



**LACROSSE
VICTORIA**



LIGHTING GUIDELINES



1. Foreword and Introduction

Lacrosse Victoria believes that adequate lighting is an essential element for the viability and sustainability of our member clubs. There is an increasing desire to utilise their ovals over an extended period each day and this has extended into evening play and requires artificial sports lighting.

The growth in participation in female sport, including lacrosse, and in some areas population growth, has put increasing demand on sporting facilities. This has led to many clubs and councils providing more uniform, higher quality and practical sports lighting to grow ground capacity, improve fixturing flexibility and help address this demand. Lighting extends oval use later into the evening, especially in the winter months, allowing greater programming, flexibility and optimisation of facility use.

While community clubs are unlikely to need the standard of lighting for televised matches, nearly all clubs will need to be able to light their grounds so players of all ages and abilities can train and participate in games safely and effectively at night, or even late afternoon in winter. It is important that the lighting is fit for purpose to ensure:

- Safety of players, officials and others involved in the game;
- Better viewing for spectators and live streaming/television where appropriate;
- Effective use of money spent on capital and operating costs and the chance to charge revenue to recoup the investments; and
- The design and lighting of the field is environmentally sensitive.

As lacrosse fields in Victoria are funded initially by government, as they own the land, it is essential that clubs and associations planning to install or update lighting liaise closely with their relevant Council.

Lighting for Lacrosse fields and Box Lacrosse courts are to be lit to the Australian Standards AS-2560-2 (2021). The Australian Standard AS2560.2:2021 Sports Lighting Part 2: Specific Applications is the starting point for community lacrosse fields in Victoria.



2. Key Terminology in Sports Lighting

There are some terms you may want to understand when researching and considering lighting.

Average maintained horizontal illuminance (E_h) - This is the average quantity of lux over the horizontal playing surface.

Darkness - When natural lighting is less than 100 lux.

Field of Play (FOP) - For lighting / broadcasting the FOP is defined as the Playing Area that measures and the Perimeter Margins that extended outside the Playing Area (normally 4m at each end and side).

This gives the lighting FOP overall dimensions of the lacrosse fields:

- Men Field - 114m x 64m.
- Women Field: 95m - 104m x 50 - 64m
- Men and Women Sixes - 74m x 36m
- Box Lacrosse – 60m x 25m

Glare - For outdoor lacrosse venues, a Glare Rating (GR) is given based on a mathematical glare formula.

Glare rating - The degree to which installation is disturbing to a person on or near the pitch.

Horizontal illuminance - Light incident on a horizontal plane 1m above the pitch.

Illuminance - A measure of how much luminous flux is spread over a given area and is required for the sport to be played.

Obtrusive Light - The amount of light spill and glare that leaves the premises.

Perimeter margin - The margin around the outside the playing area within the FOP.

Playing area - The area within the side and end lines. Quantity of light required (illuminance) - This is the amount of light (measured in lux) that is required for the sport to be played.

Uniformity - Describes how evenly light is distributed over the field surface and is expressed by the ratios of min/max.



3. Successful Lighting Scheme

3.1. Introduction

The following principles should be considered and applied when designing a new lacrosse field lighting system or making alterations to an existing system:

- provide a level of illuminance that enhances players' comfort and performance while ensuring that the ability of match officials to perform effectively;
- consider the relevant categories of competition that will be played on the field;
- provide a level of illuminance that enables to operate effectively if the field will be used for live streaming;
- designed to allow spectators to be able to watch and enjoy the game without suffering any discomfort caused by the lighting system;
- Ensure illuminance levels and uniformity that comply with the requirements of the relevant Lacrosse Victoria lighting category, with soft shadows where possible;
- reliable and effective for the given location. The specific conditions that are relevant for the venue location should be carefully assessed;
- assess the lighting impact, and the design team should be committed to achieving an environmentally sustainable solution;
- ensure the uniqueness of the venue is reflected in the design solution that is appropriate for it and the illuminance levels required.
- reflect the venue infrastructure and design on the type of lighting system that can be used.

3.2. Six Stage Lighting Development & Implementation

Summary The development of a sports lighting scheme for a lacrosse field can be broken down into the following six stages. These stages, if the work is completed by your council, will be controlled by them. It is important for each lacrosse club to know these stages and provide input where necessary.

Each club should pay particular attention to **Stage 1** where the luminary guidelines recommendations for each level of participation for lacrosse are outlined. The positioning and heights of poles are also important to the success of the project.

Stage 1 – Project Conception

- Scope out project brief and demonstrate the need for sports lights
- Consult with key stakeholders (Lacrosse Victoria, proposed users, local Council planners,)
- Determine the lighting standards required for level of competition
- Identify planned use, time, and hours of use per week



- Engage with lighting specialist for initial consultation and determine outline feasibility
- Outline budget (capital and revenue)
- Identify risks: planning challenges, unsecured finance, etc.

Stage 2 – Feasibility

- Appoint an accredited lighting consultant
- Conduct electrical surveys to assess power supply (your appointed lighting engineer should be able to help)
- Hold informal talks with relevant planning department
- Design feasibility: explore viable options (advantages and disadvantages)

Stage 3 – Outline and Procurement

- Engage with specialist lighting engineer to produce layouts and project and specification
- Engage and consult with residents, particularly those most affected by the scheme
- Obtain budget estimates, review funding
- Submit planning application
- Obtain quotations from specialist lighting suppliers / contractors
- Select and appoint lighting contractor

Stage 4 – Installation & Commissioning

- Site preparation
- Electrical works, including power supply
- Supply and installation sports lights
- Testing

Stage 5 - Handover

- Sign off
- Performance and electrical certification

Stage 6 - Maintenance

- Operation and maintenance manual



3.3. Stage 1: Project Conception

This initial stage is about bringing all the information together to ensure that the project is at the level required. It should also provide you with enough information to decide on the options available for the club's preference regarding lighting. Background information to consider at this stage should include:

3.3.1. Need for Lights

Is there a need for lights and will that allow lacrosse to be played in the evening or late afternoon? The need will have to be demonstrated and the impact on growth of the sport, especially if funding is being sought from a third party. All stakeholders should be consulted at this stage.

3.3.2. Determine the Lighting Standards

The following standards need to be considered:

In relation to the type of floodlights, the traditional Metal Halide light technology should now be replaced with the updated technology of LED lighting, allowing greater flexibility with the lights, reduced running costs and extended life expectancy.

Level of Competition	Typical Activity	Average Horizontal Illuminance (lux)	Minimum Horizontal Illuminance
Recreational	3 V 3 (soft ball), walking lacrosse	100	0.3
Training	Ball and physical training	200	0.4
Junior matches	Junior club competitions	200	0.4
Senior Matches	Senior Club competitions	250	0.5
National & International Competitions	Senior National Competitions	500	0.5



We understand that there may be limitations on future lighting projects, such as Council-imposed budget restrictions, or running cost concerns. However, we suggest that the lux levels noted in the Guidelines are increased closer to that shown above. These can then be a target, and can be negotiated lower if required to meet budgetary restraints etc.

Additionally, we would recommend identifying that multiple lux levels can be accommodated at a single installation via switch down settings. This can be via key card readers, key switches, push buttons, etc. and can include restrictions that will allow certain clubs/coaches to use lower illumination levels only. This may assist in satisfying any concerns regarding running costs.

3.3.3. Pole Heights and Locations

Guidelines for pole heights and locations are given within the Australian Standard (AS 2560-2 (section 2.7.2.3.2) with guidance as follows that:

The luminaires should not be installed at a height less than the following unless all the standards can be met:

- 20m for a 6-pole side arrangement
- 28m for a 4-pole arrangement

The luminaires should be located to result in the least glare to players and, where applicable, spectators. The light poles must not be within the field of play run-off areas. Understanding of the lighting levels and, number of poles will allow you to have a conversation with the lighting engineer to ascertain the various options and prices on the market currently.

We recommend the benefit of using a higher number of poles is that it creates a more even illumination and reduces shadowing.

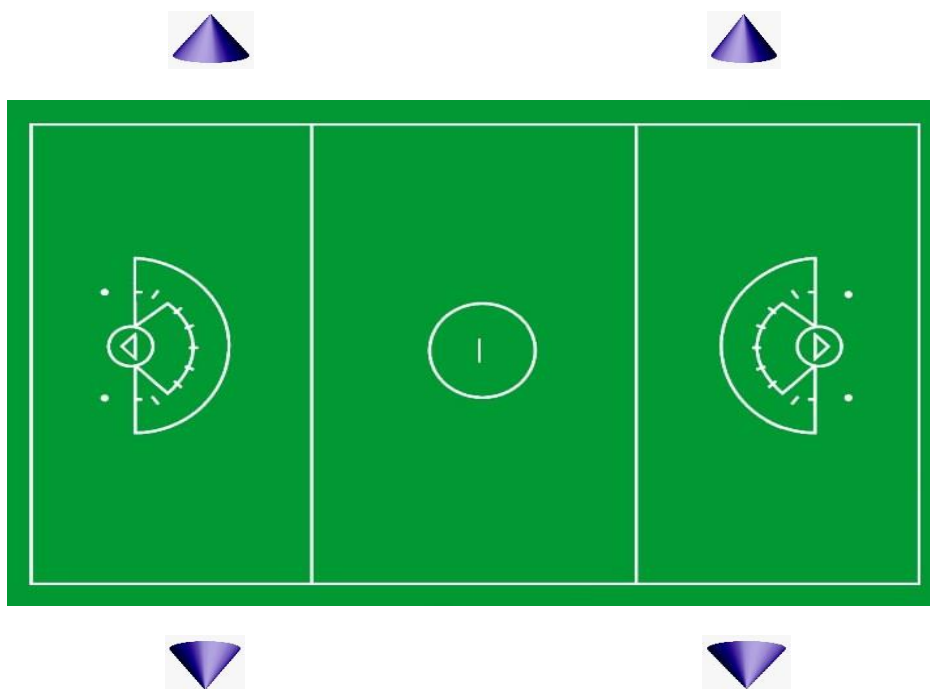
We suggest that for the purposes of safety, lighting columns should be located at least 5m beyond the principal playing area, or beyond a fence where one exists.

If the luminaries are column mounted, the columns must always be situated outside the perimeter margins of the field, and to provide a glare free environment for players, officials and media.

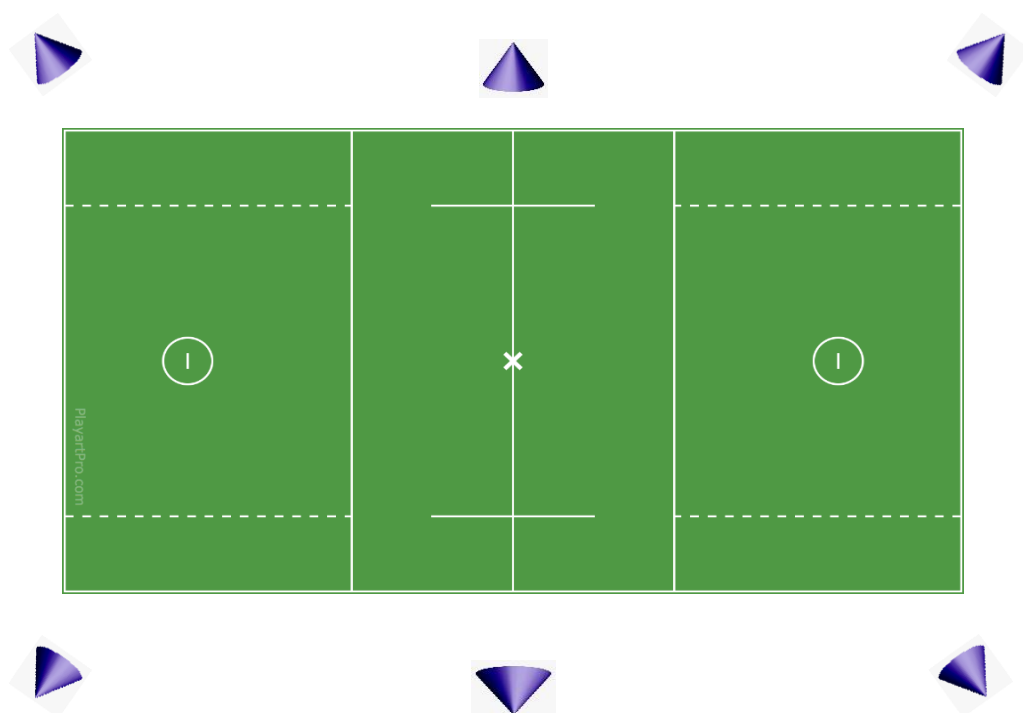


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4 POLES



6 POLES





3.4. Stage 2: Feasibility

We recommend that the lighting design is procured through a Professional Engineer rather than through a lighting supplier. This will ensure the project is not locked in to a particular lighting brand, and will also ensure cohesion between the electrical design and the lighting design.

During this stage, the following should also be considered with assistance from the lighting consultant:

- Provide a preliminary opinion of cost for the works.
- Assessment of potential design risks such as:
 - Tree protection zones that may restrict pole placements.
 - Existing underground services (through Dial Before You Dig) that may restrict reticulation routes or pole locations.
 - Possible cost risks from sources such as electricity supply upgrades or requirements to combine electrical supplies into a single supply.
- Engagement of a geotechnical engineer for preparation of a soil test report to assist in subsequent detailed design of the lighting column footings.

3.5. Stage 3: Outline and Procurement

This will generally be unique to each site. However, a critical item that should be considered in this section is spill lighting onto nearby roads and residences. The lighting consultant should prepare obtrusive lighting calculations as detailed in AS 4282 “Control of the obtrusive effects of outdoor lighting”. This will assist in community engagement or discussions, allowing Lacrosse Victoria/Council to demonstrate that the proposed installation complies with the relevant obtrusive lighting requirements.

Additionally, a structural engineer will be required at this part of the project to design the pole footings based on the selected pole heights/types and the geotechnical report provided in Stage 2.

With the lighting engineers lighting strategy, drawings and specification together with an approved Development Planning Application (DA), you will be ready to proceed. It is critical to obtain quotes from more than a single supplier to ensure that the club is receiving best value for their investment.

The best value should consider:

- Capital costs
- Quality of design and advertisement for specified standards
- Expertise of the construction and installation team
- Warranty, especially the number of hours that each luminaire is guaranteed and replaced
- Timelines for installation



3.6. Stage 4: Installation & Commissioning

The coordination of the lights needs to consider the impact on other stakeholders, depending upon the lighting strategy. If it is a new facility build, the installation should be aligned by the overall builder's project manager to ensure that the installation around the electricity conduits, fencing, surface is all coordinated. If it is a replacement light strategy, it will be better to install in the summer and low season as to not impact on the usage during the dark nights. All of these options need to be specified within the procurement specification. The luminaires must be aimed according to the lighting design and this should be followed by measurements to ensure that the installation meets the requirements of this guide.

Measurements should be carried out using a calibrated illuminance meter.

- Before measuring, the supply voltage should be checked.
- On field measurements may vary from computer predicted results. On new installations, this should be on the positive side of the average light levels required. For existing fields if the average light level is below computer predicted light level averages the light levels should be reviewed by a professional sports lighting engineer to determine if safety is impacted.
- A measurement record sheet should be used to record the results. A template report is given in Appendix C of this Guide.
- For testing, a grid of maximum size 5m x 5m should be laid out with a point in the centre of the field and covering the FOP and perimeter margins.

3.7. Stage 5: Handover

Prior to handover to the client/club, there needs to be sign off by an independent lighting engineer and preferably a certification of the lighting levels across the field to ensure that what has been purchased has been constructed and installed.

Warranties vary greatly in length and coverage. LV recommends obtaining warranty documents from each manufacturer being considered, that clearly states what is covered. Product warranties are a good gauge of a manufacturer's confidence in their products. Periods covered can range from 12 months to 25 years, and details of covered items and conditions vary greatly. LV recommends you request warranties that include guaranteed light levels (performance), parts, labour, and lamp replacements. Financially funded reserves are a gauge as to whether the manufacturer is committed to their warranty.

It may be pertinent for Lacrosse Victoria/Club to request a copy of the Operation & Maintenance manual where these have been provided directly to a local Council. This may assist with planning for future installations.



3.8. Stage 6: Maintenance

It would be expected that the supplier of the luminaires/poles will be providing an operation and maintenance manual, to make sure include the obligation within the procurement specification. AS 2560.1 provides guidance on what should be provided with an operations and maintenance manual. LED light sources typically have a long life but do lose light as it ages.



Level 2, Sports House, 375 Albert Rd Albert Park, VIC 3206
phone: 03 9682 3300
email: office@lacrossevictoria.com.au
website: lacrossevictoria.com.au
ABN 31 876 640 323