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Gary Cowell

From: [REDACTED]
Sent: 02 April 2015 17:20
To: [REDACTED]
Cc: [REDACTED]
Subject: a1503-31 - Proposed Floodlighting Blackburn Rovers Football & Athletic plc Academy Pitch Brockhall Village Old Langho
Attachments: 01a-036-Blackburn836-Layout_md60²_pdf; 02aa-Blkbn832f-5m-500²_pdf; 03aa-SC16-700-701-RL-6-Gib copy_pdf; 04a-Olympic_UK_rev_3_Pages 1-6a_pdf; 06a-a1501-23a-BS_EN_12193 Spill Light Control copy_pdf; 06b-a1202-guidance-notes-light-pollution-2011[1]_pdf

Blackburn Rovers Football & Athletic Ltd
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BB2 4JF

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Floodlighting Report

Proposed Floodlighting:

Blackburn Rovers Football & Athletic plc Academy Pitch Brockhall Village Old Langho.

General Considerations.

The floodlighting is required to meet the specification and standard for high level professional Football as laid out in the Facilities Guidance Notes published by the Football Foundation and Sport England.

The scheme design standard is proposed to meet the requirements for High Level competition providing for an average Horizontal Illumination Level of 500 Lux with a Min/Ave Uniformity of not less than 0.6.

To meet the safety requirements the scheme allows for a Safety Zone between playing lines and the Column positions of not less than 5m.

Where perimeter Fence installations are included, Floodlight Columns are to be situated outside the perimeter fence line or safety barrier.

Existing Floodlighting Systems.

The design proposals take into account the existing floodlighting infrastructure on adjacent sports areas, so as to consider future maintenance costs and Environmental Impact.

The design takes into account the recent comments from the Environmental Health Officers with specific regard to the current floodlighting installed at the Academy pitch ATP installed adjacent to Blackburn Rovers Academy.

Floodlight design and reduction in Source Intensity viewed from adjacent local Residential Properties has been incorporated within the design proposals for this scheme.

As a result the floodlighting design has been based on meeting the requirements of Environmental Zone E.1 – Areas of Outstanding Natural Beauty as laid out within BS.EN 12193.

Specific calculations have been carried out to ensure the Source Intensity meets this requirement.

Proposed Design - Soccer – 500/350/200 Lux Standard.

The floodlighting proposed layout is shown on the attached document 01 showing the proposed column positions

The scheme is designed so as to take into account the impact on the local Environment and reference is made to the Guidance Notes for The Limitation of Spill light Intensity as published within the British & European Standard BS.EN.12193 and the CIBS [Chartered Institute of Building Services] / ILP [Institute of Lighting Professionals].

Within this guide the UK is split down into 4 Environmental Zones covering inner city areas Zone E.4 down to Rural Areas Zone E.2 and finally Areas of Outstanding Natural Beauty – Environmental Zone E.1

It is considered that the location of the playing field within the grounds of the Brockhall Village Old Lanho Academy area, will fall within the category of Environmental Zone E.1 – Areas of Outstanding Natural Beauty.

The floodlighting proposals are therefore designed so as to limit the level of Spill Light Intensity and meet these requirements.

The floodlighting is therefore designed to produce an average Illumination level of 500 Lux over the pitch area with a 0.6 Min/Ave uniformity using a floodlighting system to meet a maximum vertical illumination level of 2 lux and source intensity of not more than 2kcds measured at the windows of surrounding residential properties with an upward light ratio of 0% .

The resultant scheme layout comprises of 8 no 16m high Base Hinged Raise and Lower Columns designed in accordance with BS.5649/EN.40 suitable to support the number and type of floodlights required, supporting a total of 36no 2.15 Kw high efficiency Long Arc Metal halide floodlights.

These floodlight fittings are currently the most efficient system available for the floodlighting of sports pitch areas and currently equal the efficiency of comparable LED systems. It is considered that suitable LED systems will lead to improvements in efficiency within the next 2-4 years 2017-2019.

At this time the unit cost of LED systems are currently some 300% above the equivalent Metal Halide and will not yet provide the beam control necessary to meet the more stringent requirements of Environmental Zone E.1.

Additionally the maximum usage of floodlighting for a typical busy sports pitch area will not exceed 500 hours per annum. Thus the operational hours will not allow a suitable pay back period to allow any predicted potential savings in running costs to be achieved at this time.

Floodlight Control Management.

The floodlighting system has been designed to provide an average horizontal Illumination Level of 500 Lux. However the system will allow the illumination to be reduced to two lower settings at the lower 350 Lux standard and also the minimum standard for Sport England Soccer of 200 Lux.

In addition the lighting may also be reduced to 3 * 1/3 pitch areas for 5 a side cross pitch play for each third of the pitch area.

With this system the lighting may thus be reduced in the event that only parts of the area are required for practice of coaching activities. The lighting may be switched to the lower standard of 350 or 200 Lux for training activities.

This will allow the impact of the floodlighting on surrounding areas to be reduced when these activities are carried out.

Lighting Calculations.

Document ref 02a – provides Lighting calculations for the proposed Soccer pitch area using 8 no 16m high Base Hinged Raise and lower floodlighting columns supporting a total of 36 no 2.15K Metal Halide Floodlights housed within the the Olympic Horizontal Body Ultra Low Glare floodlight assembly.

This unit is fitted with a double asymmetric reflector assembly with adjustable lamp positions so as to allow a reduction of spill light intensity suitable to meet the requirements of environmental Zone e.1 . The floodlights are fitted with an additional external cowl with a dark grey / black powder coat paint finish to limit the impact of spill light intensity

The attached lighting calculations show the Horizontal Illumination level calculations on page 1 together with the maximum Vertical Illumination level calculations

detailed on page 2. Illumination level contour lines have been added so as to show the limit where the measured illumination level meets the requirements of each Environmental Zone.

We have also added an additional Contour line to show where the spill lighting control equals the measured levels of natural Moonlight. Due to the pitch location this is considered important so as to determine where the pitch lighting control meets that produced by natural Phenomena – Moonlight.

This can then be used to consider the impact on the Natural Habitat.

Illumination Level calculations are prepared to show the results measured at ground level. When considering spill lighting to surrounding areas the illumination level reduces as the height above ground increases. Thus the calculations show the maximum levels which may be recorded at specific distances from the pitch perimeter.

We are able to provide additional calculations to demonstrate this aspect.

Floodlight Columns.

The proposed Floodlighting Columns are designed and manufactured in accordance with BS.5649/EN40 specifically to meet the mean wind speed and gust loadings recorded for the Blackburn area of the UK. Columns and foundations are designed to meet these loads, and match the existing structures currently installed on the existing ATP Soccer Academy pitch.

Columns are treated with an external Zinc galvanise protective coating in accordance with BS 729 so as to provide through life protection from corrosion.

The design of the columns includes for the facility to house all electrical control gear within the base compartment of each structure without the need for additional control gear housings adjacent to each column base section.

The use of these structures will allow all future maintenance to be carried out with the same equipment as used on the existing Academy Muga.

The Column mounting height has been calculated so as to minimise the elevation angle of each floodlight, and allow the source Intensity to be controlled and reduced so as to meet the requirements of Environmental Zone E.1.

This reduces the levels of spill light intensity and protects the Natural habitat.

Floodlighting Columns may be provided with an additional protective coating using a pvc/acrylic Icosit paint system with a recommended colour of Green which will allow the columns to blend in with the background. This addition will also extend the design life of the structures by providing an additional protective barrier to the galvanised coating.

Floodlights.

36 no – 2.18 Kw HQI-TS-WNL Olympic Metal Halide Floodlights c/w additional protective powder coat paint system to Aluminium body allows improved through life protection and extended life with reduced operating costs.

The provision of this system will protect the floodlight body and provide improved lumen maintenance to the floodlight, resulting in improved maintained illumination levels recorded through life over the pitch surface.

These floodlights are fitted with a special double asymmetric reflector assembly so as to provide the average specified illumination over the pitch and also limit the spill light intensity suitable to meet the requirements of Environmental Zone e.1.

This new floodlight allows improved beam control without the detrimental effect of additional external louvres currently in use on the existing Academy pitch.

Electrical Load.

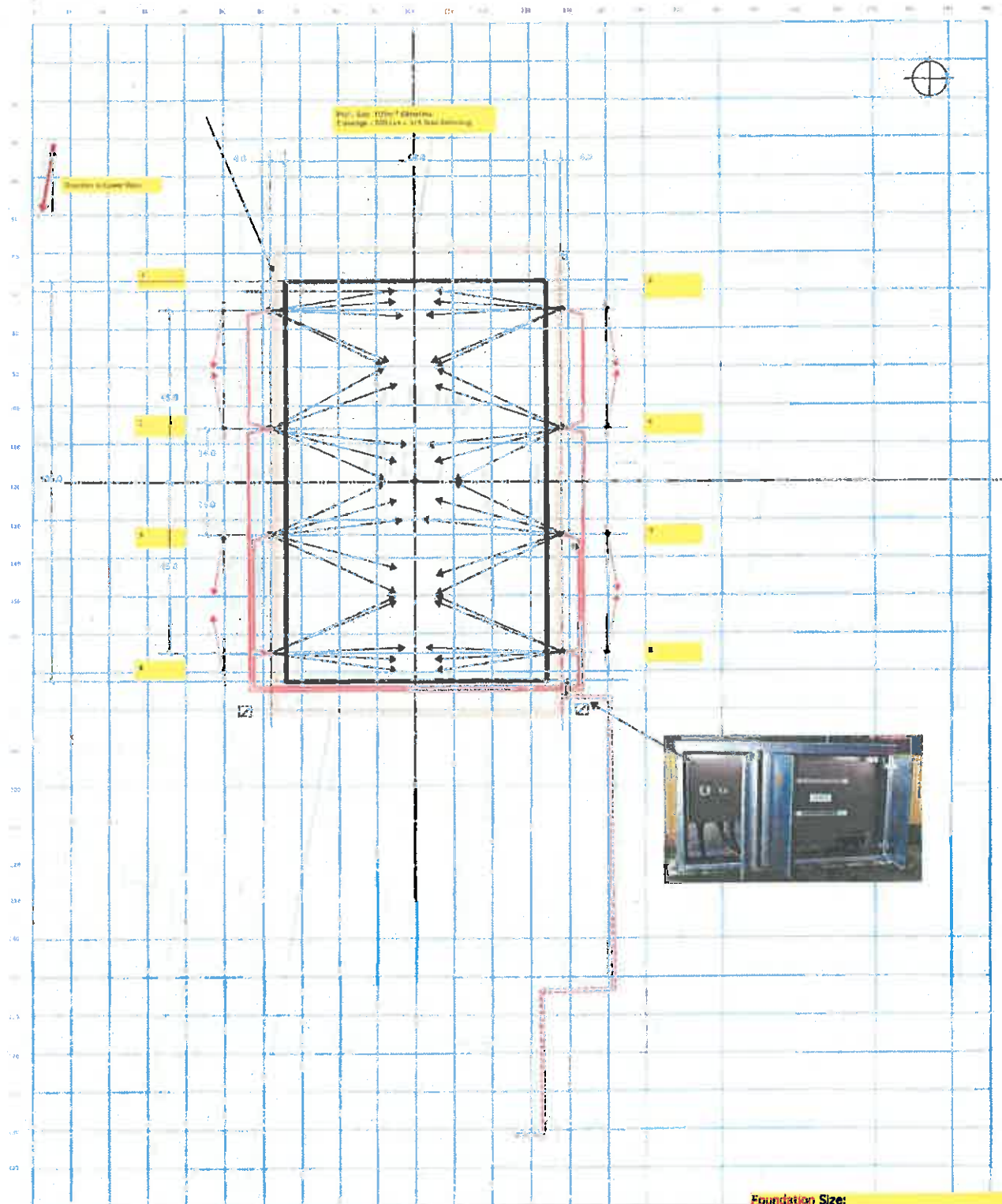
The attached layout diagram Ref 01a also indicates the proposed position to connect the electrical feed to the new floodlighting. At this position it is anticipated there will be provision to support the additional load detailed as follows -

Load 98 KVA 3 Phase & Neutral 240/415 Volt Supply - Max Phase load Running Current at 136 amps / Phase.

We would recommend the Academy confirms with the supply authority to ensure adequate additional capacity is available to support this additional electrical load.

**G.E.Leslie MILP.
Christy Lighting Ltd
8 Northumberland court,
Dukes Park Industrial Estate,
Chelmsford
Essex
CM2 6UW
01245-451212 Fax 01245-451818 Mobile 07802-807033**

Copy: PSD Consultants - Mike Harbridge

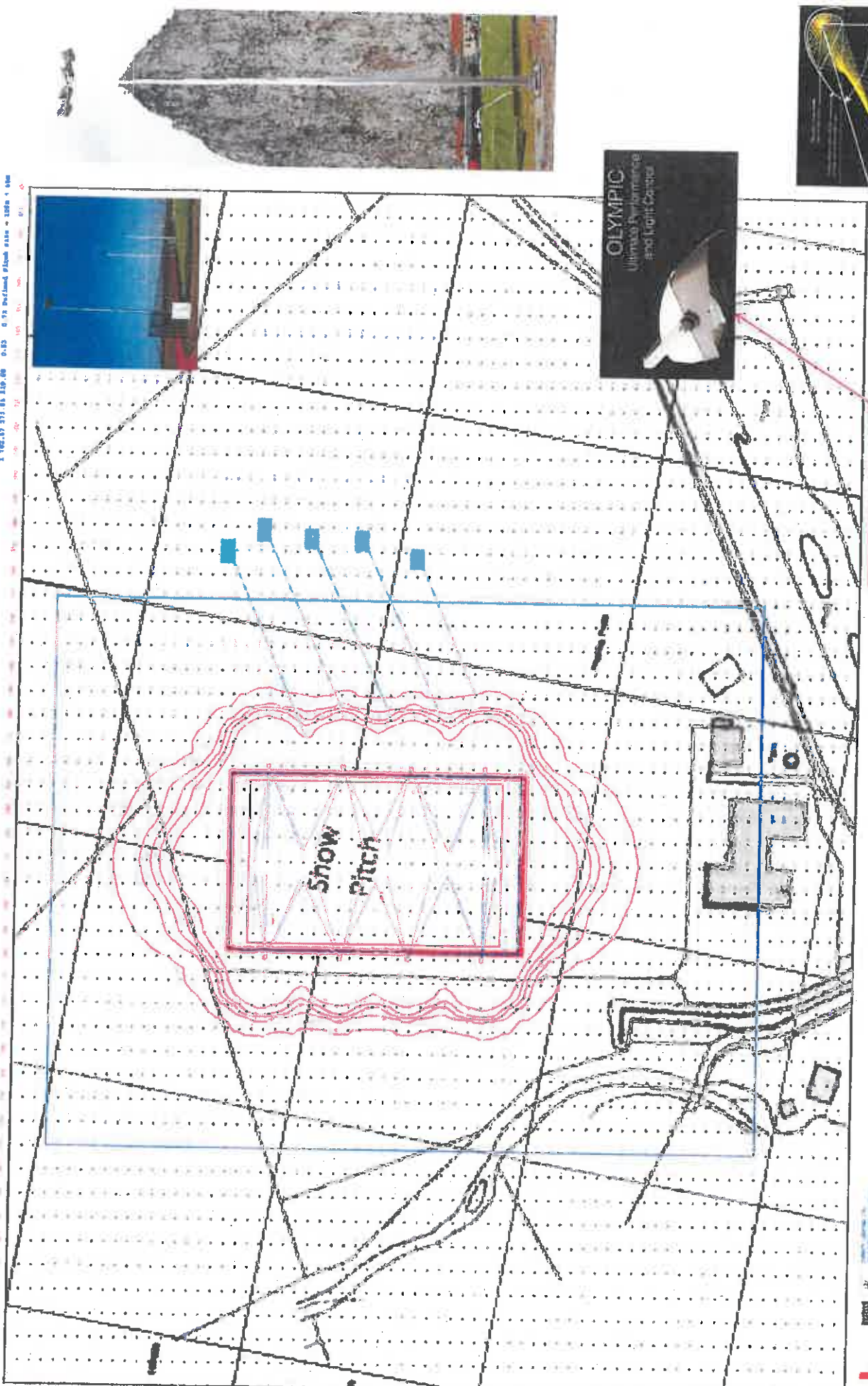


Foundation Size:
Column Type:
SC16-700/871/RL-5
Foundation Bolts:
SFB600/M33*1200
Foundation Size:
1200mm * 1200mm * 1550mm deep.

PROPOSED NEW SMF/Olympic - 3272— 2180 Watt HQ-TS-WNL Floodlight mounted at 16 metres
 Scale 1:1000 jrm/ed/ra/1



Page 1
 Horizontal Illumination
 Calculation at pitch level - 836 - 16m Base Hinged Raise & Lower Columns.
 Contour lines showing levels of Spill Light Intensity for compliance with BS:EN 12183 Environmental Zones E.1 to E.4
 Christy Lighting Ltd. Bilton832F-Blackburn Rovers Academy Show Pitch Team 1 Training Pitch Lighting 500 Lux standard.
 22-Mar-2015 (Horizontal)



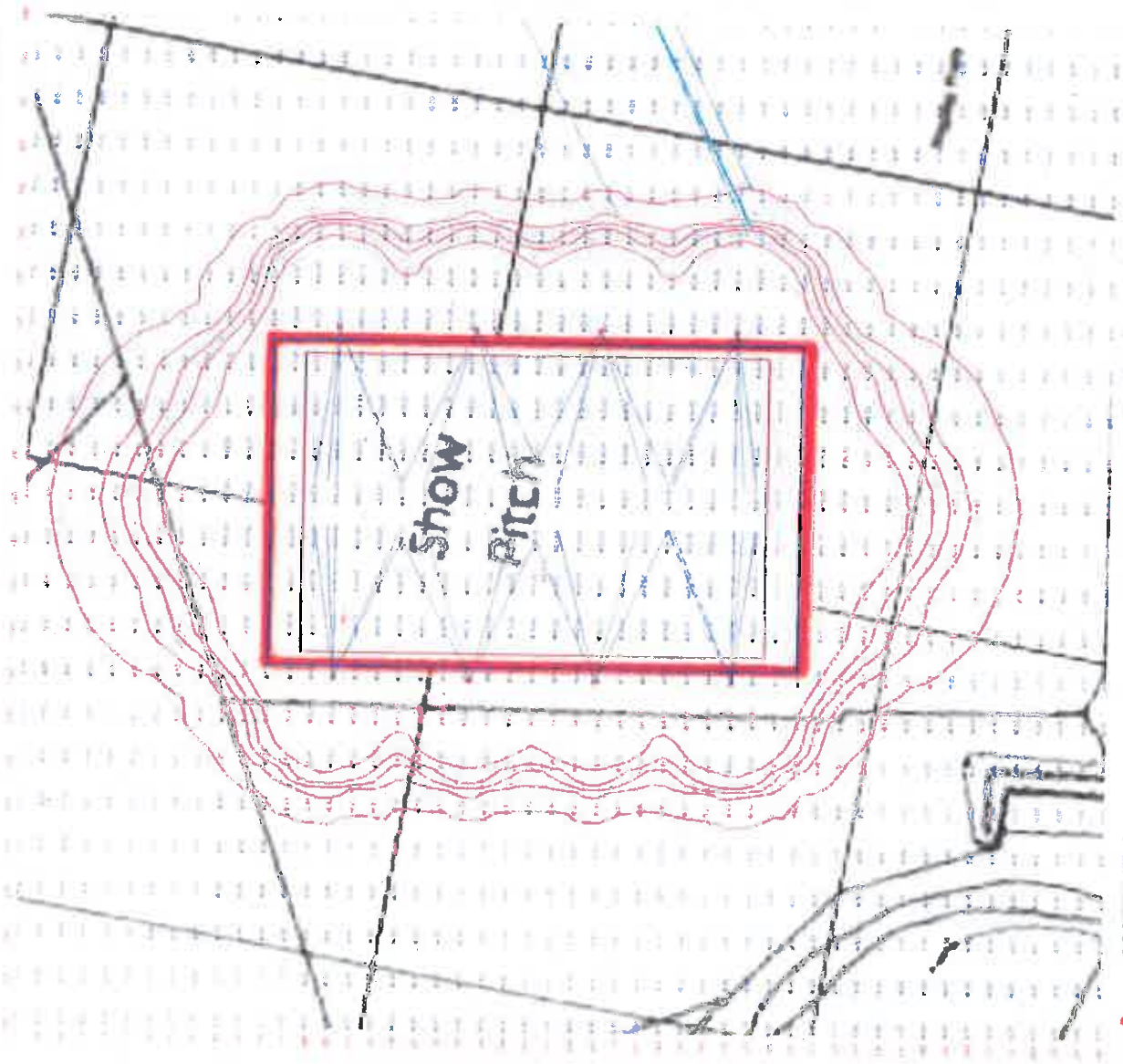
Illumination results (Horizontal)
 Max 852 699 845
 1 102.87 212.83 110.08 0.83 0.75 0.75
 100 200 300 400 500 600 700 800 900 1000



Ultra Low Glare Traffic Assembly



Page 2. Horizontal illumination.
 Calculation at pitch level - 836 - 16m Base Hinged Raise & Lower Columns.
 Contour lines showing levels of Spill Light Intensity for compliance with BS EN 12193 Environmental Zones E.1 to E.4
 Blackburn Rovers Football & Athletic plc Academy pitch Brookhall Village Old Langda.
 Pitch Size: 106m x 68m Area: 7208m² 70m.
 Calculations to show levels of horizontal illumination measured on the Horizontal Plane at ground level.



Page 3. Maximum Vertical Illumination Blackburn Rovers Football & Athletic, pic Academy Pitch Brookhall Village Old Langho. Calculation at pitch level. - 836 - 46m. Base Hinged Raise & Lower Columns. 500 / 360 / 200 Lux pitch standard - 5m * 5m Grid. Pitch Size: 106m * 68m. Area 120m * 70m. Contour lines showing levels of Spill Light Intensity for compliance with BS:EN 12193 Environmental Zones E.1 & E.4. Calculations to show levels of Vertical Illumination measured on the Vertical Plane at 0.1m x 0.1m

Christy Lighting Ltd Bilbim832: Blackburn Rovers Academy Show Pitch Team 1 Training Pitch Lighting 500 Lux standard. 22-Mar-2015 (Normal to TV)



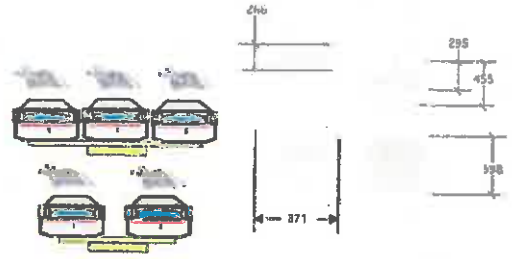
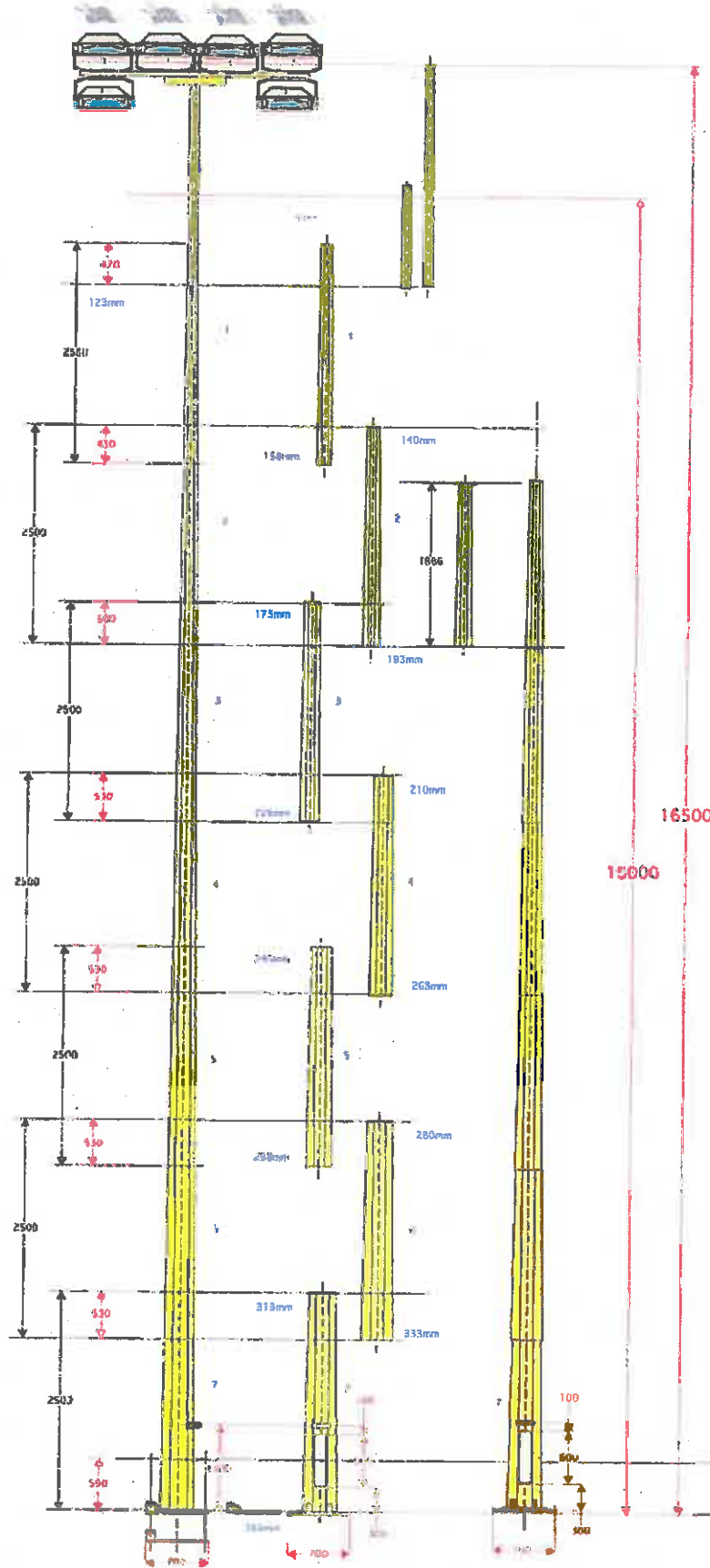
BS EN 12193
 Table 1 - Minimum Light Intensity for External Lighting Installations

Environmental Zone	Daytime (lx)	Evening (lx)	Night (lx)
E.1	10	10	10
E.2	10	10	10
E.3	10	10	10
E.4	10	10	10

a05 - a12-0112594
 SC15-700/703/RL-4 15m & 16m - Lighting Mast
 BASE HINGED RAISE & LOWER MAST
 PREPARED FOR :-
 Scale 1:50 printed on A3.

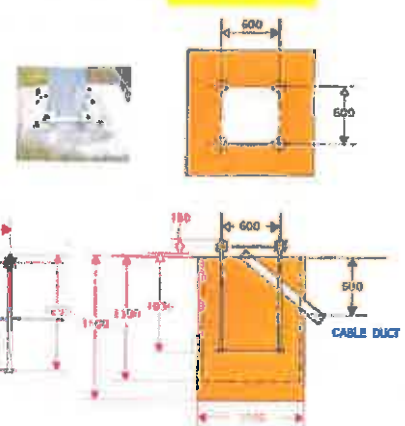


CHRISTY LIGHTING LTD
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 01245-451212 FAX 01245-451018.



FOUNDATION BOLT CENTRES BASE SECTION 7 & 8.
 PROPOSED FOUNDATION SIZE FOR NORMAL SOIL CONDITIONS - 180 KN/PM

Foundation Bolt M33 x1200





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Christy Lighting Ltd Btkhs8325-Blackburn Novena Academy Show Pitch Team 1 Training Pitch Lighting 500 Lux standard. 22-Mar-2015

note note note note note note note note 14-Pitch Lighting.

0216 x0 0.00 y0 0.00 zMax 500.00 yMax 350.00

Sub-grid

sum s0 y0 zMax yMax enabled

1 186.00 97.50 254.00 202.50 YES Refined Pitch wise - 105m x 89m

TV x 220.00 y 150.00 z 13.00

Pleedlights

Run	x	y	z	slew	bars	x	y	flux	enabled	circuit	data
1	180.00	105.00	16.00	65.65	188.13	215.00	106.00	220.00	YES	1:0M	3271
2	180.00	105.00	16.00	65.47	183.27	215.00	203.00	220.00	YES	1:0M	3271
3	180.00	105.00	16.00	65.43	180.00	215.00	105.00	220.00	YES	none:0M	3271
4	180.00	105.00	16.00	65.95	157.01	213.00	119.00	220.00	YES	1:0M	3271
5	180.00	105.00	16.00	61.64	154.89	212.00	120.00	220.00	YES	1:0M	3271
6	0.00	0.00	0.00	nan	nan	0.00	0.00	0.00	NO	none:OFF	3271
7	180.00	136.00	16.00	65.91	206.37	212.00	120.00	220.00	YES	1:0M	3271
8	180.00	136.00	16.00	66.44	197.45	215.00	123.00	220.00	YES	1:0M	3271
9	180.00	136.00	16.00	66.12	185.58	215.00	145.00	220.00	YES	1:0M	3271
10	0.00	0.00	0.00	nan	nan	0.00	0.00	0.00	NO	none:OFF	3271
11	180.00	164.00	16.00	65.79	203.63	212.00	150.00	220.00	YES	1:0M	3271
12	180.00	164.00	16.00	66.12	194.42	215.00	155.00	220.00	YES	1:0M	3271
13	180.00	164.00	16.00	66.12	165.56	215.00	173.00	220.00	YES	1:0M	3271
14	0.00	0.00	0.00	nan	nan	0.00	0.00	0.00	NO	none:OFF	3271
15	180.00	195.00	16.00	67.42	155.43	215.00	180.00	220.00	YES	1:0M	3271
16	0.00	0.00	0.00	nan	nan	0.00	0.00	0.00	NO	none:OFF	3271
17	180.00	195.00	16.00	67.21	201.20	215.00	180.00	220.00	YES	1:0M	3271
18	180.00	195.00	16.00	67.00	201.80	215.00	181.00	220.00	YES	1:0M	3271
19	0.00	0.00	0.00	nan	nan	0.00	0.60	0.60	NO	none:OFF	3271
20	260.00	185.00	16.00	65.55	351.87	225.00	100.00	220.00	YES	6:0M	3271
21	260.00	185.00	16.00	65.47	356.73	225.00	203.00	220.00	YES	6:0M	3271
22	260.00	185.00	16.00	65.43	0.00	225.00	105.00	220.00	YES	none:0M	3271
23	260.00	185.00	16.00	67.00	21.80	225.00	113.00	220.00	YES	6:0M	3271
24	260.00	185.00	16.00	67.21	23.20	225.00	120.00	220.00	YES	6:0M	3271
25	0.00	0.00	0.00	nan	nan	0.00	0.00	0.00	NO	none:OFF	3271
26	260.00	185.00	16.00	67.42	335.43	225.00	120.00	220.00	YES	6:0M	3271
27	260.00	185.00	16.00	66.44	342.55	225.00	135.00	220.00	YES	6:0M	3271
28	260.00	185.00	16.00	66.12	14.42	225.00	145.00	220.00	YES	6:0M	3271
29	260.00	185.00	16.00	64.21	25.02	230.00	150.00	220.00	YES	6:0M	3271
30	0.00	0.00	0.00	nan	nan	0.00	0.00	0.00	NO	none:OFF	3271
31	260.00	185.00	16.00	64.21	334.98	230.00	150.00	220.00	YES	6:0M	3271
32	260.00	185.00	16.00	66.12	345.58	225.00	155.00	220.00	YES	6:0M	3271
33	260.00	185.00	16.00	66.44	17.45	225.00	175.00	220.00	YES	6:0M	3271
34	260.00	185.00	16.00	67.42	24.57	225.00	180.00	220.00	YES	6:0M	3271
35	0.00	0.00	0.00	nan	nan	0.00	0.00	0.00	NO	none:OFF	3271
36	260.00	185.00	16.00	67.21	336.80	225.00	180.00	220.00	YES	6:0M	3271
37	260.00	185.00	16.00	67.00	338.20	225.00	181.00	220.00	YES	6:0M	3271
38	260.00	185.00	16.00	65.43	0.00	225.00	195.00	220.00	YES	none:0M	3271
39	260.00	185.00	16.00	65.47	3.27	225.00	197.00	220.00	YES	6:0M	3271
40	260.00	185.00	16.00	65.65	8.13	225.00	200.00	220.00	YES	6:0M	3271