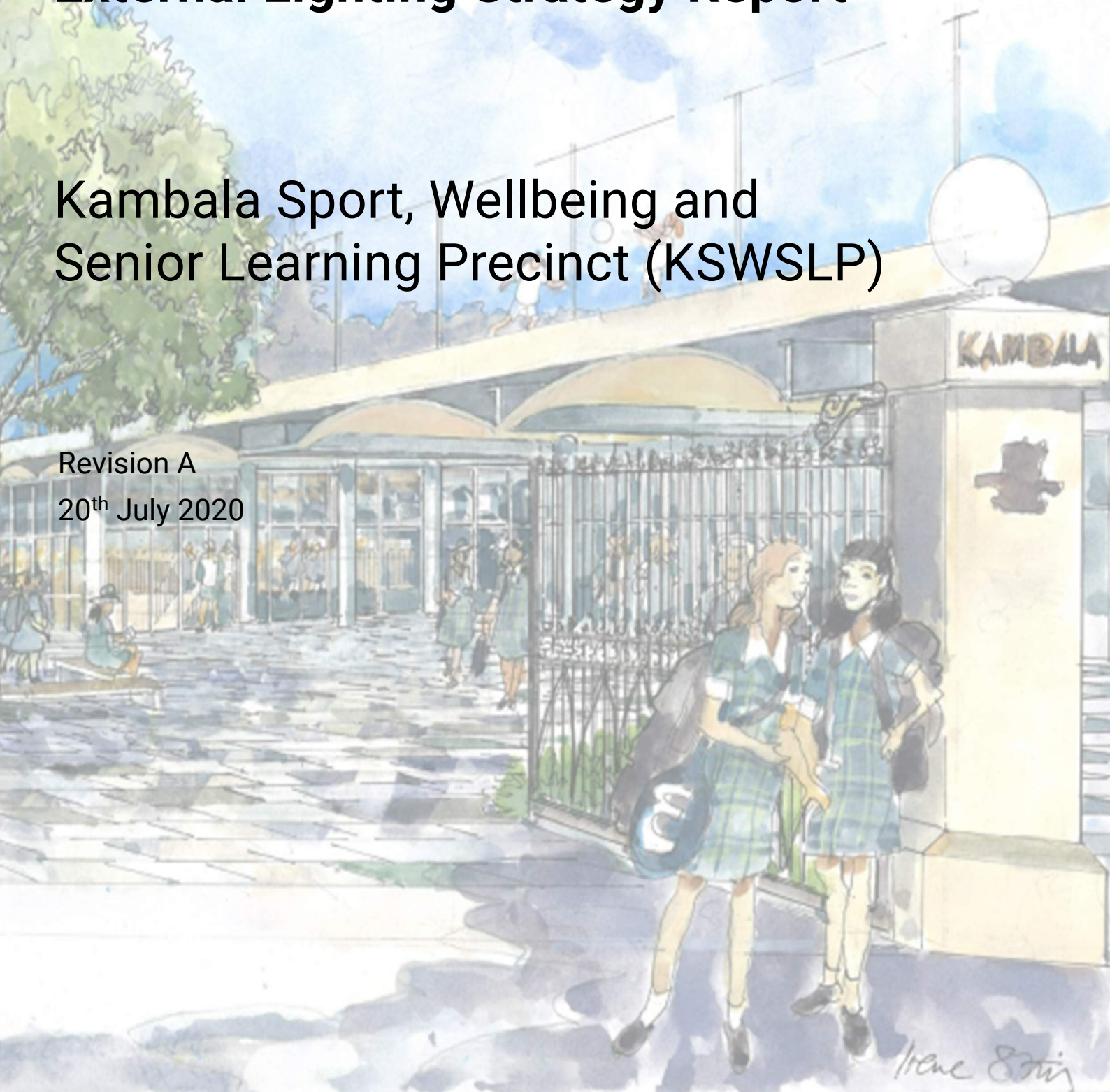


External Lighting Strategy Report

Kambala Sport, Wellbeing and Senior Learning Precinct (KSWSLP)

Revision A

20th July 2020



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Revision Information

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Revision Schedule

Revision	Date	Issue Name	Author	Authorised
P1	23/4/2020	Preliminary Issue	Carter Leung	Shi-En Lim
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1 Executive summary

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning, Infrastructure and Environment (DPIE) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act), for the proposed redevelopment of the sports precinct of Kambala School at 794 -796 New South Head Road, Rose Bay.

This application is SSD by way of clause 8 and schedule 1 under State Environmental Planning Policy (State and Regional Development) 2011 on the basis that the development is for the purpose of an existing school and has a Capital Investment Value of more than \$20 million.

This report has been prepared having regard to the Secretary's Environmental Assessment Requirements issued for the project by DPIE, ref no SSD-10385 issued on 24 November 2019.

The addresses key external lighting design considerations and parameters for KSWSLP. It seeks to address the requirements of the Planning Secretary's Environmental Assessment Requirements (SEARs) as follows:

5) *Environmental Amenity: Include a lighting strategy and measures to reduce light spill into the surrounding sensitive receivers.*

2 Introduction

This report shall provide a high level lighting strategy, outlining:

- Lighting design parameters based on the usage of the site afterhours
- Potential lighting design strategy to achieve the parameters and accommodate the aesthetic and security requirements of the project
- Measures in place to reduce potential lighting obtrusive to the surroundings

Given the extension of the school, a lighting design strategy will be required to allow for afterhours access and circulation lighting in overcast condition. The existing site is currently an open sports field that is not used at night. Only low level poles at approximately 4m height are installed around the tennis court perimeter to provide low intensity lighting for afterhours circulation

As the site is within a residential zone, a plan is required to minimise and mitigate any potential obtrusive lighting to the neighbouring properties.

3 Background

Need for a Campus Masterplan

Kambala is an independent day and boarding school for girls up to 18 years. Kambala also has an early learning centre catering for approximately 70 girls and boys aged between 6 months and 5 years. The school was established in the late 1800s and moved to the current campus in 1913. The campus has evolved in an organic and ad-hoc manner over the last 100 years as the school and its demands have grown.

A new campus-wide planning approach offers the opportunity to strategically plan for the future in a sustainable and effective manner and to preserve the unique aesthetic and heritage qualities of the campus. The preparation of a campus-wide planning approach is also consistent with the School's 2019 - 2023 Strategic Plan which identified the need for a broader strategic plan to coordinate renewal and development in a feasible and staged manner.

4 Site Description

Kambala is located at 794 -796 New South Head Road, Rose Bay and is within the Woollahra Council local government area (LGA). Situated in the eastern suburbs of Sydney, the School is approximately 8km east of the Sydney CBD. The School is located on New South Head Road which is a classified road connecting the City with the eastern beaches. The School is surrounded by predominantly residential uses.

The campus is bound by New South Head (to the east), Bayview Hill Road (to the north) and Tivoli Avenue (to the west). Fernbank Boarding House is located at 1A -3 Bayview Hill Road opposite the Kambala School grounds. No works are proposed to this part of the campus in this DA. The locational context of the School is illustrated at **Figure 1**. **Figure 2** provides an aerial map of the School and its immediate surrounds.

The School campus slopes down from New South Head Road in the east to the west and comprises a series of existing buildings in the western part of the campus that range in height and age. The south western and north western part of the campus accommodates much of the school's existing built form, while the eastern part has the school's sporting fields and courts.

The Kambala School building known as Tivoli House is in the heart of the campus. The house, its interiors, gateposts, gates and flanking walls with railing facing Tivoli Avenue, as well as 2 Norfolk Island Pines are listed as a heritage item in Woollahra Local Environmental Plan 2014 (WLEP 2014).

Within the School campus, the site of this SSDA is illustrated in **Figure 3**. The site proposed for new buildings is on top of the existing sports field and music building, as shown in green. The site proposed for demolition works and associated façade redevelopment and landscaping works is shown in red and is limited to a portion of the existing Hawthorne Building and the Arts building. The site of new landscape works is shown in yellow and includes all external spaces connecting these works. It is anticipated that the construction works will be staged, so the construction site for any given stage will be smaller than the overall site identified in **Figure 3**. The four key main buildings proposed are identified in **Figure 4**.

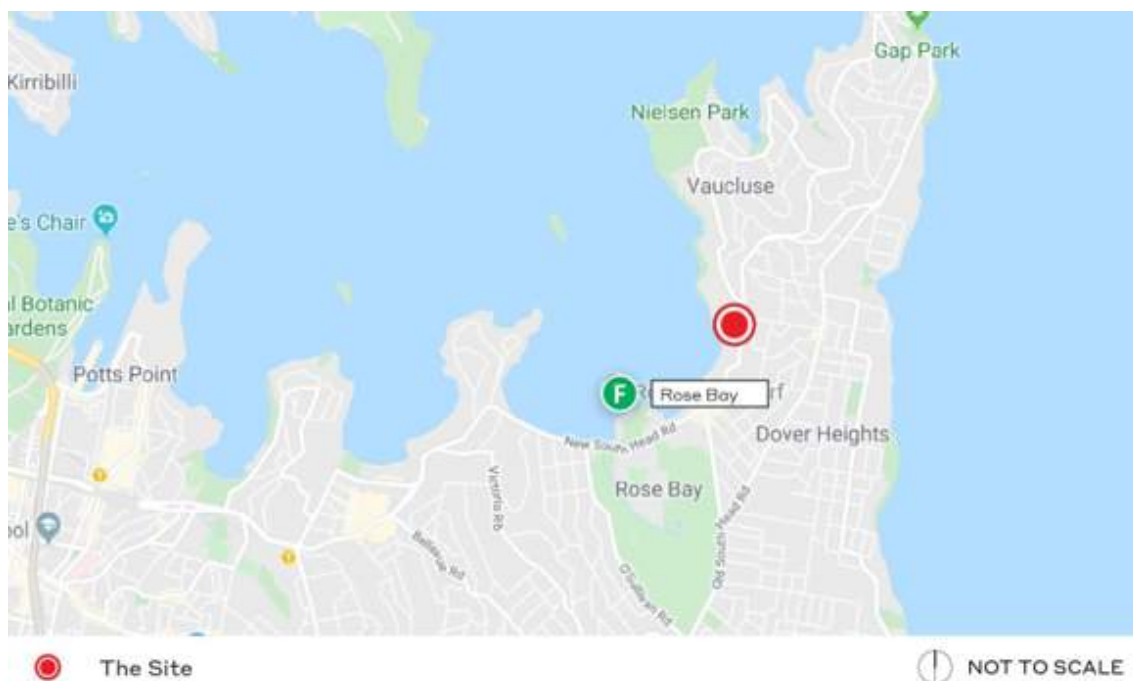


Figure 1 – Kambala School Location Context Plan

Source: Ethos Urban



Figure 2 – Aerial Map of the Kambala Campus
Source: Near Map

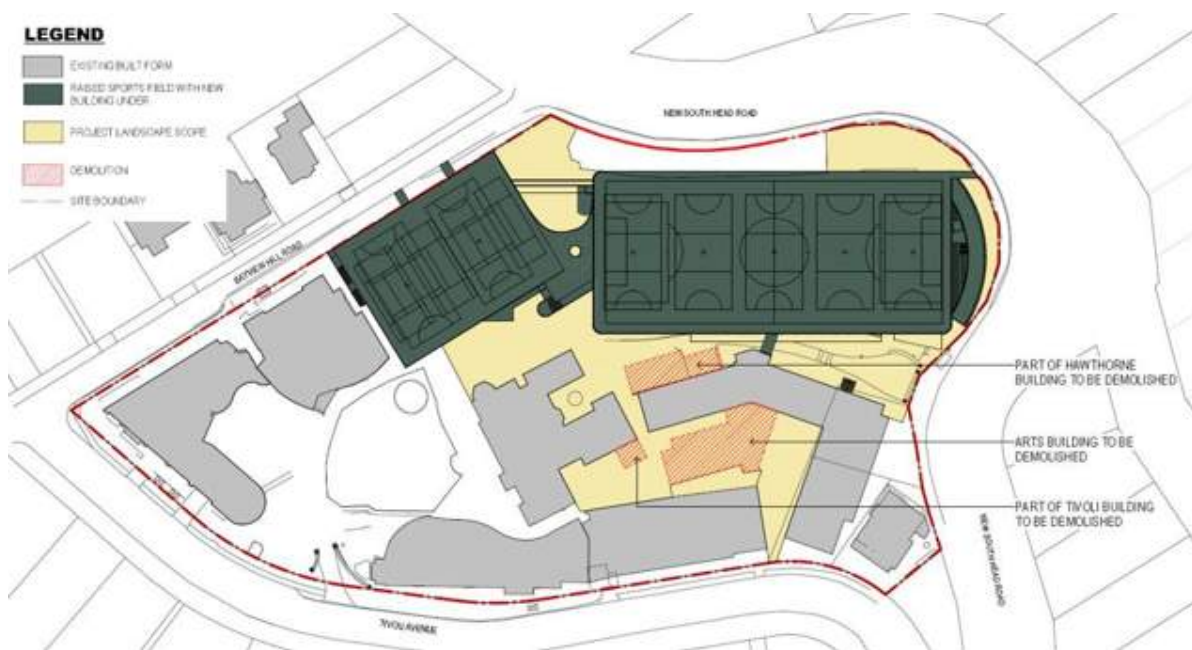


Figure 3 – Project Scope
Source: AJC

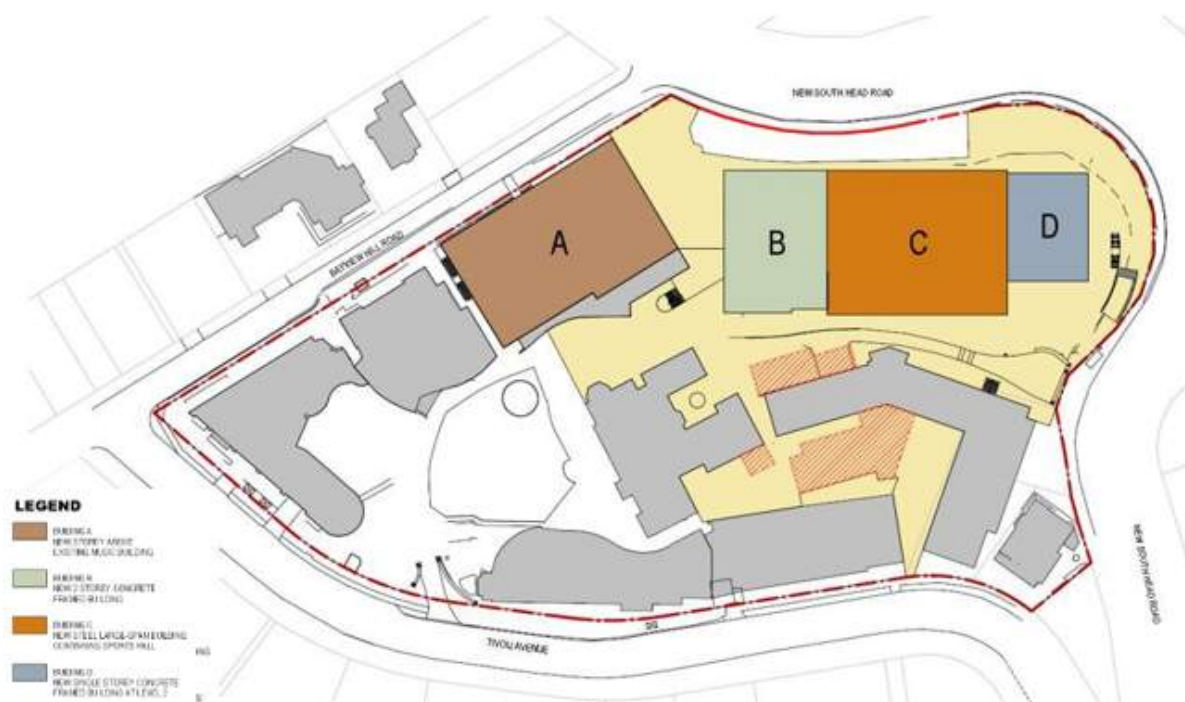


Figure 4 – Key Plan

Source: AJC

4.1.1 Legal Description and Ownership

The campus comprises several allotments, the legal descriptions of which are provided in **Table 1** below. The existing campus has a site area of approximately 22511m².

Table 1 Legal Description

Address	Lot	Plan
794-796 New South Head Road	Lot 67	DP 2538
	Lot C	DP 210074
	Lot 1	DP 1089403
3 Tivoli Avenue	Null	SP 64653
3 Bayview Hill Road	Lot 1	DP 175832
1A Bayview Hill Road	Lot 45	DP 2538
1 Bayview Hill Road	Lot 46	DP 2538

5 Overview of Proposed Development

This SSDA includes detailed plans for a new sport, wellbeing and senior learning precinct. Accordingly, consent is sought for the following:

- The excavation of part of the existing sports field to facilitate the construction of the following:
 - sports facilities including weights room and dance rooms;
 - indoor multipurpose sports courts for use by up to 1500 people;
 - innovative and flexible teaching and learning spaces;
 - amenities, store rooms, plant, circulation and ancillary spaces
 - reinstatement of the sports field surface on the roof (sports field and perimeter fencing)
 - spectator seating / bleachers;
- The removal of the tennis courts (currently on the roof of the music building), and the construction of the following:
 - a wellbeing centre, called the SHINE centre, to accommodate the Kambala SHINE program
 - a new staff centre, called the KITE centre, to accommodate staff workstations, meeting areas, staff development workshop rooms and amenities
 - reinstatement of the tennis courts, lighting and perimeter fencing on the new roof
- a new eastern forecourt for the school, new external landscaped areas and new courtyards;
- minor works to the existing music building to facilitate a new connection to the new courtyard;
- the partial demolition of the Hawthorne building and the construction of a new façade, roof and landscaping; and
- the demolition of the Arts building and the construction of new facades to adjacent affected buildings, and new landscaping to the footprint of the demolished building

6 Design criteria

External lighting will be provided around the courtyard to provide a safe environment for users of the facility afterhours. While the normal school hours end at 3:20pm and the gates are closed and secured at 7pm, the site is still accessible by students undertaking extra-curricular activities, cleaners and boarding students up until 9pm. The roof tennis courts (on the existing building extension) will be used for afterhours training, while the open sports courts (on the new building) will be closed from usage afterhours and only allowed for circulation.

Lighting design must be provided, with consideration given to:

- safe movements of pedestrians
- sufficient lighting for sports training
- integration with the architectural design intent and to compliment the overall aesthetics of the building and surrounds
- minimisation of obtrusive light spill and glare to surrounding properties and the public domain
- security lighting
- application of the Crime Prevention through Environmental Design (CPTED) strategy (TBC)

6.1 Standards and guidelines

External lighting will be designed according to the following standards and guidelines:

Standards	
AS/NZS 1158.3.1	Lighting for roads and public spaces Part 3.1: Pedestrian area (Category P) lighting – performance and design requirements
AS 2560.1	Sports lighting Part 1: General principles
AS 2560.2.1	Sports lighting Part 2.1: Outdoor Tennis
AS 4282	Control of the obtrusive effects of outdoor lighting

7 Light spill

A light spill assessment to AS 4282 will be completed as part of the detailed design. Preliminary investigation into light spill has identified the following factors:

Effects on residential properties

The closest residential properties are identified as 50 Towns Road (located at the north eastern corner) and 889 New South Head Road (south eastern corner). Both are more than 30m from the property boundary to the new Kambala School extension. 50 Towns Road is at a higher location relative to the extension. Both properties are separated by the 4-lanes New South Head Road from the Kambala School site. It is unlikely that the new lighting strategy would have any effects to the property.

Adjacent properties

To the north west is the boarding house “Fernbank”, owned by Kambala School. These are likely to be affected by the roof top tennis court lighting during evening training sessions.

The lighting design shall ensure that any luminaires proposed on site will be aimed at the target area within the site, and additional glare control devices (glare shield, louvres etc) are provided to further mitigate and minimise any potential glare to the neighbours.

Effects on transport system users

Selection and placement of luminaires will be designed to minimise the impact on traffic travelling along Bayview Road and New South Head Road.



8 Light strategy

External lighting will adopt the following strategy:

General purpose luminaires

Luminaires will be selected during detailed design. The light source will be high-quality, efficient LED type to minimise energy consumption. A warm white colour temperature (3000K) will be adopted across the facility for external lighting in circulation area to provide a warm, welcoming environment, while cool white (4000K+) will be used at sports facilities.

To minimise light spill, luminaires will generally be low-cutoff, aeroscreen style to minimise uplight.

Luminaire mounting

Luminaires serving general circulation areas should be integrated to the architectural details where possible to minimise visual cluttering. Pole mounted luminaires for circulation are to be either low height poles (<4m) or lighting bollards.

The design of the lighting bollards/poles will be carefully coordinated with the design of the sports field perimeter fence, acknowledging that it is important to achieve a delicate, uncluttered outcome.

Light poles at the roof top tennis courts located on the western roof are to be less than 7m where possible to achieve the required training level while limiting the number of poles required.

Switching and control

The site is fenced and use of the facility will generally be controlled after hours. Circulation lighting shall be time clock controlled and switched off after 9pm. Lighting provided for security purposes will operate between dusk and dawn. The extent of security is to be confirmed as the design progresses.

Sports lighting are to be manually switched when required. A time limit must be provided so that the lighting cannot operate one hour before council curfewed hours (TBC – Council curfew hours assume to be 9pm based on previous residential project reference as per Woollahra meeting minutes https://www.woollahra.nsw.gov.au/_data/assets/pdf_file/0005/131378/feb24-14councilmins.pdf) to minimise obtrusive lighting to neighbouring properties.

Circulation lighting

AS/NZS 1158.3.1 define lighting classifications and parameters for pedestrian pathways (walkways). Pathways are within the fenced area; however this is a public use facility with use by children and teenagers. The project will therefore adopt the following category:

Category	Classification
Type of road or pathway	Pedestrian or cycle oriented pathway
Basic operating characteristics	Pedestrian/cycle traffic only
Pedestrian/cycle activity	Medium
Risk of crime	Low
Need to enhance prestige	N/A
Applicable lighting subcategory	PR3

Pedestrian pathways will adopt the following lighting parameters:

Parameter	Value
Average horizontal illuminance	1.75 lx
Point horizontal illuminance	0.3 lx
Illuminance (horizontal) uniformity Cat. P	10
Point vertical illuminance	0.3 lx

Roof top tennis courts lighting

The tennis courts located on the western roof top are proposed to be used for training afterhours. The sports fields on the eastern roof top are not to be used afterhours and only designated pathways will be illuminated for circulation purpose only.

The design category for the western tennis courts are as follows:

Category	Classification
Type of sports	Tennis or Basketball
Basic operating characteristics	Training
Applicable lighting subcategory	Residential and Recreational

The tennis courts will adopt the following lighting parameters:

Parameter	Value
Average horizontal illuminance (PPA)	250 lx
Average horizontal illuminance (TPA)	150 lx
Minimum horizontal uniformity U1 (PPA)	0.6
Minimum horizontal uniformity U1 (PPA)	0.3
Minimum horizontal uniformity U2 (PPA)	0.2
Minimum horizontal uniformity U2 (PPA)	0.1

Covered Outdoor Learning Area (COLA)

COLA is located on the ground floor at the eastern end of the new building. As specified in the EFSG, SG951, a higher lighting level is required when it is occupied for learning purpose. The lighting should be switched OFF/dimmed down when not occupied. Timeclock shall be installed to ensure that the lighting is switched to the lower level after curfewed hours.

The design category for the is proposed to be as follows:

Category	Classification
Type of activity	Teaching & Learning
Operating time	Class time / limited after hours teaching
Applicable lighting subcategory	General Learning Area (SG951)
Type of activity	Circulation
Operating time	Space not occupied / after hours
Type of road or pathway	Pedestrian or cycle oriented pathway
Pedestrian/cycle activity	Medium
Risk of crime	Low
Need to enhance prestige	N/A
Applicable lighting subcategory	PR3
Applicable lighting subcategory	PR3

The COLA will adopt the following lighting parameters:

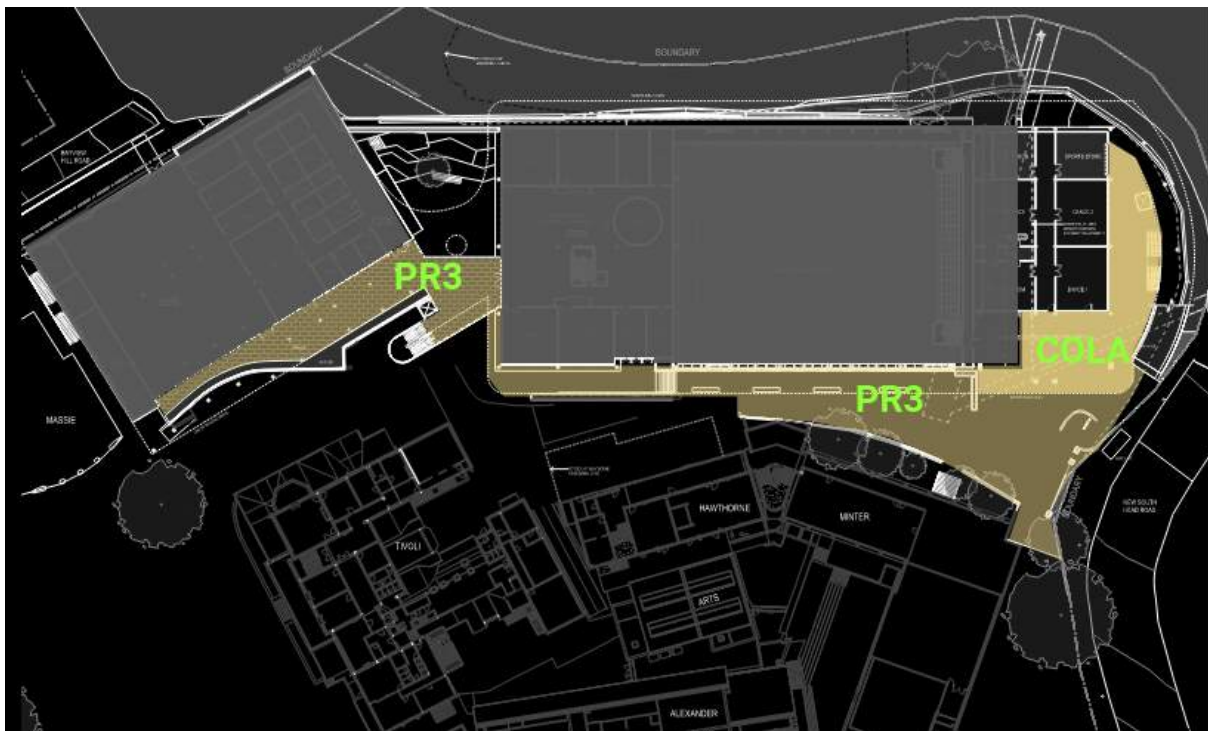
Parameter	Value
Type of activity	Class time / limited after hours teaching
Average horizontal illuminance	240 lx
Uniformity	0.5 on task area
Type of activity	Circulation
Average horizontal illuminance	1.75 lx
Point horizontal illuminance	0.3 lx
Illuminance (horizontal) uniformity Cat. P	10
Point vertical illuminance	0.3 lx

Proposed Illuminance Diagram

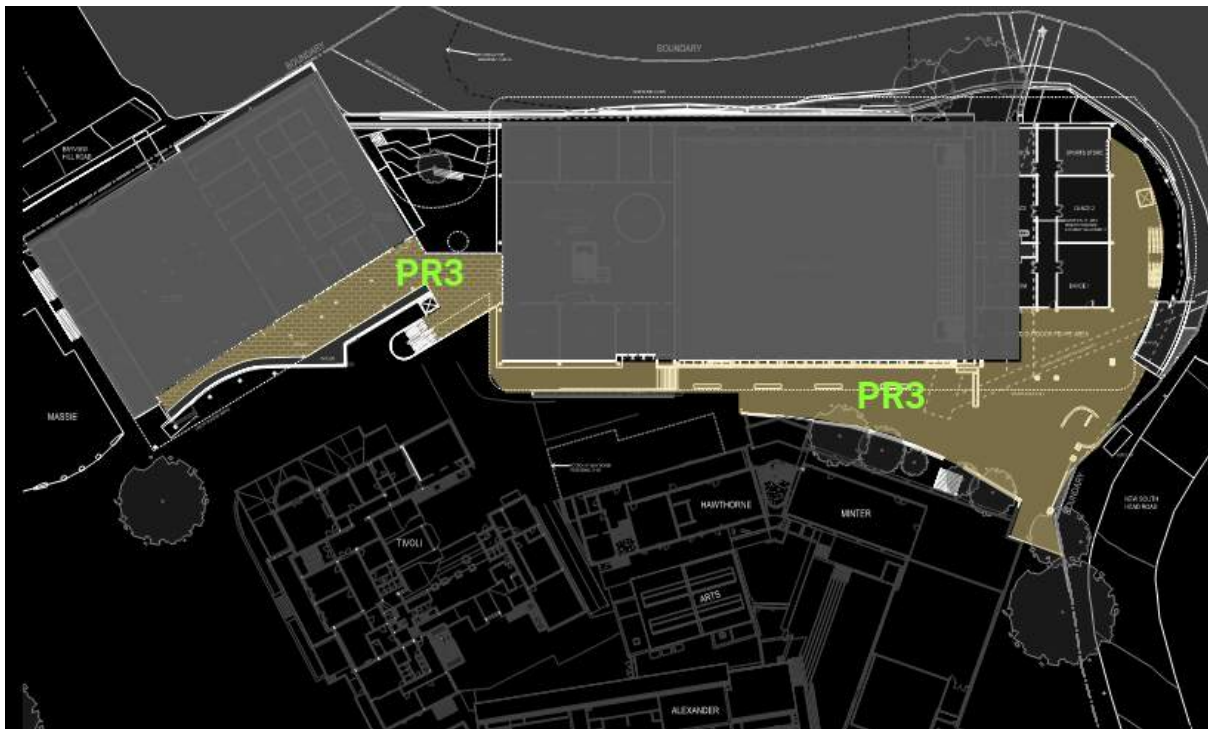
Level 0



Level 1 – After hours teaching



Level 1 – After hours circulation only



Level 2 (Roof)

