements therefore needs to consider the existing adjacent vegetation and aim to limit the scale of visual change. Planting at the perimeter of the proposed site would be preserved, where possible, to maintain a level of screening from the adjoining land uses. Where this is not possible, the re-establishment of vegetation cover would be prioritised.

## Landscape design

The landscape response is an integral element of the mitigation strategy. Landscape areas have focused on achieving vegetated buffers between the M2 Motorway structures and overlooking residential properties in order to enhance both visual screening and the sense of a bushland corridor. In terms of the road user, landscape has been used only in front of walls where a substantial space is available to achieve long lasting, minimal maintenance landscape outcomes. Visual quality for the road user is enhanced by improved design quality of structures and enhanced back drop rather than attempts to soften the road appearance between carriageway and structure.

The key elements of the landscape design comprise:

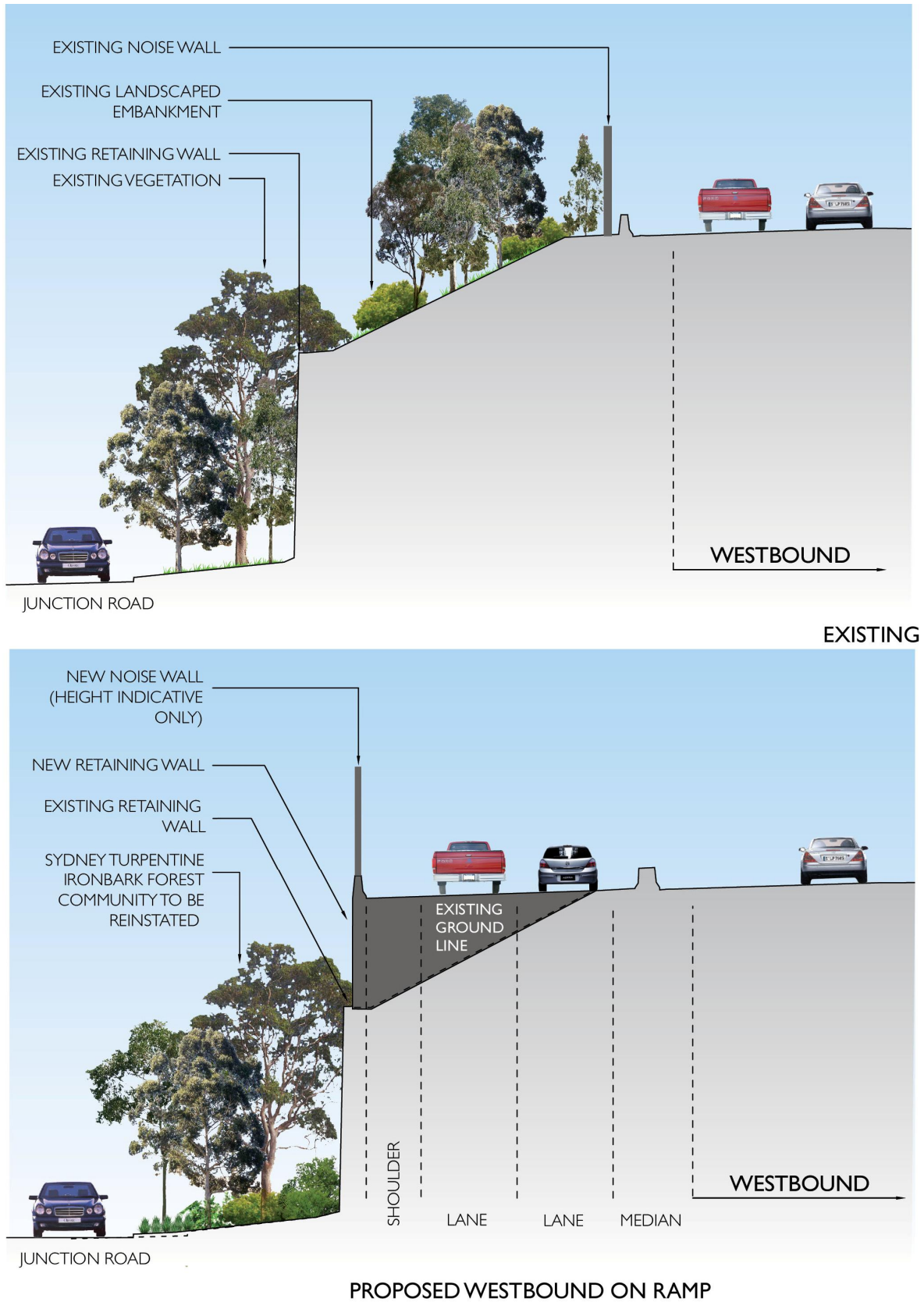
- Use of a landscape palette which is responsive to the differing vegetation communities through which the M2 corridor passes.
- Strengthening of the bushland character to reinforce the perception of the M2 Motorway being within a bushland corridor and provide a sense of separation from adjacent properties.
- Screening of noise and retaining walls where practicable, particularly where residences are in close proximity.
- Use of landscape only in zones where it can be established, maintained and make a meaningful contribution to the visual presentation of the corridor.
- Use of vegetation to enhance environmental outcomes of the project.

An example of the application of landscape treatments to a section of upgraded road is provided in Figure 37. Full details are available in Technical Paper 4.

Overall, the proposed works provide the opportunity to provide a positive impact on the visual appearance of the road. Some impacts would be unavoidable and these changes would be mitigated through the architectural design so that the detailing and the material qualities, texture, colour, and so on address the critical concerns of the adjacent use. The integration of new higher standard design elements would provide a new desired character and identity for the M2 Motorway.

Figure 37 Cross-sections of M2 Motorway near the new Windsor Road ramps

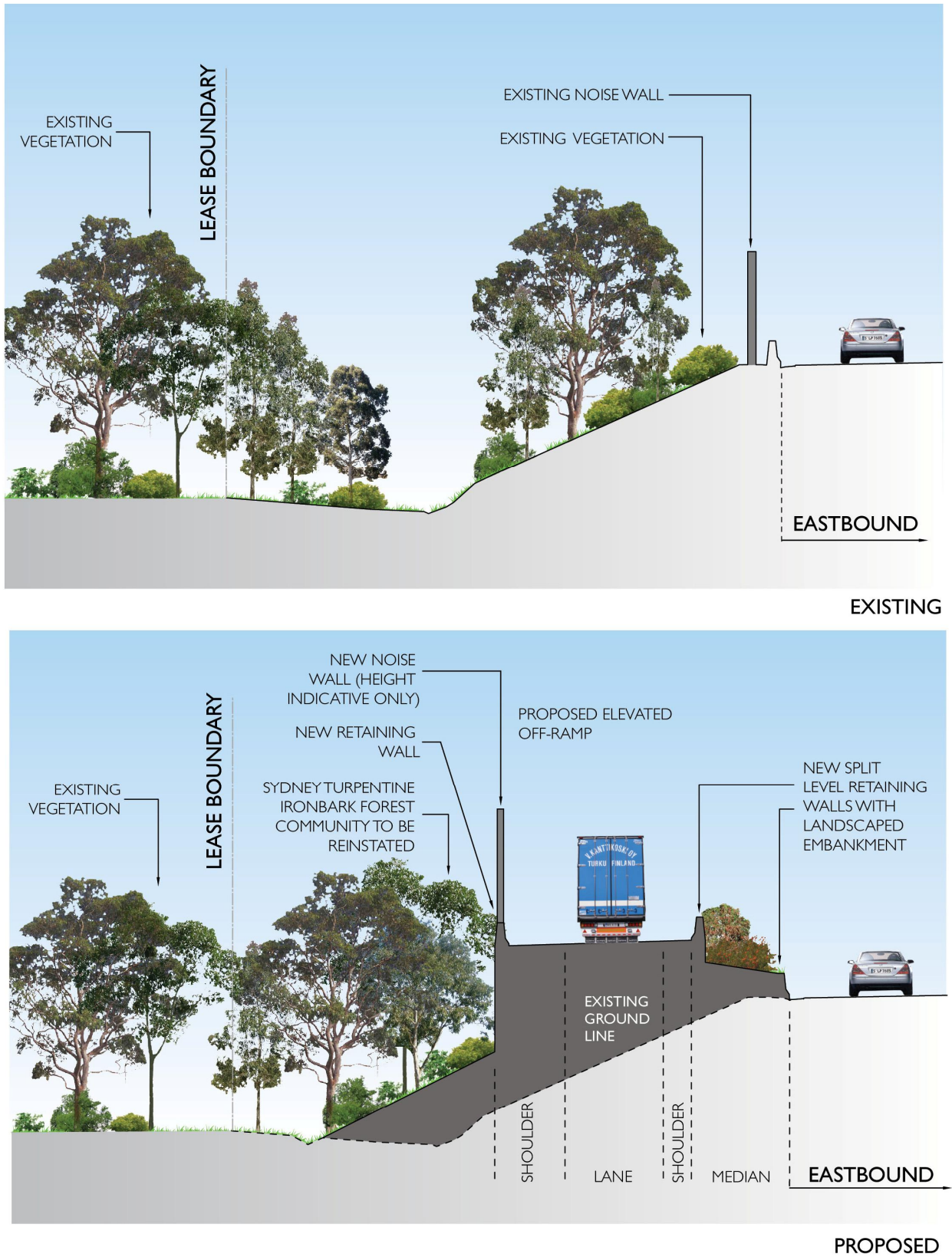
Figure shows examples of landscape treatments near new Windsor Road ramps



Source: Tract, 2010

Figure 37 (con't) Cross-sections of M2 Motorway near the new Windsor Road ramps

Figure shows examples of landscape treatments near new Windsor Road ramps.



Source: Tract, 2010