



# Cricket NSW

31/10/2019

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## Revision Information

<b>Project</b>	CNSW COE
<b>Title</b>	External Lighting Strategy Report
<b>Client</b>	Cricket NSW
<b>Revision</b>	03
<b>Revision Date</b>	31 October 2019
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<b>Author</b>	Lachlan Kanaley

## Revision Schedule

Revision	Date	Issue Name	Author	Authorised
P1	9/9/2019	Preliminary	JLK	DC
01	27/9/2019	SSD	JLK	DC
02	23/10/2019	SSD	JLK	DC
03	31/10/2019	SSD	JLK	DC

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## 1 Executive summary

This report addresses key external lighting design considerations and parameters for the new Cricket NSW Centre of Excellence at Wilson Park, within Sydney Olympic Park. It seeks to address the requirements of the Planning Secretary's Environmental Assessment Requirements (SEARs) as follows:

*3) Facility Use: The EIS shall include updated operational details of the facility, including but not limited to: lighting and illumination*

*6) Environmental Amenity: The EIS shall: detail any new external lighting or illumination and consider the impacts of this lighting/illumination to surrounding properties and the public domain.*

*12) Biodiversity: The BDAR must also address the impacts on the Green and Golden Bell Frog and its habitat both in the construction and operational phases of the development, including impacts on frogs that may have moved onto the construction site, in addition to noise, lighting and vibration impacts to habitats.*

## 2 Introduction

This report supports a State Significant Development Application (SSDA) submitted to the Minister for Planning and Public Spaces, pursuant to Part 4.7 of the Environmental Planning and Assessment Act 1979 (EP&A Act). This SSDA seeks consent for the design, construction and operation of a new Cricket NSW Cricket Centre (CNSWCC) at Wilson Park, within Sydney Olympic Park.

The CNSWCC will comprise a state-of-the-art, dedicated, year-round cricket, training and administration facility that services both regional and metropolitan cricketers, as well as providing facilities for aspiring junior cricketers to support sport, social, health and educational programs.

## 3 Background

Given the redevelopment and closure of Sydney Football Stadium and its associated cricket training facilities, Cricket NSW decided to relocate its facilities to Sydney Olympic Park. The Wilson Park site has therefore been selected as the appropriate location for the development.

Wilson Park is a former gasworks site, today being used predominantly as playing fields with mature trees generally located around the peripheries. The site has a landfill leachate treatment plant located to its north-east, sharing the same boundary with the site.

## 4 Site Description

The site is located at Wilson Park, in the suburb of Sydney Olympic Park, within the Cumberland Local Government Area (LGA) and is situated at the north western corner of the Sydney Olympic Park (SOP) precinct.

The site is located in proximity to a number of regionally significant facilities and amenities including the Olympic Park Railway Station, ANZ Stadium, Qudos Bank Arena and Sydney Showground, which are all approximately 2.5km south east of the site. Further to this, the site is located approximately 2km west of Wentworth Point.

The site's locational context is shown in Figure 1 below.



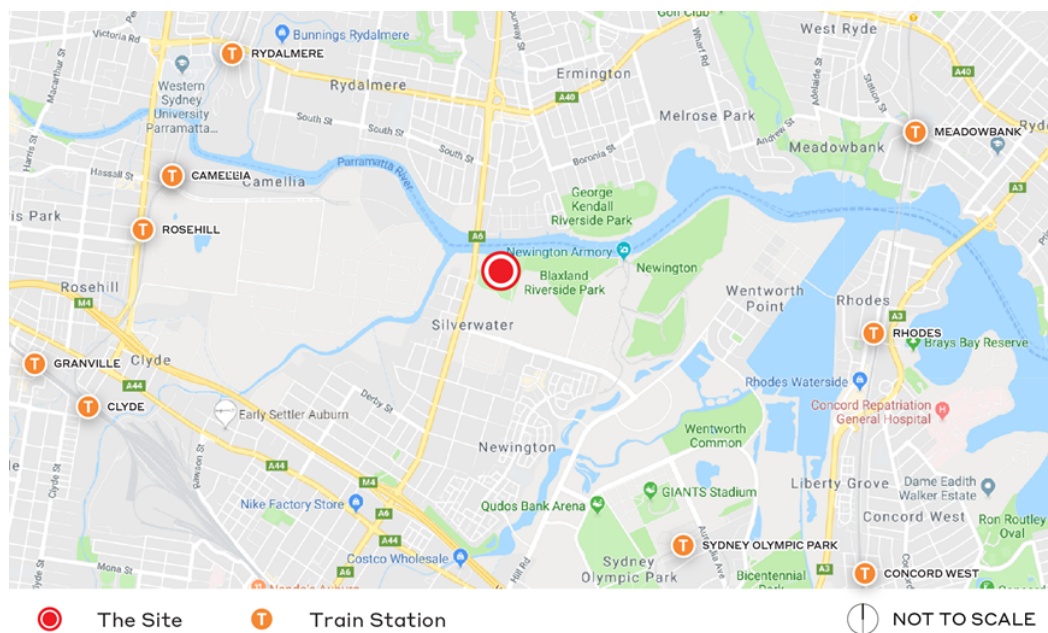


Figure 1 Locational context

The site is irregular in shape and comprises a single allotment of land with an area of 121,082m<sup>2</sup> and a leased area where development will occur with a site area of 65,767m<sup>2</sup>. The leased area excludes the portion of the Wilson Park site that is used for remediation purposes, as shown in the aerial image of the site provided at Figure 2. The site is currently owned by the Sydney Olympic Park Authority (SOPA) and it is legally described as Lot C in DP 421320. The site is bounded by the Parramatta River to the north, Silverwater Correctional Complex to the east, a busway and industrial lands to the south and Silverwater Road to the west.



Figure 2 Site aerial

## 5 Overview of Proposed Development

The proposal relates to a State Significant Development Application (SSDA) to facilitate the development of a Cricket Centre for Cricket NSW at the Wilson Park site. Specifically, the works that are proposed for the SSDA include:

- A two storey cricket centre including an internal atrium, gymnasium, community facilities, sports science and sports medicine facilities and business offices;
- An International Cricket Council compliant oval 136m long x 144m wide (16,040m<sup>2</sup>) (Oval 1) and associated seating;
- A second oval (Oval 2) that complies with the Cricket Australia community guidelines for community club cricket (with a minimum diameter of 100m) (6365m<sup>2</sup>);
- Outdoor practice nets, 71 wickets with a minimum of 30m run ups;
- A double height (10.7m) indoor training facility with 15 wickets;
- A single storey shed for machinery and storage;
- Associated car parking, landscaping and public domain works; and
- Extension and augmentation of services and infrastructure as required.

## 6 Planning Approvals Strategy

The site is located within the Sydney Olympic Park precinct, which is identified as a State Significant site in Schedule 2 of State Environmental Planning Policy (State and Regional Development) 2011. As the proposed development has a capital investment value exceeding \$10 million, it is declared to be State Significant Development (SSD) for the purposes of the EP&A Act, with the Minister for Planning and Public Spaces the consent authority for the project.

This SSDA seeks approval for the detailed scope of development described in Section 5 above.

The Department of Planning, Industry and Environment provided the Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development on 23 July 2019. This report has been prepared having regard to the SEARs as relevant.

## 7 Design criteria

External lighting will be provided around the facility to provide a safe and welcoming environment for users of the facility and the general public, with consideration given to:

- safe movements of pedestrians, cyclists and vehicles
- 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
- minimise the impact of external lighting on biota, including the Green and Golden Bell Frog and it's habitat
- security lighting
- application of the Crime Prevention through Environmental Design (CPTED) strategy – refer to the Ethos Urban report: Crime Prevention Through Environmental Design Report.

## 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/NZS 1158.4	Lighting for roads and public spaces Part 4: Lighting of pedestrian crossings
AS 2560.1	Sports lighting Part 1: General principles
AS/NZS 2890	Parking facilities
AS 4282	Control of the obtrusive effects of outdoor lighting
BCA – Building Code of Australia	
Cricket Australia – Venue Guidelines for Australian Cricket	
Cricket Australia – Community Cricket Facility Guidelines	
Parklands Elements Design Manual – Sydney Olympic Parklands	
Access Guidelines – Sydney Olympic Park	

## 8 Light spill

A preliminary light spill assessment to AS 4282 has been completed based on the concept lighting design – refer to Appendix B. The light spill assessment will be updated as the design develops.

### 8.1 Environmental Zone

The design image for the Parklands is “to ensure that users receive an “experience of nature” that is as close as possible to that obtainable from immersion in pristine environments of a similar type.”<sup>1</sup>

While the site is located in the Sydney Metropolitan Area, to help achieve the design image and for the purposes of light spill the site has been assigned the following environmental zone (AS/NZS 4282 Table 3.1):

Zone	Description	Examples
A1	Dark	Relatively uninhabited rural areas No road lighting – unless specifically required by the road controlling utility

The following maximum values of light technical parameters are applicable (AS/NZS 4282 Table 3.2):

Zone	Vertical illuminance		Threshold increment		Sky glow
	Non-curfew	Curfew	%	Default adaption level	Upward light ratio
A0	2	0.1	N/A	N/A	0

<sup>1</sup> Parklands Elements Design Manual

The following maximum luminous intensities per luminaire are applicable (AS/NZS 4282 Table 3.3):

Zone	Luminous intensity		
	Non-curfew L1	Non-curfew L2	Curfew
A0	2500	5000	500

## 8.2 Potential obtrusive effects

The following specific effects have been identified:

### Effects on residents

The nearest residents are identified as being on the northern shore of the Parramatta River. As a light spill assessment will be conducted on the south side of the river, a further assessment of residential properties is not required.

### Adjacent properties

To the east is the Silverwater Correctional Complex, to the south is industrial use and to the west is Silverwater Road. The impact of spill lighting on users of the adjacent properties is anticipated to be negligible and will be assessed at the property boundary.

### Effects on transport system users

Selection and placement of luminaires will be designed to minimise the impact on traffic travelling along Silverwater Road and the bus lane running to the south of the site by assessment along the property boundary.

The impact of spill lighting on ferry and boat services along the Parramatta River will be minimised by assessment along the mapped river boundary.

### Effects on transport signalling systems

Selection and placement of luminaires will be designed to minimise the impact on signalised intersections located along Silverwater Road. As the distance from the nearest signalised intersection (Silverwater Rd/Clyde St) to the closest luminaire is approximately 150m, the impact from spill light will be negligible.

### Effects on biota

The green and golden bell frogs of Sydney Olympic Park are part of a key population and an important habitat for the species are the wetlands located throughout Sydney Olympic Park – refer to mapped wetland areas in Figure 3. In addition to the mapped local wetlands, the three artificial wetlands located in the north-eastern corner of the site are also considered important habitat, as is the riparian zone within 50m of the Parramatta River.

Other species of consideration include the Southern Myotis, various species of microchiropteran bats, Cumberland Plain Land Snail, Dural Woodland Snail and Red-crowned Toadlet.

Migratory species include the White-bellied Sea-eagle, Eastern Osprey and Square-tailed Kite.





Figure 3 Coastal Wetland Map

To minimise the impact of site lighting on threatened and migratory species, the following measures will be adopted:

- avoid direct illumination and minimise spill light of mapped coastal wetland areas by assessment at the mapped boundaries
- avoid direct illumination and minimise spill light along the Parramatta River by assessment along the mapped river boundary
- avoid direct illumination and minimise spill light in the artificial wetland areas to the north-east of the site by assessment along the mapped boundaries
- avoid direct illumination of the riverfront amenities block as this is outside the development area
- minimise lighting within the mapped coastal wetland proximity area where practicable
- direct lighting away from habitat and use glare shields where practical
- minimise the intensity of lighting to the minimum required to comply with standards as far as practical
- minimise the intensity of lighting by switching to a reduced lighting design category when the facility is unoccupied or in use by maintenance staff only
- minimise the duration of light by turning off site lighting when not required for access or security purposes
- minimise lighting to community use areas within the 50m buffer zone along the Parramatta River
- minimise lighting to community use areas within 100m buffer zone surrounding the mapped wetlands
- the luminaires selected shall be warm white (3000K) to minimise the impact on nocturnal animals and in accordance with the "Parklands Elements Design Manual".

## Effects on astronomical observations

Nearby observatories were identified from the Astronomical Society of Australia list of designated observatories (review 6/9/2019).

- Macquarie University – 8.2km
- Sydney Observatory – 14.5km
- Penrith Observatory – 30km

As the site is located in the heart of Sydney, there is sports lighting already present on the site and the environmental category A1 for upward light ratio, it is not anticipated the development will have an impact on the observatories.

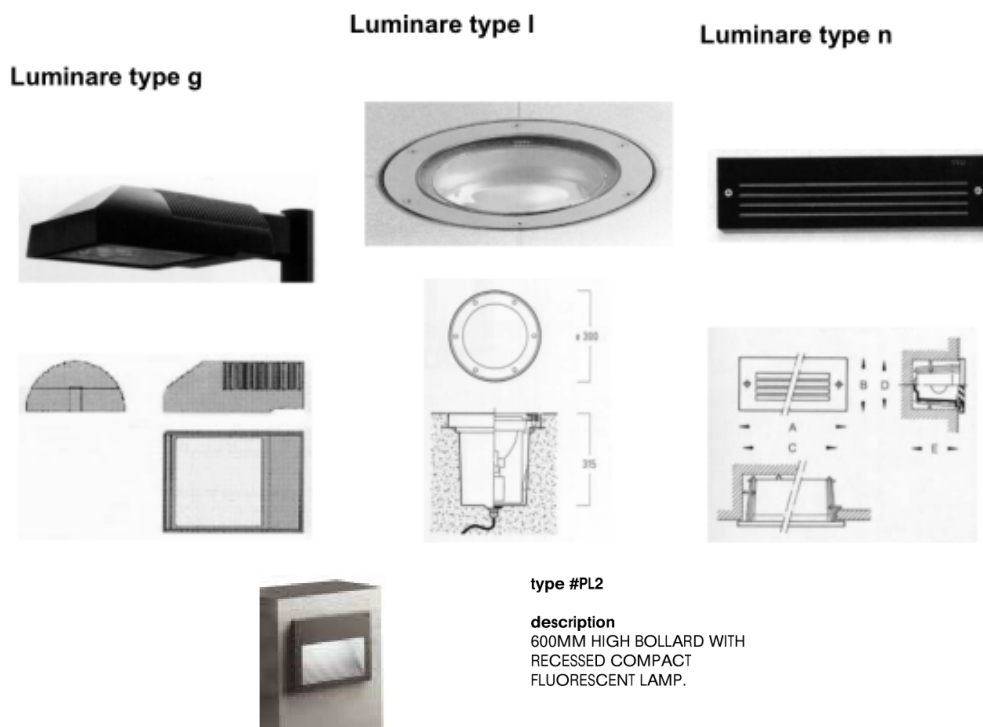
## 9 Lighting strategy

The use of the development site is a cricket training facility. The external areas will be used in the early evening and early morning during all seasons. The buildings within the facility will be used at night.

External lighting will adopt the following strategy:

### 9.1 General purpose luminaires

Preliminary luminaire selection has been undertaken using the lighting design guidelines in the “Parklands Elements Design Manual”, with indicative luminaire selection shown in the images below. The luminaires specified in the manual use fluorescent and metal halide lamps which has been superseded by LED technology. Fittings from the same nominated manufacturer/product family with similar aesthetic are being used for the assessment.



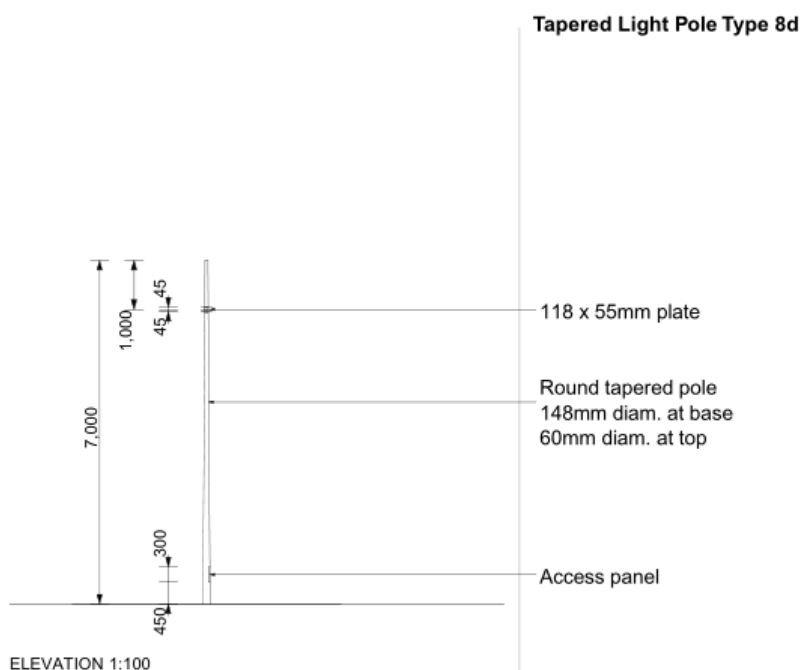
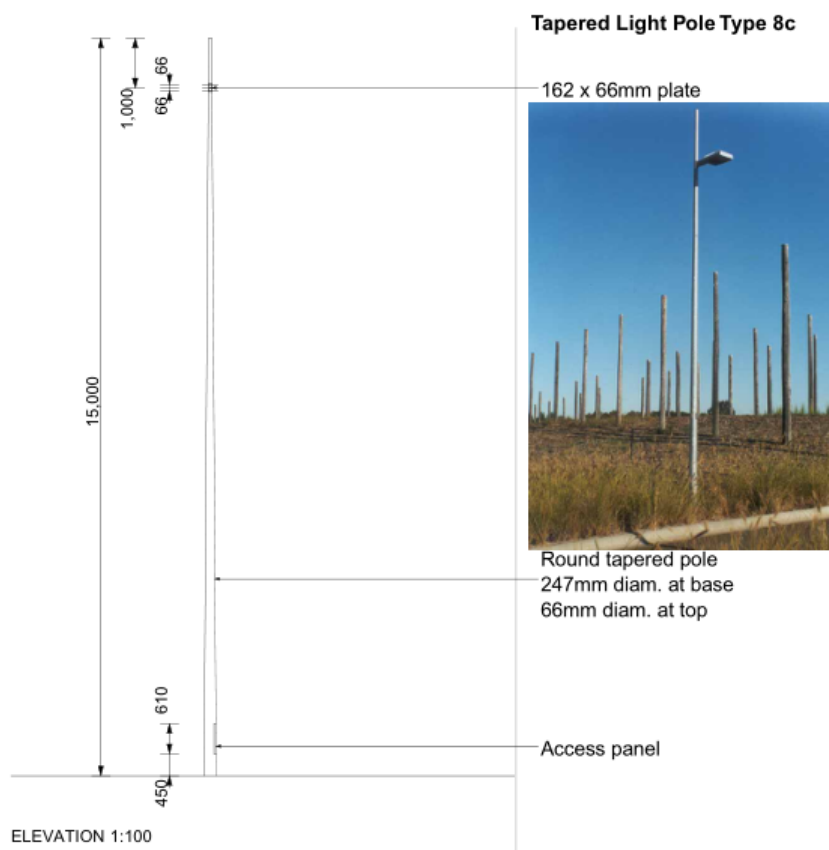
Lamps will be high-quality, efficient LED type to minimise energy consumption.

A consistent colour temperature (3000K) will be adopted across the facility for external lighting in order to integrate with the existing parkland lighting and to minimise the impact on biota.

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

## 9.2 General purpose poles

Luminaires serving access roads and carparks and pathways will generally be mounted below 14m, while luminaires for pedestrian walkways will generally be mounted below 6m. Poles will be tapered to match the specification in the “Parklands Elements Design Manual”.



Photovoltaic cells mounted on poles may be provided where it is economical to do so.

### 9.3 Switching and control

The site switching and control strategy will utilise a flexible programmable control system that can be adjusted to meet changing requirements for community use.

The site is fenced and use of the facility will generally be controlled after hours.

The main use of the site lighting will be at dusk and dawn to ensure safe community access and use and will be switched using a timeclock/photoelectric cell with manual override.

Later in the evening a curfew lighting scheme will be adopted, with lighting switched off or dimmed to meet the requirements for maintenance staff and site security.

Lighting provided for security purposes will operate between dusk and dawn.

### 9.4 Pathway 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 minors. The project will therefore adopt the following parameters:

Category	Classification	Classification – curfew
Type of road or pathway	Pedestrian or cycle oriented pathway	Pedestrian or cycle oriented pathway
Basic operating characteristics	Pedestrian/cycle traffic only	Pedestrian/cycle traffic only
Pedestrian/cycle activity	Medium	Low/None
Risk of crime	Low	Low
Need to enhance prestige	N/A	N/A
Applicable lighting subcategory	P3	P4/Off

Pedestrian pathways will adopt the following lighting parameters:

Parameter	Value	Value – curfew
Average horizontal illuminance	1.75 lx	0.85 lx
Point horizontal illuminance	0.3 lx	0.14 lx
Illuminance (horizontal) uniformity Cat. P	10	10
Point vertical illuminance	0.3 lx	N/A

### 9.5 Pathway lighting – minor paths

AS/NZS 1158.3.1 define lighting classifications and parameters for pedestrian pathways (walkways). The foreshore pathway between the oval and river foreshore, the pathway around the main oval and paths in the south of the site are anticipated to have only low through-traffic and the pathways are within the fenced area. The project will therefore adopt the following parameters:

Category	Classification	Classification – curfew
Type of road or pathway	Pedestrian or cycle oriented pathway	Pedestrian or cycle oriented pathway
Basic operating characteristics	Pedestrian/cycle traffic only	Pedestrian/cycle traffic only
Pedestrian/cycle activity	Low	Low/None
Risk of crime	Low	Low
Need to enhance prestige	N/A	N/A
Applicable lighting subcategory	P4	P4/Off

Pedestrian pathways will adopt the following lighting parameters:

Parameter	Value	Value – curfew
Average horizontal illuminance	0.85 lx	0.85 lx
Point horizontal illuminance	0.14 lx	0.14 lx
Illuminance (horizontal) uniformity Cat. P	10	10
Point vertical illuminance	N/A	N/A

## 9.6 Roadway and intersection lighting

No changes are proposed to the existing lighting along the bus lane to the south of the site as this is outside the development area.

New lighting will be provided along the minor access road to the east of the site. The roads are within the fenced area, however this is a public use facility with use by children and minors. The project will therefore adopt the following parameters:

Category	Classification	Classification – curfew
Type of road or pathway	Local roads or streets	Local roads or streets
Basic operating characteristics	Mixed vehicle and pedestrian traffic	Mixed vehicle and pedestrian traffic
Pedestrian/cycle activity	Medium	Low/None
Risk of crime	Low	Low
Need to enhance prestige	N/A	N/A
Applicable lighting subcategory	P3	P4/Off

Internal roads will adopt the following lighting parameters:

Parameter	Value	Value – curfew
Average horizontal illuminance	1.75 lx	0.85 lx
Point horizontal illuminance	0.3 lx	0.14 lx
Illuminance (horizontal) uniformity Cat. P	10	10
Point vertical illuminance	N/A	N/A

## 9.7 Foreshore lighting

No lighting is currently installed along the Parramatta River foreshore.

As this area is outside the development area, no lighting along the foreshore is proposed to be installed.

## 9.8 Carpark lighting

No lighting is currently installed in the public carpark adjacent the boat ramp to the north-west of the site. These areas are outside the development area and no lighting is currently proposed to be installed.

Within the development site, carparks are within the fenced area, however this is a public use facility with use by children and minors. Use during curfew will be restricted to maintenance and security staff.



The project will therefore adopt the following parameters:

Category	Classification	Classification – curfew
Type of road or pathway	Parking spaces, aisles and circulation roadways	Parking spaces, aisles and circulation roadways
Night time vehicle or pedestrian movements	Medium	Low
Night time occupancy rates	≥25%, ≤75%	<25%
Risk of crime	Low	Low
Applicable lighting subcategory	P11b	P11c
Parking spaces intended for people with disabilities	P12	P12

Carparking will adopt the following lighting parameters:

Parameter	Value	Value – curfew
Average horizontal illuminance	7 lx	3.5 lx
Point horizontal illuminance	1.5 lx	0.7 lx
Illuminance (horizontal) uniformity Cat. P	10	10
Point vertical illuminance	1.5 lx	N/A

To minimise spill light onto the Parramatta River, the northernmost lights in the western carpark will be switched off during curfew hours.

## 9.9 Sports field lighting

The existing Wilson Park sports field lighting is proposed to be removed from site.

No sports lighting is currently proposed for the main or junior ovals.

## 9.10 External practice wickets

No sports lighting is currently proposed for the external cricket nets.

## 9.11 Entrance lighting

Entrance lighting will be provided to comply with the requirements in the “Access Guidelines – Sydney Olympic Park”. In particular, “a graduated level of illumination shall be provided at building entries and exits to assist people who are blind or have low vision. A minimum of 50 lux shall be provided outside the entry or exit”.

## 9.12 Security lighting

Lighting is one element in creating a safe and secure environment using a Crime Prevention through Environmental Design strategy. Security lighting will be provided around building perimeters and other assets to minimise dark areas and reduce the risk of vandalism.

Security lighting will adopt the following parameters, subject to design development and security risk assessment:

Parameter	Value
Average horizontal illuminance	10 lx
Minimum horizontal illuminance	1 lx
Point vertical illuminance	3 lx

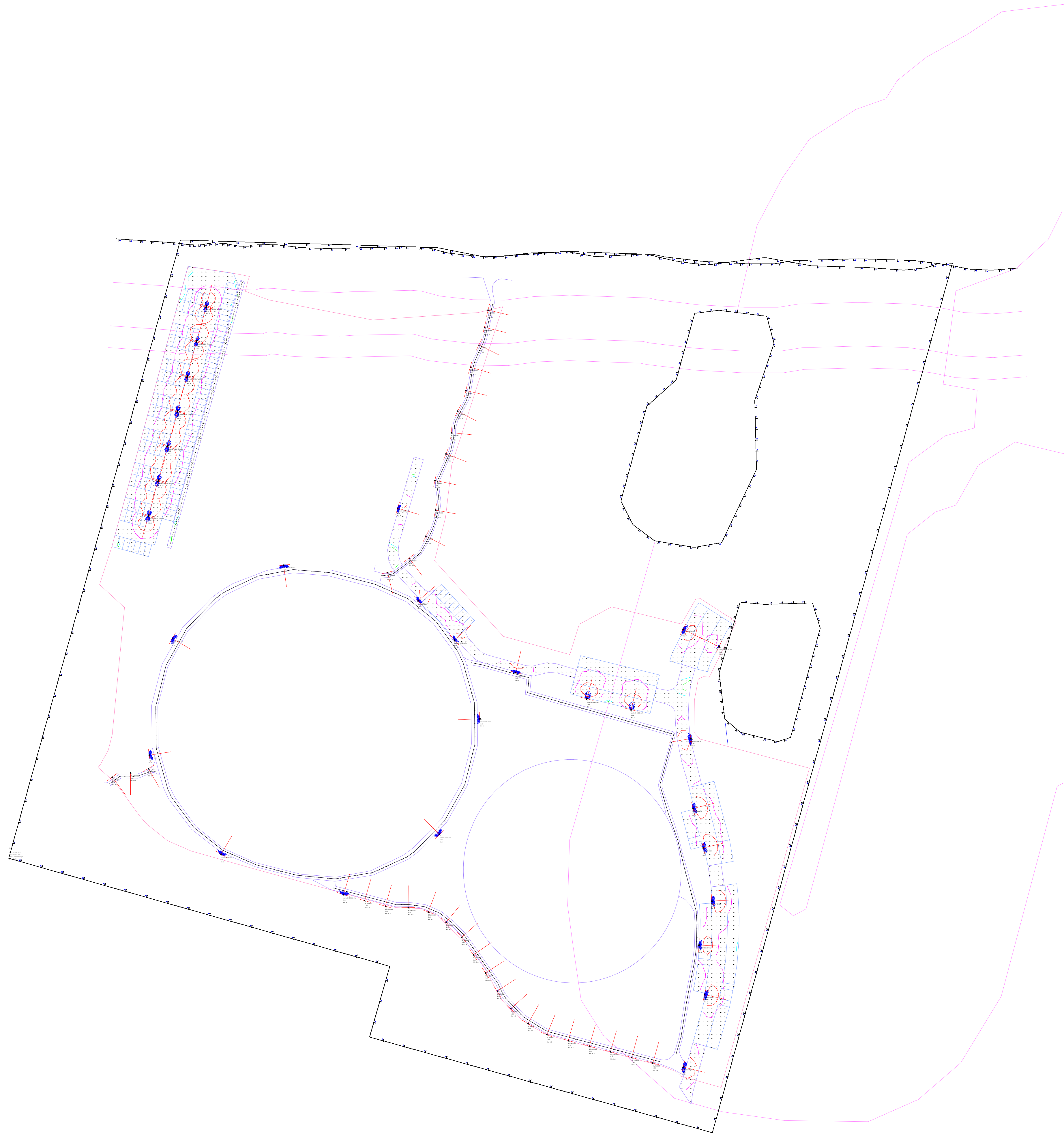
## Appendix A    Lighting strategy site plan








## Appendix B      Concept site lighting design



PRELIMINARY SITE LIGHTING DESIGN  
CALCULATION DEMONSTRATING  
EXTENT OF SITE LIGHTING AND SPILL  
LIGHTING ASSESSMENT CALCULATION  
SURFACES.  
CALCULATION DOES NOT INCLUDE  
BUILDING PERIMETER SECURITY  
LIGHTING.

Project:	Cricket NSW COE	
Client:	COX Architecture	
Drawing:	External Lighting Strategy	
Concept Design - Non-curfew		
Project: 19049		
Revision: 02		
Date: 23.10.19		
Author: JLK		
Scale: NTS		



# Obtrusive Light - Compliance Report

AS/NZS 4282:2019, A1 - Dark, Non-Curfew L1

Filename: Site\_Lighting\_P2

23/10/2019 4:45:04 PM

## Illuminance

Maximum Allowable Value: 2 Lux

Calculations Tested (85):

Calculation Label	Test Results	Max. Illum.	
ObtrusiveLight_1_III_Seg1	PASS	0.5	
ObtrusiveLight_1_III_Seg2	PASS	0.7	
ObtrusiveLight_1_III_Seg3	PASS	0.9	
ObtrusiveLight_1_III_Seg4	PASS	1.0	
ObtrusiveLight_1_III_Seg5	PASS	1.1	
ObtrusiveLight_1_III_Seg6	PASS	1.0	
ObtrusiveLight_1_III_Seg7	PASS	0.9	
ObtrusiveLight_1_III_Seg8	PASS	0.9	
ObtrusiveLight_1_III_Seg9	PASS	0.8	
ObtrusiveLight_1_III_Seg10	PASS	0.7	
ObtrusiveLight_1_III_Seg11	PASS	0.6	
ObtrusiveLight_1_III_Seg12	PASS	0.5	
ObtrusiveLight_1_III_Seg13	PASS	0.3	
ObtrusiveLight_1_III_Seg14	PASS	0.2	
ObtrusiveLight_1_III_Seg15	PASS	0.1	
ObtrusiveLight_1_III_Seg16	PASS	0.1	
ObtrusiveLight_1_III_Seg17	PASS	0.1	
ObtrusiveLight_1_III_Seg18	PASS	0.0	
ObtrusiveLight_1_III_Seg19	PASS	0.0	
ObtrusiveLight_1_III_Seg20	PASS	0.0	
ObtrusiveLight_1_III_Seg21	PASS	0.0	
ObtrusiveLight_1_III_Seg22	PASS	0.0	
ObtrusiveLight_1_III_Seg23	PASS	0.0	
ObtrusiveLight_1_III_Seg24	PASS	0.0	
ObtrusiveLight_1_III_Seg25	PASS	0.0	
ObtrusiveLight_1_III_Seg26	PASS	0.0	
ObtrusiveLight_1_III_Seg27	PASS	0.0	
ObtrusiveLight_1_III_Seg28	PASS	0.0	
ObtrusiveLight_1_III_Seg29	PASS	0.0	
ObtrusiveLight_1_III_Seg30	PASS	0.0	
ObtrusiveLight_1_III_Seg31	PASS	0.0	
ObtrusiveLight_1_III_Seg32	PASS	0.0	
ObtrusiveLight_1_III_Seg33	PASS	0.0	
ObtrusiveLight_1_III_Seg34	PASS	0.0	
ObtrusiveLight_1_III_Seg35	PASS	0.0	
ObtrusiveLight_1_III_Seg36	PASS	0.0	
ObtrusiveLight_1_III_Seg37	PASS	0.0	
ObtrusiveLight_1_III_Seg38	PASS	0.0	
ObtrusiveLight_1_III_Seg39	PASS	0.0	
ObtrusiveLight_1_III_Seg40	PASS	0.0	
ObtrusiveLight_2_III_Seg1	PASS	0.0	
ObtrusiveLight_2_III_Seg2	PASS	0.0	
ObtrusiveLight_2_III_Seg3	PASS	0.0	
ObtrusiveLight_2_III_Seg4	PASS	0.0	
ObtrusiveLight_2_III_Seg5	PASS	0.0	
ObtrusiveLight_2_III_Seg6	PASS	0.1	
ObtrusiveLight_2_III_Seg7	PASS	0.1	
ObtrusiveLight_2_III_Seg8	PASS	0.0	
ObtrusiveLight_2_III_Seg9	PASS	0.0	
ObtrusiveLight_2_III_Seg10	PASS	0.0	
ObtrusiveLight_2_III_Seg11	PASS	0.0	
ObtrusiveLight_2_III_Seg12	PASS	0.0	
ObtrusiveLight_2_III_Seg13	PASS	0.0	
ObtrusiveLight_3_III_Seg1	PASS	1.7	
ObtrusiveLight_3_III_Seg2	PASS	0.3	
ObtrusiveLight_3_III_Seg3	PASS	0.4	

ObtrusiveLight_3_III_Seg4	PASS	0.2
ObtrusiveLight_3_III_Seg5	PASS	0.0
ObtrusiveLight_3_III_Seg6	PASS	0.0
ObtrusiveLight_3_III_Seg7	PASS	0.0
ObtrusiveLight_3_III_Seg8	PASS	0.0
ObtrusiveLight_3_III_Seg9	PASS	0.0
ObtrusiveLight_4_III_Seg1	PASS	0.0
ObtrusiveLight_4_III_Seg2	PASS	0.0
ObtrusiveLight_4_III_Seg3	PASS	1.1
ObtrusiveLight_4_III_Seg4	PASS	0.9
ObtrusiveLight_4_III_Seg5	PASS	0.0
ObtrusiveLight_4_III_Seg6	PASS	0.0
ObtrusiveLight_4_III_Seg7	PASS	0.0
ObtrusiveLight_4_III_Seg8	PASS	0.0
ObtrusiveLight_4_III_Seg9	PASS	0.0
ObtrusiveLight_4_III_Seg10	PASS	0.0
ObtrusiveLight_4_III_Seg11	PASS	0.0
ObtrusiveLight_4_III_Seg12	PASS	0.0
ObtrusiveLight_4_III_Seg13	PASS	0.0
ObtrusiveLight_4_III_Seg14	PASS	0.0
ObtrusiveLight_4_III_Seg15	PASS	0.0
ObtrusiveLight_4_III_Seg16	PASS	0.0
ObtrusiveLight_4_III_Seg17	PASS	0.0
ObtrusiveLight_4_III_Seg18	PASS	0.0
ObtrusiveLight_4_III_Seg19	PASS	0.0
ObtrusiveLight_4_III_Seg20	PASS	0.1
ObtrusiveLight_4_III_Seg21	PASS	0.2
ObtrusiveLight_4_III_Seg22	PASS	0.3
ObtrusiveLight_4_III_Seg23	PASS	1.5

## Luminous Intensity (Cd) At Vertical Planes

Maximum Allowable Value: 2500 Cd

Calculations Tested (85):

Calculation Label	Test Results
ObtrusiveLight_1_Cd_Seg1	PASS
ObtrusiveLight_1_Cd_Seg2	PASS
ObtrusiveLight_1_Cd_Seg3	PASS
ObtrusiveLight_1_Cd_Seg4	PASS
ObtrusiveLight_1_Cd_Seg5	PASS
ObtrusiveLight_1_Cd_Seg6	PASS
ObtrusiveLight_1_Cd_Seg7	PASS
ObtrusiveLight_1_Cd_Seg8	PASS
ObtrusiveLight_1_Cd_Seg9	PASS
ObtrusiveLight_1_Cd_Seg10	PASS
ObtrusiveLight_1_Cd_Seg11	PASS
ObtrusiveLight_1_Cd_Seg12	PASS
ObtrusiveLight_1_Cd_Seg13	PASS
ObtrusiveLight_1_Cd_Seg14	PASS
ObtrusiveLight_1_Cd_Seg15	PASS
ObtrusiveLight_1_Cd_Seg16	PASS
ObtrusiveLight_1_Cd_Seg17	PASS
ObtrusiveLight_1_Cd_Seg18	PASS
ObtrusiveLight_1_Cd_Seg19	PASS
ObtrusiveLight_1_Cd_Seg20	PASS
ObtrusiveLight_1_Cd_Seg21	PASS
ObtrusiveLight_1_Cd_Seg22	PASS
ObtrusiveLight_1_Cd_Seg23	PASS
ObtrusiveLight_1_Cd_Seg24	PASS
ObtrusiveLight_1_Cd_Seg25	PASS
ObtrusiveLight_1_Cd_Seg26	PASS
ObtrusiveLight_1_Cd_Seg27	PASS
ObtrusiveLight_1_Cd_Seg28	PASS
ObtrusiveLight_1_Cd_Seg29	PASS
ObtrusiveLight_1_Cd_Seg30	PASS

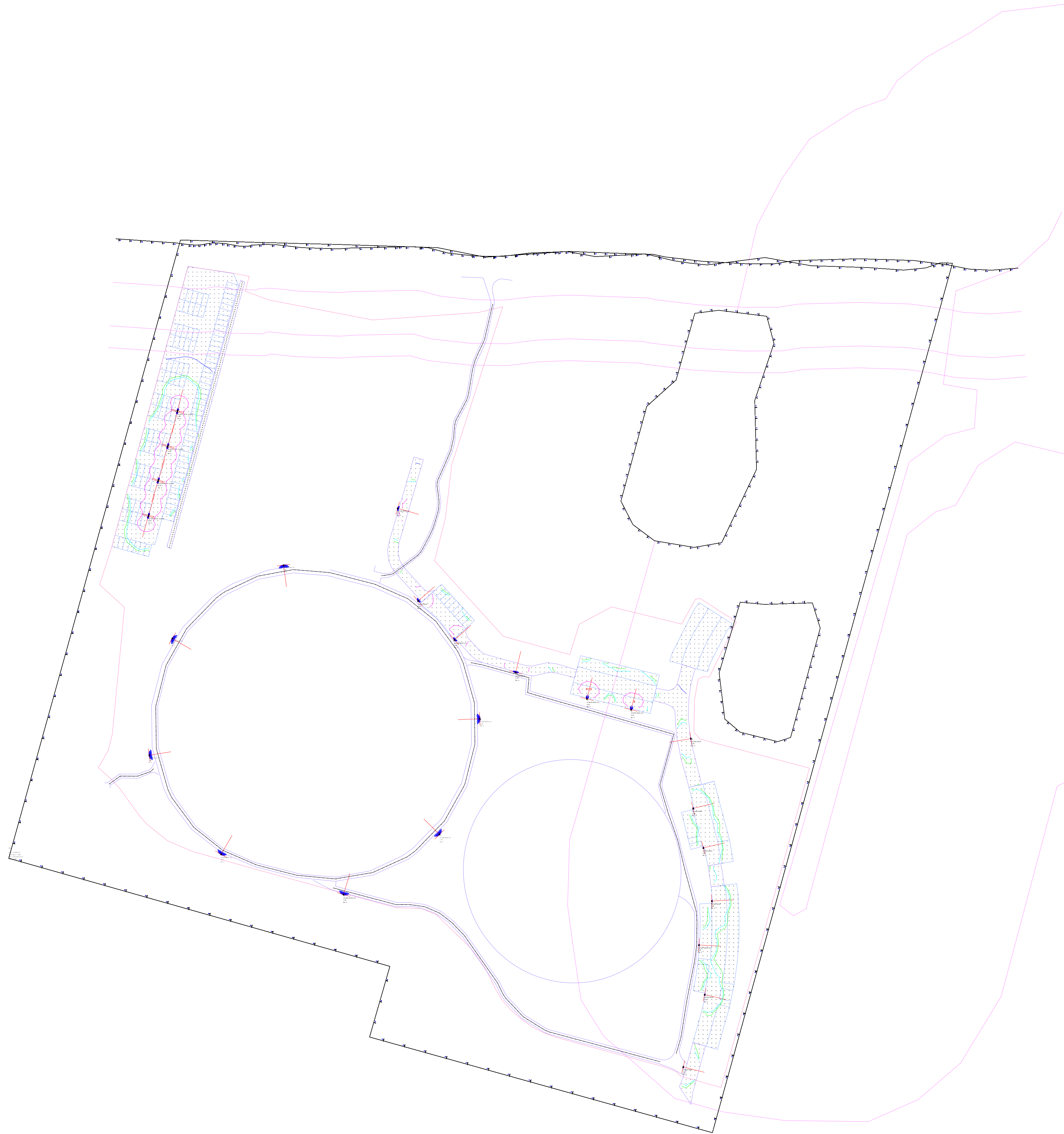
ObtrusiveLight_1_Cd_Seg31	PASS
ObtrusiveLight_1_Cd_Seg32	PASS
ObtrusiveLight_1_Cd_Seg33	PASS
ObtrusiveLight_1_Cd_Seg34	PASS
ObtrusiveLight_1_Cd_Seg35	PASS
ObtrusiveLight_1_Cd_Seg36	PASS
ObtrusiveLight_1_Cd_Seg37	PASS
ObtrusiveLight_1_Cd_Seg38	PASS
ObtrusiveLight_1_Cd_Seg39	PASS
ObtrusiveLight_1_Cd_Seg40	PASS
ObtrusiveLight_2_Cd_Seg1	PASS
ObtrusiveLight_2_Cd_Seg2	PASS
ObtrusiveLight_2_Cd_Seg3	PASS
ObtrusiveLight_2_Cd_Seg4	PASS
ObtrusiveLight_2_Cd_Seg5	PASS
ObtrusiveLight_2_Cd_Seg6	PASS
ObtrusiveLight_2_Cd_Seg7	PASS
ObtrusiveLight_2_Cd_Seg8	PASS
ObtrusiveLight_2_Cd_Seg9	PASS
ObtrusiveLight_2_Cd_Seg10	PASS
ObtrusiveLight_2_Cd_Seg11	PASS
ObtrusiveLight_2_Cd_Seg12	PASS
ObtrusiveLight_2_Cd_Seg13	PASS
ObtrusiveLight_3_Cd_Seg1	PASS
ObtrusiveLight_3_Cd_Seg2	PASS
ObtrusiveLight_3_Cd_Seg3	PASS
ObtrusiveLight_3_Cd_Seg4	PASS
ObtrusiveLight_3_Cd_Seg5	PASS
ObtrusiveLight_3_Cd_Seg6	PASS
ObtrusiveLight_3_Cd_Seg7	PASS
ObtrusiveLight_3_Cd_Seg8	PASS
ObtrusiveLight_3_Cd_Seg9	PASS
ObtrusiveLight_4_Cd_Seg1	PASS
ObtrusiveLight_4_Cd_Seg2	PASS
ObtrusiveLight_4_Cd_Seg3	PASS
ObtrusiveLight_4_Cd_Seg4	PASS
ObtrusiveLight_4_Cd_Seg5	PASS
ObtrusiveLight_4_Cd_Seg6	PASS
ObtrusiveLight_4_Cd_Seg7	PASS
ObtrusiveLight_4_Cd_Seg8	PASS
ObtrusiveLight_4_Cd_Seg9	PASS
ObtrusiveLight_4_Cd_Seg10	PASS
ObtrusiveLight_4_Cd_Seg11	PASS
ObtrusiveLight_4_Cd_Seg12	PASS
ObtrusiveLight_4_Cd_Seg13	PASS
ObtrusiveLight_4_Cd_Seg14	PASS
ObtrusiveLight_4_Cd_Seg15	PASS
ObtrusiveLight_4_Cd_Seg16	PASS
ObtrusiveLight_4_Cd_Seg17	PASS
ObtrusiveLight_4_Cd_Seg18	PASS
ObtrusiveLight_4_Cd_Seg19	PASS
ObtrusiveLight_4_Cd_Seg20	PASS
ObtrusiveLight_4_Cd_Seg21	PASS
ObtrusiveLight_4_Cd_Seg22	PASS
ObtrusiveLight_4_Cd_Seg23	PASS

## Upward Waste Light Ratio (UWLR)


Maximum Allowable Value: 0.0 %

Calculated UWLR: 0.0 %

Test Results: **PASS**



PRELIMINARY SITE LIGHTING DESIGN  
CALCULATION DEMONSTRATING EXTENT  
OF SITE LIGHTING AND SPILL LIGHTING  
ASSESSMENT CALCULATION SURFACES.  
CALCULATION DOES NOT INCLUDE  
BUILDING PERIMETER SECURITY  
LIGHTING.

Project:	Cricket NSW COE	
Client:	COX Architecture	
Drawing:	External Lighting Strategy	
Concept Design - Curfew		
Project: 19049		
Revision: 02		
Date: 23.10.19		
Author: JLK		
Scale: NTS		

# Obtrusive Light - Compliance Report

AS/NZS 4282:2019, A1 - Dark, Curfew

Filename: Site\_Lighting\_P2

23/10/2019 5:05:07 PM

## Illuminance

Maximum Allowable Value: 0.1 Lux

Calculations Tested (85):

Calculation Label	Test Results	Max. Illum.	
ObtrusiveLight_1_III_Seg1	PASS	0.0	
ObtrusiveLight_1_III_Seg2	PASS	0.0	
ObtrusiveLight_1_III_Seg3	PASS	0.0	
ObtrusiveLight_1_III_Seg4	PASS	0.0	
ObtrusiveLight_1_III_Seg5	PASS	0.0	
ObtrusiveLight_1_III_Seg6	PASS	0.0	
ObtrusiveLight_1_III_Seg7	PASS	0.0	
ObtrusiveLight_1_III_Seg8	PASS	0.0	
ObtrusiveLight_1_III_Seg9	PASS	0.0	
ObtrusiveLight_1_III_Seg10	PASS	0.0	
ObtrusiveLight_1_III_Seg11	PASS	0.0	
ObtrusiveLight_1_III_Seg12	PASS	0.0	
ObtrusiveLight_1_III_Seg13	PASS	0.0	
ObtrusiveLight_1_III_Seg14	PASS	0.0	
ObtrusiveLight_1_III_Seg15	PASS	0.0	
ObtrusiveLight_1_III_Seg16	PASS	0.0	
ObtrusiveLight_1_III_Seg17	PASS	0.0	
ObtrusiveLight_1_III_Seg18	PASS	0.0	
ObtrusiveLight_1_III_Seg19	PASS	0.0	
ObtrusiveLight_1_III_Seg20	PASS	0.0	
ObtrusiveLight_1_III_Seg21	PASS	0.0	
ObtrusiveLight_1_III_Seg22	PASS	0.0	
ObtrusiveLight_1_III_Seg23	PASS	0.0	
ObtrusiveLight_1_III_Seg24	PASS	0.0	
ObtrusiveLight_1_III_Seg25	PASS	0.0	
ObtrusiveLight_1_III_Seg26	PASS	0.0	
ObtrusiveLight_1_III_Seg27	PASS	0.0	
ObtrusiveLight_1_III_Seg28	PASS	0.0	
ObtrusiveLight_1_III_Seg29	PASS	0.0	
ObtrusiveLight_1_III_Seg30	PASS	0.0	
ObtrusiveLight_1_III_Seg31	PASS	0.0	
ObtrusiveLight_1_III_Seg32	PASS	0.0	
ObtrusiveLight_1_III_Seg33	PASS	0.0	
ObtrusiveLight_1_III_Seg34	PASS	0.0	
ObtrusiveLight_1_III_Seg35	PASS	0.0	
ObtrusiveLight_1_III_Seg36	PASS	0.0	
ObtrusiveLight_1_III_Seg37	PASS	0.0	
ObtrusiveLight_1_III_Seg38	PASS	0.0	
ObtrusiveLight_1_III_Seg39	PASS	0.0	
ObtrusiveLight_1_III_Seg40	PASS	0.0	
ObtrusiveLight_2_III_Seg1	PASS	0.0	
ObtrusiveLight_2_III_Seg2	PASS	0.0	
ObtrusiveLight_2_III_Seg3	PASS	0.0	
ObtrusiveLight_2_III_Seg4	PASS	0.0	
ObtrusiveLight_2_III_Seg5	PASS	0.0	
ObtrusiveLight_2_III_Seg6	PASS	0.0	
ObtrusiveLight_2_III_Seg7	PASS	0.0	
ObtrusiveLight_2_III_Seg8	PASS	0.0	
ObtrusiveLight_2_III_Seg9	PASS	0.0	
ObtrusiveLight_2_III_Seg10	PASS	0.0	
ObtrusiveLight_2_III_Seg11	PASS	0.0	
ObtrusiveLight_2_III_Seg12	PASS	0.0	
ObtrusiveLight_2_III_Seg13	PASS	0.0	
ObtrusiveLight_3_III_Seg1	PASS	0.0	
ObtrusiveLight_3_III_Seg2	PASS	0.1	
ObtrusiveLight_3_III_Seg3	PASS	0.1	



ObtrusiveLight_3_III_Seg4	PASS	0.0
ObtrusiveLight_3_III_Seg5	PASS	0.0
ObtrusiveLight_3_III_Seg6	PASS	0.0
ObtrusiveLight_3_III_Seg7	PASS	0.0
ObtrusiveLight_3_III_Seg8	PASS	0.0
ObtrusiveLight_3_III_Seg9	PASS	0.0
ObtrusiveLight_4_III_Seg1	PASS	0.0
ObtrusiveLight_4_III_Seg2	PASS	0.0
ObtrusiveLight_4_III_Seg3	FAIL	0.2
ObtrusiveLight_4_III_Seg4	FAIL	0.2
ObtrusiveLight_4_III_Seg5	PASS	0.0
ObtrusiveLight_4_III_Seg6	PASS	0.0
ObtrusiveLight_4_III_Seg7	PASS	0.0
ObtrusiveLight_4_III_Seg8	PASS	0.0
ObtrusiveLight_4_III_Seg9	PASS	0.0
ObtrusiveLight_4_III_Seg10	PASS	0.0
ObtrusiveLight_4_III_Seg11	PASS	0.0
ObtrusiveLight_4_III_Seg12	PASS	0.0
ObtrusiveLight_4_III_Seg13	PASS	0.0
ObtrusiveLight_4_III_Seg14	PASS	0.0
ObtrusiveLight_4_III_Seg15	PASS	0.0
ObtrusiveLight_4_III_Seg16	PASS	0.0
ObtrusiveLight_4_III_Seg17	PASS	0.0
ObtrusiveLight_4_III_Seg18	PASS	0.0
ObtrusiveLight_4_III_Seg19	PASS	0.0
ObtrusiveLight_4_III_Seg20	PASS	0.0
ObtrusiveLight_4_III_Seg21	PASS	0.0
ObtrusiveLight_4_III_Seg22	PASS	0.0
ObtrusiveLight_4_III_Seg23	FAIL	0.7

THESE CALCULATION SURFACES ARE AT THE EASTERN ROAD INTERSECTION WITH THE BUS-LANE AT THE PROPERTY BOUNDARY AND DO NOT REPRESENT A NON-COMPLIANCE.

THIS CALCULATION SURFACE FACES ONTO THE EXISTING ROAD TO THE BOATRAMP AT THE PROPERTY BOUNDARY AND DO NOT REPRESENT A NON-COMPLIANCE.

#### Failed Meter Locations (19):

Calculation Label	Lux	Meter Coords
ObtrusiveLight_4_III_Seg23	0.2	114.922, 413.356, 1.75
ObtrusiveLight_4_III_Seg23	0.2	93.502, 336.277, 2.75
ObtrusiveLight_4_III_Seg23	0.2	96.179, 345.912, 2.75
ObtrusiveLight_4_III_Seg23	0.2	112.245, 403.721, 2.75
ObtrusiveLight_4_III_Seg23	0.3	93.502, 336.277, 1.75
ObtrusiveLight_4_III_Seg23	0.3	112.245, 403.721, 1.75
ObtrusiveLight_4_III_Seg23	0.3	101.535, 365.181, 2.75
ObtrusiveLight_4_III_Seg23	0.3	106.89, 384.451, 2.75
ObtrusiveLight_4_III_Seg23	0.3	109.567, 394.086, 2.75
ObtrusiveLight_4_III_Seg23	0.4	96.179, 345.912, 1.75
ObtrusiveLight_4_III_Seg23	0.4	98.857, 355.546, 2.75
ObtrusiveLight_4_III_Seg23	0.4	104.212, 374.816, 2.75
ObtrusiveLight_4_III_Seg23	0.5	109.567, 394.086, 1.75
ObtrusiveLight_4_III_Seg23	0.6	98.857, 355.546, 1.75
ObtrusiveLight_4_III_Seg23	0.6	104.212, 374.816, 1.75
ObtrusiveLight_4_III_Seg23	0.6	106.89, 384.451, 1.75
ObtrusiveLight_4_III_Seg23	0.7	101.535, 365.181, 1.75
ObtrusiveLight_4_III_Seg3	0.2	358.159, 63.57, 1.75
ObtrusiveLight_4_III_Seg4	0.2	386.609, 104.178, 1.75

## Luminous Intensity (Cd) At Vertical Planes

Maximum Allowable Value: 500 Cd

#### Calculations Tested (85):

Calculation Label	Test Results
ObtrusiveLight_1_Cd_Seg1	PASS
ObtrusiveLight_1_Cd_Seg2	PASS
ObtrusiveLight_1_Cd_Seg3	PASS
ObtrusiveLight_1_Cd_Seg4	PASS
ObtrusiveLight_1_Cd_Seg5	PASS
ObtrusiveLight_1_Cd_Seg6	PASS
ObtrusiveLight_1_Cd_Seg7	PASS
ObtrusiveLight_1_Cd_Seg8	PASS

ObtrusiveLight_1_Cd_Seg9	PASS
ObtrusiveLight_1_Cd_Seg10	PASS
ObtrusiveLight_1_Cd_Seg11	PASS
ObtrusiveLight_1_Cd_Seg12	PASS
ObtrusiveLight_1_Cd_Seg13	PASS
ObtrusiveLight_1_Cd_Seg14	PASS
ObtrusiveLight_1_Cd_Seg15	PASS
ObtrusiveLight_1_Cd_Seg16	PASS
ObtrusiveLight_1_Cd_Seg17	PASS
ObtrusiveLight_1_Cd_Seg18	PASS
ObtrusiveLight_1_Cd_Seg19	PASS
ObtrusiveLight_1_Cd_Seg20	PASS
ObtrusiveLight_1_Cd_Seg21	PASS
ObtrusiveLight_1_Cd_Seg22	PASS
ObtrusiveLight_1_Cd_Seg23	PASS
ObtrusiveLight_1_Cd_Seg24	PASS
ObtrusiveLight_1_Cd_Seg25	PASS
ObtrusiveLight_1_Cd_Seg26	PASS
ObtrusiveLight_1_Cd_Seg27	PASS
ObtrusiveLight_1_Cd_Seg28	PASS
ObtrusiveLight_1_Cd_Seg29	PASS
ObtrusiveLight_1_Cd_Seg30	PASS
ObtrusiveLight_1_Cd_Seg31	PASS
ObtrusiveLight_1_Cd_Seg32	PASS
ObtrusiveLight_1_Cd_Seg33	PASS
ObtrusiveLight_1_Cd_Seg34	PASS
ObtrusiveLight_1_Cd_Seg35	PASS
ObtrusiveLight_1_Cd_Seg36	PASS
ObtrusiveLight_1_Cd_Seg37	PASS
ObtrusiveLight_1_Cd_Seg38	PASS
ObtrusiveLight_1_Cd_Seg39	PASS
ObtrusiveLight_1_Cd_Seg40	PASS
ObtrusiveLight_2_Cd_Seg1	PASS
ObtrusiveLight_2_Cd_Seg2	PASS
ObtrusiveLight_2_Cd_Seg3	PASS
ObtrusiveLight_2_Cd_Seg4	PASS
ObtrusiveLight_2_Cd_Seg5	PASS
ObtrusiveLight_2_Cd_Seg6	PASS
ObtrusiveLight_2_Cd_Seg7	PASS
ObtrusiveLight_2_Cd_Seg8	PASS
ObtrusiveLight_2_Cd_Seg9	PASS
ObtrusiveLight_2_Cd_Seg10	PASS
ObtrusiveLight_2_Cd_Seg11	PASS
ObtrusiveLight_2_Cd_Seg12	PASS
ObtrusiveLight_2_Cd_Seg13	PASS
ObtrusiveLight_3_Cd_Seg1	PASS
ObtrusiveLight_3_Cd_Seg2	PASS
ObtrusiveLight_3_Cd_Seg3	PASS
ObtrusiveLight_3_Cd_Seg4	PASS
ObtrusiveLight_3_Cd_Seg5	PASS
ObtrusiveLight_3_Cd_Seg6	PASS
ObtrusiveLight_3_Cd_Seg7	PASS
ObtrusiveLight_3_Cd_Seg8	PASS
ObtrusiveLight_3_Cd_Seg9	PASS
ObtrusiveLight_4_Cd_Seg1	PASS
ObtrusiveLight_4_Cd_Seg2	PASS
ObtrusiveLight_4_Cd_Seg3	PASS
ObtrusiveLight_4_Cd_Seg4	PASS
ObtrusiveLight_4_Cd_Seg5	PASS
ObtrusiveLight_4_Cd_Seg6	PASS
ObtrusiveLight_4_Cd_Seg7	PASS
ObtrusiveLight_4_Cd_Seg8	PASS
ObtrusiveLight_4_Cd_Seg9	PASS
ObtrusiveLight_4_Cd_Seg10	PASS
ObtrusiveLight_4_Cd_Seg11	PASS
ObtrusiveLight_4_Cd_Seg12	PASS

ObtrusiveLight_4_Cd_Seg13	PASS
ObtrusiveLight_4_Cd_Seg14	PASS
ObtrusiveLight_4_Cd_Seg15	PASS
ObtrusiveLight_4_Cd_Seg16	PASS
ObtrusiveLight_4_Cd_Seg17	PASS
ObtrusiveLight_4_Cd_Seg18	PASS
ObtrusiveLight_4_Cd_Seg19	PASS
ObtrusiveLight_4_Cd_Seg20	PASS
ObtrusiveLight_4_Cd_Seg21	PASS
ObtrusiveLight_4_Cd_Seg22	PASS
ObtrusiveLight_4_Cd_Seg23	PASS

## Upward Waste Light Ratio (UWLR)

Maximum Allowable Value: 0.0 %

Calculated UWLR: 0.0 %

Test Results: **PASS**