Hills M2 Motorway integration works

The Hills M2 Motorway integration works would be generally located within the existing road reserve. Residential properties back onto the motorway road reserve for the majority of the length of the works. Two schools and areas of bushland also share a boundary with the motorway along the integration works section. The following structures, equipment and construction activities are likely to be visible:

- Earthworks including cuttings, fill embankments and construction of retaining walls.
- Fencing surrounding the site.
- Temporary noise walls along the motorway.
- Bridge works and associated access.
- Vehicle access and egress directly to and from the motorway.

Motorists would be subject to views of road construction works over a period of around two and half years, including likely loss of views to adjoining areas due to clearing of vegetation, barriers and construction plant. Residents along this section of the motorway would potentially have views of construction plant.

The sensitivity of residents would be moderate to low given the generally well vegetated screen between residences and the motorway, and the magnitude of the visual impact would be low, providing an overall rating of moderate to low.

The sensitivity of motorists along this section of the motorway during construction would be moderate to low within the context of the visual amenity of the corridor, and the magnitude of the visual impact would be moderate, particularly with regard to the duration of the works, providing an overall visual impact rating of moderate.

Southern interchange compound (C5) and associated construction works

The southern interchange compound would be located to the north-west of the Hills M2 Motorway / Pennant Hills Road interchange. The following structures, equipment and construction activities are likely to be visible from surrounding receiver locations:

- Bulk earthworks.
- A hoarding along Eaton Road and the long edge adjacent to residential properties to the west of the compound.
- Fencing surrounding the site.
- Vehicle access and egress to and from Eaton Road. Vehicle movements may occur up to 24 hours per day and seven days per week.
- Two acoustic sheds (maximum height of around 17 metres from existing ground level), located to the centre-north and centre-south of the site, and with the long edges facing Pennant Hills Road.
- Equipment and machinery, including crawler cranes (around 15-20 metres high) and excavators (arm extent around ten metres).
- A two storey office with amenities (around six metres high) and a substation (around three metres high) to the north of the site.
- A workshop (around three metres high) and a water treatment plant (around five metres high) in the centre of the site.

Due to the topography falling away from Pennant Hills Road to the west and the compound site facilities being located close to Pennant Hills Road, the residential properties within the vicinity of the construction compound would look up to the hoarding and are likely to have views to the acoustic shed roofs and the office building roof above. The frontage of Pennant Hills Road would give open views into the construction compound.

The expected duration of construction activities at this site would be up to around four years. During this period, temporary structures would be replaced with the construction of several permanent buildings including the southern ventilation facility, a substation, a water treatment plant, a service yard, a workshop, and the motorway control centre. Landscape buffer zones would be implemented around the edges of the site.

The number of residents that would have substantial views from their residences to the southern interchange compound would be relatively few. However, a large number of local residents would be visually exposed to the works for a short period, on a daily basis, when accessing Pennant Hills Road via Eaton Road.

The Coral Tree Drive switching station would be immediately adjacent to the Hills M2 Motorway, and opposite residential development in Coral Tree Drive. The following structures, equipment and construction activities are likely to be visible from surrounding receiver locations:

- Bulk earthworks.
- A hoarding along Coral Tree Drive.
- Fencing surrounding the site.
- Heavy and light vehicle access and egress to and from Coral Tree Drive. Vehicle movements would generally occur during daylight hours.

Three representative receiver locations have been identified for views from residential properties (receiver locations 1, 2 and 3), and two for motorists (receiver locations 4 and 5) as shown in **Figure 7-42**.

Table 7-127 Southern interchange construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residential – Gum Grove Place	Provides a representative receiver location for views from residences within the vicinity of this street and Hillside Place. The sensitivity of these residents to works being undertaken within proximity of their homes would be high to moderate and the magnitude of the visual impact would also be high to moderate, providing an overall visual impact rating of high to moderate.
2	Residential – Karloon Road / Eaton Road intersection	Provides a representative receiver location for views from residences within the vicinity of both roads and the compound. The sensitivity of these residents to works being undertaken within proximity of their homes would be high to moderate and the magnitude of the visual impact would also be high to moderate, providing an overall visual impact rating of high to moderate.
3	Residential – Coral Tree Drive	Provides a representative receiver location for views from residences within the vicinity of the switching station. The sensitivity of these residents to works being undertaken within proximity of their homes would be moderate given the relatively short period of construction, and the magnitude of the visual impact would be high to moderate albeit for relatively few receivers, providing an overall visual impact rating of high to moderate.
4	Motorists – Pennant Hills Road / Hills M2 Motorway interchange	Provide representative views of the compound by motorists using the Hills M2 Motorway and Pennant Hills Road. The sensitivity of the motorists would be low, and the magnitude of the visual impact would be high to moderate, providing an overall visual impact rating of moderate.
5	Motorists – Pennant Hills Road / Copeland Road intersection	

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Figure 7-42 Representative receiver locations - Southern interchange construction compound

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Wilson Road compound (C6)

The Wilson Road compound would be located at the intersection of Wilson Road and Pennant Hills Road, extending through to Killaloe Avenue. The following structures, equipment and construction activities are likely to be visible from surrounding receiver locations:

- Bulk earthworks.
- A hoarding surrounding the majority of the site with breaks for access and egress of vehicles.
- Fencing surrounding the site.
- Heavy vehicle access and egress onto Pennant Hills Road and light vehicle access and egress onto Wilson Road. Vehicle movement may occur up to 24 hours per day and seven days per week.
- An acoustic shed (around 15 metres high), located at the centre of the site.
- Equipment and machinery, including gantry and crawler cranes (around 15-20 metres high) and excavators (arm extent around ten metres).
- A two storey office with amenities (around six metres high) located behind the acoustic shed to the north of the site.
- A workshop and first aid facility adjacent to the east of the acoustic shed (around three metres high).
- Water treatment plant (around five metres high) towards the southern boundary.

Residential properties surrounding the construction compound would see the hoarding with the acoustic shed and the roof of the site office above. From Pennant Hills Road, views would be open through the heavy vehicle access and egress point.

The expected duration of construction activities at this site would be around three years. During this period, temporary structures would be replaced with the construction of the Wilson Road tunnel support facility. Behind the facility the land would batter down to the level of Killaloe Avenue, and would be finished with landscape plantings.

The number of residents that would have close, direct or oblique views from their residences to the construction compound would be relatively few, being only those immediately adjacent to the site.

Two representative receiver locations have been identified for views from residential properties (receiver locations 1 and 2), and one for motorists (receiver location 3) as shown in **Figure 7-43.**

Table 7-128 Wilson Road compound construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residential – Killaloe Avenue / Wilson Road intersection	Provides a representative location for views from residences within the vicinity of, and across the street from the compound. The sensitivity of these residents to works being undertaken within proximity of their homes is considered to be high to moderate given that the views would be seen from the front garden areas of the residences when leaving and entering their dwellings, rather than from rear garden areas where outdoor recreation activities could be expected to take place. The magnitude of the visual impact is also considered to be high to moderate, given the extent intervening screening vegetation both within the street and within the residential lots, providing an overall visual impact rating of high to moderate.
2	Residential – receivers which adjoin the site to the west	Provides a representative location for residences with views to the compound from the west. The sensitivity of these residents to works being undertaken within proximity of their homes is considered to be high, particularly given the proximity of the compound to the three adjoining residences, and the fact that residents would view the compound from their rear garden areas where outdoor recreation activities could be expected to take place. The magnitude of the visual impact is also considered to be high given the proximity of the compound, providing an overall visual impact rating of high.
3	Motorists – Pennant Hills Road / Beecroft Road intersection	Provide representative views of the compound by motorists using Pennant Hills Road. The sensitivity of motorists using Pennant Hills Road is considered to be low, and the magnitude of the proposed development to be moderate to low, providing an overall visual impact rating of moderate to low.

Figure 7-43 Representative receiver location - Indicative Wilson Road construction compound

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Trelawney Street compound (C7)

The Trelawney Street compound would be located on Pennant Hills Road between Trelawney Street and Loch Maree Avenue. The following structures, equipment and construction activities are likely to be visible from surrounding receiver locations:

- Bulk earthworks.
- Hoarding and / or fencing surrounding the site.
- Heavy vehicle access from Loch Maree Avenue and egress to Pennant Hills Road and light vehicle access and egress to and from Loch Maree Avenue. Vehicle movement may occur up to 24 hours a day and seven days a week.
- An acoustic shed (around 15 metres high), located at longways along the western edge of the site compound adjacent to Pennant Hills Road.
- Equipment and machinery, including gantry and crawler cranes (around 15-20 metres high) and excavators (arm extent around ten metres).
- A two storey office with amenities (around six metres high), a water treatment plant (around five metres high) and a substation (around three metres high) are grouped to the south-west corner of the site, at the intersection of Pennant Hills and Loch Maree Avenue.
- A workshop and first aid facility adjacent to the east of the acoustic shed (around three metres high).

The local topography falls away steeply from Pennant Hills Road to the east, and the construction compound would be located at the top of a rise along Pennant Hills Road. Residential properties to the east of the compound would have views up towards the three metre high perimeter hoarding, which would provide screening of the construction compound. However, the steep construction batter up to the works platform, which would house the acoustic shed may be visible from some residences. From Pennant Hills Road, views would be partially screened by the hoarding, with views above that to the acoustic shed, the top of the water treatment plant, the top of the office block, and construction plant such as cranes.

The expected duration of construction activities at this site would be around three years. During this period, temporary structures would be replaced with the construction of the tunnel support facility. Behind these buildings the land would batter down to the level of the adjacent properties at the eastern boundary of the site. All site batters would be landscape planted.

The number of residents that would have close, direct or oblique views from their residences to the compound would be relatively few, being only those immediately adjacent to the site.

Three representative receiver locations have been identified for views from residential properties (receiver locations 1, 2 and 3), and one for motorists (receiver location 4) as shown in **Figure 7-44.**

Table 7-129 Trelawney Street compound construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residential – Loch Maree Avenue	Provides a representative view for residences in Loch Maree Avenue located across the road from the compound. The sensitivity of these residents to works being undertaken within proximity of their homes is considered to be high to moderate given that the views would be seen from the front garden areas of the residences when leaving and entering their dwellings, rather than from rear garden areas where outdoor recreation activities could be expected to take place. The magnitude of the visual impact is considered to be moderate given that the southern side of Loch Maree Avenue has a substantial row of street trees that provide screening from front garden areas to the compound, and the residences generally have screen planting within the front gardens, providing an overall visual impact rating of high to moderate.
2	Residential – receivers which adjoin the site to the east	Provides a representative view for residences from the east. The sensitivity of these residents to works being undertaken within proximity of their homes is considered to be high, particularly given the proximity of the compound to the three adjoining residences, and the fact that residents would view the compound from their rear garden areas where outdoor recreation activities could be expected to take place. The magnitude of the visual impact is also considered to be high given the proximity of the compound and the fact that the works would be seen as a skyline view, providing an overall visual impact rating of high.
3	Residential – Trelawney Street	Provides a representative view for residences in Trelawney Street located across the road from the compound. The sensitivity of these residents to works being undertaken within proximity of their homes is considered to be high to moderate given that the views would be seen from the front garden areas of the residences when leaving and entering their dwellings, rather than from rear garden areas where outdoor recreation activities could be expected to take place. The magnitude of the visual impact is considered to be high to moderate given the moderate extent of screening from front garden areas to the compound, providing an overall visual impact rating of high to moderate.
4	Motorists – Pennant Hills Road / Phyllis Avenue intersection	Provide representative views of the compound by motorists using Pennant Hills Road. The sensitivity of motorists using Pennant Hills Road would be low, and the magnitude of the proposed development would be moderate, providing an overall visual impact rating of moderate to low

Figure 7-44 Representative receiver locations - Indicative Trelawney Street construction compound

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Pioneer Avenue compound (C8)

The Pioneer Avenue compound would be located on Pioneer Avenue, adjoining the Northern Railway Line. The following structures, equipment and construction activities are likely to be visible from surrounding receiver locations:

- Retained concrete silos and a factory building.
- A two storey site amenities building (around six metres high).
- Fencing surrounding the site.

The local topography falls away from Duffy Avenue to the north. The site is flanked by light industrial development to the south, west and north, and the Northern Railway line to the east. The rail corridor has a substantial vegetative screening along both edges. Views from the train to the site would be seen within the context of a light industrial area.

A small pocket of residential development on Pennant Hills Road backs onto the rail corridor immediately adjacent to the site. The likelihood of these dwellings having substantial views to the site would be low within the context of the extent of vegetative screening to both the rear garden areas and the rail corridor.

The expected duration of construction activities at this site would be around four years.

Three representative receiver locations have been identified for views from residential properties (receiver location 1), one for rail passengers (receiver location 2) and one for motorists (receiver location 3) as shown in **Figure 7-45.**

Table 7-130 Pioneer Avenue compound construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residents – Pennant Hills Road	Provides a representative view for residences on Pennant Hills Road located across the rail corridor from the compound. The sensitivity of these residents to the compound being within proximity of their homes is considered to be moderate to low given the setting of light industrial development, and location with regard to the busy rail corridor. The magnitude of the visual impact is considered to be low given the likely extent of screening by vegetation, and that most of the new development within the site will comprise car parking that should not be visible, providing an overall visual impact rating of high to moderate to low.
2	Rail passengers – Northern Railway line	Provides a representative view for rail users. The sensitivity of these commuters to the compound is considered to be low within the context of the industrial setting. The magnitude of the visual impact is also considered to be low given the small duration that the development would be visible from the passing train in conjunction with existing corridor vegetative screening, providing an overall visual impact rating of low.
3	Motorists – Pioneer Avenue	Provide representative views of the compound by motorists using Pioneer Avenue. The sensitivity of motorists would be low, and the magnitude of the proposed development would be low, providing an overall visual impact rating of low

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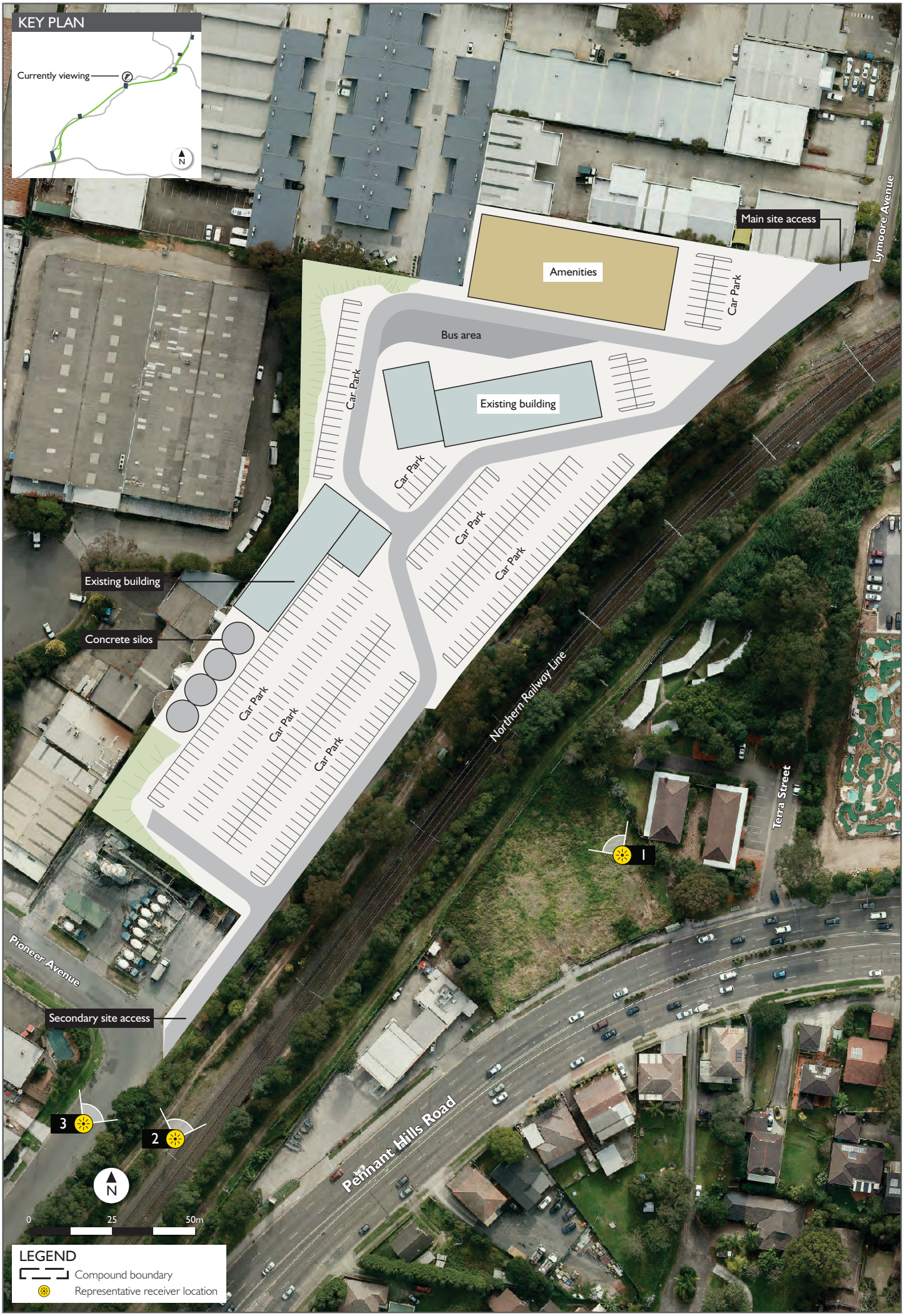

Figure 7-45 Representative receiver locations - Pioneer Avenue construction compound

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Northern interchange compound (C9) and associated construction works

The northern interchange compound would be located south of the M1 Pacific Motorway / Pennant Hills Road connector and north of Eastbourne Avenue. The following structures, equipment and construction activities are likely to be visible from surrounding receiver locations:

- Hoarding and / or fencing surrounding the site.
- Heavy vehicle access and egress to and from the M1 Pacific Motorway and light vehicle access and egress to and from Eastbourne Avenue. Vehicle movement may occur up to 24 hours per day and seven days per week.
- Vegetation removal to allow for the compound area and the light vehicle access to Eastbourne Avenue.
- An acoustic shed (around 15 metres high), located at the northern end of the site with the long edge parallel with the northern edge of the compound.
- Equipment and machinery, including gantry and crawler cranes (around 15-20 metres high) and excavators (arm extent around ten metres).
- A two storey office with amenities (around six metres high), a water treatment plant (around five metres high) and a substation (around three metres high) are grouped along the south east edge of the site.
- A workshop and first aid facility adjacent to the south of the acoustic shed (around three metres high).
- A compressor adjacent to the north of the acoustic shed (around three metres high).

Adjoining residential properties occur to the east and west, backing onto the site, including one heritage listed building adjoining the compound and one further setback. The acoustic shed and the roof of the office block would be visible from the rear of the adjoining properties. The compound would be visible from the M1 Pacific Motorway.

The expected duration of construction activities at this site would be around three and a half years. Visual components at this site would be temporary and would be removed at the end of the construction phase. The site would be revegetated at the completion of construction works.

The number of residents that would have close, direct or oblique views from their residences to the compound would be relatively few, being only those immediately adjacent.

One representative receiver location has been identified for views from residential properties (receiver location 1), and one for motorists (receiver location 2) as shown in **Figure 7-46.**

Table 7-131 Northern interchange compound construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residents – Kingsley Close	Provides a representative view for residences around the compound. The sensitivity of nearby residents would be high to moderate given the adjoining boundary condition with the compound viewed from rear garden spaces to the western side in particular, and the magnitude of the visual impact would also be high to moderate given the lack of existing screening to the western residences, providing an overall visual impact rating for residents of high to moderate.
2	Motorists – M1 Pacific Motorway	Provides a representative view for motorists using the M1 Pacific Motorway. The sensitivity of motorists would be low and the magnitude of the visual impact would also be low, providing an overall visual impact rating of low.

Figure 7-46 Representative receiver locations - Northern interchange construction compound

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Bareena Avenue compound (C10)

The Bareena Avenue compound would be located at the intersection of Bareena Avenue and Woonona Avenue North, Wahroonga. The following structures, equipment and construction activities are likely to be visible:

- Hoarding and / or fencing around the western and northern sides of the compound.
- Vehicle access and egress to and from Woonona Avenue North and directly off the M1 Pacific Motorway.
- Equipment and machinery, including a mobile crane (around 15-20 metres high) and excavators (arm extent around ten metres).
- An office with amenities (around three metres high).
- General equipment and materials storage.

The construction compound would be located to the east and south of residential properties, with the M1 Pacific Motorway immediately to the east. Part of the upper storey of the ventilation building, and the ventilation outlet and associated crane would be visible above the hoarding from residential properties. The construction works would be visible from the M1 Pacific Motorway in both directions.

The construction duration for this site would be around four years in conjunction with the portal construction. The temporary structures and elements would be replaced with the construction of several permanent buildings including the ventilation outlet, a substation, a pump room and deluge tanks, and a four to five metre high noise wall.

One representative receiver location has been identified for views from residential properties (receiver location 1), and one for motorists (receiver location 2) as shown in **Figure 7-47.**

Table 7-132 Bareena Avenue compound construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residents – Woonoona Avenue North and Bareena Avenue	Provides a representative view for residences around the compound. The sensitivity of nearby residents would be high given the current quiet and leafy streetscape and the magnitude of the impact would be high, particularly given the loss of trees from the compound site, providing an overall rating of high.
2	Motorists – M1 Pacific Motorway	Provides a representative view for motorists using the M1 Pacific Motorway and local roads. The sensitivity of motorists would be low and the magnitude of the visual impact would be moderate, providing an overall visual impact rating of moderate to low.

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Figure 7-47 Representative receiver locations - Bareena Avenue construction compound

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Junction Road compound (C11)

The Junction Road compound would be located to the rear of residential properties adjoining the M1 Pacific Motorway at the intersection of Junction Road and Coonanbarra Road. The following structures, equipment and construction activities are likely to be visible:

- Hoarding and or fencing along the eastern edge, where the site compound adjoins residential properties.
- Vehicle access and egress to and from Coonanbarra Road.
- Materials and equipment housed in the compound.
- Office with amenities (around three metres high).

Residential properties to the east of the compound would back onto the site. However, in most cases these residences have substantial bushland remnants within the rear sections of their blocks, and would therefore be unlikely to have a view of the boundary hoarding or materials and equipment within the compound.

The site would be screened from view of motorists on the M1 Pacific Motorway by an existing noise wall, and a retained strip of screening vegetation along the western edge of the site, in the order of ten to 15 metres wide.

The expected duration of construction activities at this site would be around four years. Visual components would be temporary and would be removed at the end of the construction phase. The site would be revegetated at the completion of construction works.

One representative receiver location has been identified for views from residential properties (receiver location 1), and one for motorists (receiver location 2) as shown in **Figure 7-48.**

Table 7-133 Junction Road compound construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residents – receivers which adjoin the site to the east	Provides a representative view for residences around the compound. The sensitivity of nearby residents to the temporary works would be moderate to low and the magnitude of the impact would also be moderate to low, providing an overall rating of moderate to low.
2	Motorists – M1 Pacific Motorway	Provides a representative view for motorists using the M1 Pacific Motorway and local roads. The sensitivity of motorists would be low and the magnitude of the visual impact would be low, providing an overall visual impact rating of low.

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Figure 7-48 Representative receiver locations - Junction Road construction compound

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M1 Pacific Motorway tie-in works

The M1 Pacific Motorway tie-in works would be generally located within the existing road reserve. Residential properties adjoin the motorway road reserve for the majority of the length of the works, but are generally well screen by a combination of vegetation, cuttings and noise walls. The following structures, equipment and construction activities are likely to be visible:

- Earthworks including cuttings, fill embankments and construction of retaining walls.
- Temporary noise walls along the motorway.
- Fencing surrounding the site.
- Vehicle access and egress directly to and from the motorway.

Motorists would be subject to views of road construction works over a period of up to around four years, including likely loss of views to adjoining areas due to clearing of vegetation, barriers and operating plant. Residents along this section of the motorway would potentially have views to construction plant.

One representative receiver location has been identified for views from residential properties (receiver location 1), and one for motorists (receiver location 2).

Table 7-134 M1 Pacific Motorway tie-in works construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residents	Provides a representative view for residences around the works. The sensitivity of residents would be moderate to low given the generally well vegetated screen between residences and the motorway, and the magnitude of the visual impact would be low, providing an overall rating of moderate to low.
2	Motorists – M1 Pacific Motorway	Provides a representative view for motorists using the M1 Pacific Motorway. The sensitivity of motorists would be moderate to low within the context of the visual amenity of the corridor, and the magnitude of the visual impact would be high to moderate, particularly with regard to the duration of the works, providing an overall visual impact rating of moderate.

Construction night lighting impacts

The potential night lighting impacts at each construction site are assessed in detail in **Table 7-136**. A summary of assessed night lightings impacts is provided in **Table 7-135**.

Table 7-135 Construction night lighting impacts assessment summary

Construction area	Receiver	Sensitivity to change	Magnitude of change	Overall rating
Hills M2 Motorway integration works	Residents	Moderate to low	Low	Moderate to low
	Motorists	Low	Low	Low
Windsor Road compound (C1)	Residents	Moderate to low	Moderate	Moderate
	Motorists	Low	Low	Low
Darling Mills Creek compound (C2)	Residents	Low	Low	Low
	Motorists	Low	Low	Low
Barclay Road compound (C3)	Residents	Moderate to low	Moderate to low	Moderate to low
	Motorists	Low	Low	Low
Yale Close compound (C4)	Residents	Moderate	Moderate	Moderate
	Motorists	Low	Low	Low
Southern interchange compound (C5) and associated construction works	Residents	High to moderate	High to moderate	High to moderate
	Motorists	Low	Moderate to low	Moderate to low
Wilson Road compound (C6)	Residents	High to moderate	Moderate	High to moderate
	Motorists	Low	Low	Low
Trelawney Street compound (C7)	Residents	High to moderate	Moderate	High to moderate
	Motorists	Low	Low	Low
Pioneer Avenue compound (C8)	Residents	Low	Low	Low
	Train passengers	Low	Low	Low
	Motorists	Low	Low	Low
Northern interchange compound (C9) and associated construction works	Residents	High to moderate	High to moderate	High to moderate
	Motorists	Low	Low	Low
Bareena Avenue compound (C10)	Residents	High to moderate	High to moderate	High to moderate
	Motorists	Low	Low	Low
Junction Road compound (C11)	Residents	Low	Moderate to low	Moderate to low
	Motorists	Low	Low	Low
M1 Pacific Motorway tie-in works	Residents	Moderate to low	Moderate to low	Low
	Motorists	Low	Low	Moderate to low

Table 7-136 Construction night lighting impact assessment

Construction area	Night lighting impact assessment
Windsor Road compound (C1)	The visual setting of the construction compound includes lighting associated with the Hills M2 Motorway, local streets, vehicle headlights and illuminated windows of residential properties. Lighting during construction would be associated with car parking and office facilities at the compound. Lighting would be directed and use cut-off fittings, which would reduce the amount of light trespass to adjoining residential properties. However the compound would be located at an elevated location above residential development. These residents would look up towards the compound, which may result in increased localised glare, and lighting movement from headlights pointing out into the valley. The sensitivity of the residents is considered to be moderate to low given the previous use of the area as a construction compound, and the magnitude of lighting increase to be moderate within the context of the proposed light spill reduction measures, providing an overall visual impact assessment rating of moderate. The sensitivity of motorists to night lighting is anticipated to be low, and the magnitude of lighting increase to be low, providing an overall visual impact assessment rating of low.
Darling Mills Creek compound (C2)	The visual setting of the construction compound includes lighting associated with the Hills M2 Motorway and vehicle headlights. Given that the compound would be located beneath the Darling Mills Creek viaduct with access off the Hills M2 Motorway, the sensitivity of residents is considered to be low, and the magnitude of lighting increase to be low within the context of the proposed light spill reduction measures and visual screening of bushland, providing an overall visual impact assessment rating of low. The sensitivity of motorists to night lighting is anticipated to be low, and the magnitude of lighting increase relative to the overall motorway landscape is considered to be low, providing an overall visual impact assessment rating of low.

Construction area	Night lighting impact assessment
Barclay Road compound (C3)	The visual setting of the construction compound includes lighting associated with the Hills M2 Motorway, local streets, vehicle headlights and illuminated windows of residential properties. Residential properties are generally well screened from the compound and the motorway by vegetation, and the presence a golf club opposite the compound. Lighting during construction would be associated with the compound and night road works on the Hills M2 Motorway. Lighting would be directed and use cut-off fittings, which would reduce the amount of light trespass onto adjoining residential properties. The sensitivity of the residents is considered to be moderate to low within the context of the compound having previously used for this purpose, and the magnitude of lighting increase to be moderate to low within the context of the proposed light spill reduction measures and screening from nearby residences, providing an overall visual impact assessment rating of moderate to low. The sensitivity of motorists to night lighting is anticipated to be low, and the magnitude of lighting increase to be low, providing an overall visual impact assessment rating of low.
Yale Close compound (C4)	The visual setting of the construction compound includes lighting associated with the Hills M2 Motorway, local streets to the west, vehicle headlights and illuminated windows of residential properties. Residential properties are generally well screened from the motorway and the compound by vegetation. However, the local topography also provides filtered views through trees to the compound site from the elevated end of Yale Close in particular. Lighting during construction would be associated with the compound and night road works on the Hills M2 Motorway. Lighting would be directed and use cut-off fittings, which would reduce the amount of light trespass onto adjoining residential properties. The sensitivity of the residents is considered to be moderate and the magnitude of lighting increase to be moderate given the temporary nature of the work and the potential for direct, filtered views across a low point from adjacent and nearby residences to the lit compound, providing an overall visual impact assessment rating of moderate. The sensitivity of motorists to night lighting is anticipated to be low, and the magnitude of lighting increase to be low, providing an overall visual impact assessment rating of low.

Construction area	Night lighting impact assessment
Hills M2 Motorway integration works	The visual setting of the construction works along the Hills M2 Motorway integration works include lighting associated with the motorways, local roads and illuminated windows from residential properties adjoining the site. Residential development adjacent to the project is predominantly characterised by substantial vegetative screening or noise walls that preclude direct views to the motorway. Lighting during construction would be associated with night-time road works along the motorway. Lighting on-site would be directed and use cut-off fittings to reduce the amount of light trespass onto adjoining residential properties. The sensitivity of residents to construction related night lighting is considered to be moderate to low and the magnitude of change to be low given the extent of screening, providing an overall rating of moderate to low. The sensitivity of motorists to construction related night lighting is considered to be low and the magnitude of change to be moderate to low, providing an overall rating of moderate to low.
Southern interchange compound (C5) and associated construction works	The visual setting of the construction compound and works includes lighting associated with the Hills M2 Motorway, Pennant Hills Road, local streets, vehicle headlights and illuminated windows of residential properties. To the east of the compound, the Pennant Hills Golf Course comprises a relatively dark urban location. Lighting during construction would be associated with the compound and night road works on Pennant Hills Road and the southern interchange. Lighting would be directed and use cut-off fittings, which would reduce the amount of light trespass onto adjoining residential properties. However the compound would be located at the top of a ridgeline with residential dwellings located downslope to the west. These residents would look up towards the compound, with the darker area of Pennant Hills Golf course behind, which may result in increased localised glare. The key residents to be impacted by night lighting would be those located adjacent to the compound. The sensitivity of the residents adjacent to the compound is considered to be high to moderate, and the magnitude of lighting increase to be high to moderate taking into account proposed light spill reduction measures, providing an overall visual impact assessment rating of high to moderate. The sensitivity of motorists to night lighting is anticipated to be low, and the magnitude of lighting is considered to be moderate to low, providing an overall visual impact assessment rating of moderate to low.

Construction area	Night lighting impact assessment
Wilson Road compound (C6)	The visual setting of the construction compound includes lighting associated with Pennant Hills Road, local streets and associated vehicular traffic, and illuminated windows of residential properties. Observatory Park located opposite the compound comprises a relatively low lit area. Lighting during construction would include lighting for site access from Pennant Hills Road and lighting within the compound including the car parking area, site office, and the area around the acoustic shed. Lighting would be directed and use cut-off fittings, which would reduce the amount of light trespass onto adjoining residential properties. The sensitivity of the residents is considered to be high to moderate given the area is residential, and the magnitude of lighting increase to be moderate taking into account proposed light spill reduction measures, providing an overall visual impact assessment rating of high to moderate. The sensitivity of motorists on Pennant Hills Road to night lighting is anticipated to be low, and the magnitude of lighting relative to the road lighting is considered to be low, providing an overall visual impact assessment rating of low.
Trelawney Street compound (C7)	The visual setting of the construction compound includes lighting associated with Pennant Hills Road, local streets and associated vehicular traffic, and illuminated windows of the residential properties. Lighting during construction would include the site office, the area around the acoustic shed, the site access, and the car parking area. Lighting would be directed and use cut-off fittings, which would reduce the amount of light trespass onto adjoining residential properties. The sensitivity of the residents is considered to be high to moderate given the area is residential and the existing development provides a visual screen to lighting from Pennant Hills Road, and the magnitude of lighting increase to be moderate taking into account proposed light spill reduction measures, providing an overall visual impact assessment rating of high to moderate. The sensitivity of motorists on Pennant Hills Road to night lighting is anticipated to be low, and the magnitude of lighting relative to the road lighting is considered to be low, providing an overall visual impact assessment rating of low.

Construction area	Night lighting impact assessment
Pioneer Avenue compound (C8)	The visual setting of the construction compound includes lighting associated local streets and associated vehicular traffic, illuminated windows of commercial developments and potential light from Brickpit Park. Lighting during construction would include the site access car parking, bus transfer and amenities building areas. Lighting would be directed and use cut-off fittings, which would reduce the amount of light trespass to adjoining areas. Additionally, the site is well separated from residential development by the Northern Railway line and including substantial existing vegetation. The sensitivity of the residents is considered to be low, and the magnitude of lighting increase to be low taking into account proposed light spill reduction measures, providing an overall visual impact assessment rating of low. The sensitivity of the train passengers is considered to be low, and the magnitude of lighting increase to be low taking into account proposed light spill reduction measures, providing an overall visual impact assessment rating of low. The sensitivity of motorists on Pioneer Avenue to night lighting is anticipated to be low, and the magnitude of lighting relative to the road lighting to be low, providing an overall visual impact assessment rating of low.
Northern interchange compound (C9) and associated construction works	The visual setting of the construction compound and works includes lighting associated with the M1 Pacific Motorway / Pennant Hills Road connector, local roads and illuminated windows from residential properties adjoining the site. Lighting during construction would include the car parking area, the site office and the ground level of the acoustic shed. Lighting on-site would be directed and use cut-off fittings to reduce the amount of light trespass onto adjoining residential properties. The sensitivity of the residents is considered to be high to moderate given that the compound is currently substantially vegetated with trees and a number of the residences would directly adjoin the compound, and the magnitude of lighting increase to be high to moderate taking into account proposed light spill reduction measures, providing an overall visual impact assessment rating of high to moderate. The sensitivity of motorists on the M1 Pacific Motorway / Pennant Hills Road connector to night lighting is anticipated to be low, and the magnitude of lighting relative to the road lighting to be low, providing an overall visual impact assessment rating of low.

Construction area	Night lighting impact assessment
Bareena Avenue compound (C10)	The visual setting of the construction compound includes lighting associated with the M1 Pacific Motorway, local roads and illuminated windows from residential properties adjoining the site. Lighting during construction would include the site access and site storage areas. Lighting on-site would be directed and use cut-off fittings to reduce the amount of light trespass onto adjoining residential properties. The sensitivity of the residents is considered to be high to moderate given that the fronting residential streets are relatively low lit, residences predominantly face the compound, and the compound is currently vegetated with trees and therefore substantially screened from motorway light impacts. The magnitude of lighting increase is considered to be high to moderate taking into account that the removal of this vegetative screening material would expose the residences to additional construction lighting from the motorway in addition to lighting from the compound notwithstanding proposed light spill reduction measures, providing an overall visual impact assessment rating of high to moderate. The sensitivity of motorists on the motorway to night lighting is anticipated to be low, and the magnitude of lighting relative to the road lighting to be moderate to low, providing an overall visual impact assessment rating of moderate to low.
Junction Road compound (C11)	The visual setting of the construction compound includes lighting associated with the M1 Pacific Motorway, local roads and illuminated windows from residential properties adjoining the site. Lighting during construction would include the site access, car parking, site office, amenities building and site storage areas. Lighting on-site would be directed and use cut-off fittings to reduce the amount of light trespass onto adjoining residential properties. The sensitivity of the residents to night lighting is considered to be moderate to low given the apparent extent of screening vegetation at the rear of their blocks, and the magnitude of lighting increase to be moderate to low taking into account proposed light spill reduction measures, providing an overall visual impact assessment rating of moderate to low. The sensitivity of motorists on the M1 Pacific Motorway to night lighting is anticipated to be low, and the magnitude of lighting relative to the road lighting to be low, providing an overall visual impact assessment rating of low.

Construction area	Night lighting impact assessment
M1 Pacific Motorway tie-in works	The visual setting of the construction works along the M1 Pacific Motorway tie-in works predominantly comprises lighting associated with the motorway and roads crossing the motorway including Edgeworth David Avenue. Residential development adjacent to the area is predominantly characterised by substantial vegetative screening, cuttings and noise walls which minimise light spill from the motorway. Lighting during construction would be associated with night-time road works along the motorway. Lighting on-site would be directed and use cut-off fittings to reduce the amount of light trespass onto adjoining residential properties. The sensitivity of residents to construction related night lighting is considered to be moderate to low given the extent of corridor screening, and the magnitude of change to be moderate to low, providing an overall rating of moderate to low. The sensitivity of motorists to construction related night lighting is considered to be low and the magnitude of change to be moderate, providing an overall rating of moderate to low.

Operation

The following sections provide an assessment of the potential operational urban design and landscape impacts of the project including:

- In-tunnel urban design.
- Landscape character impacts in each landscape character zone.
- Visual impacts from built form components of the project.
- Night lighting impacts.
- Compatibility of the project with the desired future character of areas affected by the project.

In-tunnel urban design

The concept for the urban design within the tunnel is as a transition element within the larger geographic area, from an 'urban gateway' in the south to the 'green gateway' in the north. These in-tunnel urban design features would be refined during detailed design to meet safety standards and achieve a high quality driver experience.

The urban design of the tunnel is aimed at resolving the following key issues:

- Tunnel safety – maintaining operational criteria of all safely features.
- Perception of safety – maintaining driver recognition of safety features within the tunnel.
- Driver fatigue – providing interest along the journey and avoiding fatigue due to a repetitive visual environment.
- Driver orientation – providing awareness of where drivers are in Sydney or how far along their journey they have travelled.
- Driver distraction – adding interest to the experience without compromising road awareness.

The key issues have been used to inform the key narrative objectives of the in-tunnel experience. These are:

- Provide orientation to above ground features and add driver interest within the tunnel.
- Provide reference to easily recognised and publicly accessible places.
- Develop 'visual events' at approximately two minutes apart.
- Provide visual changes of significant magnitude to be experienced by drivers focused on the road.
- Provide gradual transitions to 'visual events' to avoid driver distraction.
- Coordinate 'visual events' with tunnel safety features to ensure that legibility of safety features is not compromised.

The ‘visual events’ provide the core feature of the in-tunnel design. The concept design includes two ‘visual events’ at around third points through the tunnel journey which incorporate place name on the tunnel walls. These events provide:

- A sense of place and measure of progress for the motorist during the journey through the tunnel.
- A connection to the surface features.

The ‘visual events’ provide three distinct zones to the tunnel. A change in wall colour would create three distinct colour zones within the overall tunnel length allowing for a differing driver experiences during the journey, highlighting the tunnel as a transition between the urban and green gateways. Wall colours would be selected to reinforce this concept.

The tunnel would also provide the necessary emergency signage to provide direction toward emergency exits.

Operational landscape character impacts

An assessment of the potential operational landscape character impacts of the project is presented in **Table 7-138**, with a summary of the outcomes of that assessment provided in **Table 7-137**. The assessment has been based on the landscape character zones identified in **Section 7.5.1**

Table 7-137 Landscape character impact assessment summary

Landscape character zone	Sensitivity of landscape	Magnitude of change	Overall rating
Hills M2 Motorway integration landscape character zone	Moderate to low	Moderate to low	Moderate to low
Southern landscape character zone	Moderate	Moderate	Moderate
Wilson Road landscape character zone	High to moderate	High to moderate	High to moderate
Trelawney Street landscape character zone	Moderate	Moderate	Moderate
Northern landscape character zone	Moderate	Moderate	Moderate

Table 7-138 Operational landscape character impact assessment

Landscape character zone	Operational project components	Landscape character impact assessment
Hills M2 Motorway integration works	Key project elements within this landscape character zone would be: • New westbound lane around 3.5 kilometres in length between the Pennant Hills Road on-ramp and the Windsor Road off-ramp. • Widening or lengthening of existing bridge structures. • Widening of existing cuttings and fills, including batters and retaining walls. • Relocation of noise walls and adjustments to some existing noise walls.	The new road infrastructure elements within this landscape would be similar to those currently in place, including sandstone cuttings and bushland edges, thereby substantially conserving the naturalistic, bushland corridor character of this zone. Where the bushland edge is particularly narrow at locations such as that adjoining Carmen Drive in Carlingford, within the vicinity of Barclay Road bridge in North Rocks and adjoining Williams Road in North Rocks, the effect of a predominantly continuous bushland corridor edge for this landscape character zone may be impacted. The new gantry over Pennants Hills Road around Hannah Street would be seen within the context of the busy six-lane road corridor and is within the vicinity of an existing large illuminated variable message sign at the intersection of Hannah Street and Pennant Hills Road. When considering the project elements, the sensitivity of this landscape character zone to change would be moderate to low given the capacity of the natural landscape to accept the type of change proposed, and the magnitude of change would be moderate to low assuming some relatively minor losses to the bushland corridor effect, providing a landscape character impact rating of moderate to low.
Southern landscape character zone	Three distinct groupings of project elements would be present within this landscape character zone: • Road infrastructure: – The main alignment tunnel portals and approaches on the Hills M2 Motorway, including associated gantries. – The on and off-ramp tunnel portals on Pennant Hills Road and associated	The new road infrastructure elements in this landscape character zone would be primarily focused within the existing Hills M2 Motorway and Pennant Hills Road, road reserves. The nature and scale of this development would be generally consistent with that of the Hills M2 Motorway, notwithstanding the addition of new elements in the form of portals, gantries and signage. Additionally, the new surface road infrastructure would broadly fit within existing road reserves. The motorway operations complex would comprise new elements located immediately adjacent to existing low density residential areas. The scale, form

Landscape character zone	Operational project components	Landscape character impact assessment
	gantries. • Motorway operations complex: – Southern ventilation facility around 50 metres wide x 55 metres long x 20 metres high. – Workshop around 20 metres wide x 65 metres long x 11 metres high. – Covered service yard around 30 metres wide x 65 metres long x ten metres high. – Motorway control centre around 25 metres wide x 60 metres long x 15 metres high. • Switching station on Coral Tree Drive: – Around 25 metres wide x 30 metres long x seven metres high, with the highest point around ten metres above street level. • New gantry over Pennant Hills Road around Hannah Street.	and fabric of these buildings would be in contrast to the adjacent residential development. However, the buildings represent architecturally well considered and articulated structures, exhibiting a visibly integrated family of forms and fabric, and a visually recessive colour scheme that would blend with the proposed landscaping. Landscaping would include tall native tree plantings, and the addition of exotic feature tree plantings to the motorway operations complex road perimeter. The motorway operations complex would comprise a grouping of buildings that would flank the on and off-ramp portals, and provide a relatively long and narrow architectural buffer between the road infrastructure and existing residential area. The motorway operations complex / residential boundary would comprise a visually strong straight edge. As such, the motorway operations complex would comprise a highly legible and visually discrete new form within the landscape, the scale of which would be visually compatible with that of the road. The adjoining residential development falls and is orientated away from the motorway operations complex. Tall tree and screen landscaping would be provided to this edge. This buffer planting would provide a distinct visual separation between the two development types when mature. The switching station on Coral Tree Drive would comprise a new building type, within the existing Hills M2 Motorway buffer planting zone, that would sit adjacent to low density residential development. The scale, form and fabric of this building would be in contrast to adjacent residential development. However, this project element would be a single structure, moderately set back (around ten metres) from the residential road edge within an existing vegetated area which would be augmented as part of the development. The new gantry over Pennant Hills Road around Hannah Street would be seen within the context of the busy six-lane road corridor and in the vicinity of existing overhead variable message signage.

Landscape character zone	Operational project components	Landscape character impact assessment
		When considering all project elements combined, the sensitivity of this landscape character zone to change would be moderate, particularly with regard to the visual 'fit' of the built form elements within the motorway landscape, and the magnitude of change would be moderate, providing a landscape character impact rating of moderate.
Wilson Road landscape character zone	Key project elements within this landscape character zone would be: • Wilson Road emergency smoke extraction outlet: – Perpendicular to Pennant Hills Road. – Around 35 metres wide x 55 metres long x five to seven metres high. – Maximum building height above residential areas would be around eight metres. • Substation: – Located to the rear of the site, with the long side parallel to Pennant Hills Road. – Around 20 metres wide x 45 metres long x five metres high. – Maximum building height above residential areas would be around six metres. • Landform: – Similar to existing ground level.	The total footprint of the Wilson Road tunnel support facility would be around 120 metres long by 65 metres wide. Setbacks to the buildings would be in the order of 15 metres from the side boundaries, six metres to ten metres from the front boundary, and 25 metres from the rear boundary. The Wilson Road tunnel support facility would comprise new elements which are contrasting with the existing landscape character of the zone in terms of form, scale and materials. However, given the proximity of the tunnel support facility to the Pennant Hills Road frontage, this would be mitigated due to the major infrastructure character of the road. Additionally, the various colours and sizes of the glass fibre reinforced concrete panel finish to the buildings would provide a pattern and fine grained scale that is designed to reduce the visual bulk of the building and provide visual interest to its appearance. The perimeter areas would be planted with an informal planting of ground covers, shrubs, climbers and trees. Additionally, four existing large trees to the Wilson Road frontage would be retained if possible. The combination of relatively generous setbacks and proposed perimeter landscape treatments would provide a buffering effect between the development and adjoining residential area. The sensitivity of this zone to change is considered to be high to moderate, and the magnitude of change to be high to moderate, providing a landscape character impact of high to moderate.

Landscape character zone	Operational project components	Landscape character impact assessment

Trelawney Street landscape character zone	Key project elements within this landscape character zone would be:
	• Trelawney Street emergency smoke extraction outlet:
	  – Parallel to Pennant Hills Road.
	  – Around 35 metres wide x 55 metres long x seven metres high.
	• Substation:
	  – Perpendicular to Pennant Hills Road and adjacent to Trelawney Street.
	  – Around 20 metres wide x 45 metres long x five metres high.
	• Landform:
	  – Around 6.5 metres above existing ground level at the rear of the site.
	• A gantry over Pennant Hills Road around Kenley Park.
		The total footprint of the Trelawney Street tunnel support facility would be around 130 metres long by 75 metres wide. Setbacks to the buildings would be in the order of ten metres to 20 metres at the front property boundary, 35 metres from the Loch Maree Avenue boundary, ten metres to 15 metres from the Trelawney Street boundary and 22 metres to 25 metres from the rear residential boundary.
		
		The Trelawney Street tunnel support facility would sit opposite a substantial area of large floor plate retail / commercial development, and would comprise buildings that are broadly characteristic of retail and commercial development within this zone in terms of form, scale and, to some extent, materials.
		
		The facility would be in contrast with the adjacent residential development which would be immediately adjacent to the site at the rear boundary and separated from the site across local roads on the side boundaries. However, the various colours and sizes of the glass fibre reinforced concrete panel finish to the buildings would provide a pattern and fine grained scale that would reduce the visual bulk of the building and provide visual interest to its appearance.
		
		Due to the current fall of the site from Pennant Hills Road, a 6.5 metre high landscaped batter would be provided at the rear of the site which would also provide a vegetated buffer with an informal arrangement of ground covers, shrubs, climbers and trees to the adjacent residential area. The remaining southern and northern perimeter areas would also be planted with the same informal planting arrangement. The Pennant Hills Road frontage would be planted to a formal street planting of native trees with an informal groundcover and shrub layer.
		
		The new gantry over Pennant Hills Road around Kenley Park would be seen within the context of the busy six-lane road corridor and within a well vegetated section of Pennant Hills Road.
		
		The sensitivity of this zone to change is considered to be moderate, particularly

Landscape character zone	Operational project components	Landscape character impact assessment
		with regard to its relationship with Pennant Hills Road and the adjacent commercial / retail development, and the magnitude of change to be moderate, providing a landscape character impact of moderate.
Northern landscape character zone	Key project elements within this landscape character zone would be: • Road infrastructure: - The M1 Pacific Motorway tie-in works. - The main alignment tunnel portals to the M1 Pacific Motorway, including the cycle overpasses. - On and off-ramp tunnel portals to Pennant Hills Road. • Northern ventilation facility: - Located above the northbound portal, the ventilation building would be around 18 metres wide x 50 metres long x 13 metres high, with a discrete raised section of additional height. - A substation located south of the ventilation building around eight metres wide x 35 metres long x ten metres high. - A fire services pump room around eight metres wide x 18 metres long x five metres high - Two water tanks each around 12 metres in diameter and ten metres high. • Landform: - Around eight to ten metres above existing ground level at the residential boundary side of the facility.	The nature and scale of the new road elements would be generally consistent with that of the M1 Pacific Motorway, notwithstanding the addition of new elements such as portals. Additionally, most of the new surface road infrastructure would fit substantially within the existing road reserves. The northern ventilation facility would be generally located immediately above the northbound portal around the intersection of Bareena Avenue and Woonona Avenue. Noise walls would be located around the western and northern sides of the facility which would give the appearance of the facility being located within the M1 Pacific Motorway road reserve. The residential area adjoining the northern ventilation facility lies within the Hornsby Shire Council Wahroonga Heritage Conservation Area, with two heritage listed properties located immediately opposite the site. The northern ventilation facility would be visually contrasting in terms of location, form, scale and materials with the landscape character of the M1 Pacific Motorway road reserve, although this zone of the M1 Pacific Motorway provides a transition zone from the bushland setting to the built nature of the suburbs along Pennant Hills Road and the Pacific Highway. The façade of the facility has been designed to provide a series of smaller elements to present a more domestic and small scaled appearance. This would be achieved through the combination of glass fibre reinforced concrete panels, sandstone, 'timber-look' battens and glazed openings to reflect the adjacent heritage residential area. This strategy is repeated in the design of the noise wall which features sandstone planter boxes and 'timber-look' battens. The sensitivity of this zone to change is considered to be moderate and the magnitude of change to be moderate, providing a landscape character impact of moderate.

Desired future character assessment

The Hills M2 Motorway integration

The Hills M2 Motorway integration works seek to conserve and reinforce the existing native vegetation screening of the motorway, and minimise impacts on adjacent residential areas in line with the desired future character of these areas.

All project components would broadly sit within the existing Hills M2 Motorway road corridor, and would have minimal visual impact on adjacent residential developments.

As such, project components in and around the Hills M2 Motorway integration works would reflect the desire to maintain the existing low density residential character of the area.

Southern interchange

The project has focused the buildings associated with the motorway operations complex into a single grouping that aligns along the rear boundaries of existing residential developments. The location of the motorway operations complex facing away from the residential area and the provision of screening vegetation along this boundary would assist in conserving the local community setting.

The switching station on Coral Tree Drive would comprise a single, well considered architectural element set back from existing residential development, which would be visually associated with the Hills M2 Motorway.

All other project components would broadly sit within the existing Pennant Hills Road corridor and would have minimal visual impact on adjacent residential developments.

As such, project components in and around the southern interchange would reflect the desire to maintain the existing low density residential character of the area.

Wilson Road tunnel support facility

The Wilson Road tunnel support facility would comprise a single, relatively small intervention within the broader low density residential area, with a frontage to Pennant Hills Road. The facility has been designed to provide a refined and integrated edge that considers the residential development, and would incorporate a 'bushland' screen planting that would be visually consistent with the existing residential streets and the adjacent Observatory Park. As such, the Wilson Road tunnel support facility would be consistent with the existing and future desired character of the area.

Trelawney Street tunnel support facility

The Trelawney Street tunnel support facility would comprise a single, relatively small intervention within the broader low density residential area, with a frontage to Pennant Hills Road, and adjacent to large commercial developments with comparable size and form. The surrounding zoning under the Local Environmental Plan identifies that the desired future character of the broader area is to retain the existing low density development, whilst also continuing to encourage business development within the enterprise corridor adjacent to Pennant Hills Road. The facility would be orientated with the long edge to Pennant Hills Road, reducing the potential visual impacts to nearby residences. The facility would provide a refined and integrated edge that considers the residential development, and would incorporate a 'bushland' screen planting to the rear and side boundaries, as well as formal street tree planting to the Pennant Hills Road frontage that would be visually consistent with the area. As such, the Trelawney Street tunnel support facility would be consistent with the existing and future desired character of the area.

Northern interchange and M1 Pacific Motorway tie-in works

The design of the northern interchange and M1 Pacific Motorway tie-in works has sought to minimise the need for acquisition of residential properties. The design has been developed to incorporate appropriate screening measures, including the use of 'bushland' patches and plantings to minimise the visual impact of the project. The façade of the northern ventilation facility has also been designed to reflect the adjacent heritage residential area. These design measures would minimise visual impacts on adjacent residential developments, thereby retaining the existing character of the area. As such, the northern interchange and M1 Pacific Motorway tie-in works would be consistent with the existing and future desired character of the area.

Operational visual impacts

The operational visual impacts of the project have been assessed at the four principal sites of ongoing built form operational infrastructure:

- Motorway operations complex.
- Wilson Road tunnel support facility.
- Trelawney Street tunnel support facility.
- Northern ventilation facility.

Potential operational visual impacts have been assessed in the following sections, with a summary of the outcomes of the assessment provided in **Table 7-139**.

Table 7-139 Operational visual impact assessment summary

Receiver No.	Receiver / construction area	Sensitivity of receivers	Magnitude of change	Overall rating
Motorway operations complex				
1	Residential – Gum Grove Place	High to moderate	High to moderate	High to moderate
2	Residential – Karloon Road / Eaton Road intersection	High	High	High
3	Residential – Coral Tree Drive	Moderate	High to moderate	High to moderate
4	Motorists – Pennant Hills Road / Hills M2 Motorway interchange	Low	Low	Low
5	Motorists – Copeland Road / Pennant Hills Road intersection	Low	Low	Low
Wilson Road tunnel support facility				
1	Residential – Killaloe Avenue / Wilson Road intersection	High to moderate	High to moderate	High to moderate
2	Residential – receivers which adjoin the site to the west	High	High to moderate	High
3	Motorists – Pennant Hills Road / Beecroft Road intersection	Low	Low	Low
Trelawney Street tunnel support facility				
1	Residential – Loch Maree Avenue	Moderate	Moderate	Moderate
2	Residential – receivers which adjoin the site to the east	High	High	High
3	Residential – Trelawney Street	High to moderate	High to moderate	High to moderate
4	Chinese and Australian Baptist Church	Moderate	Moderate	Moderate
5	Motorists – Pennant Hills Road / Phyllis Avenue intersection	Low	Low	Low
Northern ventilation facility				
1	Residential – Woonona Avenue and Bareena Avenue	High to moderate	High to moderate	High to moderate
2	Motorists – M1 Pacific Motorway	Moderate to low	Moderate to low	Moderate to low

Motorway operations complex

Figure 7-37 illustrates the theoretical visibility of the project from the surrounding areas. The visual envelope model is taken from the top of the motorway control centre building at a height of around 16 metres above existing ground level, and demonstrates that the key locations from which potential close views of the site would be obtained are from the residential areas in the west and from Pennant Hills Road.

In reality, views from the east are effectively screened by the Pennant Hills Golf Course perimeter planting. From the west, the landform adjacent to the motorway operations complex falls away and, in conjunction with residential buildings and substantial mature street and garden tree cover, areas greater than 300 metres from the site are unlikely to have substantial visibility of the project elements.

Similarly, it is unlikely that residents from the Coral Tree Drive area to the south of the Hills M2 Motorway would be able to view the western exit portal given the density of the existing screen planting along this edge.

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Figure 7-49 Motorway operations complex visual envelope map

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