

Lighting at Lambert Park Soccer Field 20 to 22 Marion Street Leichhardt -**Light Spill & Floodlighting****Introduction**

We understand that it is proposed to erect residential apartments on the property to the South of the Lambert Park soccer field. The Apia Club is concerned that lightspill and glare from the existing luminaries will result in complaints from residents in the development. We are advised that the northern walls of the development facing Lambert Park will be generally opaque and will be designed have no openings facing directly to the North.

The existing lighting installation results in significant light spill and glare. The glare is evident several streets away and is likely to be disturbing to buildings to the north of Marion Street. (see photos).

The current system features traditional globe technology, which cannot be focused effectively and accurately onto the field. Conventional lighting technology such as Mercury Vapour (MV) metal halide, and High-Pressure Sodium (HPS) produce light 360 degrees all round. They rely in reflectors to direct the light to where it is required to reduce sky glow and light overspill. Such systems inevitably result in the glare from the lights being visible from far away.



Aerial Photograph showing uneven light distribution and light overspill

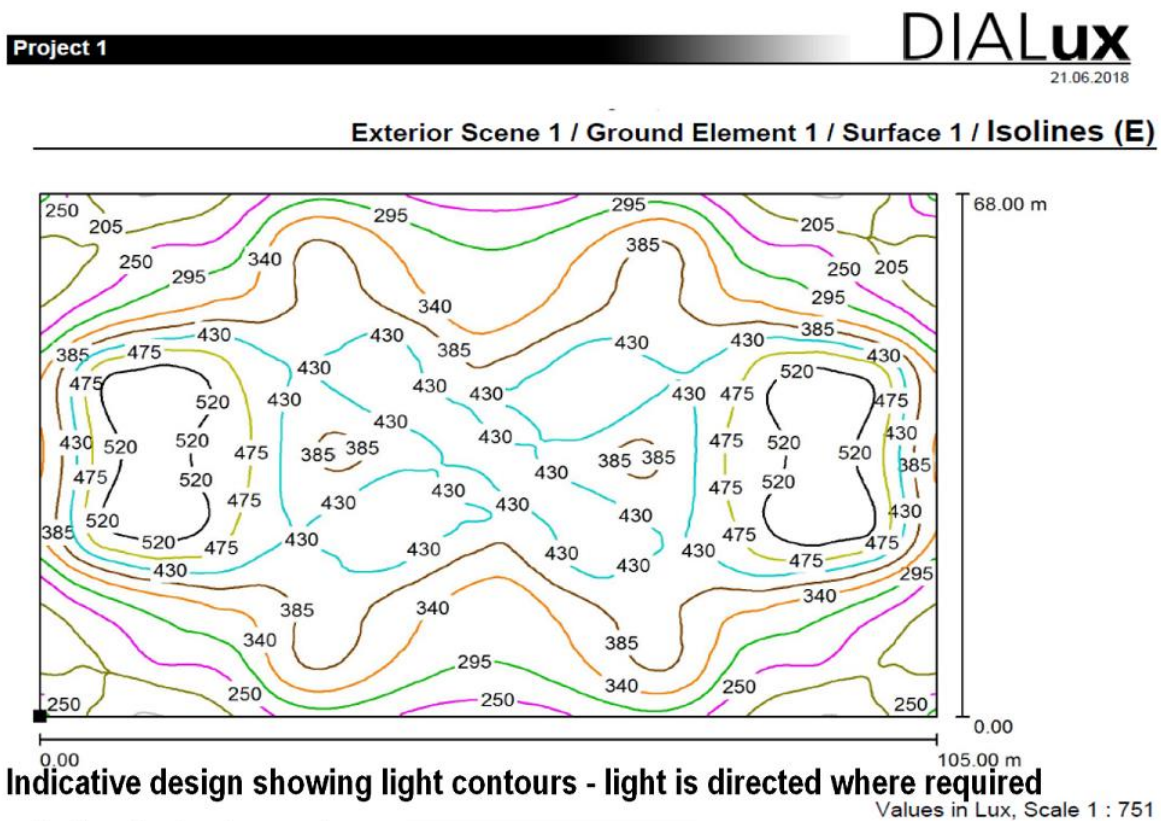
Conventional technology has the following disadvantages.

- The inability to accurately focus the light (light spill) results in unwanted illumination and adverse effect on the surrounding area.
- Glare from the lights is visible from far away.
- Light is directed to where it is not needed, resulting unnecessary energy consumption.
- It is difficult to adjusting lighting levels to suit different illumination requirements for types of games and televised matches.
- High energy consumption

Proposal

It is proposed to refit the floodlighting at Lambert Park with a carefully designed and focused state of the art floodlighting system using LED light fittings which will have an acute 15 and 40 degree beam angle projection to direct light to where it is required.

The luminaries will, be LED Series HD-SP fittings and luminaires specially designed for sports lighting. Such light can be supplied with immediate on/off control with no warm time and with dimming options.



The above diagram has been by prepared by Troy Gregory of Eco Industrial Supplies
www.ecoindustrialsupplies.com/

It is an indicative design for a system which can be refined so that illumination can be set for the appropriate playing conditions, ie training, a normal match or a televised match.

A new lighting system will direct light onto the field, resulting in minimal light overspill and glare. It will have a modern and accurate control system to ensure that the lighting is suitable for the activity being undertaken. The combination of accurate focusing, energy efficient lighting with better control, which will result in savings, exceeding 50% of current electrical costs.

The system will benefits surrounding residents, including the Uniting Aged Care facility on Marion Street, as well as residents of the proposed development. A detailed technical assessment will be prepared to assess the light spill impact from Lambert Park on the proposal based on the upgraded lighting.

Conclusion

A new state of the art LED installation can be designed to ensure that the light will be directed to where it is required.

The combination of the LED lighting design and the orientation of the building will ensure that residents will not be able to see any glare or light emanating directly from luminaires from their apartments.



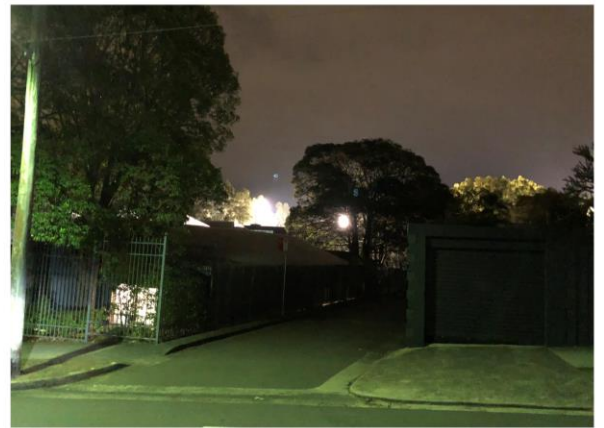
Light Spill along Davies Street



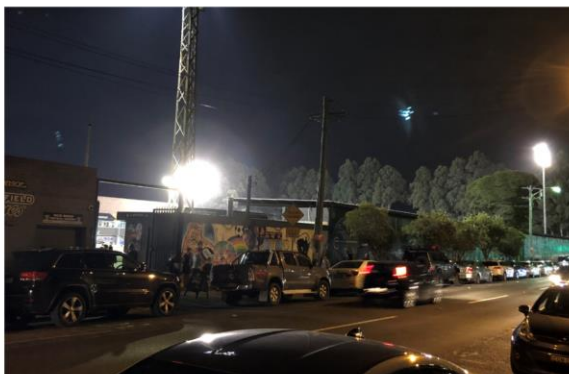
Light Spill - North Side of Marion Street



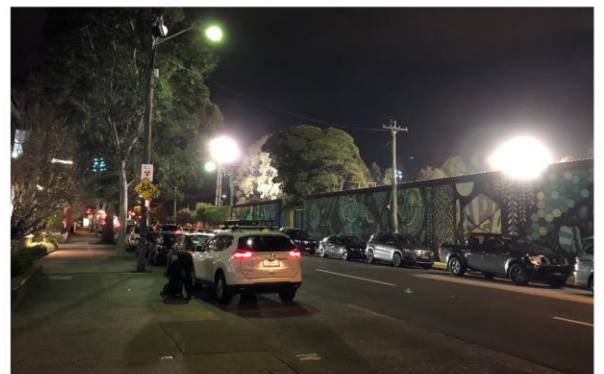
Lights on West side of Soccer Field



Light Spill - Davies Lane



Light Spill - along Marion St



Light Spill - along Marion St

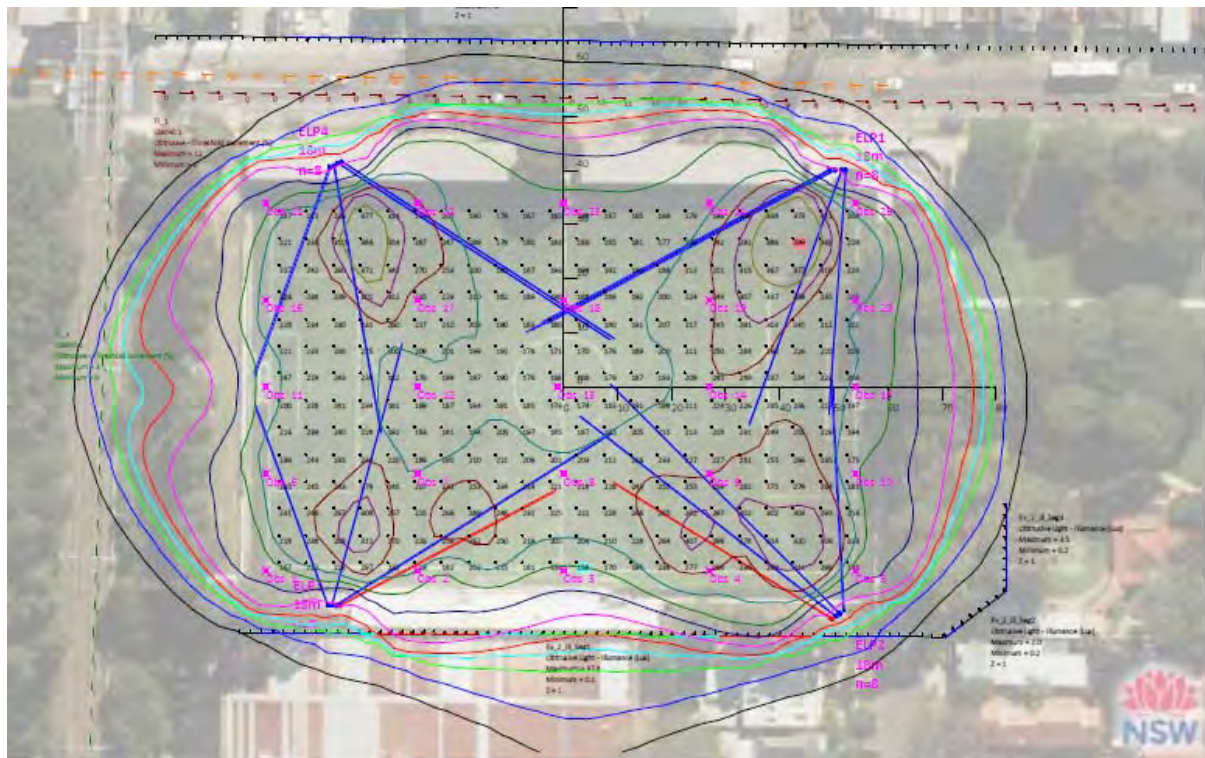


Trees illuminated by Light Spill



Illuminated houses in Marion St

Lambert Park Lighting Upgrade



Prepared by Light Energy Australia Pty Ltd

FES in conjunction with Light Energy Australia (LEA) has been contracted by Platino Properties (Developers) to upgrade and improve the lighting at Lambert Park for the APIA Tigers (CLUB) in accordance with lighting standards.

To arrive at this design LES, FES, the CLUB and Developers have met together and separately over July, August and September to ensure all partners requirement are achieved whilst complying with State and National Standards applicable Sport Floodlighting in a built up area.

It was agreed that the Lighting level as a minimum exceed the current lighting levels whilst reducing the environmental impact to the surrounding area. Consideration to increasing the lighting levels was also discussed.

To provide this lighting upgrade in the most efficient manner it was agreed to reusing the existing infrastructure this includes but limited to, the Poles, the electrical reticulation and energy supply.

Previous Lighting

Currently Lambert park uses 48 Metal halide 1,500W Roto-symmetrical distribution floodlights Given the height of the poles these Floodlights are aimed at high angles greater than 70°. Both the housing and lamp used whilst relevant at the time of installation no longer provide the best lighting solution, require period maintenance and lamp replacements. All Lights are operated irrespective of the event being illuminated.

Proposed Lighting

Replacing the Metal Halide Floodlights with LED provides the Club, community and environment significant benefits. The LED floodlights used are Asymmetrical distribution which ensure the aiming angles are considerably lower in the order of 30°, thereby reducing the overall quantum of spill light both to the surround area and upward (Skyglow). The LED Floodlights used provide a much greater control of the light and produce the light far more efficiently meeting the lighting levels for

Summary Table

Current Installed Lighting	Qty	Wattage (W)	Weight kg	Sail Area M ²
SL-1500-MH-3	44	1650	10	0.1829214
BL1500	4	1650	12	0.237075
Lighting Levels 250 lux	48	79200	488	8.996841598
Replacement Lighting	Qty	Wattage (W)	Weight kg	Sail Area M ²
LO 757	28	1301.52	28	0.43736
757+ZVP420L	4	1301.52	28	0.43736
Lighting Levels 250 lux	32	41648.64	896	1.74944

The Design

Lighting Levels in compliance with NSW Soccer have been achieved, the Threshold Increment (Glare to Vehicles) has been achieved for surround roads. Obtrusive Lighting Levels have been improved significantly with a pre-curfew limit of AS4282 achieved or a reduction in current spill light for the southern boundaries

Standards

AS1158.1.1:2005

AS4282-1997*

Soccer NSW Version 1, issued 6 November 2015

* currently being revised

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Description	LLF	Lum. Watts
	28	BVP525ANBD9LOM	SINGLE	Apex OptiVision LED Gen2 3-Module Asymmetric Narrow Beam LO 757	0.810	1301.52
	4	BVP525S8D9M+ZVP420L	SINGLE	Apex OptiVision LED Gen2 3-Module Symmetric S8 Beam 757+ZVP420L	0.810	1301.52

Design Notes:
Draft Design for Review.
Dimensions have been taken from a pdf/satellite image, subject to confirmation prior to installation/commissioning.
MH = 18 metres (assumed); the height above the playing surface to a single crossarm.
The suitability of the existing poles to support new floodlights must be confirmed by others.

Glare Ratings (GR) are based on a diffuse playing surface reflectance of 25%.
GRmax <=50 for observers per Figure 6 AS 2560.2.3-2007 Football.

A maintenance factor of 0.85 has been allowed to apply to all luminaires.
A maintenance policy should be adopted to support the maintenance factor.

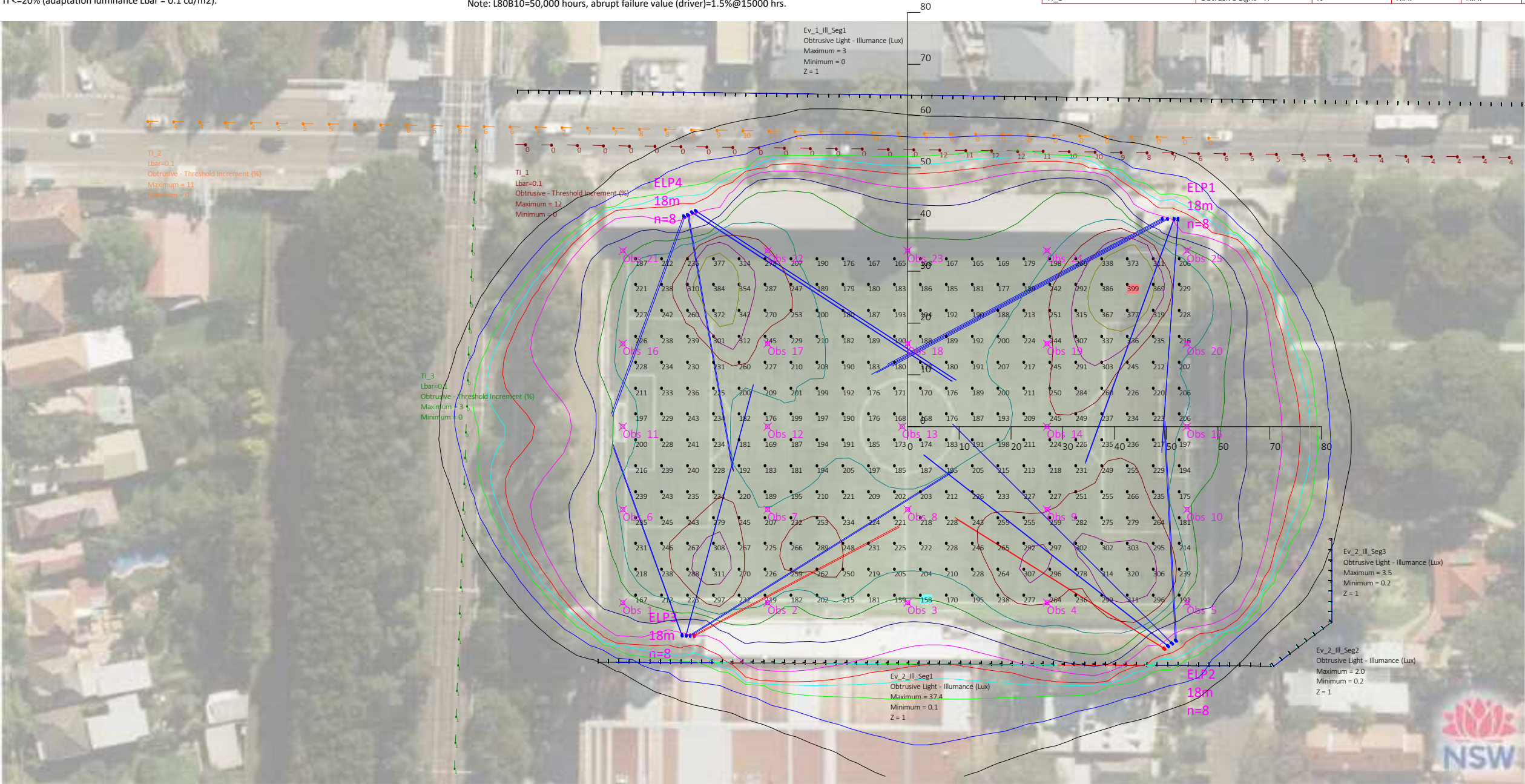
AS4282-1997 Obtrusive light assesment:
All luminaires on, direct flux only, no obstructions such as trees are included.
For initial values of Ev the values should be divided by the maintenance factor.
Maximum luminous intensity per luminaire:
A-NBLO = Level 1 control (<=7,500 cd),
S8+ZVP = Level 2 control (<=50,000 cd).
(pre-curfew, medium/large area per Table 2.2),
Ev>=10 lux and 25 lux (measured at z = 1.0 to 20 m),
Ev<= 25 lux in 100 lux mode (measured at z = 1.0 to 20 m),
TI <=20% (adaptation luminance Lbar = 0.1 cd/m2).


Philips OptiVision LED gen2 BVP525 50K 757 T30 IP66 3 module.
Weight=28 kg(remote driver 6 kg), Note trunnion depth is 30mm, longer bolts may required.
Floodlights should be spaced at least 95cm apart.
A-NBLO (asy narrow beam) SCx=0.31 (at 40° tilt),
S8+ZVP louvre (sym wide beam) SCx=0.50 (at 65° tilt), SCx=0.56 (at 90° tilt)
A-NBLO versions use integral shields to mitigate obtrusive light.
S8+ZVP420L use an external louvre to mitigate obtrusive light.

Floodlight reference tilt (~ lmax) is noted as "TILT90".
For A-NB subtract 30° from TILT90 to get the tilt of the visor.
All A-NB luminaires are tilted with visor at <=43°.
All S8 luminaires are tilted with visor at <=70°.
Driver rating: 230-400V +/-10% 50Hz.
Input Power (nom) = 1392 W, Run current: 415V=3.6A, 240V=6.2A
Refer to Mounting instructions for inrush current details.
Cable from driver to floodlight 6C+E 1000V (by others):
Length<25m use 1.5mm2, Length<=50m use 2.5mm2.
Tolerances on light flux: +/- 7%
Can be mounted over/under without modification/accessories,
(single cross-arm only, if two or more cross-arms are required, then provision must be made for sufficient offset to avoid the luminaires on the lower arm/s shadowing those on the upper arm).

MF=0.81, from Rated useful life L88B10=30000 hrs, and LMF=0.92 (dirt) from BS5489.1 Table B.1, (E1/2/3/4 MH>6m and 6 year clean).
Note: L80B10=50,000 hours, abrupt failure value (driver)=1.5%@15000 hrs.

Calculation Summary												
Label	CalcType	Units	Grid Reflect	Obs Label	Avg	Max	Min	Min/Avg	Min/Max			
Ev_1_III_Seg1	Obtrusive Light - III	Lux	N.A.	N.A.	N.A.	3	0	N.A.	N.A.			
Ev_2_III_Seg1	Obtrusive Light - III	Lux	N.A.	N.A.	N.A.	37.4	0.1	N.A.	N.A.			
Ev_2_III_Seg2	Obtrusive Light - III	Lux	N.A.	N.A.	N.A.	2.0	0.2	N.A.	N.A.			
Ev_2_III_Seg3	Obtrusive Light - III	Lux	N.A.	N.A.	N.A.	3.5	0.2	N.A.	N.A.			
Pitch 108x68m	Illuminance	Lux	N.A.	N.A.	231.3	399	158	0.68	0.40			
Pitch GR	Glare Rating	N.A.	0.25	Obs 1	N.A.	24	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 2	N.A.	27	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 3	N.A.	44	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 4	N.A.	39	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 5	N.A.	19	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 6	N.A.	42	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 7	N.A.	42	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 8	N.A.	51	16	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 9	N.A.	50	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 10	N.A.	36	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 11	N.A.	43	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 12	N.A.	44	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 13	N.A.	47	21	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 14	N.A.	50	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 15	N.A.	47	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 16	N.A.	42	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 17	N.A.	44	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 18	N.A.	49	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 19	N.A.	47	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 20	N.A.	39	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 21	N.A.	26	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 22	N.A.	34	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 23	N.A.	46	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 24	N.A.	35	10	N.A.	N.A.			
Pitch GR	Glare Rating	N.A.	0.25	Obs 25	N.A.	23	10	N.A.	N.A.			
TI_1	Obtrusive Light - TI	%	N.A.	N.A.	N.A.	12	0	N.A.	N.A.			
TI_2	Obtrusive Light - TI	%	N.A.	N.A.	N.A.	11	0	N.A.	N.A.			
TI_3	Obtrusive Light - TI	%	N.A.	N.A.	N.A.	3	0	N.A.	N.A.			



A	2018-08-12	Original	AN	
Rev:	Date:	Comment:	By:	Chk:
Project: Lambert Park				
Title: LED upgrade				
Client:			Scale: As shown	
Doc #: 18099-01			Page: 1/1	
		175 Pitt St. Sydney NSW 2000 Australia		
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