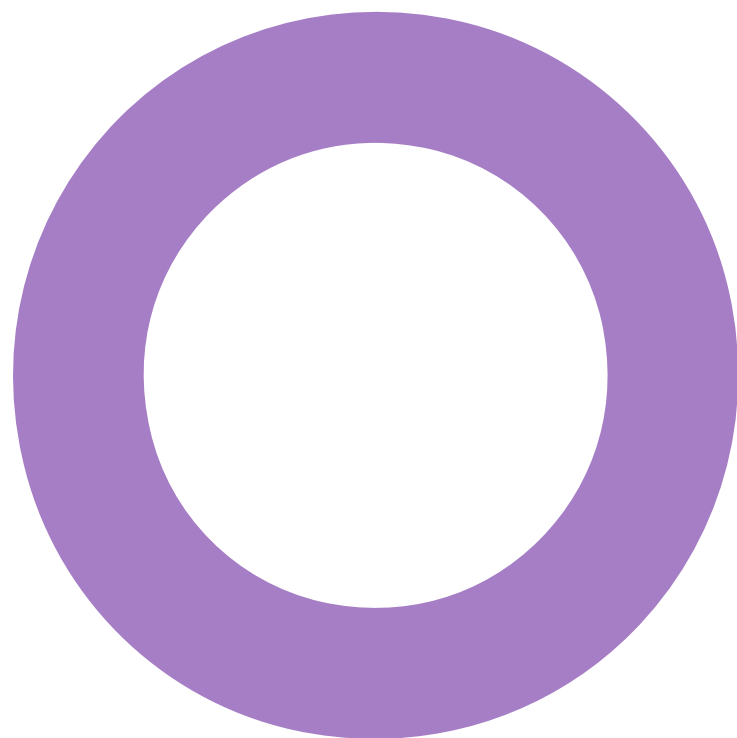


**Ysgol Gymraeg Bro Morgannwg.  
Barry.**  
Vale of Glamorgan County Council.

**MEP ENGINEERING**

MECHANICAL & ELECTRICAL DESIGN NOTE 11  
ALL-WEATHER PITCH FLOODLIGHTING  
REVISION 01 - 06 DECEMBER 2018



## Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	06/12/18	First Issue	IG	JG	AMT

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Project number: 91572

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## Introduction

This design note has been prepared as part of a series of notes that covers the major mechanical and electrical engineering systems for Ysgol Bro Morgannwg.

The project involves the remodelling and extension of the existing Welsh medium secondary school and is being undertaken as part of a wider update of the upgrading of secondary education provision within the town of Barry.

The intention of this design note series is to provide high level descriptions of system alterations and extensions to aid the contractor pricing ahead of the formal overall Stage 3 report due to be issued December 2018. These design notes will form the basis of the final Stage 3 report and will encourage early interaction and debate to ensure the project meets the requirements of the client and end users.

This report centres on the Floodlighting provision for the all-weather pitch.

Due to the nature of the project the school will remain open during the alteration works which are scheduled to take place from June 2019 and complete August 2021. The phasing of the work has been identified in the ISG phasing strategy document with identified phasing from A to U.

ISG Phasing of Works Summary Dates

Work Area	Title / Description	Start Wk	End Wk	Period
A	Set-up site compound	1	3	3
B	Demolition of MFL Teaching Block	1	21	21
C	Construct MUGA	1	17	17
D	Remodelling resource room	7	17	11
E	AWP / Bus drop-off / Running track	17	45	29
F	3 Storey teaching & Sports Hall & Link Bridge	17	57	41
G	New Plantroom	23	50	28
H	New School Entrance	23	50	28
I	Remodelling old plantroom & oil tank room into new kitchen + Dining area	51	78	28
J	Remodelling 6th form atrium	51	78	28
K	Remodelling circulation corridors and room in advance of DT block construction	51	70	20
L	Demolition of Old sports hall & boys changing	55	70	16
M	Remodel and create new corridor to dining room	55	57	3
N	External landscaping around sports hall	55	70	16
O	Remodel Classrooms	58	78	21
P	3 Storey infill with Lift	71	108	38
Q	Remodel classrooms	78	96	19
R	New DT Block	79	108	30
S	Remodel corridor and rooms	79	103	25
T	Remodelling rooms and toilets	97	108	12
U	Remodelling rooms and circulation	103	108	6

## Proposed System

### Lighting Standards and Levels

It is proposed to provide an external floodlighting solution to the all-weather pitch (AWP) for use by the school and members of the public (to act as a revenue stream).

An external floodlighting solution will be provided to the AWP intended for sporting events including rugby and football. The pitch will however be solely designed based on class II for rugby use as this is the most onerous sport to be played on the pitch. Class II, as defined by BS EN 12193, is suitable for training, local and regional level of competition.

The overall calculation area of the artificial grass surface within the fenced area will be 154m by 79m. The pitch will be 144m by 69m.

The following design documents will be utilised to provide a lighting solution:

- BS EN 12193:2007 – Light & Lighting. Sports Lighting
- Sport England Artificial Sports Lighting 2012
- CIBSE LG 4:2006 – Sports Lighting

### Columns

4 No 15M raise/lower hinged floodlighting columns are proposed each side of the 3G pitch.

All columns will be located outside run off zone and fence boundary.

Each column will be installed within a concrete base pad provide by the structural engineer.

A 1.5M wide access path will be provided to allow the raise/lower columns to be lowered and maintained in this area.

Columns will be sited to avoid clashing with the surrounding landscape when lowered. The inner 2 No columns, on each side of the pitch, will lower towards one another. The 2 No outer columns will lower in the opposite direction of one another (this is subject to the landscaping layout).

Raise/lower columns shall be utilised on the project to prevent the dangers of working on columns from height, thus facilitating lamp maintenance and access.

The base of each lighting column will be provided with a removable tape connection routed to a lightning protection earth rod, with pit cover situated in the footpath. The cover shall be provided with key access. Proprietary connections shall be made such that when the column is raised and lowered the lightning protection bonds remain continuous and facilitate the movement of the column.

### Floodlights

Double asymmetric medium beam floodlights/luminaires will be fixed to each column to satisfy the illumination requirements defined within BS EN60598. The design levels are as follows:

Activity	Class	Level	Eave (lux)	Uniformity (Em/Eave)	Colour Rendering (Ra)	Glare (GR)
Rugby	Class II	Club	200	0.6	>60	<50

<sup>1)</sup>The illumination levels may exceed the values above to facilitate 'cross play' use on the 3G pitch.

The front glass of the floodlights will be parallel to the ground to reduce spill and upward light. The housing of the luminaires will be designed to minimise sky glow and upward light. ILE Guidance Notes for the reduction of Obtrusive Light GNO1 will be adhered to.

Floodlight housing to be non-corrosive, high pressure die cast aluminium with hardened glass louvre. All mounting brackets clips, hinges to be hot dipped galvanised steel and or stainless steel.

Lamp types to be LED complete with integral control gear.

A maintenance factor of 0.8 will be assumed when calculating the lighting levels.

### LV Distribution

A three phase metered MCCB supply will be derived from the main LV switchboard within the School to feed a type B 250A three phase floodlight distribution board with integral isolator located within a feeder pillar local to the AWP.

The floodlighting distribution board will be provided with type 1 Surge Protection and will be timeclock controlled. The board will contain protective MCBs used to protect the cables serving the floodlights.

The outgoing ways of the distribution board will feed a contactor panel which will comprise a number of 4P contactors used to control the floodlights.

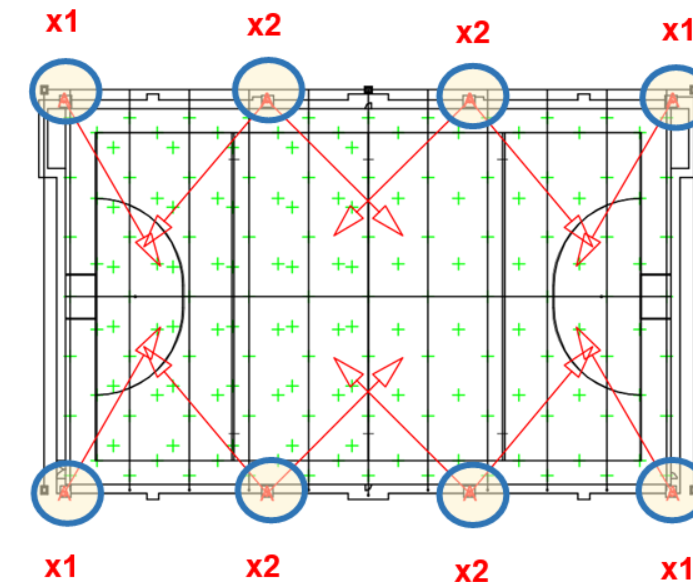
Outgoing cables from the contactor panel (serving the floodlights) will be XLPE/SWA/PVC buried in an underground LV ducting system, with draw pits. The containment system will be routed wherever possible to avoid car parks and roadways, thus facilitating future maintenance and minimising disruption.

### Controls and Switching

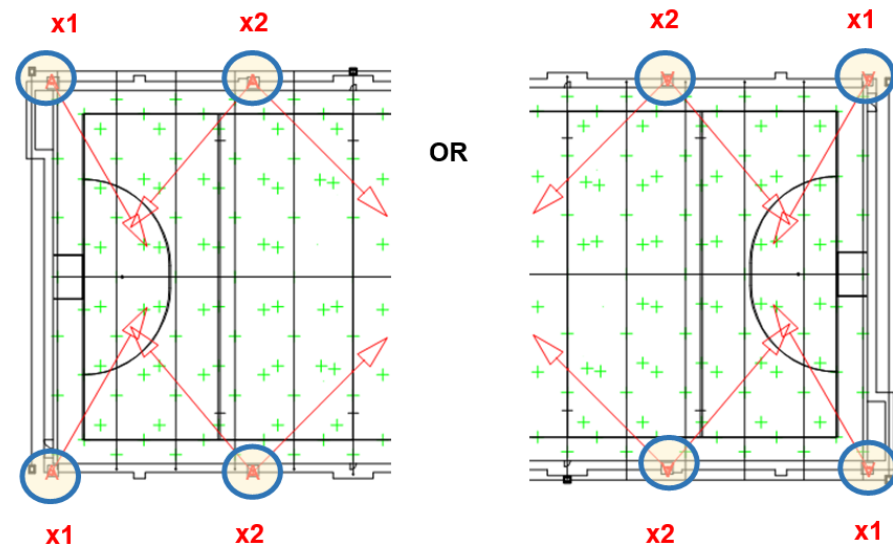
Lighting will be switchable via the contactor panel to allow Club Rugby. The lighting contactor panel will be driven via manual light switches. The lighting control strategy is as follows:

- Switch 1 arrangement: ½ pitch training illumination (left)
- Switch 2 arrangement: ½ pitch training illumination (right)
- Switch 1+2 arrangement: full pitch illumination

For club level illumination, all luminaires will be energised. The luminaires highlighted in blue below will typically be illuminated for full pitch use, however this is subject to lighting calculations.



For half pitch events, one half of the pitch shall be used at any one time i.e. to allow a training session to take place. The luminaires highlighted in blue below will typically be energised to show ½ pitch operation however this is subject to lighting calculations.



It is proposed to install time clock controls to control all floodlights to ensure they cannot inadvertently be left on, to prevent operating during daylight hours and to limit pollution during night-time.



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