

# Rozelle Interchange

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**WestConnex**

## **Solar Access & Overshadowing Report** M4-M5 Link Rozelle Interchange & Iron Cove Link RIC-JHC-RPT-00-EN-001-083



Project:

Rozelle Interchange and WHT Enabling Works -  
Design and Construct

Solar Access & Overshadowing Report

Document Number:

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Front cover image: Artist's impression: Rozelle  
Rail Yards aerial perspective (landscape shown at  
full maturity and is indicative only).

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## Document revisions

Revision	Date	Description	Author	Check	Approval
A	07.12.2020	Draft issue	AD	AD	RV
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# 1 Introduction

The M4-M5 Link is a component of the WestConnex program of works, which aims to ease congestion, create employment opportunities and connect communities. Together with the other components of WestConnex and the proposed future Sydney Gateway project, the M4-M5 Link will facilitate improved connections between western Sydney, Sydney Airport and Port Botany, and south and south-western Sydney, as well as improved connectivity between the important economic centres along Sydney's Global Economic Corridor and local communities.

The WestConnex M4-M5 Link will be built and opened in two stages;

- Stage 1: the mainline tunnels between the M4 East at Haberfield and the New M5 at St Peters, stub tunnels to the Rozelle interchange and operational ancillary infrastructure.
- Stage 2: the Rozelle Interchange and Iron Cove Link including a new underground motorway interchange to City West Link and underground bypass of Victoria Road between Iron Cove Bridge and Anzac Bridge, with links to the future Western Harbour Tunnel.

The purpose of this report is to document the solar access and overshadowing impacts resulting from the construction of project works relating to Stage 2 of the M4-M5 Link, the Rozelle Interchange Project (the 'Project').

Transport for NSW (TfNSW) is the Proponent for the Project and has engaged John Holland CPB Contractors Joint Venture (JHCPB) to design and construct the Project on its behalf.

## 1.1 Purpose of this Report

This Solar Access and Overshadowing Report has been prepared to address Minister's Condition of Approval (CoA) E138 with respect to project structures that may cause overshadowing of residential properties.

This report has been prepared to:

- i. Identify properties that do not meet CoA E138. These will be properties that receive less than the prescribed minimum hours of direct sunlight.
- ii. Present the Consultation Plan to detail how potential impacts and mitigation measures will be discussed and negotiated with the affected property owners.

This report documents the findings of the overshadowing assessment and identifies those affected residential properties that do not receive sufficient solar access detailed in CoA E138. The report also documents the next steps and describes how the potential impacts and mitigation measures will be discussed and negotiated with affected property owners.

## 1.2 Ministers Conditions of Approval

An Environmental Impact Statement (EIS) for the Project was submitted on 18 August 2017 for public exhibition and comment. In January 2018, a Submissions Report was submitted in response to submissions received during the EIS exhibition period. The Plan was considered by the Department of Planning, Industry and Environment (DPIE) and informed the Minister for Planning in the Project's approval assessment.

On 17 April 2018, planning approval for the Project was received from the Minister for Planning. The approval was subject to Conditions of Approval, including clause E138 relating to overshadowing which is specific to this Report. This CoA is contained in the following table. Compliance with the CoA is noted and includes the location in this Plan where each item is addressed.

**Table 1: E138 Condition of Approval**

Condition of Approval	Document Reference
<p>E138 Existing residential properties (and approved residential developments, at the time of this approval) that are affected by overshadowing from the CSSI (including any noise mitigation measures) are to receive a minimum of three (3) hours of direct sunlight in habitable rooms and in at least 50% of the principal private open space area between 9:00 am and 3:00 pm on 21 June. Such properties must be identified for further consideration by the Proponent in a Solar Access and Overshadowing Report which addresses compliance with these requirements.</p> <p>The Solar Access and Overshadowing Report must be reviewed by the Design Review Panel. The Proponent must respond to the outcomes of the Design Review Panel's review and then submit the Report to the Secretary prior to the commencement of construction of any structures that may cause overshadowing of residential premises, whenever is the sooner and must include:</p>	<p>This report was issued for review to the Design Review Panel (DRP) on 20/05/2021. The DRP's comments and associated outcomes have been submitted to the Secretary alongside a copy of this report.</p>
<p>a) identification of potentially affected properties;</p>	<p>Section 4 - Overshadowing assessment</p>
<p>b) assessment of the detailed design's compliance at each property, informed by -</p> <ul style="list-style-type: none"> <li>(i) a review of the habitable rooms within structures,</li> <li>(ii) the size and nature of private open spaces, and</li> <li>(iii) shadow diagrams in plan and elevation at hourly intervals between 9:00 am and 3:00 pm on 21 June; and</li> </ul>	<p>Section 4 - Overshadowing assessment</p>
<p>c) a consultation plan to detail how potential impacts and mitigation measures will be discussed and negotiated with potentially affected landowners in the event that compliance with this condition is not achieved.</p>	<p>Annexure B - Consultation Plan</p>
<p>Where existing residential development currently receives less than the required amount of solar access, existing access to sunlight should not be unreasonably reduced.</p>	<p>Section 4 - Overshadowing assessment</p>
<p>Where affected properties include dwellings held under strata or community title, this condition must be interpreted in relation to individual units within those properties.</p>	

## 2 The Project

### 2.1 The WestConnex Project

#### 2.1.1 Overview

Figure 1 shows an overview of the WestConnex Program of Works comprised of six projects.

A summary of the scope and status of this Project is provided in Table 2 on the page across.

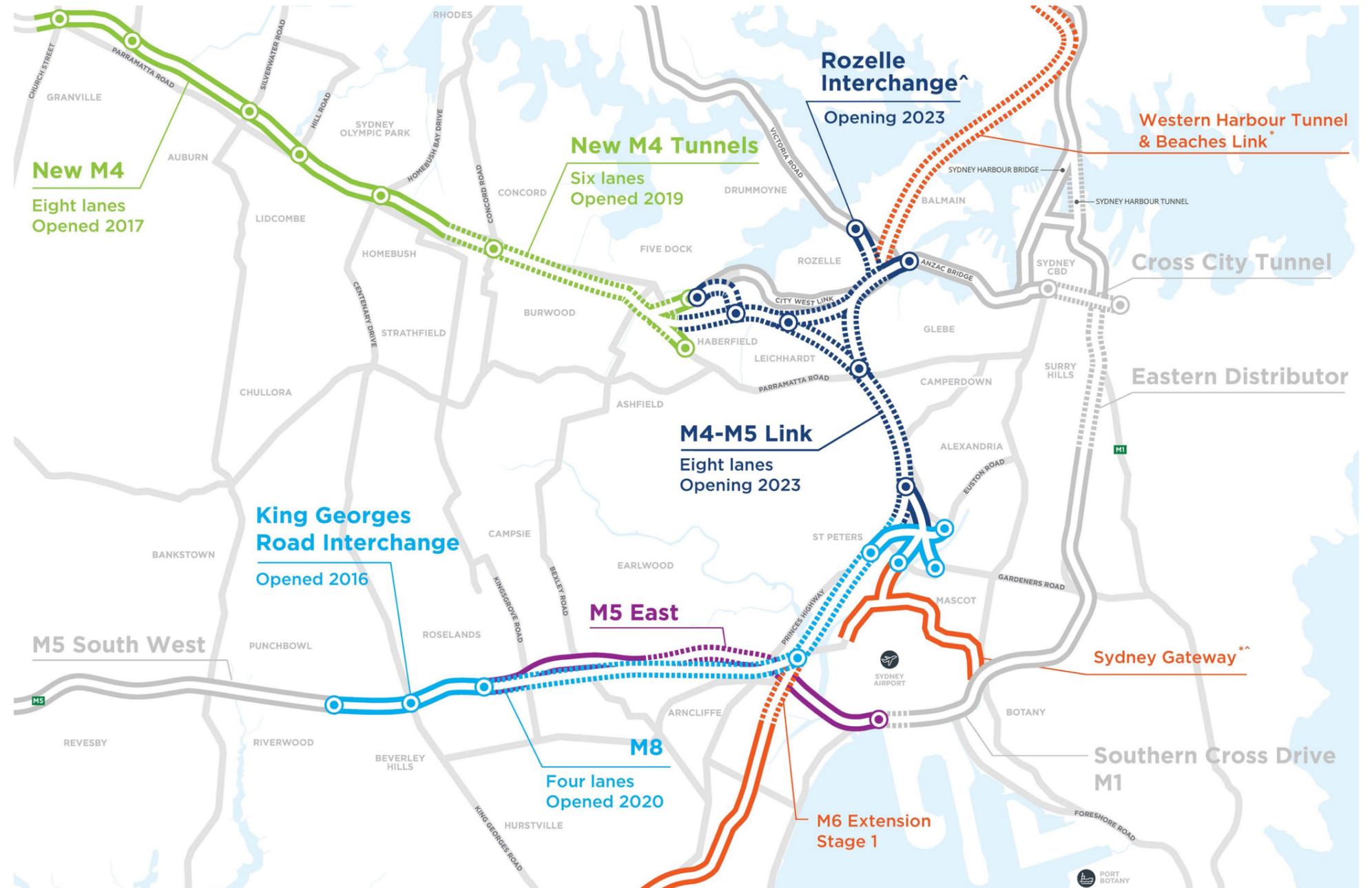


Figure 1: Overview WestConnex Program of Works

## 2.2 Rozelle Interchange and Western Harbour Enabling Works

### 2.2.1 Elements

The Project is part of the Stage 3 WestConnex works. The key elements are described in the Table 2 and shown in Figure 2 and Figure 3.

**Table 2: Rozelle Interchange Elements**

Element	Scope
M4 Connections	Connecting the M4 Motorway (via the stubs constructed as part of the Main Tunnel Works package), predominately via tunnels, with the: <ul style="list-style-type: none"> <li>• Anzac Bridge</li> <li>• Future Western Harbour Tunnel (to be delivered by others)</li> </ul>
M5 Connections	Connecting the M5 Motorway (via the stubs constructed as part of the Main Tunnel Works package) predominately via tunnels with the: <ul style="list-style-type: none"> <li>• City West Link</li> <li>• Iron Cove Link</li> <li>• Future Western Harbour Tunnel</li> </ul>
Iron Cove Link	Connecting Victoria Road via tunnels with the Anzac Bridge and the M5 Motorway
Surface Works	<ul style="list-style-type: none"> <li>• Widening and intersection works to City West Link, The Crescent and Victoria Road</li> <li>• New City West Link culvert (including outlet works at Rozelle Bay)</li> <li>• Significant works to Victoria Road underpass</li> <li>• New public open space located at the Rozelle Rail Yards site</li> </ul>
Active transport links	<ul style="list-style-type: none"> <li>• Lilyfield and Annandale at the western end of the Rozelle Rail Yards</li> <li>• Easton Park and Bicentennial Park in the central area of the Rozelle Rail Yards</li> <li>• Lilyfield Road near Lamb Street to the existing Anzac Bridge pedestrian and cyclist link at the western abutment of Anzac Bridge via a new east-west link</li> <li>• Victoria Road (both the eastern and western footpaths) to the new east-west link</li> </ul>
Segregated footpath and cycleway	Connecting the Bay Run to Victoria Road at the Iron Cove portals
Ancillary facilities within the former Rozelle Rail Yards	<ul style="list-style-type: none"> <li>• Motorway operation complex</li> <li>• Ventilation supply building(s)</li> <li>• Ventilation exhaust building (including outlets)</li> <li>• Fire suppression tanks and pump facilities</li> <li>• Electrical substation(s)</li> <li>• Water treatment plant</li> <li>• Residual utility adjustment works</li> <li>• Wetland</li> </ul>
Ancillary facilities at the Iron Cove Link portals	<ul style="list-style-type: none"> <li>• Motorway operation complex, including a ventilation facility, ventilation outlet and substations</li> <li>• Bio-retention basin</li> </ul>
Significant utility relocation works	<ul style="list-style-type: none"> <li>• Power</li> <li>• Gas</li> <li>• Water</li> <li>• Telecommunications</li> </ul>



Figure 2: Project Layout



Figure 3: Rozelle Interchange completed project aerial view — artist's impression

## 2.3 Abbreviations

**Table 3: Abbreviations used within this Report**

Abbreviation	Description
BIM	Building Information Model
CoA	Condition of Approval
DP	Design Plan
DPIE	Department of Planning, Industry and Environment
DRP	Design Review Panel
EIS	Environmental Impact Statement
JHCPB	John Holland CPB Contractors Joint Venture
PPOS	Principal Private Open Spaces
RIC	Rozelle Interchange
TfNSW	Transport for NSW
TINs	Triangulated Irregular Networks

## 3 Methodology

### 3.1 Overview

To calculate the duration of overshadowing, a three dimensional (3D) modelling and automated shadow analysis process was undertaken using specialist software used currently in the design industry.

The following steps were undertaken:

- Triangulated irregular networks (TINs) of the existing and design (proposed) surface areas were combined, to provide accurate existing and proposed terrain information.
- BIM software was utilised to construct the proposed 3D model and combine it with existing and proposed surfaces
- Rendering of cumulative and hourly overshadowing models on 21st June between 9am and 3pm in plan view to detail shadows from all structures.
- Preparation of plan shadow figures at hourly intervals for all structures and cumulative figures (where off-Project overshadowing occurs) to demonstrate overshadowing extents over potentially affected properties.

### 3.2 Definition of Terms and Assessment Criteria

The terms used in CoA E138 are defined as follows:

**Table 4: Definitions of Key Terminology**

Term	Definition
Solar access	The amount of direct access to sunlight received by a building, room or open space.
Habitable rooms	With reference to the Building Code of Australia a habitable room is: A room used for normal domestic activities and <ul style="list-style-type: none"> <li>– Includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, study, playroom, family room, home theatre and sunroom but</li> <li>– Excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.</li> </ul>
Principal private open spaces (PPOS)	For this assessment, PPOS is “an area within a lot, extending from the rear wall of the residence to the rear boundary fence, that includes terraces, decks, garden beds, turf and paved areas that are usable for general amenity purposes”. PPOS excludes driveways, garages, garden sheds and other freestanding structures.

### 3.3 Assumptions

The following assumptions were made for the assessment.

- All overshadowing analysis has been run for the winter solstice - 21 June between 9am and 3 pm. This is when the sun is lowest in the sky and overshadowing is at its greatest extent.
- The terrain models used for the analysis were based on contours at 1 metre intervals
- Other built form and natural features within the landscape such as trees and adjacent buildings have not been included within the plan and elevation modelling process.
- An aerial mapping image has been used for the diagrams.

## 4 Overshadowing Assessment

### 4.1 Assessment Plans

The following plans indicate the overshadowing impacts on properties potentially affected adjacent to or within close proximity to the SSI boundary caused by the Project.

Where these plans indicate shadows created by the Project crossing boundaries or building lines, the property details are listed within.

Section 4.2 identifies potentially impacted properties.

Section 4.3 outlines if any approved residential developments may be potentially impacted by overshadowing.

Section 4.4 lists if any properties identified in Section 4.2 as requiring further analysis based on assessment within the CoA criteria.

### 4.2 Potentially affected properties

Based on the cumulative overshadowing plans shown in Annexure A, existing residential properties that are affected by any form of overshadowing across cadastral boundaries are listed in Table 5. It is noted that the only structures that will overshadow existing residential properties include the Iron Cove Link ventilation outlets, Iron Cove Link Operational Facilities and Whites Creek Bridge (see Annexures A.1 and A.2).

Each property potentially affected is listed against the below clauses of CoA E138 and the clause(s) that may be applicable:

- CoA E138 - receive minimum of 3hrs of direct sunlight in habitable rooms between 9am and 3pm on 21 June
- CoA E138 - receive minimum of 3hrs of direct sunlight in at least 50% of the PPOS area.

Section 4.4 of this report further investigates whether the potentially affected properties receive less solar access than identified in CoA E138.

**Table 5: Potentially affected properties**

House No.	Street	Suburb	Lot No.	DP / SP No.	Total lot size (m <sup>2</sup> )	CoA E138 – property will receive minimum of 3 hours of direct sunlight in habitable rooms between 9am and 3pm on 21 June	CoA E138 – property will receive minimum of 3 hours of direct sunlight in at least 50% of the PPOS area
2	Toelle St	Rozelle	11	DP959	317	Yes	Yes
4	Toelle St	Rozelle	12	DP959	310	Yes	Yes
1	Callan St	Rozelle	49	DP815	161	Yes	Yes
3	Callan St	Rozelle	50	DP815	158	Yes	Yes
3A	Callan St	Rozelle	51	DP815	152	Yes	Yes
5	Callan St	Rozelle	1	DP1184590	245	Yes	No
9	Callan St	Rozelle	2	DP1184590	221	Yes	Yes
64	Railway Parade	Annandale	A	DP319130	254	Yes	Yes
66	Railway Parade	Annandale	A	DP319146	235	Yes	Yes
68	Railway Parade	Annandale	A	DP319416	209	Yes	Yes
70-72	Railway Parade	Annandale	1	SP39406	515	Yes	Yes
70-72	Railway Parade	Annandale	2	SP39406	515	Yes	Yes
70-72	Railway Parade	Annandale	3	SP39406	515	Yes	Yes

**Table 6: Assessment of affected property**

Residential property details						CoA E138 – property will receive minimum of 3 hours of direct sunlight in habitable rooms between 9am and 3pm on 21 June		CoA E138 – property will receive minimum of 3 hours of direct sunlight in at least 50% of the PPOS area		Compliance with CoA E138	
House No.	Street	Suburb	Lot No.	DP / SP No.	Total lot size (m2)	Area of building footprint overshadowed for more than 3hrs (m <sup>2</sup> )	% of building footprint overshadowed for more than 3hrs	Area of PPOS overshadowed for more than 3hrs (m <sup>2</sup> )	% of PPOS overshadowed for more than 3hrs	Habitable rooms	PPOS
5	Callan St	Rozelle	1	DP1184590	245	0m <sup>2</sup>	0%	68m <sup>2</sup>	54%	Yes	No

### 4.3 Approved residential developments

A search of online development approval information for approvals granted on or before 17 April 2018 was undertaken for the Inner West Council area. Based on the cumulative overshadowing plans and known approved residential developments, there are no current developments identified that would be impacted by overshadowing caused by the Project.

### 4.4 Assessment of affected properties

The property identified in Table 5 as requiring further analysis is illustrated in Annexure A.1. This assessment indicates the area of PPOS used within the calculations and building footprints.

Based on the assessment, 5 Callan Street Rozelle will receive less than the minimum of 3hrs of direct sunlight in the PPOS area required under CoA E138, as indicated in Table 6.

## 5 Summary of Issues

As seen in Sections 4.2-4.4, one property does not meet the sunlight requirements of CoA E138. On 21 June between 9am and 3pm:

- The property at 5 Callan Street, Rozelle, will not receive the 50% minimum threshold of sunlight within the PPOS area.
- All other properties will receive at least the minimum threshold of sunlight in the PPOS area and in habitable rooms.

The property at 5 Callan Street is currently vacant and is owned by the proponent for the Project, TfNSW. In consultation with TfNSW it has been determined that no remedial action is required to compensate for the loss of direct sunlight caused to the property by the construction of the Project.

## Annexure A Overshadowing Plans

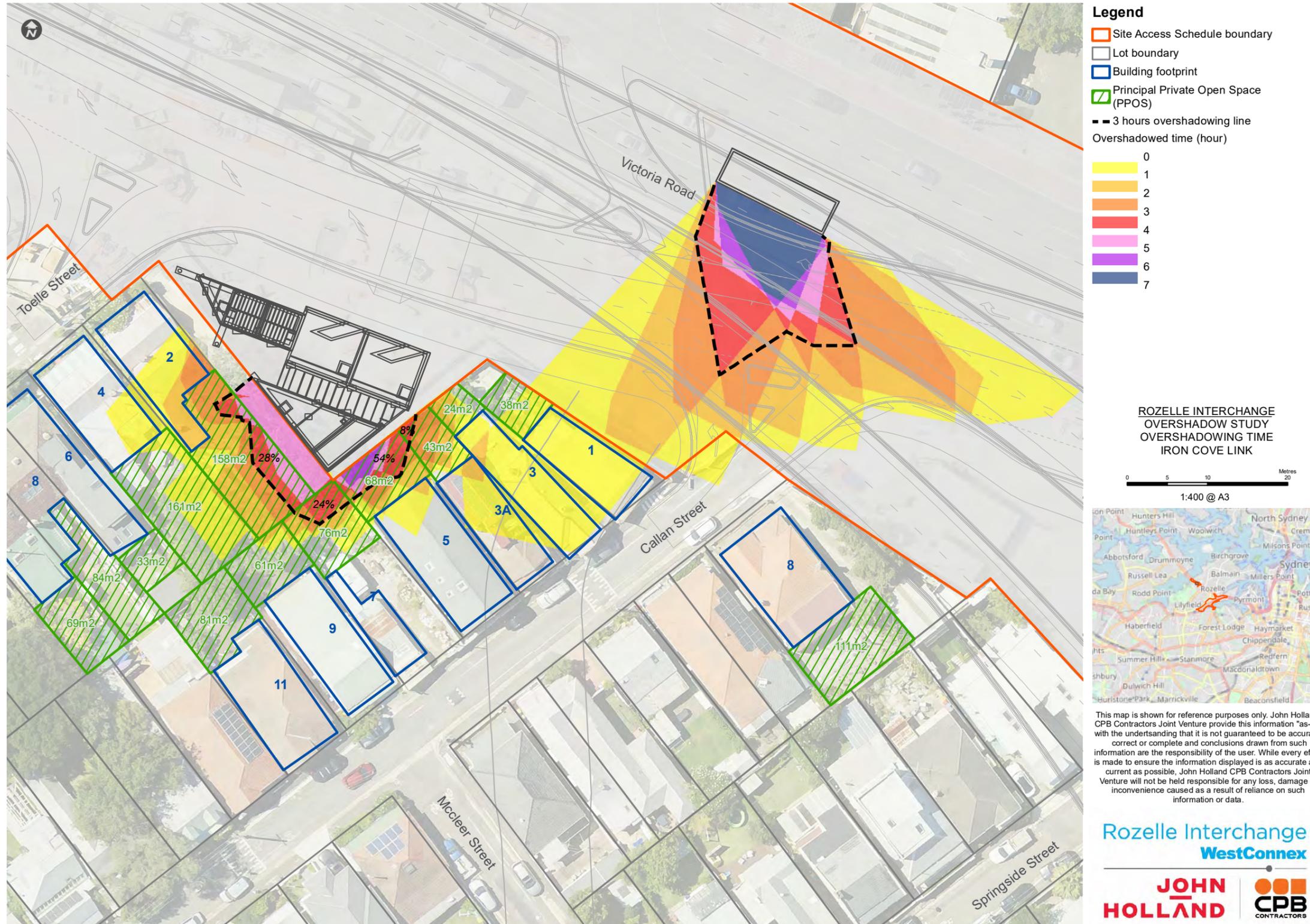


Figure A.1: Overshadowing Impacts Iron Cove Link Operational Facilities and Iron Cove Link Ventilation Outlet

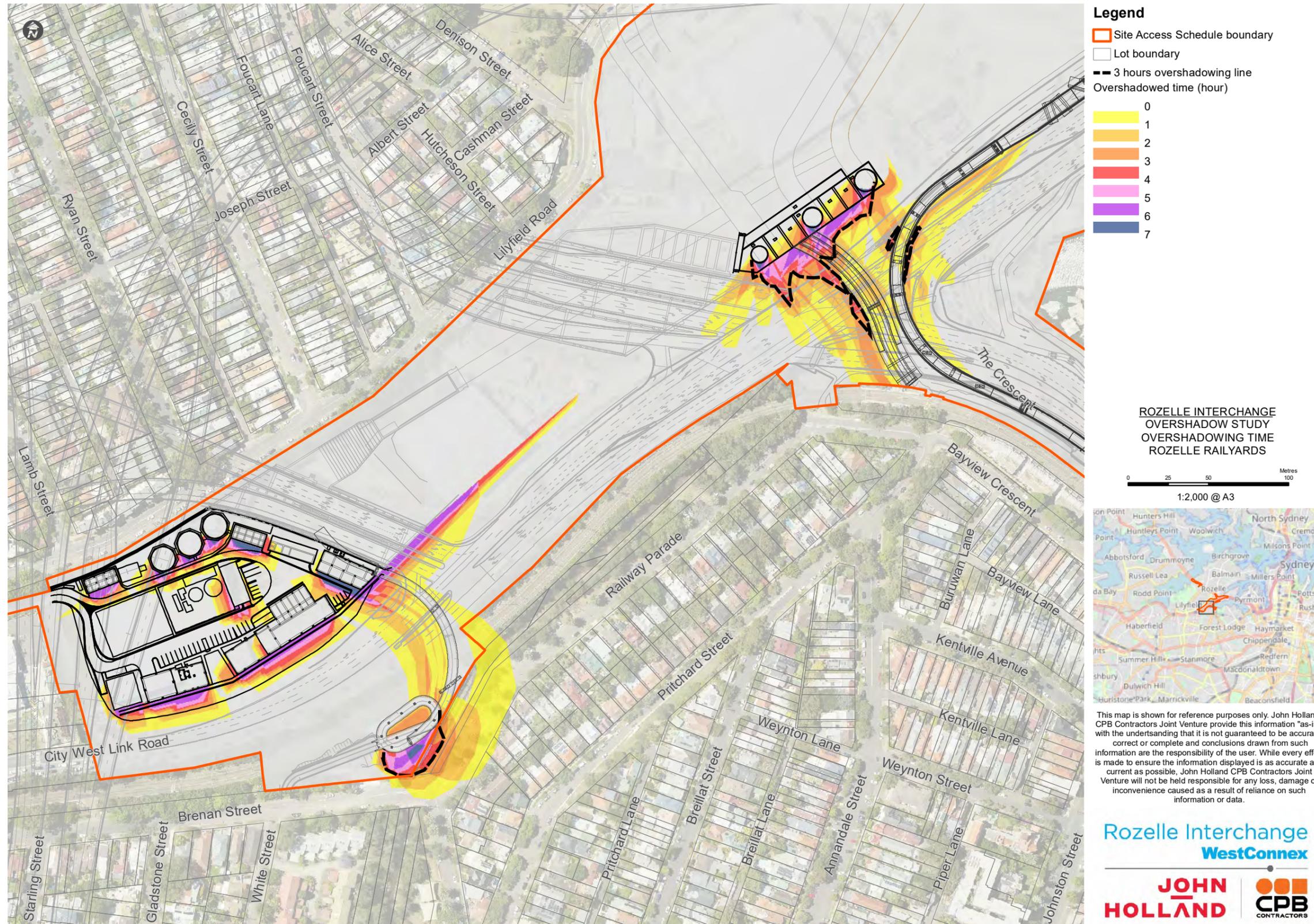


Figure A.2: Overshadowing Impacts Green Link Bridge, MOC 2, Rozelle Railyard Ventilation Outlets, Whites Creek Bridge

## Annexure B Consultation Plan

### Introduction

A Solar Access and Overshadowing Report has been developed for the Project in accordance with Condition of Approval (CoA E138). CoA E138 also requires a consultation plan to detail how potential impacts and mitigation measures will be discussed and negotiated with potentially affected property owners in the event compliance with this condition is not achieved. The process outlined in this document will be implemented should any property receive insufficient solar access (defined in CoAE138) be identified for the Project.

Insufficient solar access defined in E138 will occur where between 9:00am and 3:00 pm on 21 June:

- a. The property will not receive a minimum of three hours of direct sunlight in habitable rooms, and/or
- b. The property will not receive a minimum of three hours of direct sunlight in at least 50% of the principal private open space area.

### Consultation Strategy

Consultation would be undertaken with the following steps where solar access less than specified in E138 is identified.

#### Step 1: Contact the Property Owner

The following action will be taken by the Project to contact the property owner:

1. Letter issued within one month of identifying insufficient solar access to the property owner that includes the following:
  - Explanation of the Project overshadowing requirements
  - Expected overshadowing impacts on the property and provision of website details to access the Solar Access and Overshadowing Report.
  - Offer to meet or discuss over the phone the relevant mitigation options
  - Project contact details
2. Where no response a follow up door knock would occur after 2 weeks of issuing the letter, with a card left if no response.
3. Where still no response a subsequent door knock after another 2 weeks, with a card left if no response.

#### Step 2: Offer of mitigation measures

Once contact is made with the property owner, mitigation measures would be offered in accordance with the type of reduced solar access that has been identified. Measures would focus on at-receiver treatment and would be dependent on whether the impact is identified to affect habitable rooms and or open space areas. The Project would negotiate specific measures to suit the affected property.

#### Step 3: Dispute Resolution

Where an agreement cannot be reached, the Escalation and Mediation Process for community complaints outlined in the Community Communication Strategy would be implemented.