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HUNTER INDOOR SPORTS CENTRE

EXTERNAL LIGHTING IMPACT ASSESSMENT

Project Title: Hunter Indoor Sports Centre

Project Number: 23376

Revision History

Rev No.	Date	Description	By	Checked	Approved
A	01.03.24	Draft for Review	RT	JC	JC
B	20.03.24	Final Issue	RT	JC	JC
C	22.03.24	Revised Final Issue	RT	JC	JC

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

EPA has been commissioned by Basketball Association of Newcastle Limited (BANL) to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application (SSD- 65595459) for the proposed Hunter Indoor Sports Centre with courts, indoor stadium, amenities and associated civil and landscaping works, at 2 Monash Road and 24 Wallarah Road, New Lambton.

In these requirements, namely item #5 (Environmental Amenity) it is required as part of the SSDA submission for an external lighting plan and lighting impact assessment to be provided to demonstrate compliance with the Australian Standard AS/NZ 4282 – Control of the Obtrusive Effects of Outdoor Lighting.

1.2 PURPOSE

The purpose of this external lighting impact assessment is to present the results and findings of general light level and obtrusive/ spill light calculations to determine compliance or non-compliance with AS/NZS 4282. This report will summarise the requirements of both lighting standards AS/NZS 1158 (for a compliant lighting design) and AS/NZS 4282 (for non-obtrusive lighting design). This report will recommend optimal lighting control strategies to further control any obtrusive effects of the external lighting design. An external lighting plan will be prepared in conjunction with this report.

1.3 GLOSSARY OF TERMS

For the purpose of this document, the below features accessible definitions of the terms that are commonly used in obtrusive lighting design assessments.

Curfew – Time interval during which stricter requirements for the control of obtrusive light apply.

Environmental Zone – Categorisation of the relative ambient lighting and environmental conditions as relevant to the lighting system or affected property.

Glare – Visual impairment caused by a bright source of light, directly visible or reflected by a surface.

Obtrusive Light – Spill light which, because of quantitative or directional attributes, gives rise to excessive annoyance, discomfort, distraction, or a reduction in ability to see essential information.

Sky Glow – Brightening of the night sky that results from the reflection of radiation (visible and non-visible), scattered from the constituents of the atmosphere, in the direction of observation (by man-made sources such as outdoor lighting).

Spill Light – Light emitted by a lighting installation that falls outside the boundaries of the property for which the lighting installation is designed.

Upward Waste Light Ratio – Ratio of the luminous flux of all luminaires that is emitted directly into the night sky, divided by the total flux of all the luminaires, when the luminaires are mounted in their designed positions, and excluding reflected light from surfaces or obstructions.

1.4 SITE AND SURROUNDING AREA DESCRIPTION

The site is located at 2 Monash Road and 24 Wallarah Road, New Lambton, within the Newcastle local government area (LGA). The site comprises multiple parcels of land and is legally described as:

- Lot 2380 DP755247
- Lot 2379 DP755247
- Lot 2378 DP755247

- Lot 2377 DP755247

The project area also includes land on which the existing amenities block is located. The site is identified in Figure 1 below.

Figure 1: Site Context

The proposed project site shares a boundary to the North with Lambton High School and a boundary to the West with Arthur Edden Oval. The South of the site is constrained by the Lambton Ker-rai Creek which managers the flood ways across the region with residences located directly on the opposite side of the creek. Adjacent to Lambton High School to the North is a series of adjoining townhouses.

As a part of this external lighting impact assessment, we will assess obtrusive lighting impacts to the neighbouring residential housing to the South and adjoining townhouses to the North. Obtrusive lighting assessments to not include commercial precincts.

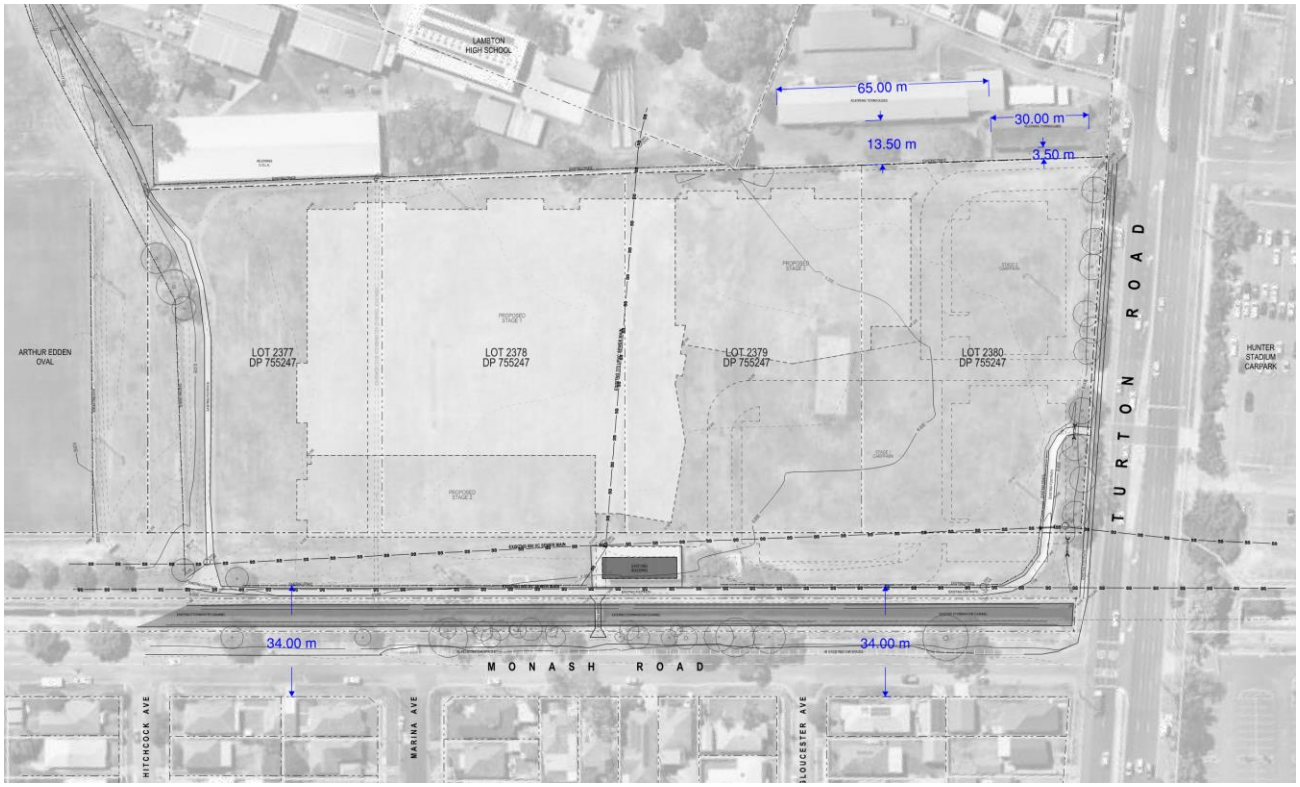


Figure 2: Proximity to Neighbouring Residential Properties

2 REFERENCE INFORMATION

2.1 CLIENT INFORMATION

The following drawings have been provided by EJE Architects:

- 14683-HBS-Developed Plans (02-02-2024) PDF
- Appendix B Agency Advice PDF
- SSD-SSI Issued SEARs Cover Letter_22013034_015448 PDF
- SSD-SSI Issued SEARs_22012024_015450 PDF
- A42 PROPOSED OVERALL SITE PLAN CAD
- 14683-HBS-Stage 2 Architectural Renders JPG

2.2 PLANNING SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

The Environmental Impact Statement (EIS) must include an environmental risk assessment to identify the potential environmental impacts associated with the development. This includes the following lighting assessment requirements:

Project SSD- 65595459	Section of report
5. Environmental Amenity *Assess amenity impacts on the surrounding locality (both within and outside the site), including lighting impacts, solar access, visual privacy, visual amenity, view loss and view sharing, overshadowing, wind impact and acoustic impacts. A high level of environmental amenity for any surrounding residential land uses must be demonstrated.*	4
Include an external lighting plan and lighting impact assessment which demonstrates compliance with the most recent/applicable version of Australian Standard AS/NZS 4282 Control of the Obtrusive Effects of Outdoor Lighting. The lighting impact and illumination assessment for the proposal should consider the adjoining residential areas, potential light pollution and light overspill, potential impacts to surrounding sensitive receivers, potential impacts on the safety of the road network, cumulative impacts and propose mitigation measures.	3, 4, 5

3 DESIGN CRITERIA

3.1 CODES, STANDARDS, SPECIFICATIONS AND STATUTORY REQUIREMENTS

The design will comply to the requirements of the relevant:

- Acts and Regulations
- Australian Standards
- National Construction Code
- Governing authority standards and guidelines
- Client communicated standard, templates and preferences

3.2 LIGHTING PARAMETERS

The following Australian Standards and Guidelines have been used to form the basis of this obtrusive lighting impact assessment:

- AS/NZS 4282 2023 – Control of the Obtrusive Effects of Outdoor Lighting
- AS/NZS 1158 2020 – Lighting for Roads and Public Spaces Series

3.3 AS/NZS 4282 2023 – CONTROL OF THE OBTRUSIVE EFFECTS OF OUTDOOR LIGHTING

Australian standard AS4282 - Control of the obtrusive effects of outdoor lighting contains recommendations for the limitation of light spill to adjacent properties. Several aspects of potential obtrusiveness are considered, visibility of light falling on surrounding properties, the brightness of luminaires in the field of view of nearby residents and the glare to users of adjacent transport systems. For control of these effects, light technical parameters have been developed taking into account the following:

- The level of lighting existing in the area.
- The time that the proposed lighting is to operate.
- The type of lighting technology available to light the activity.

AS/NZS 4282 is predominantly applicable to the impact of lighting on residential dwellings. General recommendations to reduce external light pollution presented in AS 4282 includes:

- Switch lights off when not required for safety, security of enhancement of the night-time scene (i.e. apply a curfew switch-off time).
- Wherever possible, direct light downwards, not upwards, to illuminate the target area. If there is no alternative to up-lighting, then the use of glare-shields and baffles will help reduce spill light to a minimum.
- Use specifically designed lighting equipment that once installed, minimises the spread of light near to or above the horizontal.
- Do not 'over' light.
- To keep glare to a minimum, ensure that the main beam of angle of luminaires directed towards a potential observer is kept below 70°. It should be noted that the higher the mounting height, the lower the main beam angle can be.
- In places with low ambient light, glare can be obtrusive and extra care should be taken in positioning and aiming.
- Wherever possible use floodlights with asymmetric beams that permit the front glass to be kept horizontal or near parallel to the surface being lit.

As per the standards, residential developments have stricter restrictions on obtrusive lighting, and the relative brightness of the surrounds must be considered.

Table 3.1 and 3.2 from AS 4282 2023 (extracts below) show recommended zone classifications and their relative design parameters. The zones and classifications highlighted in blue are applicable to this project.

Table 3.1 — Environmental zones

Environmental zones	Ambient light conditions	Descriptions/ Examples
A0	Intrinsically dark	UNESCO Starlight Reserve. IDA: Dark Sky Parks, Reserves or Sanctuaries Major optical observatories Other accreditations for dark sky places for example astrotourism, heritage value, astronomical importance, wildlife/ecosystem protection Lighting for safe access may be required
A1	Dark	Relatively uninhabited rural areas (including terrestrial, marine, aquatic and coastal areas) Generally roadways without streetlighting through rural areas
A2	Low district brightness	Sparsely inhabited rural and semi-rural areas Generally roadways without streetlighting through suburban, rural or semi-rural areas other than intersections
A3	Medium district brightness	Suburban areas in towns and cities Generally roadways with streetlighting through suburban, rural or semi-rural areas
A4	High district brightness	Town and city centres and other commercial areas Residential areas abutting commercial areas Industrial and Port areas Transport Interchanges
TV	High district brightness	Vicinity of major sport and event stadiums during TV broadcasts
NOTE Zones A0 and A1 would normally have a minimum area of 50 ha.(0.5 km^2). There may be smaller environmentally sensitive areas.		

Figure 3: AS/NZS 4282 2023 Table 3.1 Environmental Zones

Table 3.2 — Light technical parameter limits

Zones	Maximum vertical illuminance ($E_{v)\ lux}$		Threshold increment (TI)		Upward Light Ratio
	Non-curfew	Curfew	Maximum TI %	Default Adaptation level (L_{ad}) cd/m²	Maximum ULR_S or ULR_L
A0	0[a]	0.0	N/A	N/A	0.00
A1	2	0.1	20	0.1	0.00
A2	5	1	20	0.2[b]	0.01
A3	10	2	20	1	0.02
A4	25	5	20	5	0.03
TV	N/A	N/A	20	10	0.08

[a] For A0, E_v shall be as close to zero as practicable without impacting safety considerations.

[b] For an internally illuminated sign in a A2 zone, $L_{ad} \leq 0.25$ cd/m²

Figure 4: AS/NZS 4282 2023 Table 3.2 Light Technical Parameters

3.4 AS/NZS 4282 2023 DESIGN REQUIREMENTS FOR HUNTER INDOOR SPORTS CENTRE

With reference to table 3.1 above, the Hunter Indoor Sports Centre falls under environmental zone A4 – High district brightness for residential areas abutting commercial areas and must comply with the below light technical parameters.

LIGHT TECHNICAL PARAMETERS

A4 High District Brightness; Residential areas abutting commercial areas.

Non-curfew:	Curfew:
Vertical illuminance: 25 lux	Vertical illuminance: 5 lux
Threshold Increment – 20%	Threshold Increment – 20%
Adaption level – 5	Adaption level – 5
Upward Waste Light Ratio – 0.03	Upward Waste Light Ratio – 0.03

3.5 AS/NZS 1158.3.1 2020 – LIGHTING FOR ROADS AND PUBLIC SPACES SERIES

The main purposes of the P-Category lighting assessments are to assist pedestrians to orientate themselves and detect potential hazards of the area they are in and to discourage fear of crime while protecting the integrity of the nighttime environment through control of light spill and glare.

The P-Category assessments are implemented so that the lighting design can enhance the prestige and amenity of the location but should also be designed to minimise any obtrusive effects.

The principal design objectives for P-Category lighting are to provide the following:

- Illuminance and uniformity of illuminance over the designated area.
- Glare control to a specific level.
- Limitation of upward light from luminaires to a specified level.
- Limitation to a specified level of the light spilled into properties that abut the lit area.
- A maintenance regime such that the lighting scheme complies at all times during each maintenance cycle over the life of an installation.
- Minimising energy consumption.

The following tables are extracts from AS 1158 2020 and show recommended lighting categories and associated design criteria.

TABLE 3.3

VALUES OF LIGHT TECHNICAL PARAMETERS FOR ROADS IN LOCAL AREAS

1	2	3	4
Lighting subcategory	Light technical parameters (LTP)		
	Average horizontal illuminance[a,b] $(\bar{E}_h)$ lx	Point horizontal illuminance[a,b] (E_{Ph}) lx	Illuminance (horizontal) uniformity[c] Cat. P (U_{E2})
PR1	7	2	8
PR2	3.5	0.7	8
PR3[e]	1.75	0.3	8
PR4[d,e]	1.3	0.22	8
PR5[d,e]	0.85	0.14	10
PR6[d]	0.7	0.07	10

Figure 5: AS/NZS 1158 2020 Table 3.3 Parameters for Roads in Local Areas

TABLE 3.4

VALUES OF LIGHT TECHNICAL PARAMETERS FOR PATHWAYS AND CYCLIST PATHS

1	2	3	4	5
Lighting subcategory	Light technical parameters (LTP)			
	Average horizontal illuminance[a,b] $(\bar{E}_h)$ lx	Point horizontal illuminance[a,b,d] (E_{Ph}) lx	Illuminance (horizontal) uniformity[c] Cat. P (U_{E2})	Point vertical illuminance[a,b] (E_{Pv}) lx
PP1	10	2	5	1
PP2	7	1	5	0.3
PP3	3	0.5	5	0.1
PP4	1.5	0.25	5	0.05[e]
PP5	0.85	0.14	5	0.02[e]

Figure 6: AS/NZS 1158 2020 Table 3.4 Parameters for Pathways

TABLE 3.7

VALUES OF LIGHT TECHNICAL PARAMETERS FOR OUTDOOR CAR PARKS (INCLUDING ROOF-TOP CAR PARKS)

1	2	3	4	5
Lighting subcategory	Light technical parameters (LTP)			
	Average horizontal illuminance[a,b] $(\bar{E}_h)$ lx	Point horizontal illuminance[a,b] (E_{Ph}) lx	Illuminance (horizontal) uniformity[c] Cat. P (U_{E2})	Point vertical illuminance[a,b] (E_{Pv}) lx
PC1	14	3	8	3
PC2	7	1.5	8	1
PC3	3.5	0.7	8	—
PCD[d]	—	≥14 and ≥$(\bar{E}_h)$ [d]	—	—
PCX[e]	21	5	8	—

LIGHT TECHNICAL PARAMETERS

With reference o the table extracts from AS/NZS 1158 2020 above, the external lighting for the Hunter Indoor Sports Centre has been designed to comply with the following design categories and light technical parameters:

<u>Roads:</u>

Average Illuminance: 3.5 lux

Minimum Illuminance: 0.2 lux

Uniformity (UE2): <8

<u>Pathways:</u>

Average Illuminance: 7 lux

Minimum Illuminance: 1 lux

Minimum Vertical Illuminance: 0.3 lux

Uniformity (UE2): <5

<u>Carparks:</u>

Average Illuminance: 7 lux

Minimum Illuminance: 1.5 lux

Minimum Vertical Illuminance: 1 lux

Uniformity (UE2): <8

Disabled Park PCD Minimum Illuminance: >14 lux

4 LIGHTING CALCULATIONS

4.1 PHOTOMETRIC CALCULATIONS

Luminaire photometric and technical data was procured either directly from manufacturers or via the manufacturers website and is understood to be the latest and most up to date version of the luminaire photometry and equipment technical information.

For the purpose of this report, we have used a moderate maintenance factor. The maintenance factor applied to the luminaires is 0.75.

LIGHTING SOFTWARE

Lighting modelling software used to complete the calculations was AGI32 version 20.11.

CALCULATON RESULTS

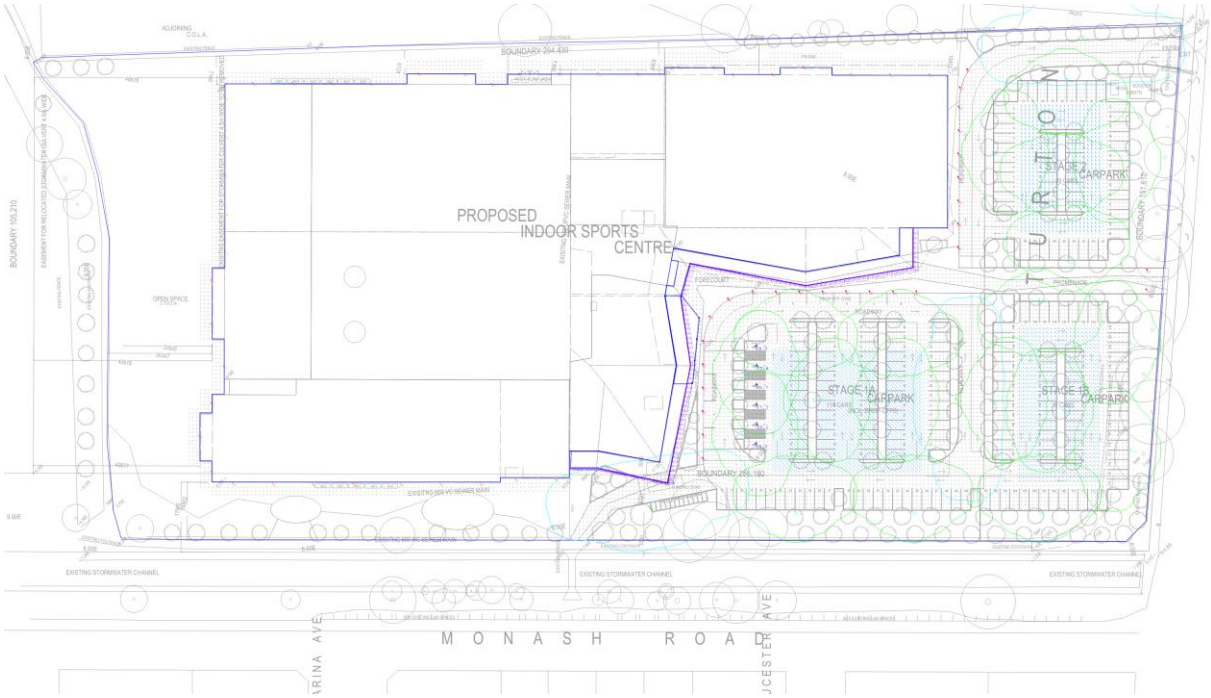


Figure 7: Lighting Calculation Compliant with AS/NZS 1158

Luminaire Schedule

Symbol	Qty	Label	Tag	LLF	Luminaire Lumens	Luminaire Watts
	39	BE_33242K3	W1	0.750	2448	21
	125	Ligera 50 80DIF1200 1124mm	SL1	0.750	1349	12.35
	3	ITALO 1 5P5 STU-M 7030_100-2M	PL2	0.750	5440	37.4
	19	ITALO 1 5P5 S05 7030_100-2M	PL1	0.750	5310	37.4
	27	BE_84705K3	B1	0.750	2802	26

Figure 8: Lighting Luminaire Schedule

Calculation Summary						
Label	CalcType	Units	Avg	Max	Min	Max/Avg
Disabled PCD 1	Illuminance	Lux	18.00	18.0	18.0	1.00
Disabled PCD 2	Illuminance	Lux	22.80	22.8	22.8	1.00
Disabled PCD 3	Illuminance	Lux	20.70	20.7	20.7	1.00
Disabled PCD 4	Illuminance	Lux	17.30	17.3	17.3	1.00
Disabled PCD 5	Illuminance	Lux	20.10	20.1	20.1	1.00
Disabled PCD 6	Illuminance	Lux	18.80	18.8	18.8	1.00
Drop-off Zone 1	Illuminance	Lux	60.84	209.5	20.9	3.44
Drop-off Zone 2	Illuminance	Lux	79.86	254.1	25.9	3.18
Motorbike Parking	Illuminance	Lux	29.45	62.5	8.3	2.12
Perimeter Security	Illuminance	Lux	20.90	296.0	0.3	14.16
Promenade PP2	Illuminance	Lux	66.01	265.6	1.8	4.02
Promenade Vertical 1	Illuminance	Lux	N.A.	66.9	49.8	N.A.
Promenade Vertical 2	Illuminance	Lux	N.A.	64.7	51.0	N.A.
Stage 1 Roadway PR2	Illuminance	Lux	23.05	206.9	1.4	8.98
Stage 1a Carpark PC2	Illuminance	Lux	10.14	35.7	2.0	3.52
Stage 1a Vertical 1	Illuminance	Lux	N.A.	23.2	1.1	N.A.
Stage 1a Vertical 2	Illuminance	Lux	N.A.	30.5	3.8	N.A.
Stage 1b Carpark PC2	Illuminance	Lux	9.38	27.7	2.6	2.95
Stage 1b Vertical 1	Illuminance	Lux	N.A.	24.2	2.8	N.A.
Stage 1b Vertical 2	Illuminance	Lux	N.A.	23.3	1.6	N.A.
Stage 2 Carpark PC2	Illuminance	Lux	10.25	27.7	2.8	2.70
Stage 2 Roadway PR2	Illuminance	Lux	15.39	197.6	0.3	12.84
Stage 2 Vertical 1	Illuminance	Lux	N.A.	27.6	2.6	N.A.
Stage 2 Vertical 2	Illuminance	Lux	N.A.	22.9	2.5	N.A.

Figure 9: Lighting Calculation Summary

4.2 OBTRUSIVE LIGHTING/ LIGHT SPILL CALCULATIONS

For the purposes of these obtrusive lighting/light spill calculations being representative of the worst-case scenario, we have amended the maintenance factor of luminaires to 1.

Luminaire photometric and technical data was procured either directly from manufacturers or via the manufacturers website and is understood to be the latest and most up to date version of the luminaire photometry and equipment technical information.

LIGHTING SOFTWARE

Lighting modelling software used to complete the calculations was AGI32 version 20.11.

CALCULATON RESULTS

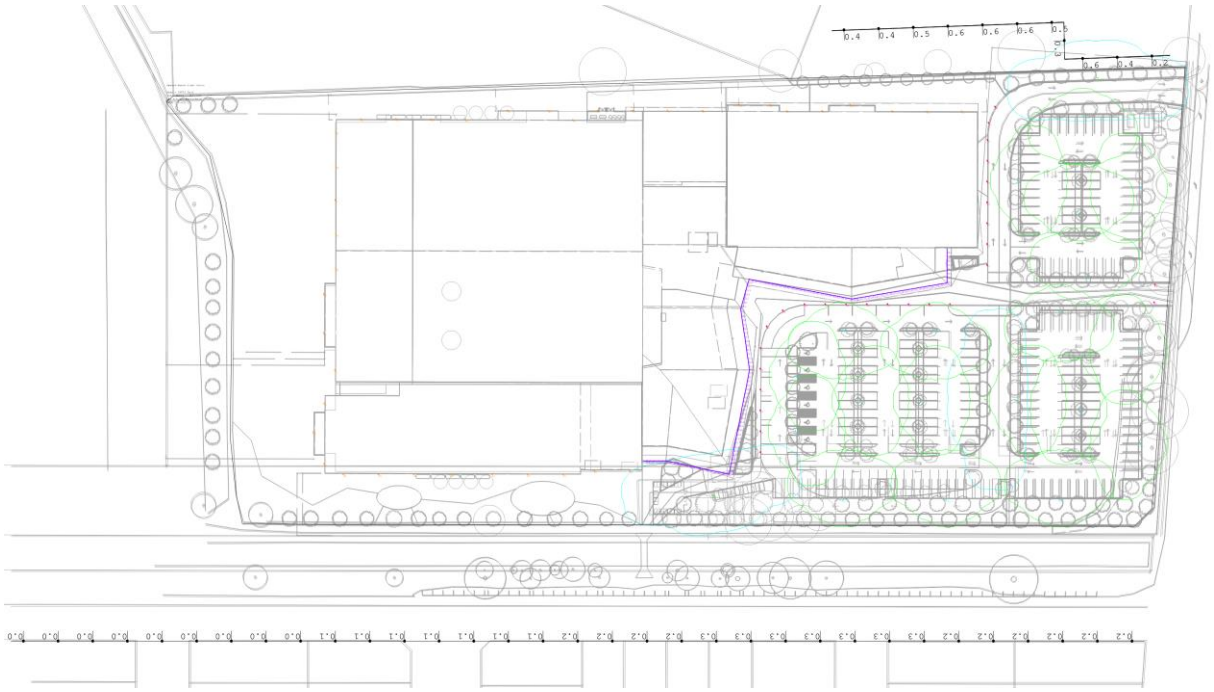


Figure 10: Lighting Calculation Compliant with AS/NZS 4282

Calculation Summary						
Label	CalcType	Units	Avg	Max	Min	Max/Avg
Obtrusive Light 1_Ill_Seg1	Obtrusive - Ill	Lux	0.15	0.3	0.0	N.A.
Obtrusive Light 2_Ill_Seg1	Obtrusive - Ill	Lux	0.51	0.6	0.4	N.A.
Obtrusive Light 2_Ill_Seg2	Obtrusive - Ill	Lux	0.30	0.3	0.3	N.A.
Obtrusive Light 2_Ill_Seg3	Obtrusive - Ill	Lux	0.40	0.6	0.2	N.A.

Figure 11: Obtrusive Light Calculation Summary

Obtrusive Light - Compliance Report
AS/NZS 4282:2019, A4 - High District Brightness, Curfew
Filename: External Lighting Obtrusive Calc
28/02/2024 3:46:27 PM

Illuminance
Maximum Allowable Value: 5 Lux

Calculations Tested (4):

Calculation Label	Test Results	Max. Illum.
Obtrusive Light 2_Ill_Seg1	PASS	0.6
Obtrusive Light 2_Ill_Seg2	PASS	0.3
Obtrusive Light 2_Ill_Seg3	PASS	0.6
Obtrusive Light 1_Ill_Seg1	PASS	0.3

Upward Waste Light Ratio (UWLR)
Maximum Allowable Value: 3.0 %

Calculated UWLR: 1.8 %
Test Results: PASS

Figure 12: Obtrusive Lighting Compliance Report

4.3 SUMMARY OF CALCULATION RESULTS

The above calculation results show the intended external lighting design is compliant with both the minimum recommendations of AS/NZS 1158 and the maximum restrictions of AS/NZS 4282. This means the current documented design for the external lighting to the Hunter Indoor Sports Centre has no obtrusive lighting impacts to the adjoining residential areas, light pollution or light spill into the night sky or site surrounds, and no obtrusive impacts to the safety of the road network.

To further mitigate the obtrusive effects of the external lighting scheme, especially during the nighttime environment when the Hunter Indoor Sports Centre is not getting the same level of use, we propose utilising smart lighting control strategies as expanded below.

5 LIGHTING CONTROL STRATEGIES

An effective tool in further limiting obtrusive lighting is the use of appropriate lighting controls. Lighting control technologies are rapidly advancing, and LED light sources allow greater flexibility in terms of dimming and switching. Smart technologies and sensors can be incorporated in a lighting installation to provide a higher degree of control. A selection of lighting control strategies that should be considered include:

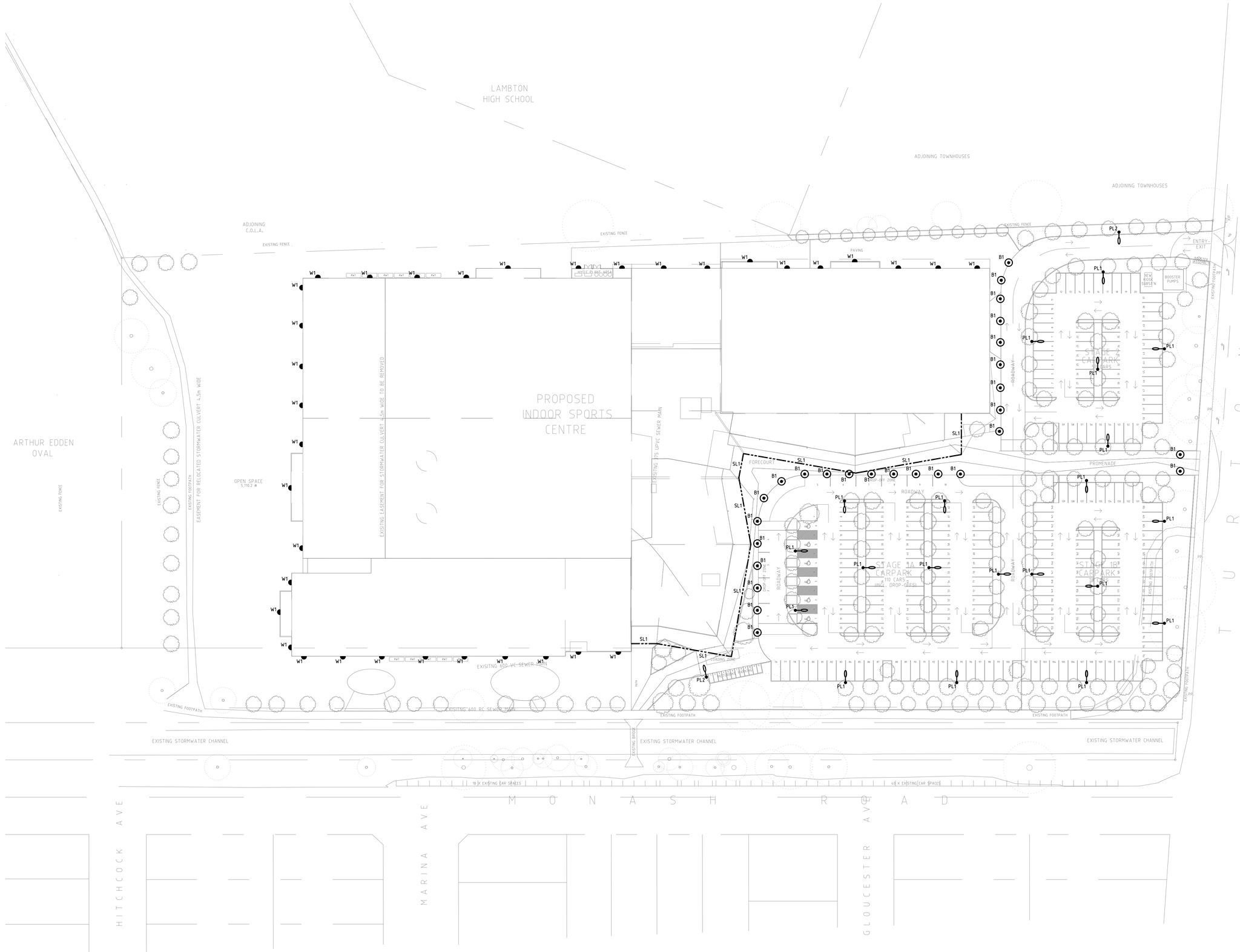
- Step dimming, whereby external lighting runs at full brightness in peak times and dims to a lower level late at night when usage is decreased.
- Curfew switch-off of certain types of lighting (e.g. at 10pm – The HISC operates 2 days a week from 7am – 10pm). This can be appropriate for ‘decorative’ lighting, which is not required for safety or orientation, and can be turned off late at night when it is less likely to add value.
- Motion detector control – luminaires incorporate motion sensor, lighting ramps up to maximum when movement is detected, reverts to minimum level when no movement is detected.

5.1 PROPOSED LIGHTING CONTROL STRATEGY

We recommend the external lighting at the Hunter Indoor Sports Centre to operate as follows:

- Dusk – 10pm: All lighting to be 100% on.
- 10pm – Dawn: All lighting to dim down to 30%, intelligent lighting control to dim up lighting back to 100% only when presence is detected. Only 3x luminaires to dim up in the location of detected presence. Dimming up sequence of 3x luminaires to follow movement (as person walks down path etc.) and dim back to 30% when movement is no longer detected.

For further details on lighting control functionality refer to external lighting layout plan 23376-E01 A.



LEGEND

B1	BEGA LIGHITNG BOLLARD 84 705 K3, 26W, 2802lm, CRI80, 3000K, 360 DEGREE LIGHT DISTRIBUTION, IP65, IK07
PL1	HBW LIGHITNG ITALO 1 5P5, CRI80, 3000K, S05 OPTIC, 100mA 2 MODULE, 37W, 5310lm MOUNTED ON 6m BLACK POLE.
PL2	HBW LIGHTING ITALO 1 5P5, CRI80, 3000K, STU-M OPTIC, 100mA 2 MODULE, 37W, 5440lm MOUNTED ON 6m BLACK POLE.
SL1	MLIGHT KLEO X 58 LINEAR, TO BE MOUNTED IN ROUTED OUT CHANNEL WITH BUTT JOINS FOR CONTINUOUS LENGTHS. 12W/m, 1349lm/m, CRI80, 3000K IP65.
W1	BEGA LIGHTING WALL LUMINAIRE 33 242 K3, 21W, 2448lm, CRI80, 3000K, ASYMMETRICAL LIGHT DISTRIBUTION, IP65, IK08.

NOTES

1. MINIMUM SET BACK OF LIGHT POLE FROM KERB TO BE 300mm.
2. LIGHT POLE FOOTING TO BE IN ACCORDANCE WITH POLE MANUFACTURERS RECOMMENDATION TO SUIT SITE CONDITIONS INCLUDING SOIL CONDITIONS.
3. LIGHTING HAS BEEN DESIGNED IN ACCORDANCE WITH AN/NZS 1158 TO COMPLY WITH THE FOLLOWING SUB-CATEGORIES:
   - 3.1 ROADWAYS - PR2
   - 3.2 PATHWAYS - PP2
   - 3.3 CARPARKS - PC2
   - 3.4 DISABLED PARKS - PCD
4. LIGHTING HAS BEEN DESIGNED TO COMPLY WITH RECOMMENDATIONS IN AS/NZS 4282 CONTROL OF THE OBTRUSIVE EFFECTS OF OUTDOOR LIGHTING. REFER TO EPA EXTERNAL LIGHTING IMPACT ASSESSMENT REPORT.
5. ALL ITALO 1 LUMINAIRES TO HAVE D4i CERTIFICATION DALI 2.0 DRIVER AND PREWIRED ZHAGA SOCKET.
6. SUPPLY ALL LUMINAIRES WITH ESAVE ZHAGA SCL-MOTION 200 SENSOR.
7. LIGHTING TO BE CONTROLLED AS FOLLOWS:
   - DUSK - 10PM: ALL LIGHTING TO BE 100% ON
   - 9PM - DAWN: ALL LIGHTING TO DIM TO 30%, INTELLEGENT LIGHTING CONTROL TO DIM UP LIGHTING WHEN PRESENCE DETECTED. ONLY 3x LUMINAIRES TO DIM UP IN THE LOCATION OF DETECTED PRESENCE. DIM UP TO FOLLOW MOVEMENT AND DIM BACK TO 30% WHEN MOVEMENT IS NO LONGER DETECTED.

REV	REVISION DETAILS	BY	APP.	DATE
A	SSDA ISSUE	SP	JC	23.02.24

SCALE BAR 1:500

0 5 10 15 20 25m

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN

Completion of the Drawing Status is evidence that the design has been verified as conforming to the requirements of the Project Quality Plan.

DRAWING STATUS	Reviewed By:	Signature	Date
Preliminary	JC	JC	23.02.24
For Information Only			
For Approval			
For Tender			
For Construction			

DESIGNED BY:
ELECTRICAL PROJECTS AUSTRALIA
386 MAITLAND ROAD
MAYFIELD NSW 2304
02 4967 5999
MAIL@EPA.ENERGY

PROJECT:
HUNTER INDOOR SPORTS CENTRE

CLIENT:
EJE ARCHITECTURE

LOCATION:
24 WALLARAH RD & 2 MONASH RD, NEW LAMBTON NSW 2305

DRAWING:
SITE PLAN
EXTERNAL LIGHTING LAYOUT

DATE: 23.02.24 DRAWN: SP
SCALE: 1:500@A1 DESIGN: JC
PROJECT No. 23376 DRAWING No: E01 ISSUE: A