

The values of light technical parameters shown in this lighting design calculation are nominal. They are based on parameters provided by the client and the specific details as reported in this document. Results in practice may be different due to variations such as luminaire positioning/aiming, surface reflectance, supply voltage, local luminaire ambient temperature, obstacles/furniture, etc. They are also subject to normally accepted photometric tolerances, and calculation/program uncertainties. Apex Lighting shall be under no liability to the Customer for failure to attain such performance figures. Commercial in confidence.

Design Notes:

Draft Design for Review.  
Dimensions and set-out are subject to confirmation prior to installation/commissioning.  
For further calculations and/or for installation/aiming details please contact Apex Lighting.

MH = the nominal height above the playing surface to a single cross-arm, as shown.  
No account is taken for any difference in height of the pole base and the playing surface.  
Any significant difference should be advised.  
The cross arm design should be checked so that luminaires can be aimed without obstruction.  
The suitability of new/existing poles to support floodlights must be confirmed by others.

Philips OptiVision LED gen3.5 CCT=5700K, Ra=70, DALI (max. dim level 10%).  
BVP528 BV 50K 75 7130 P66 3 module, Weight=26.5 kg (remote driver 6.3 kg).  
Sc=0.29 (at 30° uplight), Sc=0.33 (at 40-50° uplight)  
For A35 types subtract 35° from "Tilt" to get the uplift of the body (do not use the clear visor). All A35 luminaires have uplift < 37°.  
Floodlights should be spaced at least 95cm apart.  
Note: Fixation depth is 30 mm, longer bolts may be required.  
Drivers: remote (BV version), poles must be checked for capacity to house.  
Driver rating: 230-400V +/-10% 50Hz. Single phase preferred.  
Refer to mounting instructions for inrush current details.  
Cable from driver to floodlight 6C+E 1000V (by others):  
Length < 25m use 1.5mm<sup>2</sup>. Length > 25m use 2.5mm<sup>2</sup>. < 200m possible with extra core.  
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/s).

Glare Ratings (GR) are based on a diffuse playing surface reflectance of 25%.  
GRmax < 50 for observers per Figure 2.6.7 AS2560.2:2021 for outdoor football.

A maintenance factor (LMF) of 0.86 has been allowed to apply to all luminaires.  
A maintenance policy should be adopted to support the maintenance factor.  
These calculations use LMF = 1.0 to show obtrusive light initial values.  
All illuminance values should be multiplied by the maintenance factor for maintained values.

AS/NZS 4282:2019 Obtrusive light assessment:  
Conforms to Environmental Zone A3 - Medium District Brightness (suburban) limits:  
- Maximum luminous intensity per luminaire (I) < 12500 cd non-curve (Level 1)  
- Vertical illuminance (Ev) < 10 lux  
- Threshold Increment (TI) < 20% (adaptation level < 1 cd/m<sup>2</sup> or as shown)  
- ULR (UWLR) < 0.02  
All luminaires on, direct flux only, no obstructions such as trees are included.  
Ev and I calculated at building lines or property boundaries at the heights as shown.  
For TI the carriageway plane is assumed to be horizontal at z = 0.

Project: Ev I					
Scene: All On					
Label	CalcType	Units	Description	Max	
Ev 1_Cd_Seg1	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	3603	
Ev 1_III_Seg1	Obtrusive - III	Lux	z = 1.5 - 20 m	0.6	
Ev 2_Cd_Seg1	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	4199	
Ev 2_III_Seg1	Obtrusive - III	Lux	z = 1.5 - 20 m	1.5	
Ev 3_Cd_Seg1	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	2558	
Ev 3_Cd_Seg2	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	2704	
Ev 3_III_Seg1	Obtrusive - III	Lux	z = 1.5 - 20 m	0.4	
Ev 3_III_Seg2	Obtrusive - III	Lux	z = 1.5 - 20 m	0.3	
Ev 4_Cd_Seg1	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	1844	
Ev 4_Cd_Seg2	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	2046	
Ev 4_III_Seg1	Obtrusive - III	Lux	z = 1.5 - 20 m	0.5	
Ev 4_III_Seg2	Obtrusive - III	Lux	z = 1.5 - 20 m	0.2	
Ev 5_Cd_Seg1	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	4515	
Ev 5_III_Seg1	Obtrusive - III	Lux	z = 1.5 - 20 m	3.6	
Ev 6_Cd_Seg1	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	6622	
Ev 6_III_Seg1	Obtrusive - III	Lux	z = 1.5 - 20 m	3.1	
Ev 7_Cd_Seg1	Obtrusive - Cd	N.A.	z = 1.5 - 20 m	6860	
Ev 7_III_Seg1	Obtrusive - III	Lux	z = 1.5 - 20 m	3.7	

Project: TI					
Scene: All On					
Label	CalcType	Units	AdpLum	TI	
Huon Ct WB	Obtrusive - TI	%	0.2	9.1	
Lehmann Cres EB	Obtrusive - TI	%	0.2	0.5	
Lehmann Cres NB	Obtrusive - TI	%	0.2	5.7	
Monterey Blvd NB	Obtrusive - TI	%	0.2	4.5	
Monterey Blvd SB	Obtrusive - TI	%	0.2	1.7	
Moreton St WB	Obtrusive - TI	%	0.2	0.5	
Radiata St WB	Obtrusive - TI	%	0.2	2.0	

Calculation Summary					
Project: Illuminance					
Scene: All On					
Label	CalcType	Units	Avg	Min/Avg	Min/Max
Pitch 1	Illuminance	Lux	179	0.67	0.45
Pitch 2	Illuminance	Lux	167	0.63	0.42
Training Pitch	Illuminance	Lux	93	0.67	0.52

Luminaire Schedule					
Scene: All On					
Symbol	Qty	Label	Description	Source	Power
12	12	BVP528 A35-NB+BL	Apex OptiVision LED Gen3.5 3-module 5700K	LED2130/757 OUT T30 50K	1420
6	6	BVP528 A35-NB+LO	Apex OptiVision LED Gen3.5 3-module 5700K	LED2130/757 OUT T30 50K	1420
8	8	BVP528 A35-MB+LO	Apex OptiVision LED Gen3.5 3-module 5700K	LED2130/757 OUT T30 50K	1420
2	2	BVP528 A35-WB+LO	Apex OptiVision LED Gen3.5 3-module 5700K	LED2130/757 OUT T30 50K	1420

UWLR Area Summary	
Scene: All On	
Label	UWLR
UWLR	0.001

GR				
Project: GR				
Scene: All On				
Label	CalcType	Units	Refl.	Max
GRmax Pitch 1	Glare Rating	N.A.	r = 0.25	44.8
GRmax Pitch 2	Glare Rating	N.A.	r = 0.25	44.0
GRmax Training Pitch	Glare Rating	N.A.	r = 0.25	0.0

LEGEND									
3 ASPECT LANTERN (200mm)	SIGN	EXISTING PEDESTAL	WATER METER	WATER VALVE	STORMWATER (EXISTING)	STORMWATER (PROPOSED)	SEWER	WATER	GAS
MAST ARM (OUTREACH AS INDICATED)	PARKING METER	NEW PEDESTAL	TAP	TELSTRA PILLAR	MAJOR TELSTRA PIT	MINOR TELSTRA PIT	TELSTRA	ELECTRICITY (UNDERGROUND)	ELECTRICITY (OVERHEAD)
PED. PUSH BUTTON & LANTERN	RUBBISH BIN	NEW JOINT USE POLE	ELECTRIC PIT	TELSTRA PILLAR	MAJOR TELSTRA PIT	MINOR TELSTRA PIT	TELSTRA	ELECTRICITY (UNDERGROUND)	ELECTRICITY (OVERHEAD)
INTERNALLY ILLUMINATED SIGN	SIDE ENTRY PIT	UNITED ENERGY POLE	PERMANENT SURVEY MARK	TELSTRA PILLAR	MAJOR TELSTRA PIT	MINOR TELSTRA PIT	TELSTRA	ELECTRICITY (UNDERGROUND)	ELECTRICITY (OVERHEAD)
EXISTING STREET LIGHTING LANTERN	GRATED PIT	DOUBLE SIDED REFLECTIVE ROAD PAVEMENT MARKER	SURVEY MARK OR STATION	TELSTRA PILLAR	MAJOR TELSTRA PIT	MINOR TELSTRA PIT	TELSTRA	ELECTRICITY (UNDERGROUND)	ELECTRICITY (OVERHEAD)
PROPOSED STREET LIGHTING LANTERN	FENCE	SINGLE SIDED REFLECTIVE ROAD PAVEMENT MARKER	TREE	TELSTRA PILLAR	MAJOR TELSTRA PIT	MINOR TELSTRA PIT	TELSTRA	ELECTRICITY (UNDERGROUND)	ELECTRICITY (OVERHEAD)
	TRAFFIC SIGNAL CONTROLLER	600mm DIA. CONDUIT JUNCTION PIT	WOODEN POST	TELSTRA PILLAR	MAJOR TELSTRA PIT	MINOR TELSTRA PIT	TELSTRA	ELECTRICITY (UNDERGROUND)	ELECTRICITY (OVERHEAD)
	EXISTING DETECTOR LOOP	300mm DETECTOR PIT	STEEL POST	TELSTRA PILLAR	MAJOR TELSTRA PIT	MINOR TELSTRA PIT	TELSTRA	ELECTRICITY (UNDERGROUND)	ELECTRICITY (OVERHEAD)

PRELIMINARY ISSUE  
NOT FOR CONSTRUCTION



AMENDMENTS		DATE	BY	No.	INFRASTRUCTURE DEPARTMENT		FRANKSTON PINES SOCCER CLUB	
P1	PRELIMINARY ISSUE	30/09/22	LZ	1	DRAWN	LZ	FILE No.	2693
				2			DATUM	
				3	DESIGN		COUNCIL APPROVAL MEETING No.	/ /
				5	SURVEY		CONTRACT No.	
				7	DESIGN CHECKED	NW	SCALE	N.T.S. @ A1
				9	APPROVED BY C.W.C.		DRAWING No.	2693-E7
				10			APPROVED BY Infrastructure Manager	
				11			DATE	/ /
				12			SHEET	OF

