



ENGLAND ATHLETICS
**FLOODLIGHTING
GUIDE**

ON THE SPOT

Shining a light on athletics and running clubs



More power to you

As the official lighting partner of England Athletics, we have produced this Floodlighting Assessment Guide to empower and assist facility managers across the country to assess your current lighting standards and actively take ownership of reviewing, managing, and upgrading your floodlighting facilities.

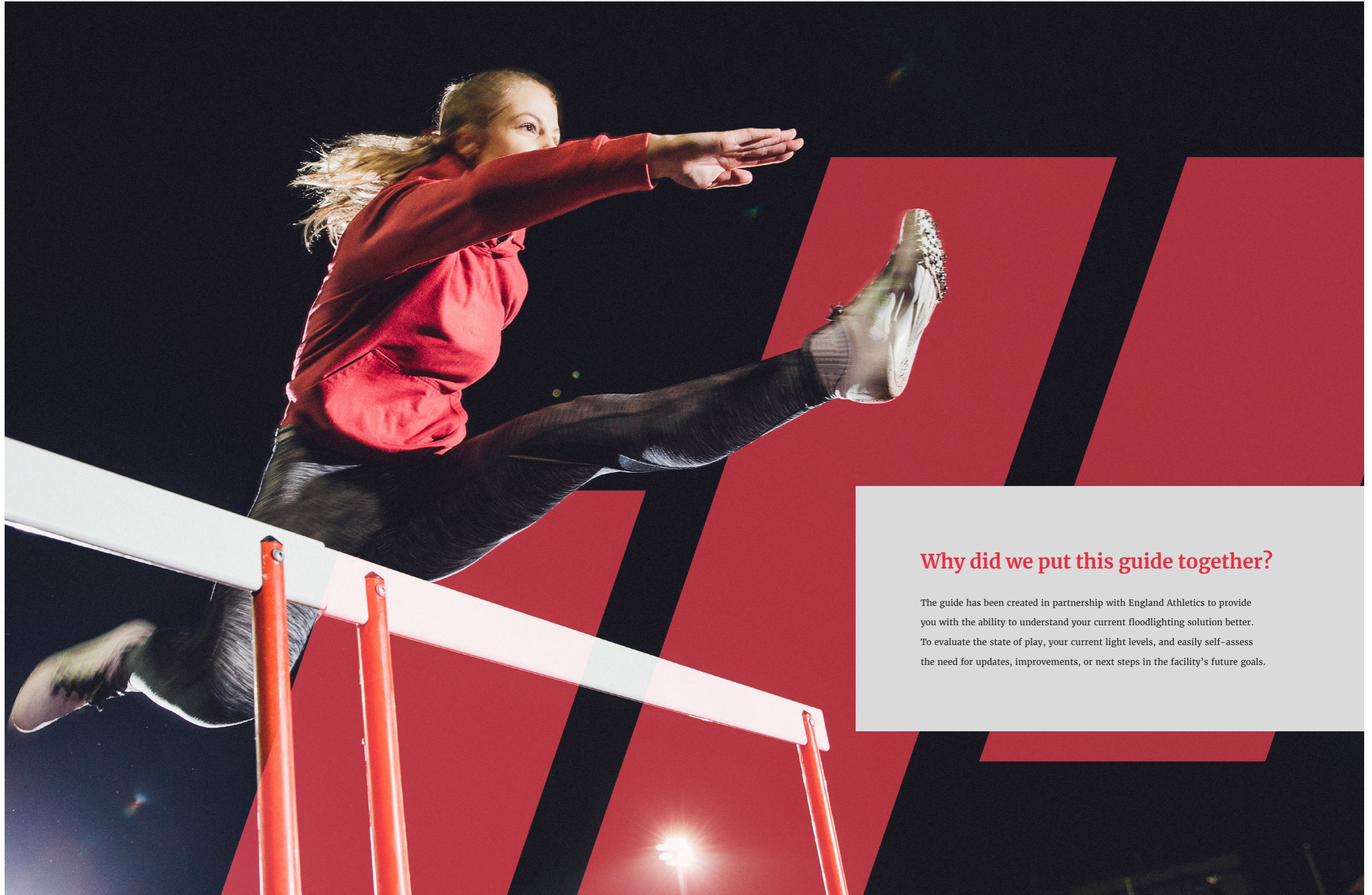
England Athletics as a priority, and as part of their on-going strategic facility improvement initiative, are striving to develop and improve standards. The importance of good facilities is imperative to the development of the sport at all levels as well as the on-going goal of increasing participation. This guide will provide you with:

- An introductory understanding of floodlighting standards relating to track and field athletics.
- Details of the basic equipment needed to analyse lighting levels.
- A step-by-step process to self-assess facility lighting levels.
- The next steps to improve their lighting, if needed.

This guide will not delve deeply into the technical details of floodlighting athletics tracks and all the technical parameters involved. Our focus is on supplying a simple guide to help you review your lighting solution. For detailed information on the technical complexities of lighting, email us at:

athletics@midstreamlighting.com





Why did we put this guide together?

The guide has been created in partnership with England Athletics to provide you with the ability to understand your current floodlighting solution better. To evaluate the state of play, your current light levels, and easily self-assess the need for updates, improvements, or next steps in the facility's future goals.

LIGHT UP THE FIELD

Why should you care about the lighting levels on your athletics track and field?

There are many advantages of improved lighting around athletics, with some benefits focused on the elite facilities and others applicable to all levels. The key benefits however can be summarised as:

- Reduce your energy consumption.
- Cut maintenance costs.
- Greatly extend the hours of play for your facility.
- Improve safety and security.
- Achieve the necessary light levels for the facility to host televised sports events.
- Future proof your facility for years to come.
- Reduce light pollution.
- And finally, to provide appropriate and compliant lighting to the levels of track and field athletics activity at your facility.

Key lighting considerations when assessing lighting around your facility

Lighting installations for athletic grounds should have been designed to consider the following aspects of a lighting solution tailored for your specific facility:

Levels of illuminance	How much light is on your track and field?
Uniformity of illuminance	Is the light perfectly uniform across the field of play?
Contrast	Is the light consistent across the field of play?
Glare control	Are participants, fans, and neighbours affected by light spilling away from the field of play or directed at the field of play?
Colour rendering	Is your light crisp and clear and are the colours clearly defined under the artificial lighting?
Type of lighting mast	Are your masts fit for purpose and would they pass a safety regulation inspection?
Number of lighting masts	Are there enough masts to achieve the lighting levels needed?
Track only lighting or track and infield	Do you need track only lighting or lighting for track and field?
Compliance with statutory regulations	Does your lighting comply with recognised safety and governing body standards?

What regulation or guidance currently exists?

The table on page 11 is the official guidance provided by Sport England, in their Artificial Sports Lighting Guide. If using this digitally you can download their complete technical guide [here](#)

Please note: England Athletics adheres to these lighting levels as part of their Athletics Facilities improvement plans and this guide complies with all standards outlined.

SPORT ENGLAND GUIDANCE

In considering lighting for athletics, events can be divided into two groups. These are:

1. Those events which take place essentially at ground level – track events, horizontal jumps, and shot putt.
2. Those events which involve the space significantly above ground level – throwing events (except shot) and vertical jumps.

For events in the first group, it is sufficient to consider horizontal illuminance at ground level.

For events in the second group, the full volume within which the event takes place must be considered – for instance, the maximum height of the flight of the javelin or hammer and the maximum height of the pole vault bar.

In most cases, the facility will be lit to a standard where the requirements of both groups of events are met simultaneously.

Proper lighting of the full volume required for events in the second group is a very important safety consideration. It is essential for the hammer and javelin and discus to be visible throughout their flight. High jumpers and pole vaulters must be able to see the bar. For an outdoor track that's not enclosed by a stadium, lighting this volume without producing overspill light and without creating glare for distant observers may be very difficult. If for whatever reason, it is not practicable to light the entire volume for a given event, that event should not take place under lights.

The Table below gives a partial summary of the recommendations of the International Association of Athletics Federations (IAAF), as published in the Track and Field Facilities Manual 2008 Edition. For televised events, different standards will apply.

LEVEL OF PLAY	HORIZONTAL ILLUMINANCE		COLOUR RENDERING INDEX (CRI)	GLARE RATING (GR)
	Outdoor Athletics			
	Average Lux levels (Eave)	Emin / Eave		
INTERNATIONAL / PREMIER	500	0.7	≥ 80	≥ 50
CLUB	200	0.7	≥ 65	≥ 50
COMMUNITY	100	0.5	≥ 20	≥ 50

NOTES

- Glare should be controlled by careful positioning of luminaries, e.g. over the pole vault area.
- The vertical illuminance at the finishing line should be at least 1000 lux for photo finish equipment.
- For outdoor tracks (community level of play), the level of horizontal illuminance can be reduced to 50 lux for jogging (see Section 5.0 of CIBSE LG4, Stadia - large and small).

Summary of the recommendations of BS EN 12193 with additional notes on key design issues.
 Note: Where not otherwise stated in the Table, the 'Classes' used in BS EN 12193: 2018 correspond approximately with Sport England 'Level of play' categories as follows: • Class 1 - International / Premier • Class II - Club • Class III - Community.





IMPORTANT **ASSESSMENT** **CONSIDERATIONS**

01.

Number of measuring points

Measuring lighting levels across the track and field can be done quickly and easily, however:

- It is vital it is done correctly.
- And it must take place at night.

The Midstream Athletics Standards approach has been applied across the entire process. This means:

- There must be measuring points taken every 10 metres squared across the track and field – see the section below.
- The larger the facility the more measuring points needed.

02.

The testing equipment you will need

If you need any advice on the equipment to use, email us at athletics@midstreamlighting.com and we'll get straight back to you.

- 1 An LED calibrated light meter. As with any electrical device, it's important you choose a reputable manufacturer's lux meter – typically with an f1' Value better than 3%. Special care should be taken to make sure the meter is suitable for LED applications, and that it's been calibrated within 12 months of use. It's also important to ensure that the correct scale is selected before you begin testing. If you'd like any help choosing a lux meter, or how to use it, just email: athletics@midstreamlighting.com

- 2 Measuring wheel or tape measure.

- 3 Objects to be used as a marker e.g. sports cones.

- 4 A 30cm square flat board or a self-levelling tripod if the reading can't be done flat on the ground.

- 5 Pen to record your results at each point.

- 6 Our photometric results sheet – you'll find one at the end of the guide.

03.

Secure the area

When following the testing guidelines, it is important to clear the field of play and make sure nobody is using it. This will allow you to complete your tests in one go, without any risk of injury or obstruction.

04.

Light meter and measuring wheel

Calibrate and set to zero before every reading

The light meter must be calibrated, tested to zero, and set to the correct light source. The measuring wheel must be zeroed too.

05.

Vertical readings

We will not cover vertical readings in this guide as they are needed for very specific venues only.

Vertical readings are important for compliance to events that involve the space significantly above ground level e.g. throwing events (except shot putt) and vertical jumps. Proper lighting of the full volume needed for these events is a very important safety consideration. For an outdoor track that's not enclosed by a stadium, lighting this volume without producing overspill light, and creating glare for distant observers may be very difficult. These light readings should be taken by a professional team.

Please email us at athletics@midstreamlighting.com for an official, professional assessment by one of our qualified team.

Note: UK Athletics Unit 5 TrackMark floodlight inspections and subsequent accreditation must be carried out by independent floodlighting experts.



TIME TO TAKE YOUR READINGS

The following steps will take you through how to take the readings at a horizontal level, how to record them, and then review your results.

STEP 1

Equipment

Check all equipment is ready, calibrated, and in good working order in accordance with the equipment list above.

STEP 2

Secure the area

It's important to make sure no activity is taking part when you're taking your measurements, so they can be taken without any obstructions or possibly cause any injuries. You should also clear all objects from the field of play, such as any trees, shrubs, or branches that could obstruct lighting levels. Also, the testing must be completed in one go on the same night.

STEP 3

Complete Section A

Complete Section A of the assessment report, highlighted below, to the best of your knowledge.

You can find copies of this at the end of this guide.

ATHLETICS ASSESSMENT REPORT - SECTION A	
Name of club/facility	
Address of club/facility	
Previous lighting installer if known	
Time you are taking the reading	
Weather conditions	
Number of masts/poles	
Approximate height of masts/poles	
Total number of floodlights	
Wattage of floodlight if known	
Numbers of lights not working	
Dimensions of track:	
Number of lanes:	
Infield in use – Yes/No. If 'Yes', for what sport:	

STEP 4

Confirming what you need to measure

Depending on your facility, there are two step-by-step processes outlined below that need to be followed.

- If you have a full track and inside playing area, start at Step 5 below.
- If you just have a running track, start at Step 6, further down.
- Whatever your facility is, you'll need to complete Step 7.

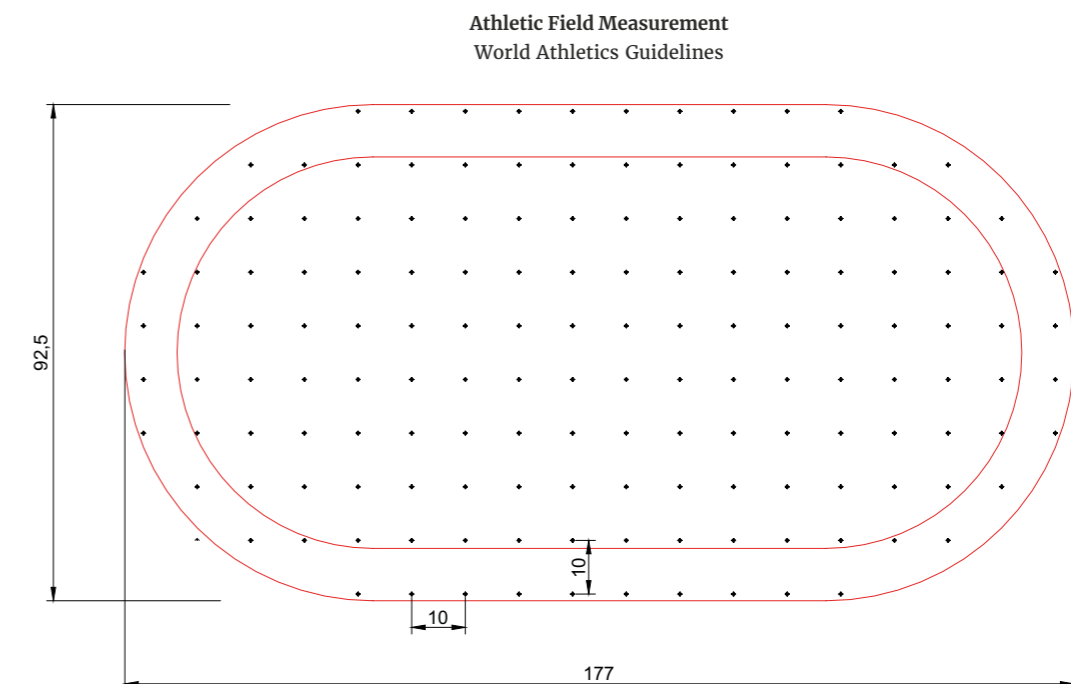
STEP 5

Full track & inside playing area measurement

5.1 Confirm your measurement points

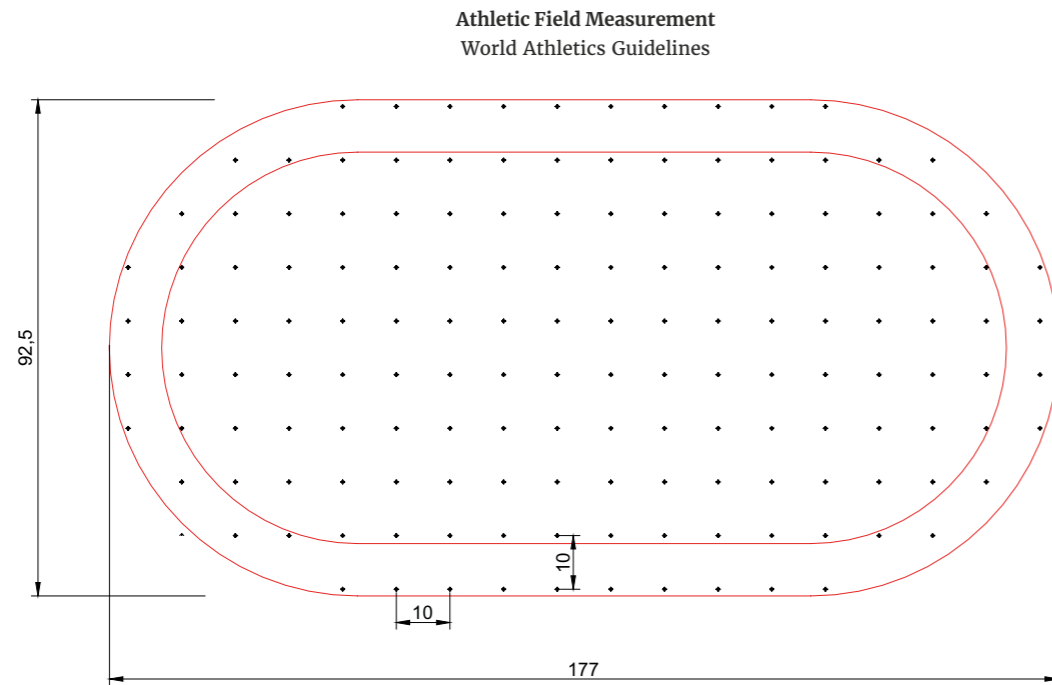
Please note: The size of your facility will determine how many measurement points are needed.

Using the image below as reference you need to create your measuring grid across the running track and playing areas. As you can see, you need to split the facility into 10m by 10m points. The easiest way to do this is to treat your running track as a complete rectangle – in length and width – and place cones from one corner to the other. You only need to measure the points inside the running track and playing field.



5.2 Placing your markers to create your measurement grid

With the measuring wheel or tape, set the first cone point at one corner and then build the grid on the track and field. Place one cone at each reading point until you have your cones set up as shown below.



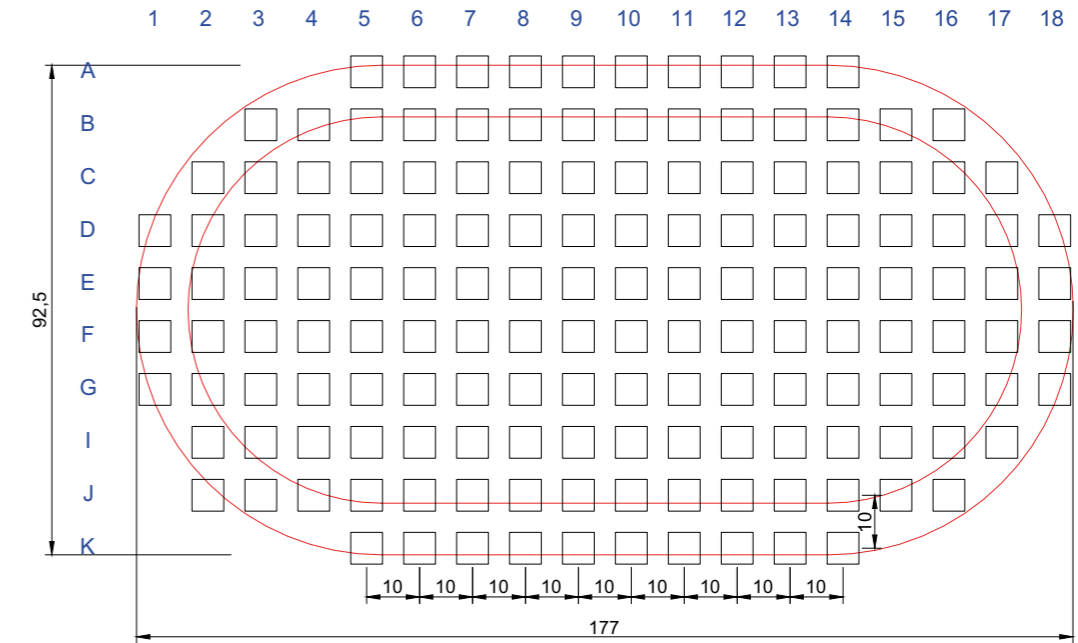
5.3 Taking your readings: get your process ready

Now it's time to measure your actual illuminance levels. The assessment will cover two areas:

- Measurement of your lux levels.
- Your lighting uniformity.

Please note: To make things easy to follow we have provided two light reporting sheets for you to choose from.

A – Write the results on the result sheet layout diagram provided at the end of this guide, where the track and field have blank white areas to note down the numbers. It looks like this:



B – Fill in the results chart sheet provided at the end of this guide, or if utilising this document digitally you can [click here](#) to download - it looks like this:

Illuminance Check
Athletic Field Measurement - World Athletics Guidelines

Project No.: _____
Customer Order No.: _____
Location: _____
Switching Level: _____

Date of Visit: _____ Time off: _____
Horizontal Illuminance: _____
Weather Conditions: _____
Light Meter: _____
Voltmeter: _____

Design Illuminance Level
Ei.des= _____ Lux

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A																		
B																		
C																		
D																		
E																		
F																		
G																		
H																		
I																		
J																		
K																		

Recorded Illuminance Levels
Ei.ave = #DIV/0! Lux
Ei.max = 0.0 Lux
Ei.min = 0.0 Lux
Min/Ave = #DIV/0!
Min/Max = #DIV/0!
% Deviation = #DIV/0!
Survey Conducted By: _____

Once you are ready it is time to take the readings.

5.4 Take reading 1

Starting at A1, or your preferred corner of the area of play, place the lux meter receptor flat on the ground, on a board, or tripod. Leave the receptor in place for five seconds for the readings to stabilise and record the value. Take care to make sure the recorder, the cone, and any other shadows do not obstruct the lux meter receptor. These readings should be taken at no more than 30cm from the ground if they can't be taken on the ground itself. For best results, use an extended cable to the light meter so no shadows or physical blocks are affecting the lighting levels.

Record the number in Box 1 or on the chart.

5.5 Now take a reading at every grid point

For each of the grid points, you need to note down the lighting value (in lux) on the chart provided or on the chart document. Continue until every reading is taken and noted down.

You can now go to Step 7: Getting your results and understanding your reading.

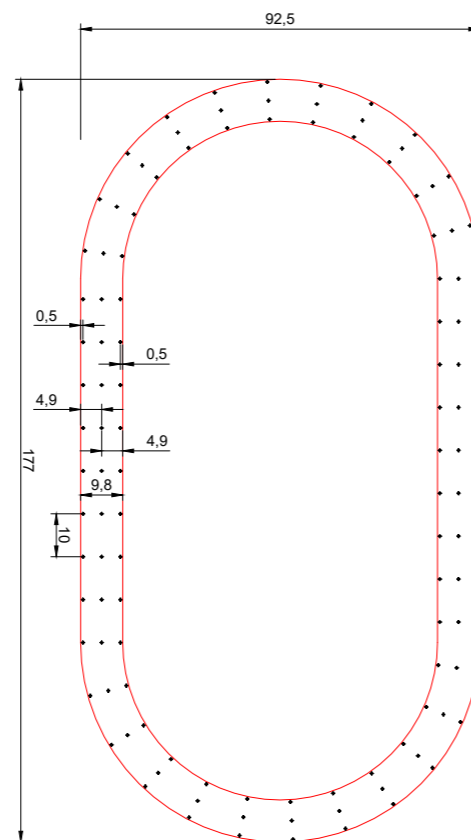
STEP 6

For running tracks only

6.1 Confirm your measurement points

Please note: The size of your track and the number of lanes will determine how many measurement points are needed.

Using the image adjacent for reference you need to create your measuring grid across the running track. As you can see, you need to split the track by laying cones 10m apart around the track and three cones across the track. Regardless of the number of lanes these three cones should always be placed 0.5m from the edge of track, 0.5m from the the inside of the track and the final cone placed in the middle equidistant from the two cones, as shown in the adjacent example.



6.2 Placing your markers to create your measurement grid

With the measuring wheel or tape, set the first cone point starting 0.5m in from the edge of the track, do the same 0.5 from the inside of the track and then place a cone in the middle. Do the same 10m apart around the track.

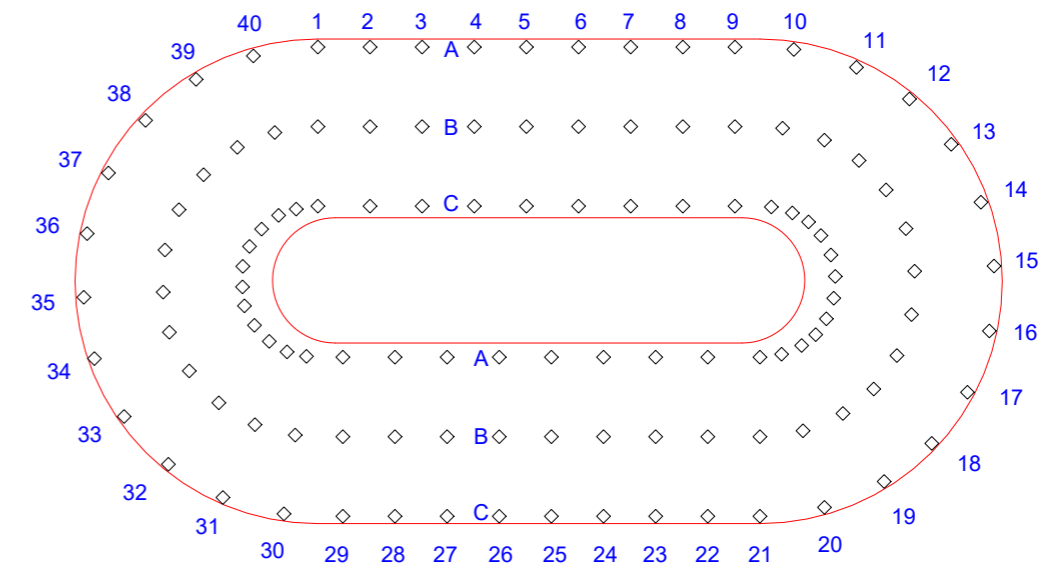
6.3 Taking your readings - get your process ready

Now it's time to measure your actual illuminance levels. The assessment will cover two areas:

- Measurement of your lux levels.
- Your lighting uniformity.

Please note: To make things easy to follow we have provided two light reporting sheets - A and B.

A - Write the results on the result sheet layout diagram provided at the end of this guide, where the track has blank white areas to note down the numbers. It looks like this:



B – Fill in the results chart sheet provided at the end of this guide, or if utilising this document digitally you can [click here](#) to download – it looks like this:

Illuminance Check
Athletic Field Measurement - World Athletics Guidelines

Project No.: _____
 Customer Order No.: _____
 Location: _____
 Switching Level: _____

Date of Visit: _____
 Time on: _____ Time off: _____
 Horizontal Illuminance: _____
 Weather Conditions: _____
 Light Meter: _____
 Voltmeter: _____

Design Illuminance Level
 E_{des} = _____ Lux

Recorded Illuminance Levels
 E_{ave} = #DIV/0! Lux
 E_{max} = 0.0 Lux
 E_{min} = 0.0 Lux

Min/Ave = #DIV/0!
 Min/Max = #DIV/0!

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
A																					
B																					
C																					

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
A																					
B																					
C																					

Once you are ready its time to take the readings

6.4 Take reading 1

Starting at A1, or your preferred corner of the area of play, place the lux meter receptor flat on the ground, on a board, or tripod. Leave the receptor in place for five seconds for the readings to stabilise and record the value. Take care to make sure the recorder, the cone, and any other shadows do not obstruct the lux meter receptor. These readings should be taken at no more than 30cm from the ground if they can't be taken on the ground itself. For best results, use an extended cable to the light meter so no shadows or physical blocks are affecting the lighting levels.

Record the number in Box 1 or on the chart.

6.5 Now take a reading at every grid point

For each of the grid points, you need to note down the lighting value (in lux) on the chart provided or on the chart document. Continue until every reading is taken and noted down.

You can now go to Step 7: Getting your results and understanding your reading.

STEP 7

Getting your results and understanding your reading

With the recorded data, fill in the Midstream Athletics online data sheet, found [here](#) if reading this document digitally – this will show the average illumination level.

Or, to get the results manually

- The lux value is just the average of all the readings taken. So, add up all your measurements and divide them by the number of measurement points.
- Once you have worked out your average value in the bullet point above, you can calculate your uniformity ratio by dividing the lowest value by this average value (E_{min} / E_{ave}).

If using our digital document, the link here will take you through to an assessment table. When your assessment is done, you can add your data to align your results to the table below. This will let you know where your facility sits within the guidelines.

Fill in Section B of the athletics assessment report – an example of this section is shown below:

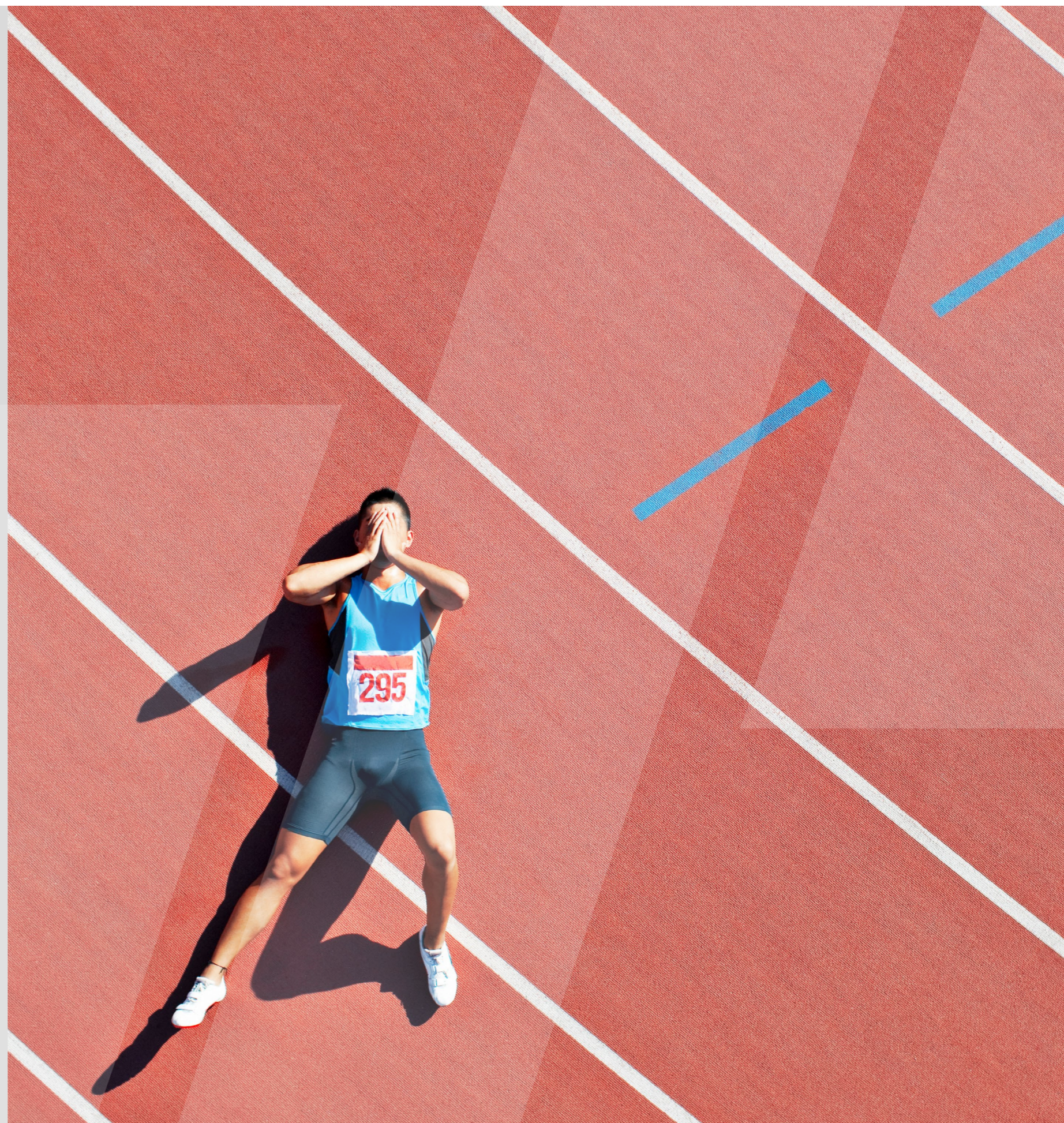
ATHLETICS ASSESSMENT REPORT - SECTION B	
Average lux level	
Lowest reading	
Highest reading	
Uniformity result	
Facility manager opinion of uniformity	
General condition of current system	
Any other comments	
Signed	
Position	

To assess your results please refer to the table here:

LEVEL OF PLAY	HORIZONTAL ILLUMINANCE	
	Outdoor Athletics	
	Eave Lux	E _{min} / Eave
INTERNATIONAL / PREMIER	500	0.7
CLUB	200	0.7
COMMUNITY	100	0.5

Common mistakes to avoid

- Don't use a light meter that isn't calibrated. The light meter must have an annual calibration check, and the results of this will always be provided with the light meter when purchased or rented.
- A mobile phone light meter won't give you accurate results. So don't use one – at all. Use an LED light meter, which is specific for the LED light spectrum.
- Light sources can be multiples, so avoid any shadowing during the readings, including your own shadow.
- Don't take readings in the rain, snow, or fog as this will affect the results too. It can also damage the sensor on the light meter.
- Make sure you start taking the results when it's completely dark and not during dusk.
- It's very important to note the time and date on the report of when the results are recorded. So, please don't forget to do this.
- Don't rotate the light meter sensor. It must be parallel to the ground.
- Make sure there is no other light source that may affect the results.
- All lighting systems must be fully functional.
- Don't forget to refer to England Athletics for the latest lighting requirements to make sure your system is compliant.
- When carrying out formal TrackMark Unit 5 Floodlight inspections always use a SAPCA approved floodlighting contractor to undertake inspections and carry out installation or repair and maintenance work.



/ WORKING DOCUMENTS

ATHLETICS ASSESSMENT REPORT - SECTION A	
Name of club/facility	
Address of club/facility	
Previous lighting installer (if known)	
Time you are taking the reading	
Weather conditions	
Number of masts/poles	
Approximate height of masts/poles	
Total number of floodlights	
Wattage of floodlight if known	
Numbers of lights not working	
Dimensions of track:	
Number of lanes:	
Infield in use – Yes/No. If 'Yes', for what sport	

ATHLETICS ASSESSMENT REPORT - SECTION B	
Average lux level	
Lowest reading	
Highest reading	
Uniformity result	
Facility manager opinion of uniformity	
General condition of current System	
Any other comments	
Signed	
Position	

FULL TRACK & INSIDE PLAYING AREA Results chart

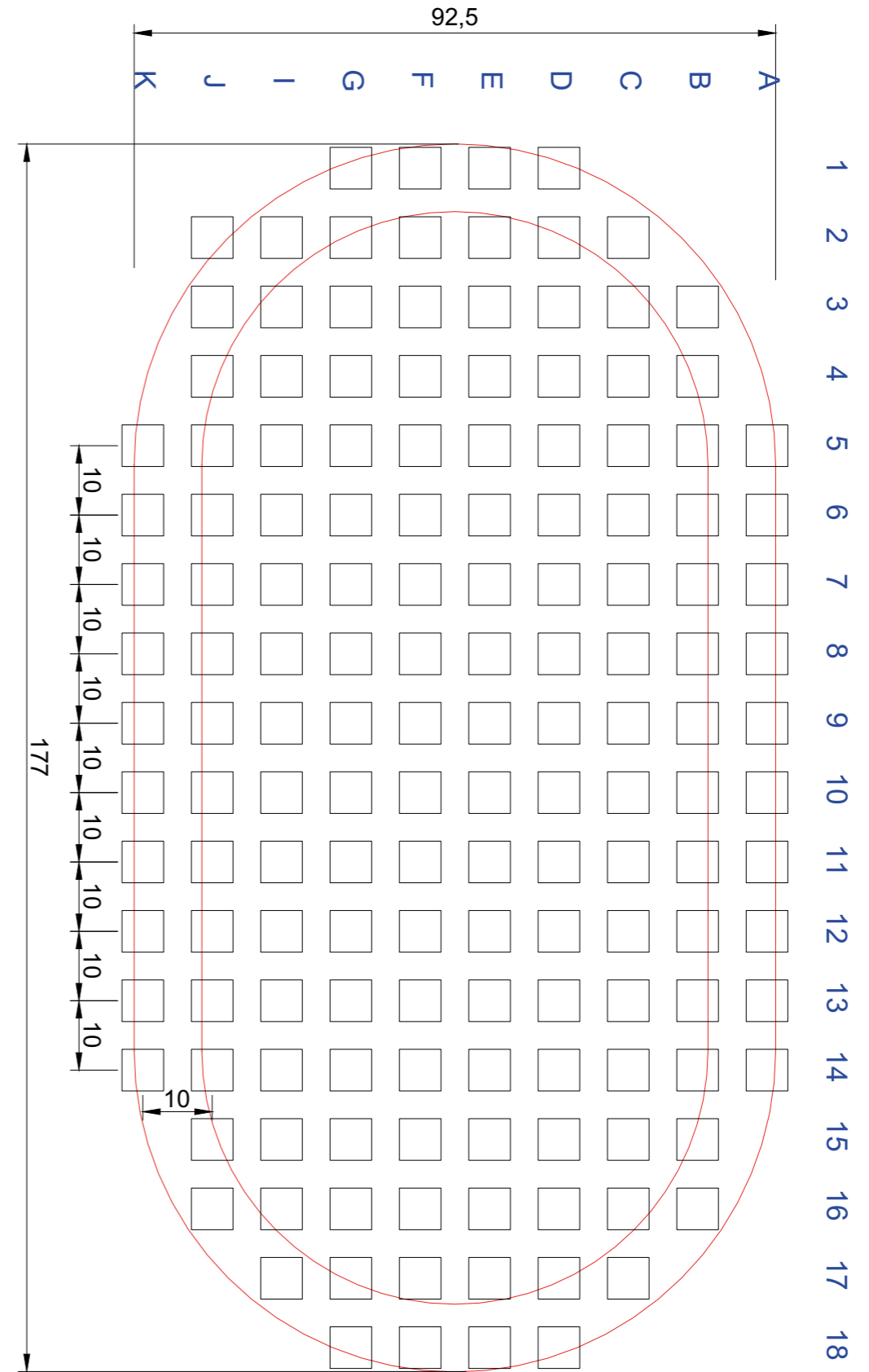
FULL TRACK & INSIDE PLAYING AREA Layout sheet

Illuminance Check Athletic Field Measurement - World Athletics Guidelines

Project No.: _____
 Customer Order No.: _____
 Location: _____
 Switching Level: _____
 Date of Visit: _____ Time off: _____
 Horizontal Illuminance: _____
 Weather Conditions: _____
 Light Meter: _____
 Voltmeter: _____

Design Illuminance Level		Recorded Illuminance Levels	
Ei.des=	Lux	Ei.ave = #DIV/0!	Lux
		Ei.max = 0.0	Lux
		Ei.min = 0.0	Lux
		Min/Ave = #DIV/0!	
		Min/Max = #DIV/0!	
		% Deviation = #DIV/0!	
		Survey Conducted By:	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A																		
B																		
C																		
D																		
E																		
F																		
G																		
H																		
I																		
J																		
K																		



RUNNING TRACK ONLY

Results chart

RUNNING TRACK ONLY

Sheet

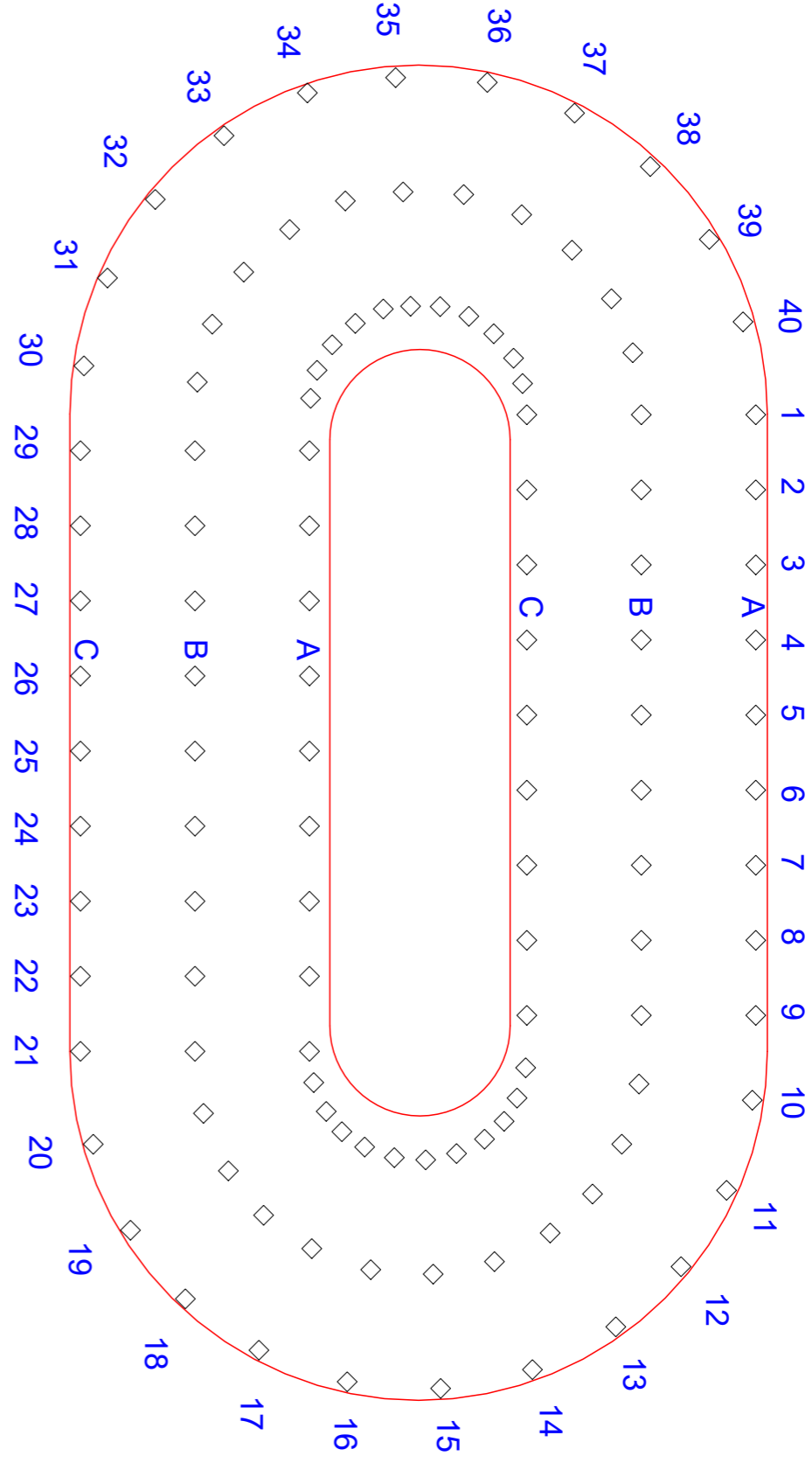
Illuminance Check
Athletic Field Measurement - World Athletics Guidelines

Project No.: _____
 Customer Order No.: _____
 Location: _____
 Switching Level: _____

Date of Visit: _____ Time off: _____
 Time on: _____
 Horizontal Illuminance: _____
 Weather Conditions: _____
 Light Meter: _____
 Voltmeter: _____

Design Illuminance Level		Recorded Illuminance Levels	
EI.des ²	Lux	EI.ave = #DIV/0!	Lux
0.0	Lux	EI.max =	Lux
0.0	Lux	EI.min =	Lux
Min/Ave = #DIV/0!		Min/Max = #DIV/0!	

Design Illuminance Level	Recorded Illuminance Levels
EI.des ²	Lux
0.0	Lux
0.0	Lux
Min/Ave = #DIV/0!	Min/Max = #DIV/0!



GLOSSARY

Lighting terms – as used by Sport England, in their Artificial Sports Lighting Guidance

Colour rendering	The ability of a lamp to make the colours of a lit surface appear the same as they do under natural light. The colour rendering of a lamp is indicated by its colour rendering index Ra. Ra has a maximum value of 100, which is equivalent to daylight. The higher the value, the better the colour rendering and visual appearance of colours. A low-pressure sodium lamp (e.g. an old yellow street light) has Ra = 0 – it is not possible to distinguish colours under that sort of lighting. High-pressure sodium lights still have a 'golden' colouring, but have much better colour rendering, with Ra ~ 25. Metal halide lights generally have Ra between 65 and 90 and LEDs should be 70 and above.	Luminaire	A general term for a light fitting.
Colour temperature	Very hot objects emit light of a colour which varies with temperature - think of 'red hot' and 'white hot'. The colour temperature of a light source is the temperature of a standard object (a 'black body') which emits light of a hue similar to that of the light source.	Lux	The unit of measurement of illuminance. One lux equals one lumen per square metre.
Disability glare	Glare that impairs the vision of an observer without necessarily causing discomfort. Disability glare may be produced directly or by reflection.	Maintenance Factor (MF)	A factor used to predict the worst-case performance of a lighting system at any point in its life, provided it is properly looked after. A detailed definition of MF is included in the County Surveyors' report on the topic (concerned mainly with road lighting), available for download from the ILP website.
Discomfort glare	Glare that causes discomfort without necessarily impairing the vision of objects. Discomfort glare may be produced directly or by reflection.	Minimum maintained (average) illuminance (Eave)	The value below which the (average) illuminance in the specified area should not fall at any time during the life of a (properly-maintained) lighting installation. It is the illuminance level at which maintenance should be carried out. The method for determining average illuminance, based on readings over a prescribed grid, is dealt with in CIBSE Lighting Guide LG4: Sports.
Diversity (electrical)	In an electrical system, the ratio of the sum of the individual maximum demands to maximum total demand. The maximum electrical load on an electrical system will be less than the total of the demands of the individual components of the system because not all items of equipment will be in use at the same time. (See also 'Uniformity').	Principal Area (PA)	The playing area needed for a sport – typically the area bounded by the outer line of the pitch or court markings, though sometimes additional space outside the lines is needed as well, for instance for tennis, volleyball, women's lacrosse. In tennis, the term Principal Play Area (PPA) is used.
Emergency lighting	Lighting provided for use when the supply to the normal lighting fails.	Reference area	The area over which lighting performance is specified or measured.
Escape lighting	A specific part of the emergency lighting, provided to ensure that the escape route is illuminated at all material times.	Reflectance/ Reflection factor	The proportion of light falling onto a surface that's reflected back off that surface. (See LRV).
Field of play	General term for the defined space in which the sports activity takes place. (Also see terms used in BS EN 12193:2007 for 'principal area' and 'total area').	Safety lighting	That part of the emergency lighting that provides illumination for the safety of people involved in a potentially dangerous process or situation and to enable proper shutdown procedures for the safety of the operator and other occupants of the premises (known as 'high-risk task area lighting' in BS 5266-7 / EN 1838).
Glare	Excessive brightness in the visual field. A glare rating value (GR) can be assessed for the field of play and other key areas. (See LG4 / BSE 12193:2007 and CIE publication TC 5.04).	Standby lighting	The part of the emergency lighting which may be provided to enable normal activities to continue.
Illuminance	The amount of light falling on a surface. Expressed as 'lux' (lumens per square metre).	Threshold Increment (TI)	The measure of disability glare expressed as the percentage increase in contrast required between an object and its background for it to be seen equally well with the source of glare present.
Illuminance gradient	The rate at which illuminance on a surface varies with position. Expressed as % per metre. For instance, for indoor bowls, the difference in illuminance at two points 1 metre apart on a rink must not be more than 5% (CIBSE Guide).	Total Area (TA)	The area encompassing the playing area plus a specified area around it, normally to provide safety margins or run-offs. In tennis, the term Total Play Area (TPA) is used, and TA is the area of the whole of the court's enclosure.
Isolux diagram	A plan, usually of the Playing Area, with lines linking points of equal illuminance – similar to the contour lines on a map that link points of equal height above sea level. When extended to include the Total Playing Area and beyond these diagrams can be used to show the extent and intensity of light spillage.	Total Light Output Ratio (TLOR)	The fraction of the light produced by the lamp which leaves the luminaire in any direction. TLOR is, in effect, the efficiency of the luminaire.
Lamp	A light source or electrically powered device which produces light.	Upward Light Output Ratio (ULOR (or ULR))	The fraction of the light produced by the lamps which leave the luminaires above the horizontal. ULOR, sometimes called ULR, should always be zero for a properly-installed, well-designed sports lighting installation.
Light Reflectance Value (LRV)	Light Reflectance Value, is the amount of light reflected from a surface, expressed as a percentage of the amount of light falling on it. LRV is measured using the method described in BS 8493.	Uniformity	The evenness of the distribution of light over the surface. There are two definitions of Uniformity, known as U1 and U2. U1 is defined as the ratio of the minimum illuminance in the area to the maximum illuminance in the area (Emin / Eave). U1 is also sometimes known as Diversity – but see the definition of diversity on the previous page. U2 is defined as the ratio of the minimum illuminance in the area to the average illuminance over the area (Emin / Eave). The uniformity of light is as important as the level of illumination. Light should be spread evenly over the whole area, including behind the baselines, outside the side lines, and above the playing area.
Lumen	The unit of luminous flux – i.e. the rate at which a source produces light.		

Want to know more?
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