



WestConnex M4-M5 Link

Rozelle Interchange - Modification: Iron Cove ventilation underground

Modification report

Appendix F

Urban design and visual amenity



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Roads and Maritime Services

WestConnex - M4-M5 Link

Iron Cove ventilation underground modification report

Modification report

Appendix F Urban design and visual amenity

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Prepared for

Roads and Maritime Services

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1 Proposed modification

The Iron Cove Link motorway operations complex (MOC4) described in the EIS would be constructed on the southern side of the realigned Victoria Road, on land occupied during construction by the Iron Cove Link civil site (C8). The electrical substation (that provides power for the operation of the ventilation facilities) would be about four metres high and located on the corner of Victoria Road and Callan Street, while the ventilation exhaust facilities building would be located between Callan Street and Springside Street and be around 10 metres above ground level, about 50 metres in length and adjacent to residential properties.

The proposed modification would relocate the Iron Cove Motorway Operations Complex (MOC4) underground within caverns housing the electrical substation and ventilation facilities and a ventilation tunnel connecting to the ventilation outlet (which will remain above ground in the same location illustrated in the EIS). Only a switch room, high voltage regulators, an alternative Operational Motorway Control System (OMCS) room and a separate stair access leading down to the ventilation tunnel would be required on the surface on the western side of Victoria Road between Toelle and Callan Streets located where the above ground substation was illustrated in the EIS and within the boundaries of the Iron Cove Link civil site (C8).

The combined switch room and high voltage regulator structure would be about six metres wide and 30 metres long, with a height of up to five metres. This structure would be adjacent to the Victoria Road Shared Use Path on the eastern side of the intersection of Victoria Road and Toelle Street. Within the same area would be the smaller 'L'- shaped OMCS room with a footprint of approximately nine metres wide by nine metres long and five metres high.

A small above-ground structure in the vicinity of Callan Street, about two metres wide, six metres long and three metres high would contain an access door and a stairway. The staircase would provide an alternative safe maintenance and emergency access to and from the ventilation tunnels from the surface, with the main access from within the road tunnels.

Dedicated parking would be provided for operations and maintenance personnel with access off Clubb Street and within the switch room site with access off Toelle Street.

This proposed modification has been developed to improve urban design outcomes when compared with the design assessed in the Environmental Impact Statement (EIS) and Submissions and Preferred Infrastructure Report (SPIR).

The proposed modification aligns with the aspirations and objectives of the WestConnex Urban Design Framework, specifically:

"The WestConnex Motorway will be a sustainable, high quality and transformational project for the people of Sydney and NSW. Exhibiting design excellence as a whole and in all constituent parts, it shall be sensitively integrated into the built and natural environments and help build local communities. It will enhance the form, function, character and liveability and contribute to the future liveability of the city."

Reducing surface infrastructure would improve visual impacts compared to the EIS, particularly a reduction in overshadowing due to the much smaller scale of permanent infrastructure.



Figure 1 Location of operational ancillary facilities at Iron Cove as shown in EIS



Figure 2 Location of operational ancillary facilities at Iron Cove, based on the proposed modification

2 Review of landscape character impacts

2.1 Landscape character impacts for the proposed modification

The landscape character impact of the proposed modification would be the same as compared to the landscape character associated with the design as assessed in the EIS.

As was undertaken in the EIS, landscape character impacts were assessed including ratings for sensitivity and magnitude at each nominated Landscape Character Zone (LCZ) related to the proposed modification. These LCZ's are shown on Figure 3 from the EIS.

Although the proposed modification would provide a reduction in operational facilities located above ground, the assessment results did not change to such a degree that would alter these overall LCZ conditions as assessed in the EIS.

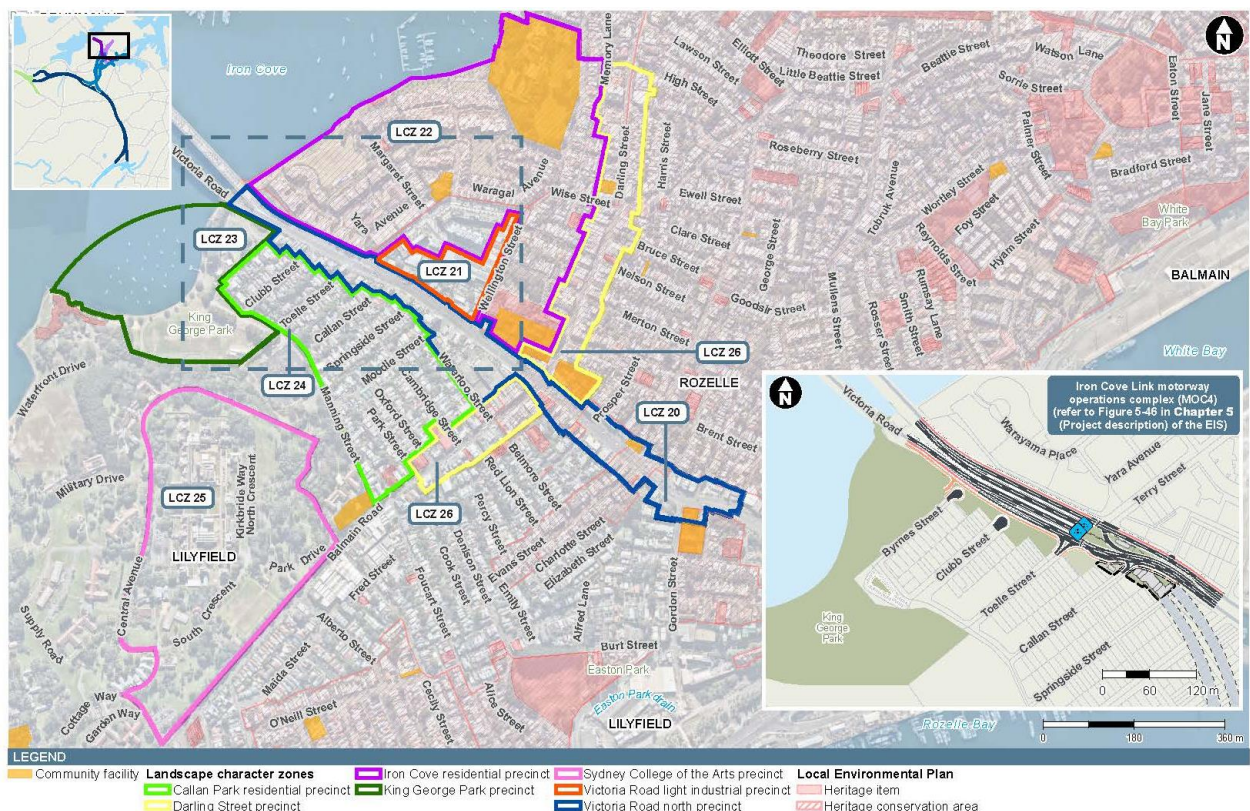


Figure 3 Northern landscape character zones as shown in EIS (Figure 13-3)

3 Review of visual impacts

3.1 EIS Visual impacts at Iron Cove Link

The EIS assessed visual impacts on receivers including ratings for sensitivity and magnitude at each nominated viewpoint.

The visual impact assessment identified the potential for 'high' visual impacts for residents on the west side of Terry Street, for the view looking south along Terry Street towards the project (IC4). The sensitivity of the three storey apartments on the west side of Terry Street was considered to be high, as the apartments currently look out onto a well-considered, almost entirely residential streetscape of substantial visual quality.

The magnitude of the change for residents on the west side of Terry Street was also considered to be high given that the view of the ventilation outlet (as part of the Iron Cove Link motorway operations complex (MOC4)) would comprise a substantial, highly contrasting element within the context of a well-articulated and substantially detailed residential development within this part of the street, and the revealed, small scale, period housing profiles on the opposite side of Victoria Road.

The EIS included the removal of residential and commercial development fronting onto Victoria Road, and replacement with well setback, lower scale existing period housing profiles and streetscape improvements, in addition to centre median planting with substantial tree cover. This is considered to comprise an improvement in the visual character of this central part of the view. 'High' visual impacts were not anticipated in the EIS for the other viewpoints identified around the Iron Cove Link.

Viewpoints used in the EIS have been reviewed and the relevant viewpoints to the Iron Cove Link (including the Iron Cove Link motorway operations complex (MOC4)) are shown in the following figures.

Impacts recorded in the EIS are also shown in the figures below.

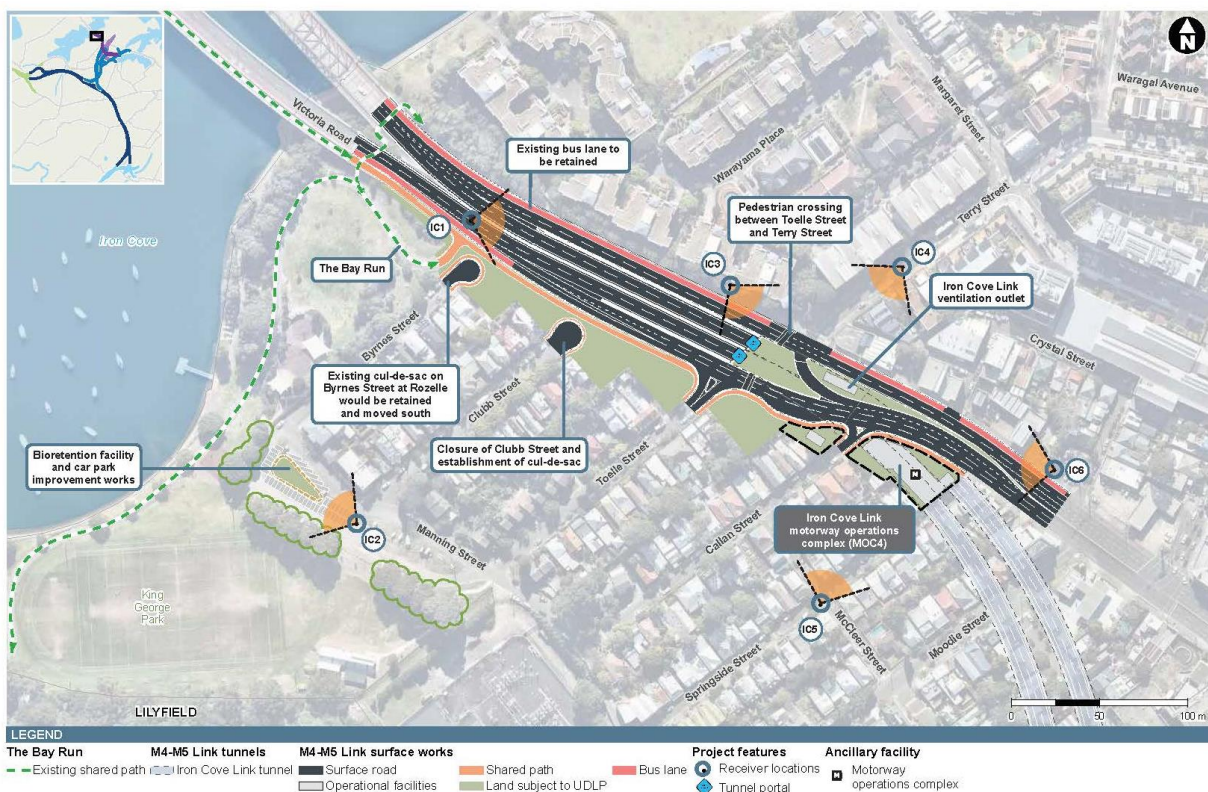


Figure 4 Visual impact assessment summary – Iron Cove Link viewpoints (EIS Figure 13-31)



Figure 5 EIS Image: Existing view from Victoria Road near Iron Cove Bridge looking east - Viewpoint IC1 (EIS Figure 13-32)



Figure 6 EIS Image: 3D artist's impression image at 10 years of operation from Victoria Road near Iron Cove Bridge looking east - Viewpoint IC1 (EIS Appendix O Figure 7-34)



Figure 7 EIS Image: Existing view from Victoria Road near Terry Street looking east- Viewpoint IC3 (EIS Appendix O Figure 7-38)



Figure 8 EIS Image: Existing view looking east along Victoria Road at corner of Crystal Street - Viewpoint IC6 (EIS Appendix O Figure 7-47)



Figure 9 EIS Image: Photomontage at 10 years of project operation for the view looking east along Victoria Road at corner of Crystal Street - Viewpoint IC6 (EIS Appendix O Figure 13-37)

Table 1 Summary of visual impacts on sensitive receivers (EIS Table 13-17)

Receiver location	Receiver type	Sensitivity	Magnitude	Overall rating
View looking east along Victoria Road near Iron Cove Bridge (IC1)	Residents	Moderate	Moderate	Moderate
	Pedestrians	Low	Moderate	Moderate–Low
	Recreation	Moderate	Moderate	Moderate
	Motorists/public transport/cyclists	Low	Moderate	Moderate–Low
View looking west from Manning Street towards bioretention facility (IC2)	Residents	Moderate	Low	Moderate–Low
	Recreational users	Moderate	Low	Moderate–Low
	Pedestrians	Moderate	Low	Moderate–Low
View looking east along Victoria Road near Terry Street (IC3)	Pedestrians	Low	Moderate	Moderate–Low
	Motorists/public transport/cyclists	Low	Moderate	Moderate–Low
View looking south along Terry Street towards Victoria Road (IC4)	Residents – Balmain Shores corner of Terry Street	Low	Moderate	Moderate–Low
	Residents – Nagurra Place: north side	Low	Low	Low
	Residents – Nagurra Place: south side	Moderate	High	High–Moderate
	Residents – Terry Street: west side	High	High	High

Receiver location	Receiver type	Sensitivity	Magnitude	Overall rating
	Residents – Terry Street: east side	Moderate	Low	Moderate-Low
	Pedestrians	Low	Low	Low
	Motorists/cyclists	Low	Low	Low
View looking north along Springside Street towards Victoria Road (IC5)	Residents	Moderate	Moderate	Moderate
	Pedestrians	Moderate	Moderate	Moderate
View looking east along Victoria Road at corner of Crystal Street (IC6)	Pedestrians	Low	Moderate	Moderate–Low
	Motorists/public transport/cyclists	Low	Moderate	Moderate–Low

3.2 Visual impacts at Iron Cove Link proposed modification

The proposed modification would improve amenity adjacent to the new shared path located next to Victoria Road westbound, due to increased areas offered with the reduction in operation facilities located above ground.

In regard to visual impact, the overall impact of the proposed modification would be slightly improved with the reduction in visible facilities, compared to comparable visual impacts as assessed in the EIS.

The major visual change from what was assessed at the EIS is the removal of the MOC4 facility from the corner of Springside Street and Victoria Road. This results in residents that were to be impacted under the EIS concept design no longer being impacted under the proposed modification in this location.

The ventilation facility building and substation shown in the EIS is now proposed to be underground, with a new switch room, high voltage regulators, and an alternative Operational Motorway Control System (OMCS) located at the corner of Victoria Road and Toelle Street.

To consolidate above ground structures within a reduced footprint in this location, the structures would be adjacent the shared path and screening of the facility with vegetation would be reduced.

A separate small above ground structure in the vicinity of Callan Street would contain an access door and a stairway to the ventilation tunnel. The visible mass of this new building is noticeably smaller than the EIS assessed MOC4 ventilation facility.

Although the location and form of the visible structures at Iron Cove Link is reduced, there is still a number of structures adjacent to Victoria Road when compared to the existing condition, and what was assessed at EIS.

Overall, the visual impact is generally similar, whilst the overall visible scale and size of the structure has been reduced from what was assessed in the EIS.

As was undertaken in the EIS, visual impacts on receivers was assessed including ratings for sensitivity and magnitude at each nominated viewpoint related to the proposed modification.

Artists impressions, photomontages and cross section of the relevant viewpoints to the Iron Cove Link (including the Iron Cove Link motorway operations complex (MOC4)) were prepared to reflect the proposed modification and are shown following. The images were created by 3d modelling or overlaying the 3d model and existing site photograph to create a viewpoint image used for assessment, showing the proposed works.

Impacts were re-assessed for the proposed modification using the method outlined in the EIS, including the production of updated photomontages.

The assessment resulted in the same visual impacts as recorded in the EIS and shown in the EIS Table 13-17, as the slight improvement associated with the proposed modification does not alter the overall rating category.



Figure 10 Iron Cove Link viewpoints, based on the proposed modification



Figure 11 Iron Cove Link - Typical section AA



Figure 12 EIS Image: Photomontage at 10 years of operation from Victoria Road near Iron Cove Bridge looking east - Viewpoint IC1 (EIS Appendix O Figure 7-34)



Figure 13 3D artist's impression image at 10 years of project operation of view from Victoria Road near Iron Cove Bridge looking east in proximity to IC1, based on the proposed modification. This modification does not alter the ventilation outlet from the approved project. Exterior design of the ventilation outlet is subject to the Urban Design and Landscape Plan.



Figure 14 EIS Image: Photomontages at 10 years of operation from Victoria Road near Terry Street looking east - Viewpoint IC3 (EIS Appendix O Figure 7-40)



Figure 15 Photomontage at 10 years of project operation for the view looking east along Victoria Road in proximity to EIS Viewpoint IC6, based on the proposed modification. This modification does not alter the ventilation outlet from the approved project. Exterior design of the ventilation outlet is subject to the Urban Design and Landscape Plan.



Figure 16 EIS Image: Photomontage at 10 years of operation looking west along Victoria Road from corner of Crystal Street - Viewpoint IC6 (EIS Appendix O 7-48)



Figure 17 Photomontage at 10 years of operation looking west along Victoria Road from corner of Crystal Street in proximity to IC1, based on the proposed modification. This modification does not alter the ventilation outlet from the approved project. Exterior design of the ventilation outlet is subject to the Urban Design and Landscape Plan.

3.3 Additional views of the proposed ancillary facilities not included in the EIS

In this section, additional views of the proposed ancillary facilities have been prepared and assessed in supplement to the EIS visual impact and consistency assessment outlined in section 3.2.

Additional viewpoint locations were identified in consultation with the project team, to reflect the scale and form of the proposed ancillary facilities in its setting. The images were created by 3d modelling to create a viewpoint image used for assessment. Viewpoint locations were selected to represent pedestrian views of nearby receivers in close proximity to the proposed facilities and shown in Figure 18 below. To assist in making the visual assessment process easier to comprehend and more accurate, each assessment provides an existing image of each viewpoint.



Figure 18 Iron Cove Link additional viewpoints, based on the proposed ancillary facilities

Viewpoint IC7 - view east from Toelle Street

Existing situation

The viewpoint is situated along Toelle Street, approximately 15m south of Victoria Road. The existing view is shown in Figure 19. The view comprises a narrow, local street with single storey, free standing cottages which form a clear built edge to the street. A limited area of Victoria Road is visible in the periphery of the view, including street signage and overhead wiring. This viewpoint is representative of views from nearby residents and pedestrians.

Project effects

The change in view from this viewpoint is shown in Figure 20. The key project effects that would be visible from this location include:

- New road widening and alignment, including road furniture such as road signage and lighting
- The proposed switching room facility on the corner of Toelle Street and Victoria Road
- Ventilation outlet in between the eastbound and westbound carriageways
- New landscaped areas along the verge and in the median of Victoria Road

In this view, the ventilation outlet would comprise a dominant feature from this location, set within the broad expanse of the carriageway and projecting above the skyline. This modification does not alter the ventilation outlet from the approved project. The operational facilities in the centre of the view would be located along the new edge of Victoria Road, which would be of a similar scale and proportion to existing commercial buildings.

The character of the view would change as the end of Toelle Street is absorbed into the arterial road corridor.



Figure 19 3D Viewpoint IC7 - existing condition, looking east along Toelle Street toward the proposed ancillary facilities



Figure 20 3D Viewpoint IC7 - artist's impression at 10 years of operation, looking east along Toelle Street toward the proposed ancillary facilities.

Note: Operation infrastructure subject to detailed design. This modification does not alter the ventilation outlet from the approved project. Exterior design of the ventilation outlet is subject to the Urban Design and Landscape Plan. Pedestrian traffic lights on Victoria Rd will be included in detailed design.

Visual impact assessment

Table 2 - Viewpoint IC7 visual impact assessment

Viewpoint	Sensitivity	Magnitude	Rating
IC6	<p>Sensitivity to change: Moderate</p> <p>This viewpoint looks out across the existing narrow local street toward established cottage houses, where viewers would be sensitive to a change in the setting.</p> <p>The existing streetscape is of moderate visual quality and provides a low capacity to absorb change with the introduction of major new project infrastructure.</p>	<p>Magnitude of change: High</p> <p>The project would result in a contrasting and permanent change in the view. Due to the proximity of the viewer, the scale of the intervention is relatively large, and most noticeable for residents closest to Victoria Road.</p>	<p>High-Moderate</p>

Viewpoint IC8 - view south from Victoria Road

Existing situation

The viewpoint is located at the existing central median along Victoria Road, at the signalised crossing point near Toelle Street. The existing view is shown in Figure 21. The view comprises a busy arterial road, free standing residential properties and mixed-use buildings, forming a poor visual environment. The view is representative of a typical pedestrian view and would be similar for motorists and residential receptors facing Victoria Road.

Project effects

The change in view from this location is shown in Figure 22. The key project effects that would be visible from this location are:

- New widened road corridor which would include road lighting and signage
- New landscape treatments in the widened median (foreground)
- New landscape treatments along the verge
- Proposed operational facilities building at the corner of Victoria Road and Toelle Street.

The operational buildings would be setback from the verge and staggered to maximise landscaped screening opportunities, where possible. The scale and height of the buildings would be in keeping with the single and double-storey dwellings and commercial buildings along Victoria Road.

Visual impact assessment

Table 3 - Viewpoint IC8 visual impact assessment

Viewpoint	Sensitivity	Magnitude	Rating
IC7	<p>Sensitivity to change: Low</p> <p>The viewpoint looks across a major arterial road where the outlook is of low visual quality. The view would be predominantly experienced by motorists who would not be sensitive to change. Pedestrians and properties fronting Victoria Road would also experience this view.</p>	<p>Magnitude of change: Moderate</p> <p>The project would increase the scale of the road corridor in this view. New built elements would be introduced that were of a similar scale to the existing dwellings, which would be offset by the introduction of new landscaped areas.</p> <p>It was considered that the project works would provide a positive contribution to the visual amenity from this location.</p>	<p>Low-moderate</p>



Figure 21 3D Viewpoint IC8 - existing condition, looking south along Victoria Road toward the proposed ancillary facilities



Figure 22 3D Viewpoint IC8 - artist's impression at 10 years of operation looking south along Victoria Road toward the proposed ancillary facilities. Note: Pedestrian traffic lights will be included in detailed design.

Viewpoint IC9 - view west along Callan Street

Existing situation

This viewpoint location is situated along Callan Street, approximately 50 metres south of Victoria Road. The existing view comprises of a narrow, laneway-scaled, local street, with no trees and established single storey dwelling built close to the boundary. The view is primarily representative of views experienced from nearby residents and pedestrians along Callan Street where views are typically confined to the narrow streetscape that slopes down from Victoria Road.

Proposed effects

From this viewpoint, it would be unlikely that the proposed facilities would be visible in this location. From similar locations along Callan Street, it would be possible that the buildings may be partially visible, however views would be limited, and the buildings would recede into the background of the view, obscured by vegetation and residential properties. It is also noted that for similar views along Callan Street, the ventilation outlet would potentially be visible. This modification does not alter the ventilation outlet from the approved project.



Figure 23 3D Viewpoint IC9 - existing condition, looking west along Callan Street toward the proposed ancillary facilities

Visual impact assessment

Table 4 -Viewpoint IC9 visual impact assessment

Viewpoint	Sensitivity	Magnitude	Rating
IC8	Sensitivity to change: Moderate The viewpoint looks across residential properties along a narrow street and would be sensitive to a change in setting.	Magnitude of change: Negligible Due to the topography and scale of the operational buildings in the background, there would be limited, if any change to the view.	Negligible

Summary of visual impacts

A summary of the visual impacts for the additional representative viewpoints discussed in this section of the report are provided below in Table 5.

Table 5 - Viewpoint IC9 visual impact assessment

Viewpoint	Sensitivity to change	Magnitude of change	Overall Rating
IC6	Moderate	High	High-Moderate
IC7	Low	Moderate	Low-moderate
IC8	Moderate	Negligible	Negligible

It is noted that the additional viewpoints that have been assessed in this section are focussed primarily on visual impact related to the proposed facilities at the corner of Toelle Street and Victoria Road. For that reason, viewpoint locations were selected at pedestrian eye level, and in closer proximity to the buildings compared to the viewpoints in the EIS.

In consideration of this, the assessment demonstrates that for nearby residential receptors in close proximity to the proposed buildings, the visual impact would be highest, particularly on Toelle Street and represented in viewpoint IC7. It is noted that the ventilation outlet, which would be visible from this viewpoint, has contributed to the high visual impact rating at this location. This modification does not alter the ventilation outlet from the approved project.

For views along Victoria Road, and represented in viewpoint IC8, the proposed buildings would be visible within the context of the broader project works which, through wide, landscaped verges, was considered to improve the visual amenity of views in the area.

Finally, viewpoints from adjacent side streets, such as IC9, are unlikely to experience any major adverse visual impact from the proposed building envelope.

4 Review of Revised Environmental Management Measures and MCoAs

4.1 Review of relevant revised environmental management measures

The Submissions and Preferred Infrastructure Report (SPIR) for the M4-M5 Link Project identified the revised environmental management measures (REMM) that would be adopted to avoid or reduce environmental impacts of the EIS, with all measures identified incorporated into management plans.

The REMM's related to Urban Design outcomes at Iron Cove Link facilities are listed below for reference.

Given the minor change in visual impacts, and that the size and form of the facilities and locations at Iron Cove Link assessed during the EIS are generally consistent with those shown in the proposed modification, the REMM's listed below are adequate to achieve the overall project outcomes.

With reference to REMM LV8, the operational facilities are still able to be designed to satisfy the functional requirements and adopt the design principles detailed in the M4-M5 Link Urban Design Report.

REMM LV19 will be complied with through the use of vegetation to reduce the visual impact associated with the ventilation outlet, where possible.

Through detailed design, the design of Iron Cove Link facilities will consider the height, bulk, scale and landscape setting in accordance with the design principles detailed in the M4-M5 Link Urban Design Report to satisfy REMM LV22.

4.2 Review of relevant Conditions of Approval

The detailed design of the Iron Cove Link will be managed under the existing Planning Approval Conditions. The Urban Design and Landscape Plan(s) (UDLP) will be prepared under Planning Approval Conditions E133 to E137.

Overshadowing will be assessed with a Solar Access and Overshadowing Report under Planning Approval Condition E138.

The UDLP and Overshadowing will be reviewed by the Design Review Panel (DRP) and the UDLP will be approved by the Secretary of the Department of Planning, Industry and Environment.

Impact	Ref	Revised environmental management measure	Timing
General impacts on landscape and visual amenity	LV8	Visible elements of operational facilities will be designed to satisfy functional requirements and adopt the design principles detailed in the M4-M5 Link Urban Design Report. The proposed designs will be documented in the relevant UDLP for the project	Construction
Impacts on visual amenity at Iron Cove Link	LV19	Investigate vegetative and other screening measures along Victoria Road to improve the visual amenity of the streetscape and reduce impacts associated with the ventilation outlet and increased glare from the portals to residential dwellings to the north of Victoria Road. Reasonable and feasible landscaping measures will be included in the relevant UDLP.	Construction

Impact	Ref	Revised environmental management measure	Timing
Visual amenity impacts associated with design of ventilation outlets at Rozelle, Iron Cove Link and St Peters	LV22	Investigate measures during detailed design to reduce the height, bulk, scale and enhance the landscape setting of the ventilation outlets, subject to achieving desired ventilation outcomes, and in accordance with the design principles detailed in the M4- M5 Link Urban Design Report	Construction

5 Conclusion

The proposed modification would improve amenity adjacent to the new shared path located next to Victoria Road westbound, due to increased landscaped areas offered with the reduction in operational facilities located above ground.

The overall visual impact of the proposed modification would be slightly improved with the reduction in visible facilities, with the same visual impacts recorded as was assessed in the EIS.