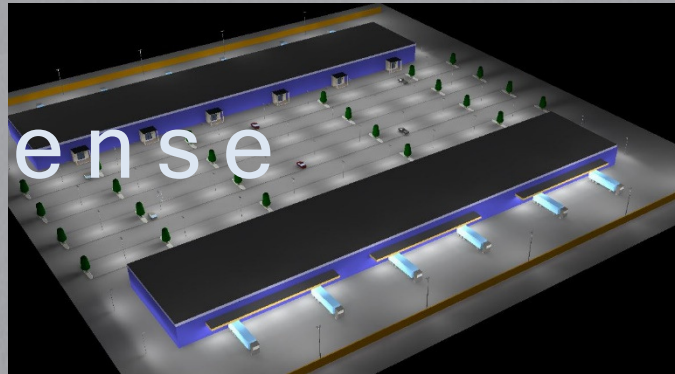


# Sports Lighting Experience

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# Project Experience

## Lords Cricket Ground

Lords Cricket Ground (MCC) came up with a re-generation master plan for the whole ground, this was to be carried out over a number of years in the off seasons. One of the largest changes to the ground was the incorporation of the 47m high telescopic floodlighting mast into the centre of the newly built Warner stand. I was appointed the Lighting consultant for the project as an Abacus employee.

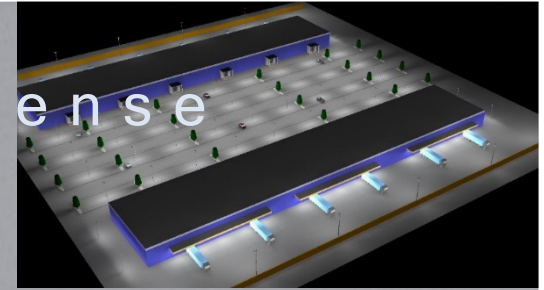
The residential area around the ground were very sensitive regarding planning permission when we first installed the lighting. To gain planning approval for the mast move it was necessary to carry out a full lighting environmental impact assessment, to prove the mast position and floodlight aiming changes would not increase the Vertical and horizontal illuminance overspill and source intensities to the massive amount properties around the site.

Along with this carried out calculations to ensure that the new Warner stand spectator canopy did not cast a shadow on the pitch, ensure that the ECB illuminance levels had been met on the pitch to all TV camera positions and that the mast would lower two the correct height set in the planning restriction.

Once the EIA was submitted and the approval granted I was also commissioned to carry out risk assessment and method statement for the position of the crane to lift the parts of the 47m mast into the building structure in the tight areas around the cricket ground and avoiding the roof and protruding features on the stand with the boom of the crane.

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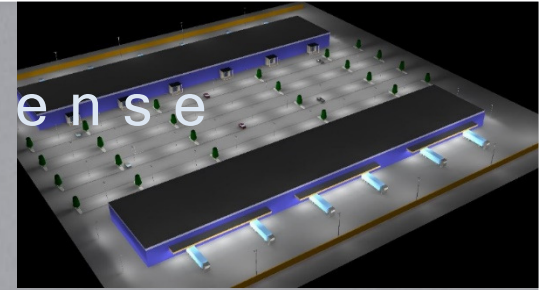
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# Project Experience

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## Manuka Oval Canberra Australia

Manuka Oval is located in Australia's Capital City Canberra, in a residential suburb. The ground went through a major modernisation including 6 bespoke masts carrying a total of 564 floodlights over-all, as well as new open stand seating and new pitch level.

The ground caters for two different sports the AFL Australian Rules Football and ICC Cricket both prioritising play in different parts of the pitch. This meant the design was complex using multiple camera position which where different for each sport, creating complex floodlight aiming's to ensure we achieve the high levels of illuminance and uniformity required.

As the ground was in a residential area we had a strict criteria to meet with regards to vertical illuminance and source intensities to residence and the roadways around the ground. We carried out a computational lighting environmental impact assessment to allow planning permission to be granted.

Once the installation was completed I travelled to Australia to supervise the aiming, and commission the project to ensure all switch-down levels where programmed correctly and that the 1000-1400 Lux vertical to camera was achieved.

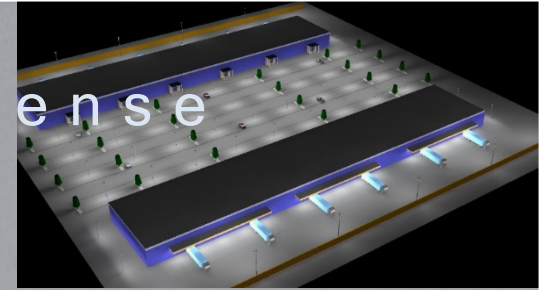
I also met the clients representative on site to run illuminance checks on the surrounding environment and residents to prove that the restrictions had been met.



# Project Experience

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## Dromoland Castle Golf club Driving range

Dromoland Castle is a 5 Star hotel and Golf club with an 18 hole golf course and golf driving range, to the south west of southern Ireland, set in the countryside with very little ambient lighting in the area.

To increase revenues at the club the client wanted to offer night time practice on the driving range. I was asked to create a lighting design that would enable play at night, however it must minimise the impact of the lighting on the surrounding area.

Conventional mast lighting or lighting from the top of the booths creates kilometres of light overspill, so the solution I chose was to light the range with a Berm lighting system. Instead of blasting light down the range, 13 berms with two 250W floodlights in each are placed at 45-50m intervals down the range. The range is only used from the Tees so only the vertical flight of the ball and the drop of the ball is required to be lit, perfect horizontal illuminance is not required. The berm lighting works by lighting approximately 60m of air in front of each berm, up to 10m in height, as these berms are at 50m intervals this creates a 10m high box of vertical light to allow the flight of the ball to be seen down the whole range.

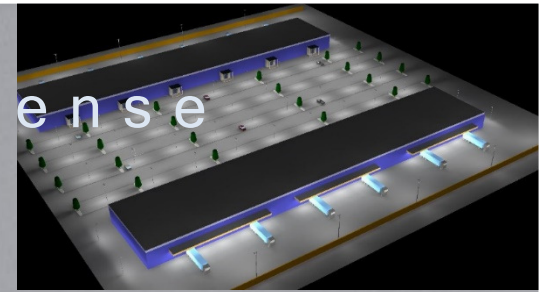
The floodlights are set in berm (mounds of grassed earth behind the floodlights) at ground level to avoid them from being seen or hit by the golfers. At Dromoland the range sloped and allowed us to use mostly the natural topography of the land as berms. The use of Berms dramatically reduces the light overspill and can be contained easily with relatively small trees, allowing the Club to get planning permission, and spectacular lighting results.



# Project Experience

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## Emirates Golf Course Dubai

I was asked to light the Nick Faldo designed 18 hole golf course at the Emirates Golf course Dubai. Golf lighting designs are a fine balance between minimising columns to avoid cluttering the course and having enough columns spread evenly along the course to achieve the uniformities necessary for a fast small ball sports.

Tees 200 - 240 Lux min/ave = 0.70

Fairways 100 - 150 Lux min/ave = 0.50 (Minimum Horizontal Illuminance Point 80Lux)

Fairways 50 min vertical at 5m in direction of Play.

Greens 200 - 240 Lux min/ave = 0.70

To achieve the specification above i used 160 x 15m masts and 500 x 2kw Challenger 1 floodlights.

It is essential that the masts aren't too low that the floodlight elevations are too high and glare is experienced on the next fairway running in the opposite direction, but also that the columns are not too high that the floodlight aiming's overshoot the fairways wasting light.

On completion of the design several trips were made to Dubai, one to present the design to the client, a second to mark out the mast position ensure suitability, and a third trip to supervise aiming of the floodlights and carryout a commissioning light check over the entire course. To avoid disruption to play the bases for the mast were cast remote and place in the ground only when the mast was going to be erected reducing disruption to play and maintaining public safety.



# Project Experience

## Bahrain Kart Track

The original design and installation for the Bahrain Kart track was 24 x 18m mast carrying up to 7 x 2kW Challenger 1 floodlights on each. The lighting requirement was a minimum of 200 lux on the track and a minimum of 150 lux on run offs and service areas. The uniformity was 0.6 on the track and 0.5 for the run offs.

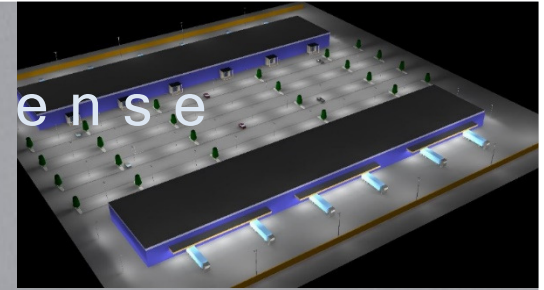
As the track undulated to create a spectacular course the lighting should not be perfectly even, as the undulations can't be seen, the different shades of lighting show the course elevations and dips from the vantage point of the driver, however it should be ensured that the slopes to the higher elevations of the track should be lit and not in total shadow by ensuring bio directional lighting.

Placement of the columns was critical, they needed to be regular enough to give lighting levels, however the columns should be placed in areas where Karts are less likely to leave the track and should be sufficient distance away from the track for any Kart to slow considerable. Columns in the centre area of the track also had tire enclosures for added safety. All the columns were base hinged raise and lower columns for ease of access for maintenance. Once completed the Track lighting was given approval by the CIKFIA for use in the Karting Championship



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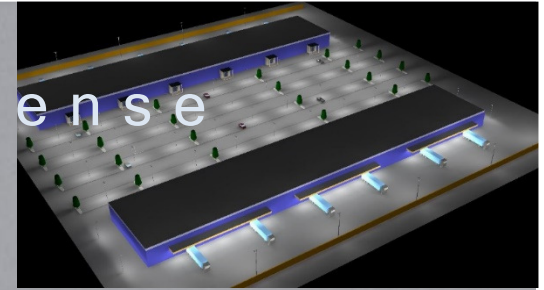
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# Project Experience

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## West Bromwich Albion FC

West Bromwich Albion Football club is in the Premier League and were required to upgrade their lighting to the premier league specification within two seasons of entering the league. We asked to design with all new floodlights however using mostly the existing infrastructure.

West Brom has the same challenges meeting the Premiership lighting specification found by a lot of the clubs in the Premiership, the clubs and stadiums were formed when lighting specifications were low and not requiring the high levels of vertical illuminance the televised games of today do. The stands being added over the years are mostly lower than required and of varying heights and are located tight to the pitch.

The Premiership specification requires vertical illuminance to all four sides 1650 lux average to the Principle camera and 1000 lux average to the secondary camera. The masts are positioned on the roof so it was not possible to obtain the vertical illuminances alone from these positions as shadowing was caused by the stands on the pitch, to combat this floodlights were mounted under stand canopies and to light the first few meters of the pitch and to add vertical illuminance for the cameras. Floodlights were also mounted on the roof of the end stands to aid the end on cameras.



# Project Experience

## Liberec World Cup Ski Jump

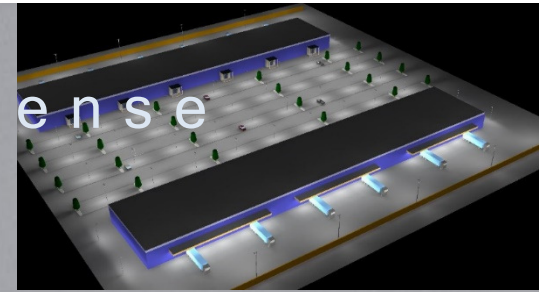
The Liberec Ski Jump is located in the Czech Republic (Czechia) it was constructed to host the FIS Nordic World Ski Jump Championships. When I carried out the lighting design several issues had to be taken into account, first there was the feasibility of mast placement, there was an existing ski lift to the left hand / east side of the Jump that restricted mast to being place on the right side until the very bottom of the slope. The placement areas for the masts were at varying heights, requiring accurate assessments of the base and final column heights to light both the Junior and senior slops, the seven mast ranged in height from 20m - 45m with a total of 202 2kW Challenger 3 floodlights.

The Ski jumper is watched from three sides, right side and front by the cameras and spectators and the lower left side by spectators. It is necessary to light up the hill slightly to ensure the flight of the jumper has good vertical illuminance to be viewed all the way through their Jump. It is necessary to predict the flight of the jumper and carryout calculations along these planes, also ensuring that glare is not encountered by the jumper.

The slope itself also need to be lit well so surface calculations are carried out, this needs to be right to improve the experience for both the Jumper and the spectators. Although a white snow surface is a great reflector of light, and can look very even on a flat surface lit from above, when the ground slopes away and undulates rapidly this can produce the appearance of a visual dark stripes when viewed from the bottom cameras and spectator areas. Although perpendicular calculations show high levels of illuminance, observer calculation are carried out to ensure these stripes don't appear from different viewing directions. The illuminance levels were 1400 lux to main camera. Due to the restricted access by road the Masts and headframes flown into place and erected by helicopter.

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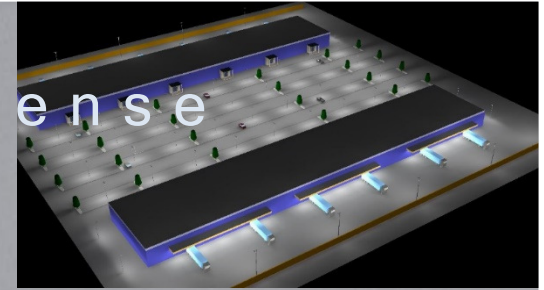
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# Project Experience

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## Manchester City Indoor Training pitch

The Manchester city indoor football training pitch on a fantastic site located in the Etihad Academy 1<sup>st</sup> Team Centre. The lighting was designed to maximise the illuminance levels but minimise the floodlight points for ease of maintenance and minimising down time of the pitch .

The design and installation utilised four rows of ten 2kW wide beam and medium beam double asymmetric floodlight.

Double asymmetric floodlights were used to give good distance throw of illuminance over the pitch while ensuring minimal viewing of the lamp arc avoiding glare to the players.

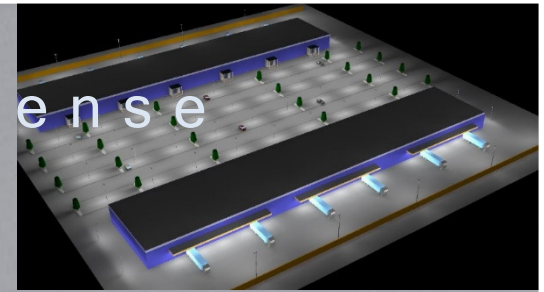
As with all indoor spaces it is a requirement to have emergency lighting this was achieved by using LED batten style luminaires that were self maintained versions to allow ease of indicating any faults that may occur.



# Project Experience

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## Kensington Oval Barbados

I designed the light for this iconic ground in the Caribbean with 4 x 60m fixed masts each carrying up to 80 Challenger 3 floodlights.

The completed system provides lighting levels of 2500Lux on the wicket, 1500Lux inner-circle and 1000Lux on the outfield.

The ground was used for many international televised games and the lighting was seen to increase the revenue of the ground by making playing time more accessible in the week.

The luminaires are precision parabolic floodlights each aimed by gunsight to the aiming co-ordinates set out in the lighting design to give an accuracy of less than 10% of average over the whole pitch areas.

The lighting brought the ground to life in an evening, filling the ground for matches especially when the curse ships were in.

