The shadow diagrams indicate that:

- The motorway operations complex would generally not overshadow any adjacent properties during the summer months.
- There would be some overshadowing of the closest residences to the west of the motorway operations complex during the morning in the winter months.
- The switching station on Coral Tree Drive would generally not overshadow any adjacent properties during the summer months, however there may be some minor overshadowing of the front yard of some properties on Coral Tree Drive during the morning in the winter months.

Five receiver locations were identified for assessment. This comprises three representative receiver locations for views from residential properties (receiver locations 1, 2 and 3), and two for motorists (receiver locations 4 and 5).

Table 7-140 Motorway operations complex 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 Gum Grove Place and Hillside Place. Key issues and considerations relevant to visibility of the motorway operations complex from this area are: • Residents adjoining the motorway operations complex boundary may view the project for extended periods of time, eg while using their back yard. • The rear boundary areas of a moderate number of the residential properties backing onto the motorway operations complex have substantial tree plantings in place, which would assist with screening. Landscaping along the motorway operations complex boundary would provide a separate screening effect. • Views to the motorway operations complex would be looking up hill towards the buildings, which may be seen in silhouette against the skyline. The potential for this outcome is mitigated by the buildings being setback behind both a ten metre wide perimeter landscape planting and an internal roadway along the length of the complex. • The urban design of the project would comprise a suite of architectural and landscape components, designed to provide a refined and integrated edge to the residential perimeter. The sensitivity of residents for receiver location 1 is considered to be high to moderate, and the magnitude of the visual impact to 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 towards the northern end of the motorway operations complex. **Figure 7-38** shows the view from the intersection for residential receivers before and after completion of the project. Key issues and considerations relevant to visibility of the motorway operations complex from this area are: • The motorway operations complex falls away from the high point at the intersection of Eaton Road and Pennant Hills

No.	Receiver location	Visual impact assessment
		Road, leaving the motorway control centre building as the main point of focus from this area. • Views to the motorway operations complex would generally be looking up hill towards the complex, which would be seen in silhouette against the skyline. This outcome would be mitigated over time as the landscaped areas mature. • The urban design of the project would comprise a suite of architectural and landscape components, designed to provide a refined and integrated edge to the residential perimeter. • Many local residents beyond the identified receiver locations would view the building on a daily basis when entering and leaving the area via Eaton Road. The sensitivity of residents within the vicinity of this receiver location is considered to be high within the context of the loss of the adjacent residential setting and replacement with an infrastructure building setting, and the magnitude of visual impact would be high given the contrast in scale, form and materials of the development, providing an overall visual impact assessment of high.
3	Residential – Coral Tree Drive	Provides a representative receiver location for views from residences within the vicinity of the switching station. Key issues and considerations relevant to visibility of the switching station from this area are that: • The building is of a relatively similar height to nearby two storey residential development and is setback around ten metres from the residential road edge, within a dense landscape buffer planting, the shrub and ground layer of which would wrap around the front of the building. • The building would lose its tree canopy backdrop, causing a gap in the corridor buffer planting, albeit near the end of this section of the corridor planting. • The building would be set on a landform up to four metres high in addition to the approximate seven metre height of the building. • The building is in contrast to adjacent residential development. • The urban design of the project would comprise a suite of architectural and landscape components, designed to provide a refined and integrated edge to the residential perimeter. • The building is located near a cul-de-sac end and would be viewed from a relatively few residential blocks. The sensitivity of residents within the vicinity of this receiver location is considered to be moderate given the relatively low number of residences from which it would be seen, and the magnitude of visual impact to be high to moderate given the proposed architectural and landscape design, providing an overall visual impact assessment of high to moderate.
4	Motorists – Pennant Hills Road / Hills M2 Motorway interchange	Provide representative views of the motorway operations complex by motorists using the Hills M2 Motorway and Pennant Hills Road. **Figure 7-51** shows the view from the intersection of Pennant

No.	Receiver location	Visual impact assessment
5	Motorists – Copeland Road / Pennant Hills Road intersection	Hills Road and the Hills M2 Motorway (receiver location 4) for motorists passing through this area, before and after completion of the project. **Figure 7-52** provides before and after views from the intersection of Copeland Road and Pennant Hills Road (receiver location 5) looking south. Key issues and considerations relevant to the visibility of the southern interchange and motorway operations complex for passing motorists are: • The duration of the views would be limited in time, and experienced as a small component of a longer journey, albeit by a large number of receivers. • The urban design of the project would comprise a suite of architectural and landscape components, designed to provide a refined and integrated edge to the Hills M2 Motorway and Pennant Hills Road at this location. • The landscape mound at the southern end of the motorway operations complex would make a significant landscape contribution to the southern interchange, and in conjunction with landscaping alongside the motorway operations complex road boundary and the existing well vegetated boundary of the Pennant Hills Golf Course, would facilitate the creation of a green corridor for this section of Pennant Hills Road. The sensitivity of motorists is considered to be low, and the magnitude of the visual impact to be moderate to low within the context of the visual integrity of the built form elements and their visual fit within the motorway landscape, providing an overall visual impact assessment of moderate to low.

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Existing corner Eaton Road and Karloon Road

Artists impression corner Eaton Road and Karloon Road

Figure 7-50 Artists impression - corner Eaton Road and Karloon Road

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Existing Hills M2 Motorway and Pennant Hills Road intersection

Artists impression Hills M2 Motorway and Pennant Hills Road intersection

Figure 7-51 Artists impression - Hills M2 Motorway and Pennant Hills Road intersection

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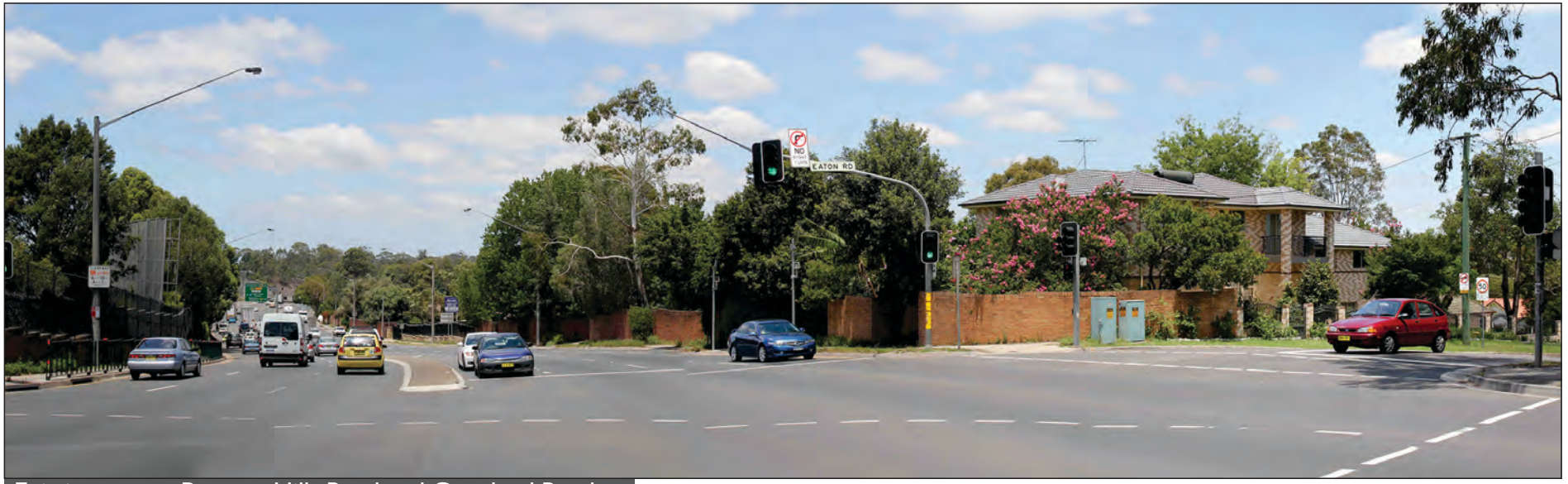

Existing corner Pennant Hills Road and Copeland Road

Artists impression Pennant Hills Road and Copeland Road

Figure 7-52 Artists impression - Pennant Hills Road and Copeland Road

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Wilson Road tunnel support facility

Figure 7-53 illustrates the theoretical visibility of the project from the surrounding areas. The visual envelope model is set to the level at the top of the tunnel support facility building at a height of around five to seven 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 to the west, north and east of the site. To the west, receivers would include residences that directly adjoin the site. Residents to the north and east of the site would be separated from the compound by roads.

In conjunction with residential buildings and substantial mature street and garden tree cover, areas greater than 100 metres from the site are unlikely to have substantial visibility of the project elements.

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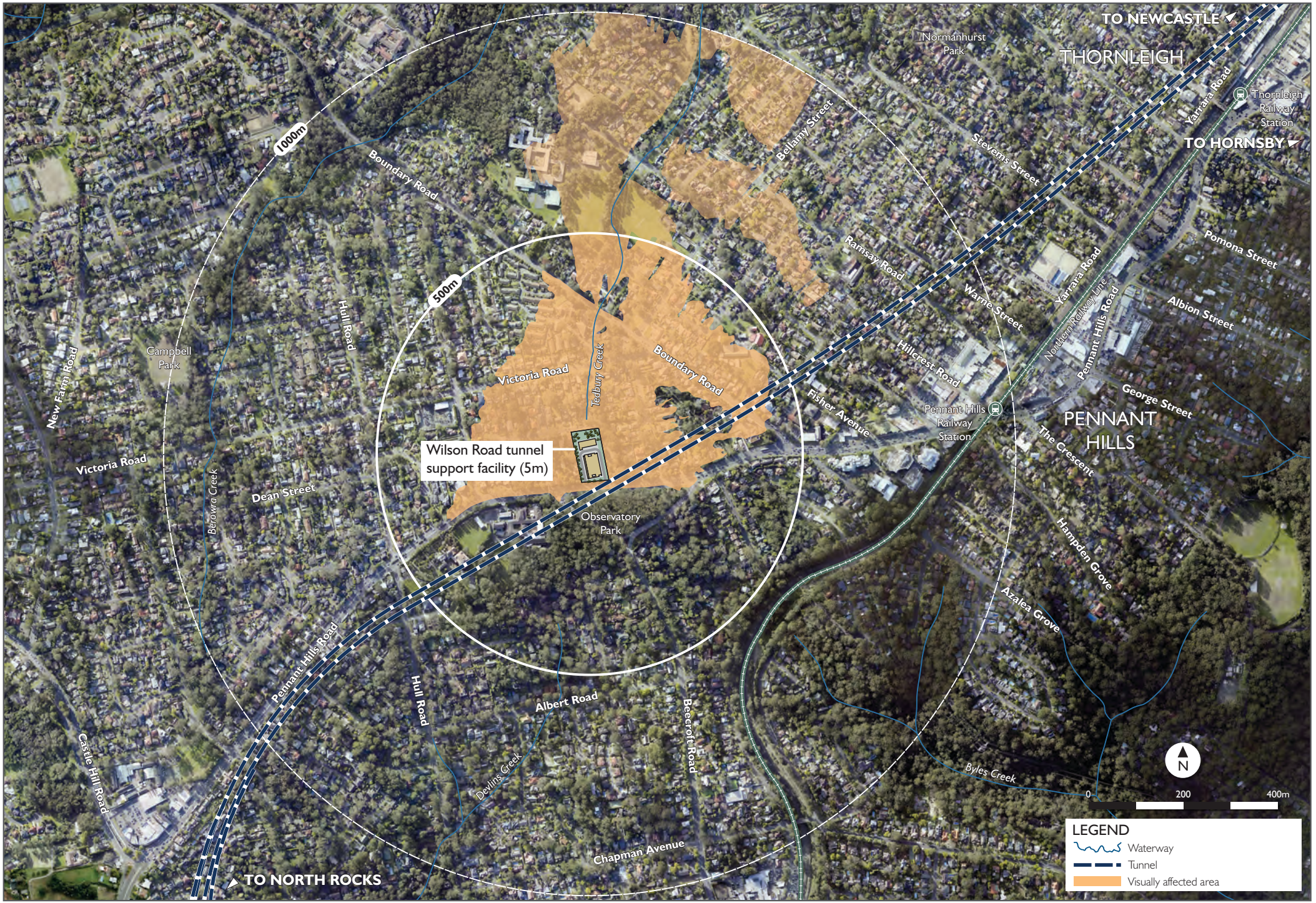

Figure 7-53 Wilson Road tunnel support facility visual envelope map

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The shadow diagrams indicate that the tunnel support facility would be unlikely to overshadow any surrounding properties.

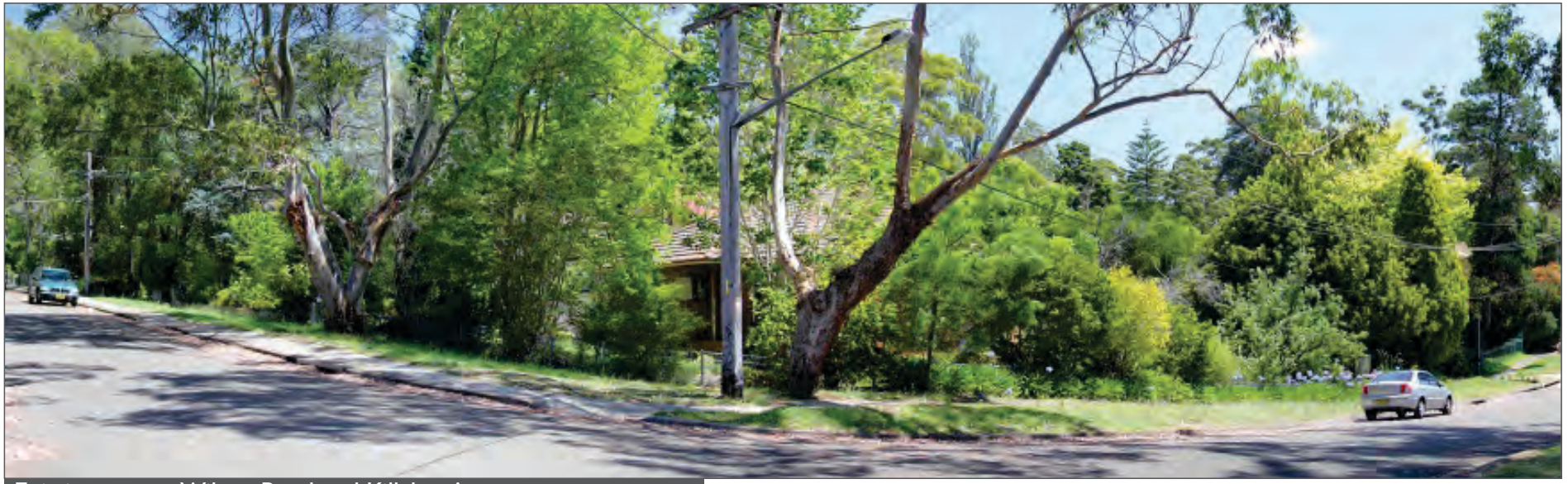
Three receiver locations were identified for assessment. This comprised two representative receiver locations for views from residential properties (receiver locations 1 and 2) and one for motorists (receiver location 3).

Given that Observatory Park is bounded by major roads and is highly visually exposed to passing traffic and high levels of road noise, it is considered likely that use of the park for recreational purposes would be low and of short duration. Potential visual impacts for occasional receivers at this location would therefore be limited and this area has not been assessed as a receiver location.

Table 7-141 Wilson Road tunnel support facility construction visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residential – Killaloe Avenue / Wilson Road intersection	Provides a representative location for views towards the tunnel support facility from these two streets. **Figure 7-54** shows the view from the Killaloe Avenue / Wilson Road intersection before and after completion of the project. Key issues and considerations relevant to the visibility of the facility from this area include: • A relatively low number of residents would be impacted, however most of these would have relatively close views, which would be seen on a daily basis when leaving and re-entering their properties. • The character of the view would change from one of small scale residential development to that of a large infrastructure facility. • The architecture of the facility buildings has considered form, colour and materials in response to the residential context. The sensitivity of the residential visual receivers is considered to be high to moderate, and the magnitude of visual impact to be high to moderate, providing an overall visual impact assessment of high to moderate.
2	Residential – receivers which adjoin the site to the west	Provides a representative location for residences with views to the tunnel support facility from the west. Key issues and considerations relevant to the visibility of the facility from this area include: • A relatively low number of residents would be impacted, however many of these would have close views seen from their back gardens. Three residences directly adjoin the facility. • Residences in this area generally have a high to moderate cover of tree planting within them that could be expected to provide screening of the facility. • The character of the view would change from one of small scale residential development to that of a large infrastructure facility. • The facility sits close to the existing ground level, and is set around two metres below ground at the Pennant Hills Road frontage. As such, the facility would be viewed at a similar

No.	Receiver location	Visual impact assessment
		height to adjacent residential development. • A boundary planting width of between five and eight metres along the receiver boundary can, in the future, be expected to provide additional screening benefit. • The architecture of the facility buildings has considered form, colour and materials in response to the residential context. The sensitivity of these visual receivers is considered to be high, and the magnitude of visual impact to be high to moderate, providing an overall visual impact assessment of high.
3	Motorists – Pennant Hills Road / Beecroft Road intersection	Provide representative views of the compound by motorists using Pennant Hills Road. **Figure 7-55** shows the view from the Pennant Hills Road / Beecroft Road intersection for motorists passing through this area, before and after completion of the project. Key issues and considerations relevant to the visibility of the Wilson Road tunnel support facility for passing motorists are: • The duration of the views would be substantially limited in time, and experienced as a very minor component of a longer journey, albeit by a large number of receivers. • The existing Pennant Hills Road residences within the vicinity of the facility have substantial front garden tree planting, which would provide some visual screening to approaching traffic. Landscaping around the facility would provide further screening when viewed from the road and from Observatory Park. • The architectural and landscape elements have been designed to provide a refined and integrated edge that considers the residential context. • The facility would be located opposite Observatory Park which is a well-known landmark on the road, and is likely to be the primary point of interest for some motorists rather than the facility. • The facility would be viewed within the context of Pennant Hills Road which is a major arterial road. The sensitivity of motorists is considered to be low, and the magnitude of the visual impact would be low, providing an overall visual impact assessment of low.



Existing corner Wilson Road and Killaloe Avenue

Artists impression corner Wilson Road and Killaloe Avenue

Figure 7-54 Artists impression - corner Wilson Road and Killaloe Avenue intersection

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Existing Pennant Hills Road and Beecroft Road intersection

Artists impression Pennant Hills Road and Beecroft Road intersection

Figure 7-55 Artists impression - Pennant Hills Road and Beecroft Road intersection

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Trelawney Street tunnel support facility

Figure 7-56 illustrates the theoretical visibility of the project from the surrounding areas. The visual envelope model is set to the level at the top of the tunnel support facility building at a height of around seven metres above existing ground level (including the proposed elevated landform), and demonstrates that the key locations from which potential close views of the site would be obtained are from the residential areas to the north, east and south of the site. To the east, receivers would include residences that directly adjoin the site. Residents to the north and south of the site would be separated from the site by roads.

The most affected receivers are likely to include those properties looking towards the tunnel support facility from Trelawney Street and Loch Maree Avenue, and from adjoining residences at the rear of the facility.

Views from the west would be limited by the adjacent commercial development. With regard to views from Pennant Hills Road, the facility would be located on a high point, with substantial curves in the road towards either end of the site. Views from the road to the facility would therefore be of short duration but relatively detailed. Views from the residential areas to the east would be limited by a combination of topography (the land falls steeply away from the site), and substantial garden and street tree plantings.

In conjunction with residential buildings and substantial mature street and garden tree cover, areas greater than 100 metres from the site are unlikely to have substantial visibility of the project elements.

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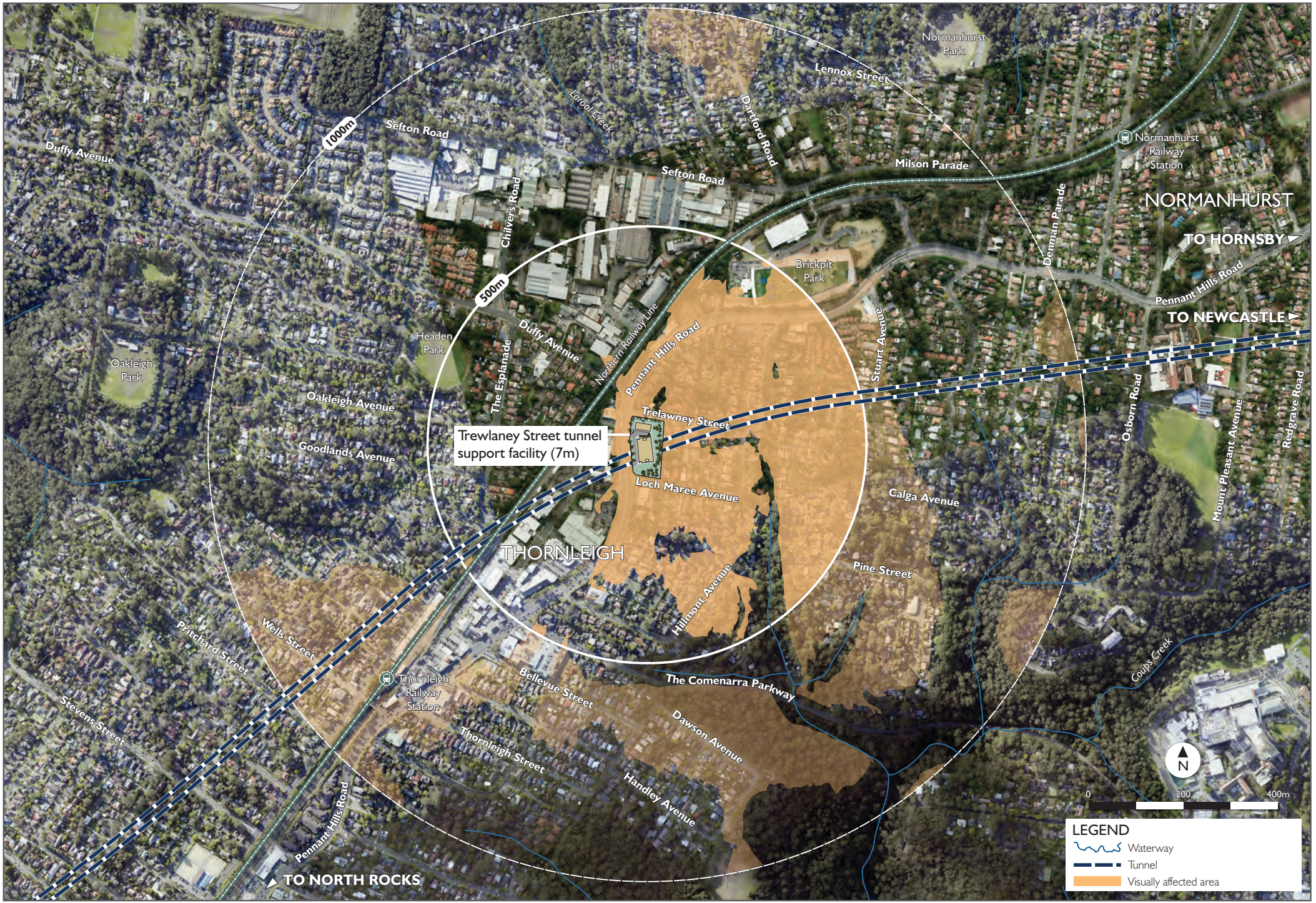

Figure 7-56 Trelwaney Street tunnel support facility visual envelope map

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The shadow diagrams indicate that the tunnel support facility would be unlikely to overshadow any surrounding properties.

Five receiver locations were identified for assessment. This comprised three for views from residential properties (receiver locations 1, 2 and 3), one from the Chinese and Australian Baptist Church located on the southern corner of Loch Maree Avenue / Pennant Hills Road intersection (receiver location 4) and one for motorists (receiver location 5).

Table 7-142 Trelawney Street tunnel support facility 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 facility. Key issues and considerations relevant to the visibility of the facility from this area include: • A relatively low number of residents would be impacted, however most of these would have relatively close views, which would be seen on a daily basis when leaving and re-entering their properties. • The facility would be viewed looking up to it sitting atop the elevated landform, and potentially seen as a skyline view. • The character of the view would change from one of small scale residential development to that of a large infrastructure facility. • The upper end of the street near Pennant Hills Road has a substantial street tree planting which can be expected to provide screening of views to the facility from front garden areas, within the context of looking up the steep street. • The architecture of the facility buildings has considered form, colour and materials in response to the residential context. • The development faces Pennant Hills Road, and has a generous landscaping setback to the southern end of approximately 35 metres. The sensitivity of the residential visual receivers is considered to be moderate given the development addresses the busy Pennant Hills Road, and the magnitude of visual impact to be moderate, providing an overall visual impact assessment of moderate.
2	Residential – receivers which adjoin the site to the east	Provides a representative view for residences from the east. Key issues and considerations relevant to the visibility of the facility from this area include: • A relatively small number of residences would be directly affected by views of the facility. Three residences directly adjoin the facility site boundary. • Residences would have views of the facility from their rear gardens, most of which would be relatively close, detailed views. However, the rear gardens appear to have a significant level of tree cover which could be expected to provide some screening of the facility. • Existing adjacent development comprises two storey commercial development and residential development. • The facility would be viewed looking up to it sitting atop the landform, and seen as a skyline view.

No.	Receiver location	Visual impact assessment
		• The character of the view would change from one of small scale residential development to that of a large infrastructure facility. • The architecture of the facility buildings has considered form, colour and materials in response to the residential context. • The development has a generous landscape setback of around 22 to 25 metres from the adjoining boundary. The sensitivity of the residential visual receivers is considered to be high, and the magnitude of visual impact to be high, providing an overall visual impact assessment of high.
3	Residential – Trelawney Street	Provides a representative view for residences on the northern side of Trelawney Street. **Figure 7-57** shows the view from Trelawney Street for residential receivers before and after completion of the project. Key issues and considerations relevant to the visibility of the facility from this area include: • A relatively low number of residents would be impacted, however most of these would have relatively close views, which would be seen on a daily basis when leaving and re-entering their properties. • The facility would be viewed looking up to it sitting atop the elevated landform, and potentially seen as a skyline view. • Development on the northern half of the site fronting Pennant Hills Road comprises two storey commercial development. • The character of the view would change from one of mixed residential and commercial development to that of a large infrastructure facility. • The architecture of the facility buildings has considered form, colour and materials in response to the residential context. • The development faces Pennant Hills Road, and has a landscaping setback to the northern end of around 15 metres, and setback to the west of around ten to 15 metres. The sensitivity of the residential visual receivers is considered to be high to moderate, and the magnitude of visual impact to be high to moderate, providing an overall visual impact assessment of high to moderate.
4	Chinese and Australian Baptist Church	Provides a representative of view from the church on the southern corner of Lock Maree Avenue and Pennant Hills Road. Key issues and considerations relevant to the visibility of the facility from this area include: • The church fronts onto Pennant Hills Road with relatively little setback or visual screening from the road. • The rear of the church is dedicated to a car parking area. • There are few windows on the northern side of the building looking towards the site. • The development has a generous landscape setback of around 35 metres to the boundary that faces the church. • The character of the view would change from one of residential development to that of a large infrastructure facility. • The architecture of the facility buildings has considered form, colour and materials in response to the residential context.

No.	Receiver location	Visual impact assessment
		The sensitivity of church parishioners to a change in the view to the site is considered to be moderate within the context of the location of both developments on Pennant Hills Road and the proximity to large commercial development across the road, and the magnitude of the visual impact to be moderate, providing an overall visual impact assessment of moderate.
5	Motorists – Pennant Hills Road / Phyllis Avenue intersection	Provide representative views of the compound by motorists using Pennant Hills Road. **Figure 7-58** shows the view from the Pennant Hills Road / Phyllis Avenue intersection, for motorists passing through this area. Key issues and considerations relevant to the visibility of the facility for passing motorists are: • The duration of views would be substantially limited in time, and experienced as a very minor component of a longer journey, albeit by a large number of receivers. • The facility will be seen within the context of large commercial development on the eastern side of Pennant Hills Road. • The architectural and landscape designs for the facility provide a refined and integrated edge that includes street tree planting. The sensitivity of motorists is considered to be low, and the magnitude of the visual impact low, particularly within the context of the adjacent large footprint commercial development, providing an overall visual impact assessment of low.

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Existing Trelawney Street

Artists impression Trelawney Street

Figure 7-57 Artists impression - Trelawney Street (looking west)

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Existing corner Pennant Hills Road and Phyllis Avenue

Artists impression corner Pennant Hills Road and Phyllis Avenue

Figure 7-58 Artists impression - corner Pennant Hills Road and Phyllis Avenue

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Northern ventilation facility

Figure 7-59 illustrates the theoretical visibility of the project from the surrounding areas. The visual envelope model is set to the level at the top of the ventilation outlet at a height of around 16 metres above existing ground level, and demonstrates that the combination of existing screening vegetation, cuttings and noise walls along this section of the motorway effectively blocks significant views into the corridor. However, given the extent of vegetation that would be cleared views to the facility would be available from adjacent residences in Woonona Avenue and Bareena Avenue.

The most affected receivers are likely to include motorists travelling on the M1 Pacific Motorway, and nearby residences in Woonona Avenue, Bareena Avenue and potentially Benson Close.

In conjunction with residential buildings and substantial mature street and garden tree cover, residential areas greater than 100 metres from the site are unlikely to have substantial visibility of the project elements.

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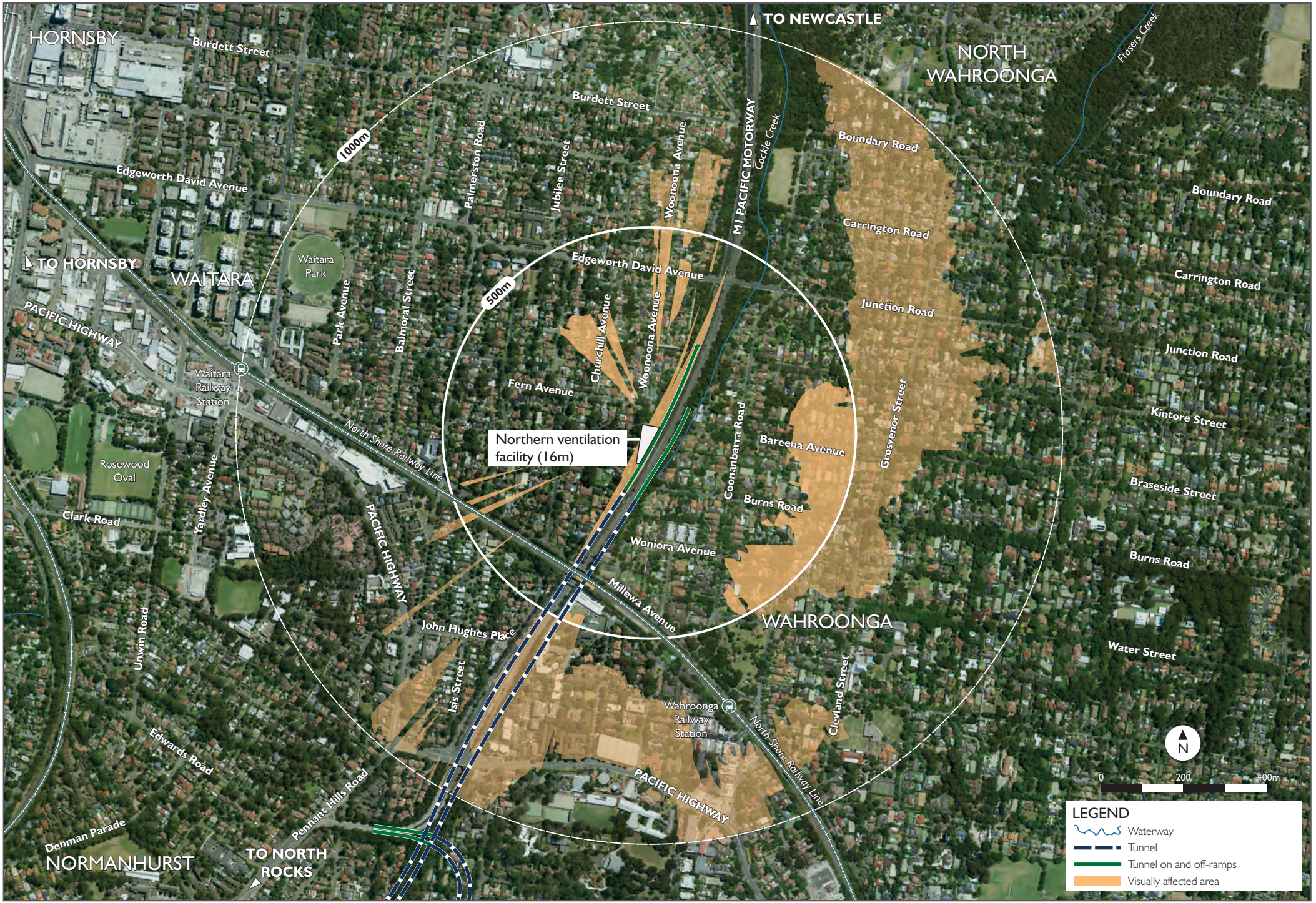

Figure 7-59 Northern ventilation facility visual envelope map

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The shadow diagrams indicate that the northern ventilation facility would be unlikely to overshadow any surrounding properties.

Two representative receiver locations were identified for assessment. This comprised one view from residential properties (receiver location 1) and one for motorists (receiver location 2).

Table 7-143 Northern ventilation facility visual impact assessment

No.	Receiver location	Visual impact assessment
1	Residential – Woonoona Avenue and Bareena Avenue	Provides a representative view for residences in Woonona Avenue, Bareena Avenue and potentially Benson Close. **Figure-7-60** shows the view from Woonona Avenue North before and after completion of the project. **Figure-7-61** shows the view from the end of Woonona Avenue North before and after completion of the project. Key issues and considerations relevant to the visibility of the facility from this area include: • The northern ventilation facility would be partially visible above noise walls from adjacent residences in Woonona Avenue and Bareena Avenue, including two heritage listed residences. Visible components of the project would include part of the upper level of the northern ventilation facility building and the deluge tanks. • The area between the road edge and noise walls would be landscaped using a combination of ground covers, shrubs, grasses and trees. The road edge / noise wall setback would generally be around six metres, with the exception of the two entry points off Woonona Avenue North and the cul-de-sac ends of Woonona Avenue North and Bareena Avenue. Landscape planting would provide an intermittent screening effect for adjacent residences. • The existing vegetated buffer planting between residences and the motorway that would have been lost during the construction process would be partially reinstated. • The façade of the facility and the noise wall would include a combination of glass fibre reinforced concrete panels, sandstone, 'timber-look' battens and glazed openings to reflect the adjacent residential area. At the motorway tie-in zone between Edgeworth David Avenue and Alexandria Parade, the height of landscape screening along new retaining walls would be intermittently limited to a mix of low shrubs and grasses. This landscaping would allow an increased level of visibility of motorway infrastructure (noise walls and pedestrian ramps) for adjacent residents. Within this zone, the remaining areas of landscape restoration outside the corridor would generally comprise substantial pocket plantings of endemic trees, shrubs and grasses which would provide significant localised visual screening effects to the motorway boundary. The sensitivity of residential receivers is considered to be high to moderate within the context of the considered architectural treatments to the development, and the magnitude of the visual impact to be high to moderate given the potential to partially reinstate a visual buffer to the motorway, providing an overall visual impact assessment of high to moderate.

No.	Receiver location	Visual impact assessment
2	Motorists – M1 Pacific Motorway	Provides a representative view for motorists on the M1 Pacific Motorway. **Figure 7-62** shows the view from the M1 Pacific Motorway for motorists travelling southbound before and after completion of the project. Key issues and considerations relevant to visibility of the northern ventilation facility from this area include: • The view within this section of the M1 Pacific Motorway is generally limited to the road reserve, as defined by adjoining noise walls, retaining walls and landscape screening plantings. • Motorists travelling from the north would have passed through extensive bushland areas, before entering a transition zone into the suburbs along Pennant Hills Road and the Pacific Highway. • There would be a significant number of motorists passing through this area on a daily basis. However, the duration of the views would be substantially limited and experienced as a small component of a longer journey. • The northern ventilation facility would be visually contrasting in terms of siting, form and scale with the landscape character of the M1 Pacific Motorway corridor. However, the architectural detailing and finishes for the facility are well considered and would assist with the visual integration of the facility into the vegetated backdrop. • The urban design of the project comprises a well-considered suite of architectural and landscape components that would facilitate a visually well integrated outcome within the existing setting. The sensitivity of motorists would be moderate to low, and the magnitude of the visual impact would be moderate to low, providing an overall visual impact assessment of moderate to low.

Existing Woonona Avenue North

Artists impression Woonona Avenue North

Figure 7-60 Artists impression - Woonona Avenue North

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Existing end of Woonona Avenue North

Artists impression end of Woonona Avenue North

Figure 7-61 Artists impression - End of Woonona Avenue North

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Existing M1 Pacific Motorway southbound

Artists impression M1 Pacific Motorway southbound

Figure 7-62 Artists impression - M1 Pacific Motorway southbound

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Operational night lighting impacts

The potential operational night lighting impacts of the project are assessed in **Table 7-145**. A summary of assessed night lighting impacts based on sensitivity and magnitude of change is provided in **Table 7-144**.

Table 7-144 Operational night lighting impacts summary

Project area	Receiver	Sensitivity to change	Magnitude of change	Overall rating
Motorway operations complex and southern interchange	Residents	High to moderate	Moderate to low	Moderate
	Motorists	Low	Low	Low
Coral Tree Drive switching station	Residents	Moderate	Moderate to low	Moderate
	Motorists	Low	Low	Low
Wilson Road tunnel support facility	Residents	High to moderate	Moderate to low	Moderate
	Motorists	Low	Low	Low
Trelawney Street tunnel support facility	Residents	High to moderate	Moderate to low	Moderate
	Motorists	Low	Low	Low
Northern ventilation facility and northern interchange	Residents	High to moderate	Moderate to low	Moderate
	Motorists	Low	Low	Low

Table 7-145 Operation night lighting impact assessment

Project area	Night lighting impact assessment
Motorway operations complex and southern interchange	Additional light would be introduced to this area during operation associated with the on and off-ramp tunnel portals and the main alignment tunnel portals. Additionally, the toll gantries would require specific illumination. The motorway operations complex would have feature lighting and up lighting to the building elevations facing Pennant Hills Road. Safety and security lighting around the car park and access paths to buildings would also be required. Lighting would include cut-off fittings and would be directed to reduce light trespass. The extent of glare emanating from the new lighting towards adjacent residential development is likely to be relatively low, given the design of the lighting and screening between project infrastructure and residential receivers. The sensitivity of residential receivers is considered to be high to moderate and the magnitude of change to be moderate to low, providing an overall rating of moderate. The sensitivity of motorists to additional lighting is considered to be low and the magnitude of change to be moderate to low, providing an overall rating of moderate to low. Additional lighting during operation would also be provided at the electricity switching station for safety and security requirements, but would be relatively low level. Lighting would use cut-off fittings and would be directed to reduce light trespass. The sensitivity of residential receivers is considered to be moderate and the magnitude of change to be moderate to low, providing an overall rating of moderate. The sensitivity of motorists to additional lighting is considered to be low and the magnitude of change to be low, providing an overall rating of low.
Wilson Road tunnel support facility	Additional lighting during operation would be provided at the Wilson Road tunnel support facility for safety and security requirements, but would be relatively low level. Lighting would use cut-off fittings and would be directed to reduce light trespass. The sensitivity of residential receivers is considered to be high to moderate and the magnitude of change to be moderate to low, providing an overall rating of moderate. The sensitivity of motorists to additional lighting is considered to be low and the magnitude of change to be low, providing an overall rating of low.

Project area	Night lighting impact assessment
Trelawney Street tunnel support facility	Additional lighting during operation would be provided at the Trelawney Street tunnel support facility for safety and security requirements, but would be relatively low level. Lighting would use cut-off fittings and be directed to reduce light trespass. The sensitivity of residential receivers is considered to be high to moderate and the magnitude of change to be moderate to low, providing an overall rating of moderate. The sensitivity of motorists to additional lighting is considered to be low and the magnitude of change to be low, providing an overall rating of low.
Northern ventilation facility and northern interchange	Additional lighting would be associated with the on and off-ramp tunnel portals, the main alignment tunnel portals and the northern ventilation facility. Lighting would use cut-off fittings and be directed to reduce light trespass. Residential development adjacent to the M1 Pacific Motorway tie-in would be substantially screened from motorway lighting by landscape plantings. Existing residents adjacent to the northern ventilation facility would be provided with partial screening through the use of planting and noise walls, with some views to the facility via the access and egress points. Lighting at this site, however, would be low level for safety and security requirements only. The sensitivity of residential receivers is considered to be high to moderate and the magnitude of change to be moderate to low, providing an overall rating of moderate. The sensitivity of motorists to additional lighting is considered to be low and the magnitude of change to be low, providing an overall rating of low.

7.5.6 Environmental management measures

The project has aimed to limit its visual impact by situating project elements within or adjacent to major transport corridors. Project elements have been designed with consideration of the surrounding areas and landscape treatments have been proposed in order to reduce the visual impacts of new infrastructure. Despite this, visual impacts would occur, particularly during the construction phase due the introduction of construction sites and large structures such as acoustic sheds.

Environmental management measures relating to urban design, landscape character and visual amenity have been identified and are provided in **Table 7-146**.

The impact assessment has assumed that landscape treatments are at an early stage of development, ie 12 to 18 months. As such, the visual impact assessment ratings can generally be expected to be reduced over time as the landscaped areas mature, providing increased screening effects and visual amenity benefits.

Table 7-146 Environmental management measures – urban design, landscape character and visual amenity

Impact	No.	Environmental management measure	Timing
Construction			
General	V1	The urban design and landscape objectives would continue to be considered during the development of the detailed design.	Detailed design
Visual amenity	V2	Existing vegetation around the perimeter of construction sites would be retained where feasible and reasonable.	Construction
	V3	The early implementation of noise walls and landscape planting around ancillary facilities would be investigated in order to provide visual screening and minimise noise impacts during the construction phase.	Construction
	V4	Elements within construction sites would be located to minimise visual impacts as far as feasible and reasonable, eg locating equipment back from site boundaries.	Construction
	V5	The design of acoustic sheds would aim to blend into the background where feasible and reasonable.	Pre-construction / construction
	V6	Design of site hoardings would consider the use of artwork or project information.	Pre-construction / construction
	V7	Regular maintenance would be undertaken of site hoardings and perimeter areas including the prompt removal of graffiti.	Construction
	V8	Revegetation / landscaping would be undertaken progressively.	Construction
Construction lighting	V9	Cut-off and directed lighting would be used and lighting location considered to ensure glare and light spill are minimised.	Construction
Landscaping	V10	Opportunities would be investigated to provide passive irrigation of landscaped areas at the operational ancillary facilities through use of directed overland flow paths.	Pre-construction / construction

Impact	No.	Environmental management measure	Timing
	V11	Opportunities would be investigated to flatten landscape batters at the operational ancillary facilities to maximise plant response and maintainability.	Pre-construction / construction
Signage	V12	A signage strategy would be developed during detailed design. Potentially affected receivers would be consulted on the final signage in relation to the location and associated impacts.	Pre-construction / construction
Operation			
Visual amenity	OpV1	Street tree plantings and landscaping would be used to visually soften operational ancillary facilities.	Construction / post-construction
	OpV2	The urban design and landscaping along the Hills M2 Motorway integration works would be consistent with the recently completed Hills M2 Motorway Upgrade project.	Detailed design
	OpV3	The visual impact of noise walls would be reduced through high quality urban design treatments in accordance with *Noise Wall Design Guideline* (RTA, 2006a).	Construction / post-construction
Landscaping	OpV4	Landscaped areas would be maintained.	Operation
Operational lighting	OpV5	Cut-off and directed lighting would be used at the interchanges, Hills M2 Motorway integration, motorway operations complex and M1 Pacific Motorway tie-in to minimise glare and light spill to surrounding receivers.	Detailed design

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