PATRICK PARSONS

External Lighting Proposal

White Water Rafting Centre
Dublin

for

Dublin City Council

N17397

May 2019

External Lighting Proposal

White Water Rafting Centre

for

Dublin City Council

Revision	Date of issue	Comments	Prepared By	Checked By
P1	13/05/2019	Issued for Planning	JRH	JRH
P2	16/05/2019	Issued for Planning	JRH	JRH
P3	25/07/2019	Project Description Updated	JRH	JRH

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PATRICK PARSONS

Contents

1.0 Executive Summary

Patrick Parsons have been commissioned to propose a conceptual design and subsequent report for the purpose of planning application on the proposed external lighting scheme. The scheme serves as artificial lighting to the Water Rafting Course to allow the course to be used during times of low ambient light as well as maintain the safety and security of the site during periods of non-operation. The purpose of the report is to demonstrate the effect proposed external lighting has on the adjoining neighbourhood.

This report illustrates that, provided the specified lighting design is implemented, the ILP Obtrusive light limits have been satisfied by the design. Luminaires have been selected with no upward light component and Sky glow levels associated with the development will not have a significant effect on the surrounding environment. A fully functional artificially illuminated Water Rafting Facility should be achievable with relatively minimal over spill of light into adjacent properties and the public highway.

2.0 Introduction

2.1 Project description

Patrick Parsons have been appointed to produce an external lighting strategy and report for the proposed Water Rafting Course at Georges dock, Dublin.

The proposed development provides provision of water based recreational facility at George's Dock and Custom House Quay, Dublin 1, incorporating the following:

a. provision of a white water rafting course utilising the existing George's Dock basin, which is a protected structure, including;

   i. central flat water training facility including water polo amenity,
   ii. white water slalom course,
   iii. kayak/raft conveyor,
   iv. pumping station and water treatment plant,
   v. a mechanical control centre and electrical substations,
   vi. enhancement of existing public lighting and provision of low illumination level floodlighting for waterbased activities; and
   vii. swift water rescue centre with floodable urban street with mock enclosures forming a 'rescue village'.

b. The demolition of former Dublin Docklands Development Authority office building and removal of 6 no. existing trees at Custom House Quay. Construction of two new quayside buildings with a combined total floor area of 763.98 m² and maximum height of 5.5m. The east building incorporating land based activities including changing rooms, reception, staff amenity area, equipment storage. The west building comprising replacement offices and conference room for the use of Dublin City Council Docklands office. Ancillary landscaped public open space between these proposed quayside buildings including surface water attenuation area and quayside walkway;

c. Reconfigured and resurfaced public open space where necessary to the existing plaza at Georges's Dock, including the removal of 4 no. existing trees, making good any damage caused by construction work, and the provision of temporary construction compound. Connection to public surface water drainage system; and

d. Conservation and protection works to the lock gate and quay walls together with retention and protection of the triumphal arch on site and the partial removal of the timber boardwalk and insertion of access structures to the canal channel at the sea wall.

It is anticipated the course will be used from early morning into the evening through all seasons. When not in use, the course presents both security and water hazard risk. It is therefore proposed that the exterior lighting will be primarily for the operation of the water leisure facility safely during periods of low ambient light and secondarily for pathway and security lighting across the site during hours of non-operation.

2.2 Standards and Regulations

During the design process, the following documents were referenced in order to gain an understanding of current guidance and regulatory information relating to this lighting scheme and environment.

Numerical guidance on suitable lighting levels to limit obtrusive;

- Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Lighting (GH01:2011)
- Commission Internationale de l'Eclairage (International Commission on Illumination; CIE), Guide on the limitation of the effects of obtrusive light from outdoor lighting installations, 2003.
- NSAI, Lighting of workplaces – Outdoor workplaces, IS EN 12464-2:2014. This also provides recommended lighting levels for various outdoor work premises.
- Chartered Institute of Building Services Engineers (CIBSE) Lighting Guide LG6 2016 "The Exterior Environment"
- Chartered Institute of Building Services Engineers (CIBSE) Lighting Guide LG4 2014 "Sports Lighting"

3.0 Site Location and Considerations

In advance of the external lighting design, a desktop study of the site location was carried out in order to assess the proximity of residential property, the site topography, existing structures and any other redeeming aspects of the development. Following this, a review was carried out to identify which, if any, adjacent properties would be affected by the proposed lighting scheme.

Figure 1 - Aerial view indicating proposed site location

The scheme is located amongst a built-up commercial area of Dublin City Centre consisting of; offices, bars, restaurants, a museum and cafés with no privately-owned residential premises within close proximity.

The North of the scheme directly borders cafés and convenience stores as well as being in close proximity of Georges Dock Road. The East of the scheme is within close proximity of Bars and Restaurants. The South is primarily adjacent Custom House Quay road and the West is adjacent multi storey offices. The only current foliage is to the East in the form of seasonally blooming trees between the course and the bars/restaurants.

The following properties are considered as having a risk of being affected by the proposed scheme;

1. Cafés and convenience stores directly bordering the site to the North
2. Georges Dock Road
3. Bars/Restaurants with close proximity to the East of the site
4. Custom House Quay road to the South

The proposed external lighting will be within the proximity of other buildings and foliage. The advanced nature of the luminaire optics, photometric performance and mounting arrangement of the luminaires used, are arranged to contain the light emission within the sports facilities boundary as far as is reasonably practicable, while minimising light spill to surrounding areas. It cannot be overstated enough that the careful placement and aiming of the luminaires is critical to allow the precise criteria to be achieved.

The Existing lighting around the perimeter of the project are bespoke in construction and we do not have access to their photometric data. We are therefore not able to include the existing lighting within the modelling. A detailed site assessment of the existing lighting has not been carried out to confirm the current lighting levels, however for the purposes of this report we have assumed that this is a public footpath in an urban area with mixed recreational and commercial land use; A P4 class lighting design has been provided by the existing scheme based upon an E4 environmental class (Refer to Table 1 in section 5 for definition) giving an average of 5-7.5lux and a minimum of 1lux.

4.0 Lighting Control Strategy

Control of the external lighting will be provided via an arrangement of a time switch, daylight sensors and dimmable lighting. The anticipated operation of the external lighting will be capable of being prohibited or dimmed to a lower level by time switches between defined time constraints. Daylight sensors shall also inhibit the operation of the external lighting should sufficient daylight be available. This arrangement allows the external lighting to operate only during prescribed hours and only when ambient light is insufficient.

It is proposed that the facility will be continuously lit during the hours of darkness to a level of approximately 10lux average for both safety and security. This will utilise the time switch and daylight sensors to dim the lighting fixtures to a pre-set level.

For operation of the Water Rafting Course during periods of insufficient daylight, the facilities staff shall operate a manual “RUN” push button switch located at the feeder pillars on the course. This shall ramp the luminaires up to a predetermined level to provide artificial lighting suitable for the sport activity. When the facility is no longer in operation the facilities staff shall operate a manual “END” push button to ramp the lighting level back down to the background lighting level (10lux average). To avoid lighting being left at high output when not in use it is proposed that the lighting controls will be connected to the Motor Control System to automatically ramp the lighting down from the “RUN” level to the “END” level over a set period should the pumps not be running and the “END” button has not been pressed.

A facility to manually over-ride the external lighting for maintenance shall also be provided.

Should a Curfew be imposed on the development the time switch shall inhibit or reduce the lighting during these hours.

5.0 Institute of Lighting Professionals (ILP) Criteria

The Institution of Lighting Professionals (ILP) has produced general guidance on the numerical limits of artificial light. These limits are defined into different zones based on the environmental area, such as Urban or Suburban. A zone will not necessarily encompass the whole of a town or village. For example, a town may have areas of relative darkness such as parks or woodland, where artificial light would cause more ecological harm and be more obtrusive, making lower light levels desirable. Conversely, where a town or large village is situated in a national park it would be appropriate to use the more relaxed light trespass limits for zone E2 or E3 within the village or town itself. Some local authorities also give their own guidance on which zones apply within their area.

Light trespass and over illuminance can be avoided by the careful selection, positioning, aiming and shielding of luminaires and by operating a curfew system where lighting is only available during specified times.

The ILP Environmental Zones can be found in Table 1 of ILP GN01:2011 and are echoed below;

Environmental Zones			
Zone	**Surrounding**	**Lighting Environment**	**Examples**
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically Dark	National Parks, Areas of Outstanding Natural Beauty Etc.
E2	Rural	Low District Brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium District Brightness	Small town centres or suburban locations
E4	Urban	High District Brightness	Town/city centres with high levels of night time activity

Table 1 - Environment Zones (Taken from ILP GN01:2011)

Where an area to be lit lies on the boundary of two zones the obtrusive light limitation values used should be those applicable to the most rigorous zone. Note an E0 zone must always be surrounded by an E1 zone.

The proposed development has been considered as an **E4 zone, Urban with high district brightness**. Therefore, all stated values are in accordance with the requirements for this zone.

The numerical limitations are indicated in the following table are based upon Table 2 of ILP GN01:2011, however may be supplemented or replaced by a local planning authorities own planning guidance for exterior lighting installations.

Obtrusive Light Limitations for exterior Lighting Installations – General Observers						
Environmental Zone	Sky Glow ULR [Max%](1)	Light Intrusion (into Windows) E_v [lux](2)		Luminaire Intensity I [candelas] (3)		Building Luminance Pre-curfew (4)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L [cd/m^2]
E0	0	0	0	0	0	0
E1	0	2	0(1*)	2500	0	0
E2	2.5	5	1	7500	500	5
E3	5.0	10	2	10000	1000	10
E4	15	25	5	25000	2500	25

Table 2 Obtrusive light limits (Taken from ILP GN01:2011)

ULR = Upward Light Ratio of the Installation is the maximum permitted percentage of luminaire flux that goes directly into the sky.

Ev = Vertical Illuminance in Lux - measured flat on the glazing at the centre of the window.

I = Light Intensity in Candelas (cd)

L = Luminance in Candelas per Square Metre (cd/m2)

Curfew = the time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by the local planning authority. If not otherwise stated - 23.00hrs is suggested.

* = Permitted only from Public road lighting installations

(1) Upward Light Ratio – Some lighting schemes will require the deliberate and careful use of upward light, e.g. ground recessed luminaires, ground mounted floodlights, festive lighting, to which these limits cannot apply. However, care should always be taken to minimise any upward waste light by the proper application of suitably directional luminaires and light controlling attachments.

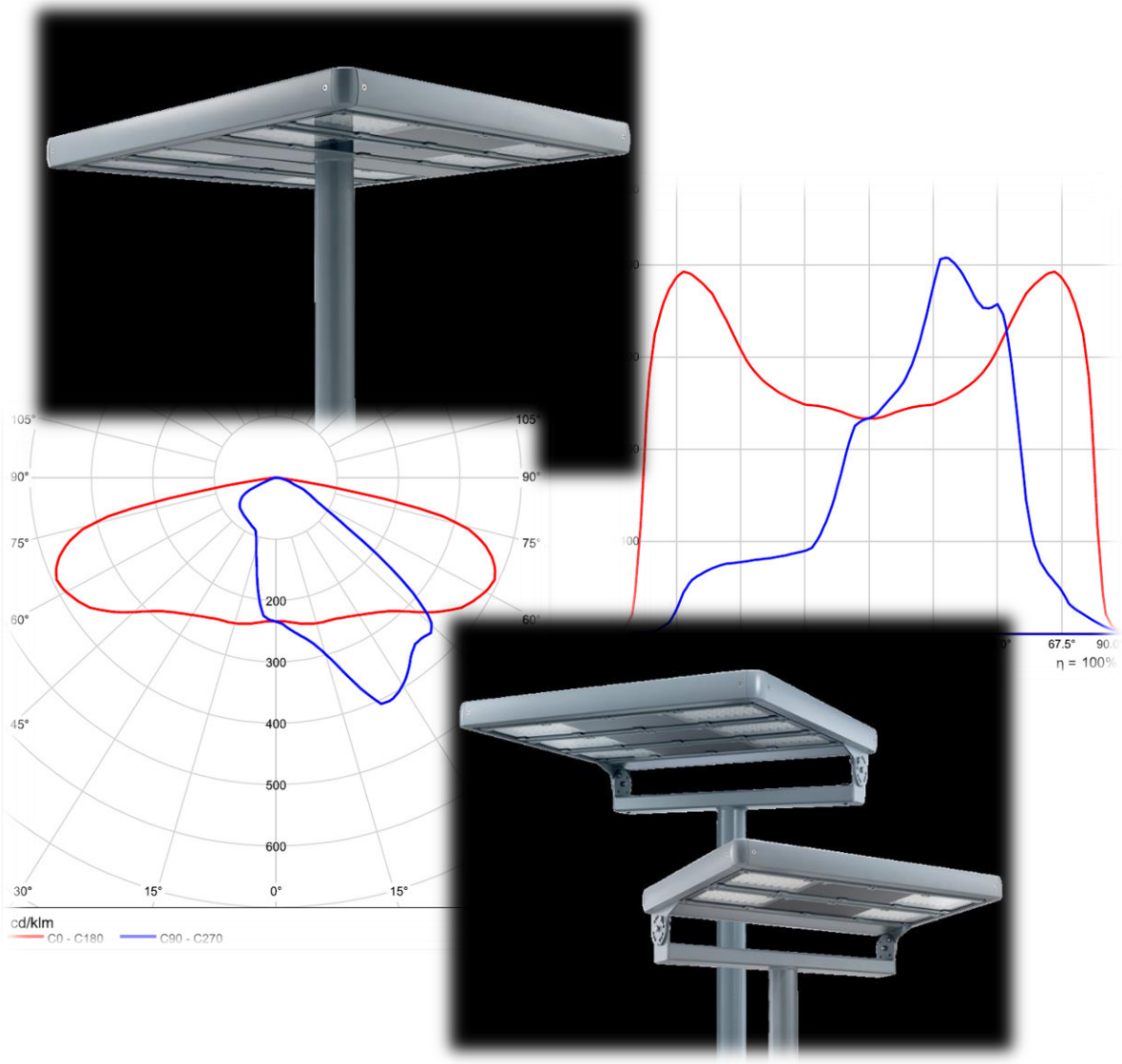
(2) Light Intrusion (into Windows) – These values are suggested maxima and need to take account of existing light intrusion at the point of measurement. In the case of road lighting on public highways where building facades are adjacent to the lit highway, these levels may not be obtainable. In such cases where a specific complaint has been received, the Highway Authority should endeavour to reduce the light intrusion into the window down to the post curfew value by fitting a shield, replacing the luminaire, or by varying the lighting level.

(3) Luminaire Intensity – This applies to each luminaire in the potentially obtrusive direction, outside of the area being lit. The figures given are for general guidance only and for some sports lighting applications with limited mounting heights, may be difficult to achieve.

(4) Building Luminance – This should be limited to avoid over lighting, and related to the general district brightness. In this reference building luminance is applicable to buildings directly illuminated as a night-time feature as against the illumination of a building caused by light spill from adjacent luminaires or luminaires fixed to the building but used to light an adjacent area.

6.0 Proposed Luminaire Characteristics

The exterior lighting proposal utilises a column mounted luminaire. The DW Window Katana Urban Luminaires have been selected due to their extensive optic options, modular arrangement and light output control as well as their un-obtrusive appearance, avoiding a typical sport lighting floodlight appearance detracting from the ambience of the city centre.



Standard options

Katana Post Top

For mounting at 8-20 metres

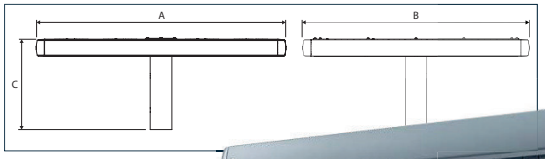
Options

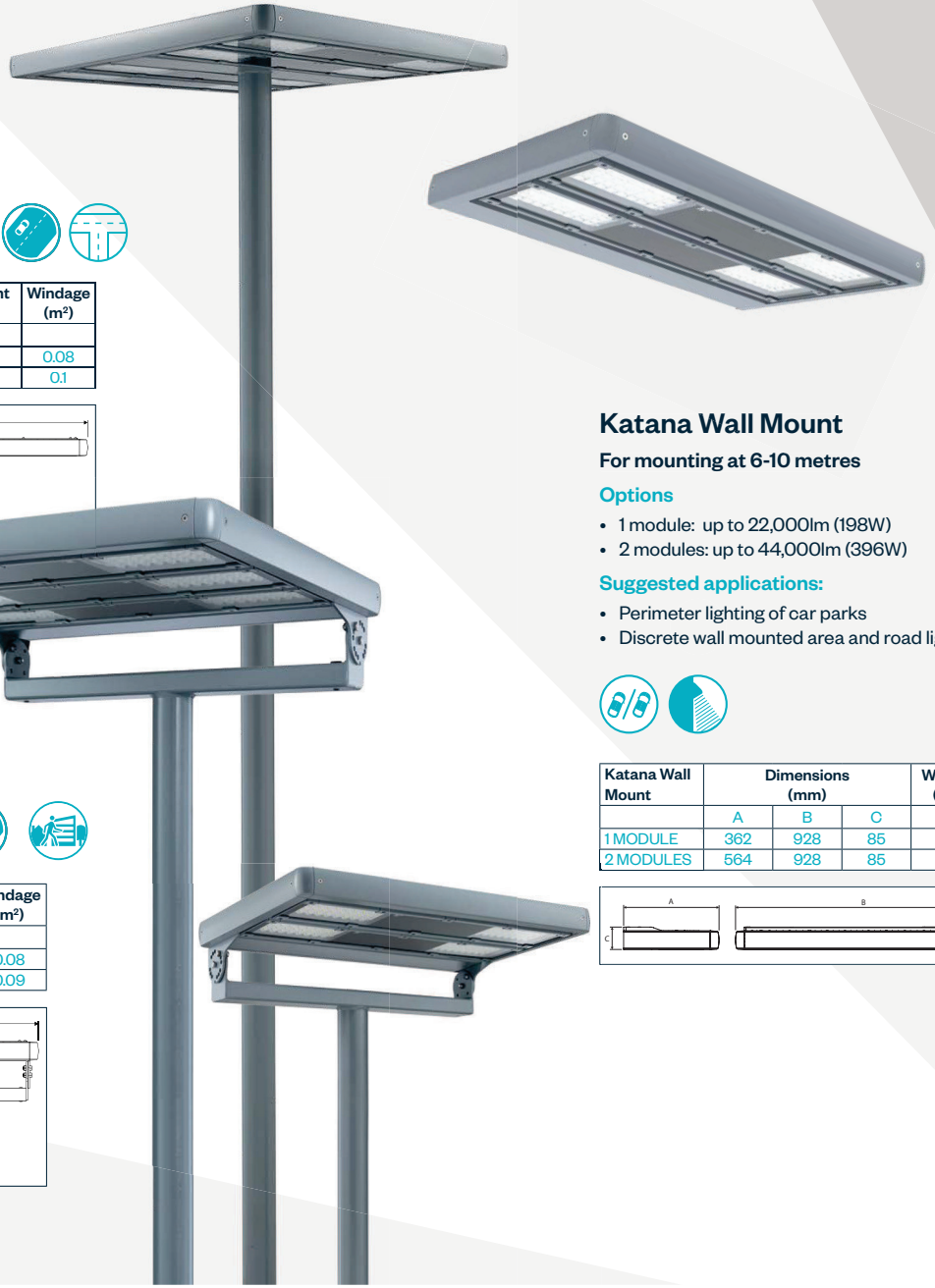
- 2 modules: up to 44000lm (396W)
- 4 modules: up to 88000lm (792W)

Suggested applications:

- Car park lighting
- Large road lighting / junction lighting

Katana Post Top	Dimensions (mm)			Weight (kg)	Windage (m^2)
	A	B	C		
2 MODULES	620	928	374	38	0.08
4 MODULES	1023	928	374	56	0.1





Katana Direct Post

For mounting at 8-15 metres

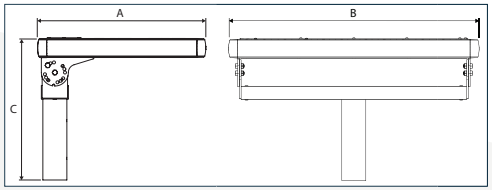
Options

- 2 modules: up to 44000lm (396W)
- 3 modules: up to 66000lm (594W)

Suggested applications:

- Perimeter lighting of car parks
- High level road lighting
- Large public spaces

Katana Direct Post	Dimensions (mm)			Weight (kg)	Windage (m^2)
	A	B	C		
2 MODULES	623	928	526	44	0.08
3 MODULES	823	928	526	49	0.09



Katana Wall Mount

For mounting at 6-10 metres

Options

- 1 module: up to 22,000lm (198W)
- 2 modules: up to 44,000lm (396W)

Suggested applications:

- Perimeter lighting of car parks
- Discrete wall mounted area and road lighting

Katana Wall Mount	Dimensions (mm)			Weight (kg)
	A	B	C	
1 MODULE	362	928	85	23
2 MODULES	564	928	85	34

Introducing Diamond+

With 24 standard optical distributions for ultimate flexibility and precise lighting control

An evolution of our award-winning and patented Diamond Optic® reflector technology, Diamond+ gives you the ability to create widely different lighting distributions from a single luminaire.

Choose Diamond+ for refined lighting distribution

Diamond+ A Optic

Options:
A1, A2, A3, A4 or A5

Typical applications:
Wide roads and dual carriageways (M classes)

Diamond+ B Optic

Options:
B1, B2, B3, B4 or B5

Typical applications:
Narrow roads and footpaths

Diamond+ C Optic

Options:
C1, C2, C3, C4 or C5

Typical applications:
Area applications

Diamond+ D Optic

Options:
D1, D2, D3, D4 or D5

Typical applications:
Standard roads and wide footpaths

Diamond+ F Optic NEW

Options:
F1

Typical applications:
Perimeter lighting and car parks

Please refer to dwwindsor.com/katana for full optical configurations

Optical accessories

Obtrusive light shields for zero upward light

Katana Module – Specification

IP66 | IK09 | CLASS I | CLASS II

Features

Highly efficient, configurable lighting solution

Flexible range of outputs and lighting distributions

Ability to combine different distributions in a single module for ultimate optical flexibility

Flexible mounting options

High efficacy

Fully controllable

Optical control

Diamond+ (see page 5)

Obtrusive light shield(s)/hood

Optional diffuse glazing (on special request)

Light source

LEDs: Luxeon TX

Number of LEDs: 64

L90 lifetime prediction

In excess of 100,000 hours (all variants)

Colour temperature

2700K (very warm white)

3000K (warm white)

4000K (neutral white)

Colour rendering index

70Ra (3000 / 4000K)

80Ra (2700 / 3000K)

Luminaire efficacy

Up to 130lm/W (total measured luminaire efficacy)

Drive Current

From 200mA – 1000mA (in 50mA increments)

Gear, switching and control

LED Driver: Philips Xi Lite / Fully programmable

Switch: On/off through conventional PEC or NEMA photocell

Dim: Factory set dimmed / customer specified dimming

CMS: Compatible with all available CMS systems

Surge protection

10kV as standard

Colours

RAL 9005 Black

RAL 7046 Mid Grey

RAL 7035 Light Grey

Other RAL colours on special request

Materials

Body: High pressure die cast aluminium

Glazing: Toughened glass

Seals: Silicone

Finish: Fine texture polyester powder coat

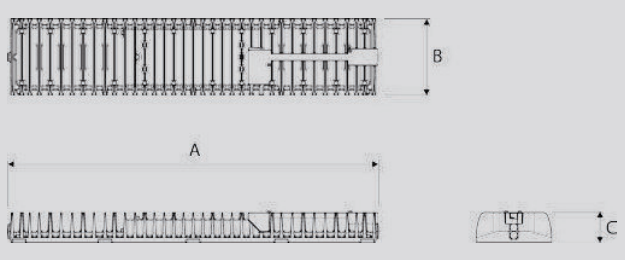
Installation and maintenance

Each module individually adjustable (5° increments)

Operational temperature range: -45° to +50°C

Modules supplied pre-cabled to suit application

For luminaire weight and windage please see pages 4 and 5



	Dimensions (mm)			Weight (kg)
	A	B	C	
SINGLE MODULE	860	176	70.5	10

DW Windsor

Pindar Road, Hoddesdon, Hertfordshire, EN11 0DX

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dwwindsor.com

MADE IN BRITAIN

July 2017

7.0 Design Illuminance Levels

Design illuminance levels have been based upon those stipulated in CIBSE Lighting Guide 4 "Sports Lighting" and ISEN 12464-2:2014 Table 5.1 "General requirements for areas and for cleaning at outdoor workplaces" ref 5.1.1 "walkways exclusively for pedestrians" and given below;

Design illuminance Levels				
Area, Task or Activity	**$\bar{E}_m$ (lx)**	**U_o**	**R_{GL}**	**R_a**
Walkways exclusively for pedestrians	5	0.25	50	20
Canoe Slalom and White Water Rafting – Lighting Class I	200	0.5	50	60
Canoe Slalom and White Water Rafting – Lighting Class II	100	0.5	50	60
Canoe Slalom and White Water Rafting – Lighting Class III	50	0.5	55	20

Table 3 Design Illuminance Levels Used

The Canoe Slalom / White Water Rafting proposed at this project has been based upon a **Class II** level of sport which is defined as;

Sports Lighting Classes	
Lighting Class	**Description**
Class I	International and National competition, Large spectator capacities with long viewing distances, Top-Level supervised training.
Class II	Mid-level competition; principal local clubs and county regional competition, medium spectator capacities with medium viewing distances, high-level supervised training.
Class III	Low-level competition local or small club competition, minimal or no spectator provision, general training; school sports and recreational activities.

Table 4 - Sports Lighting Classes

The selection of luminaire outputs, optics and positioning has been carried out carefully as part of the lighting design to ensure that the required areas are not over-lit as well as minimising light spill.

Drawing N17397-320 indicates proposed layout of the lighting around the course and the following sections indicate the detailed analysis of lux levels on the horizontal surfaces to be lit (ground level), together with values of illumination for adjacent surfaces outside of the principle area.

Vertical test surfaces are included within the following sections of this report for the North, East, West and South elevations at the site boundary. Additionally, risk items as identified in the site location and considerations section have been included in order to assess the potential light spill to these areas as indicated in this report, (it should be noted that no account of shading or obstructions has been included for this design and the readings are a worst-case scenario i.e. with no shading/obstructions). In practice it is emphasised that positions of trees and/or shrubbery, will affect any over spill. This can also be employed as a remedial action to minimise if not totally exclude any over spill into adjacent properties.

8.0 Analysis Results

The Lighting Assessment includes an evaluation of impacts associated with the proposed lighting design. This includes an assessment of light obtrusion at the site boundary and key locations as described in the previous sections of this report.

Light modelling was undertaken using Lighting Reality Pro software, an independent lighting model which is capable of calculating artificial lighting scenes in exterior scenarios. The model incorporates IES, CIE IS EN standards and is commonly used for public lighting assessment.

DATE:	**15 May 2019**
DESIGNER:	**J Robinson-Hoare**
PROJECT No:	**N17397**
PROJECT NAME:	**Dublin White Water Course**

PRELIMINARY RESULTS

Light Spill Report - P2

PREPARED BY: Patrick Parsons Ltd

Dublin White Water Course

Light Spill Model

DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Horizontal Illuminance (lux)

HORIZONTAL LIGHT SPILL GROUND

7462821506

DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

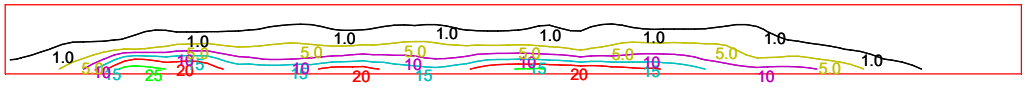
Observer direction = 0 deg. Height = 0.00

Site Boundary East

7462821506

Illuminance (lux)

Site Boundary East



Results

Eav	4.48
Emin	0.00
Emax	27.40
Emin/Emax	0.00
Emin/Eav	0.00

7462821506

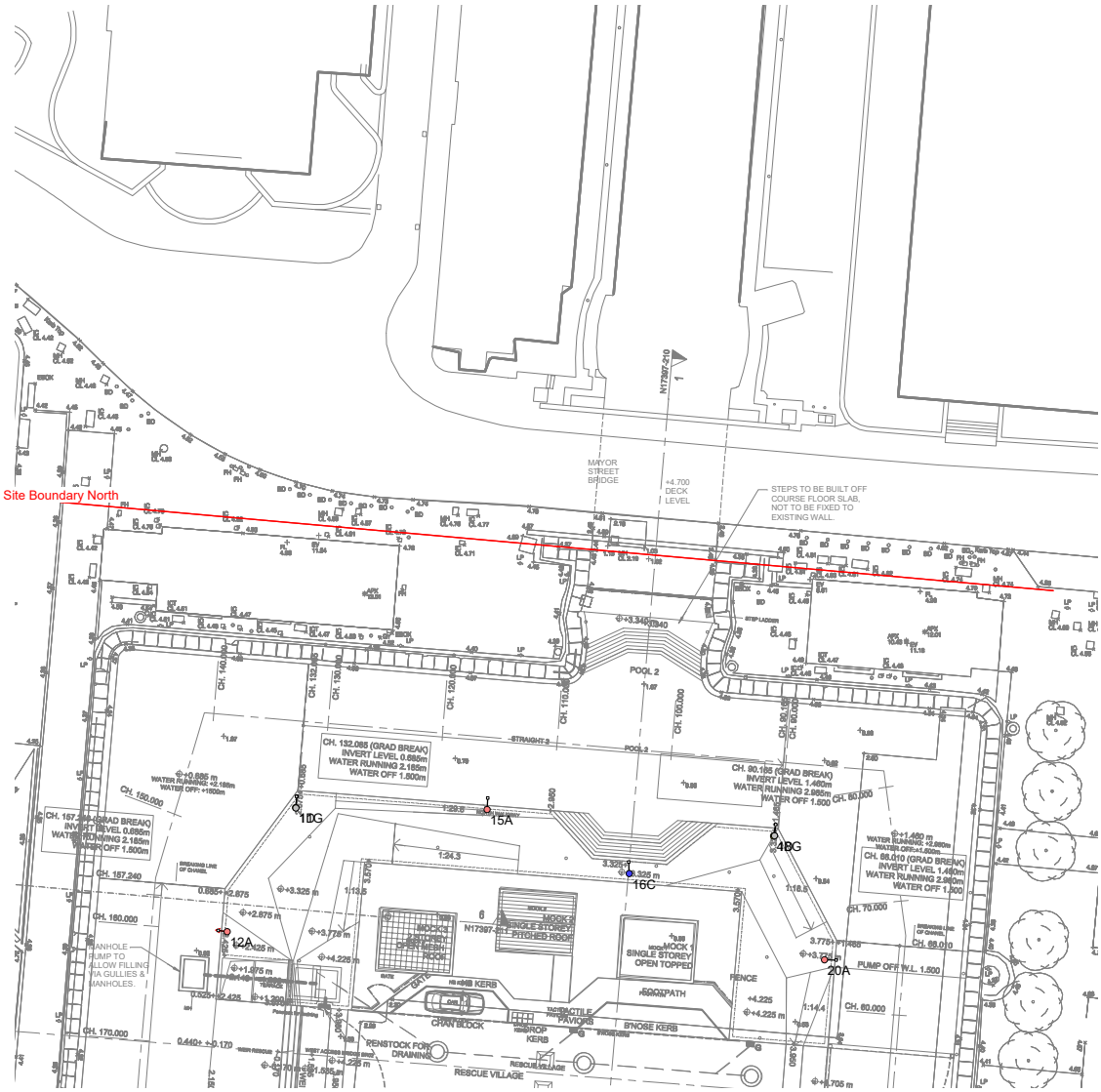
DATE: 15 May 2019 **DESIGNER: J Robinson-Hoare**

PROJECT No: N17397 **PROJECT NAME: Dublin White Water Course**

Vertical Illuminance (lux)

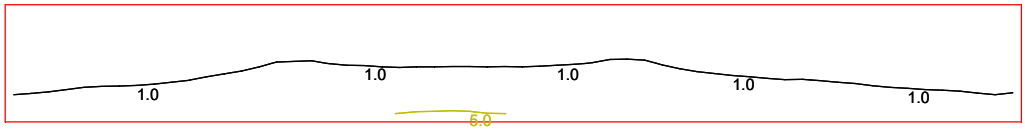
Observer direction = 0 deg. Height = 0.00

Site Boundary North



Illuminance (lux)

Site Boundary North



Results

Eav	1.15
Emin	0.00
Emax	5.32
Emin/Emax	0.00
Emin/Eav	0.00

7462821506

DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

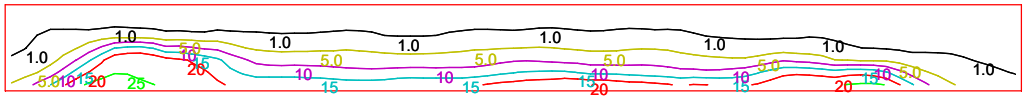
Observer direction = 0 deg. Height = 0.00

Site Boundary West

7462821506

Illuminance (lux)

Site Boundary West



Results

Eav	6.62
Emin	0.00
Emax	27.15
Emin/Emax	0.00
Emin/Eav	0.00

7462821506

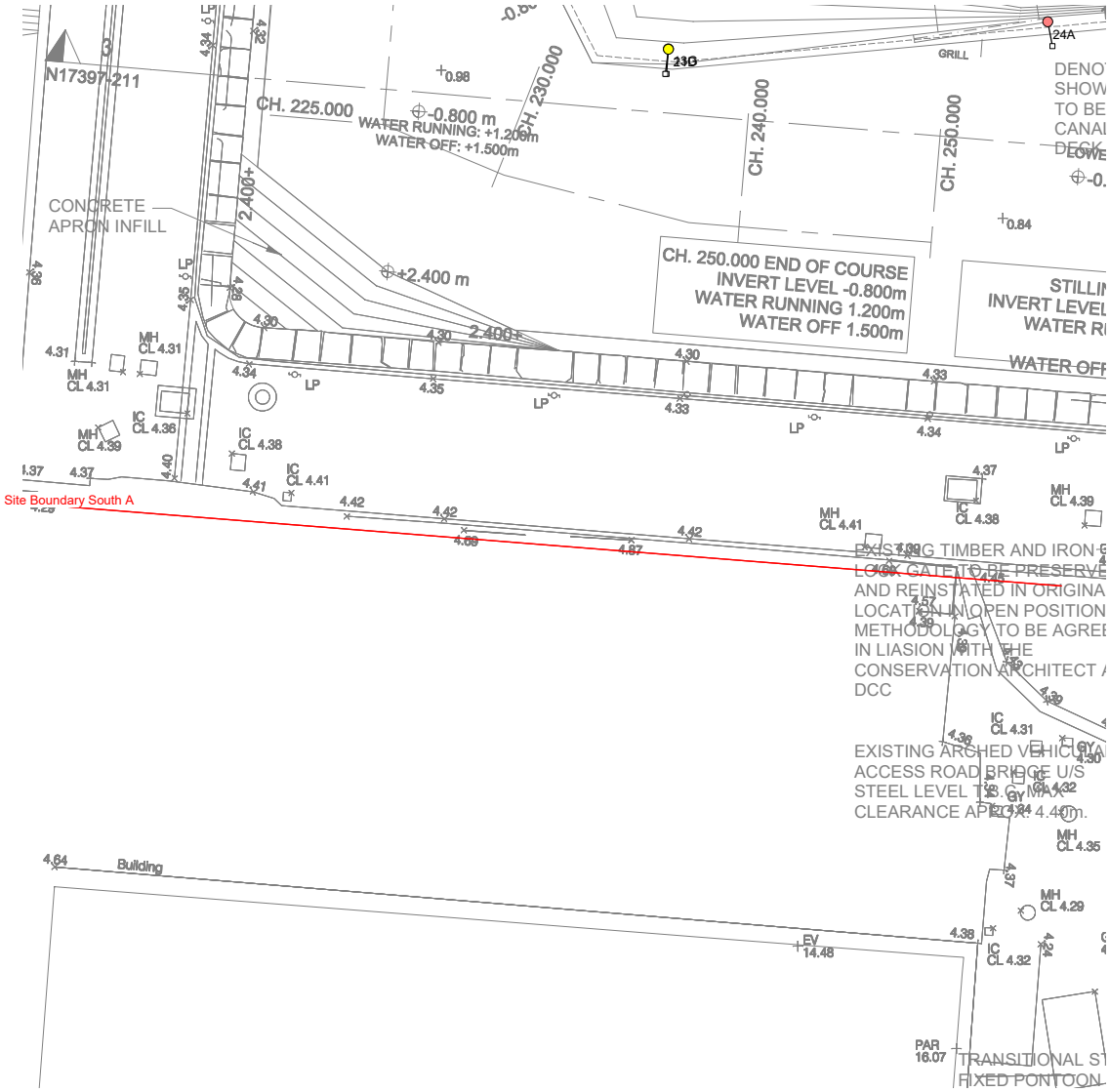
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

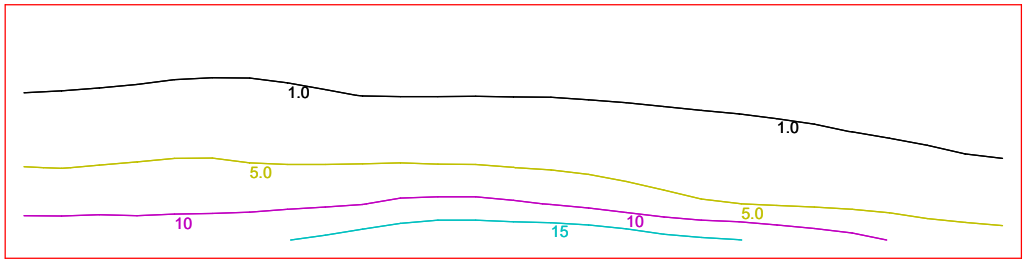
Observer direction = 0 deg. Height = 0.00

Site Boundary South A



Illuminance (lux)

Site Boundary South A



Results

Eav	4.16
Emin	0.00
Emax	19.70
Emin/Emax	0.00
Emin/Eav	0.00

7462821506

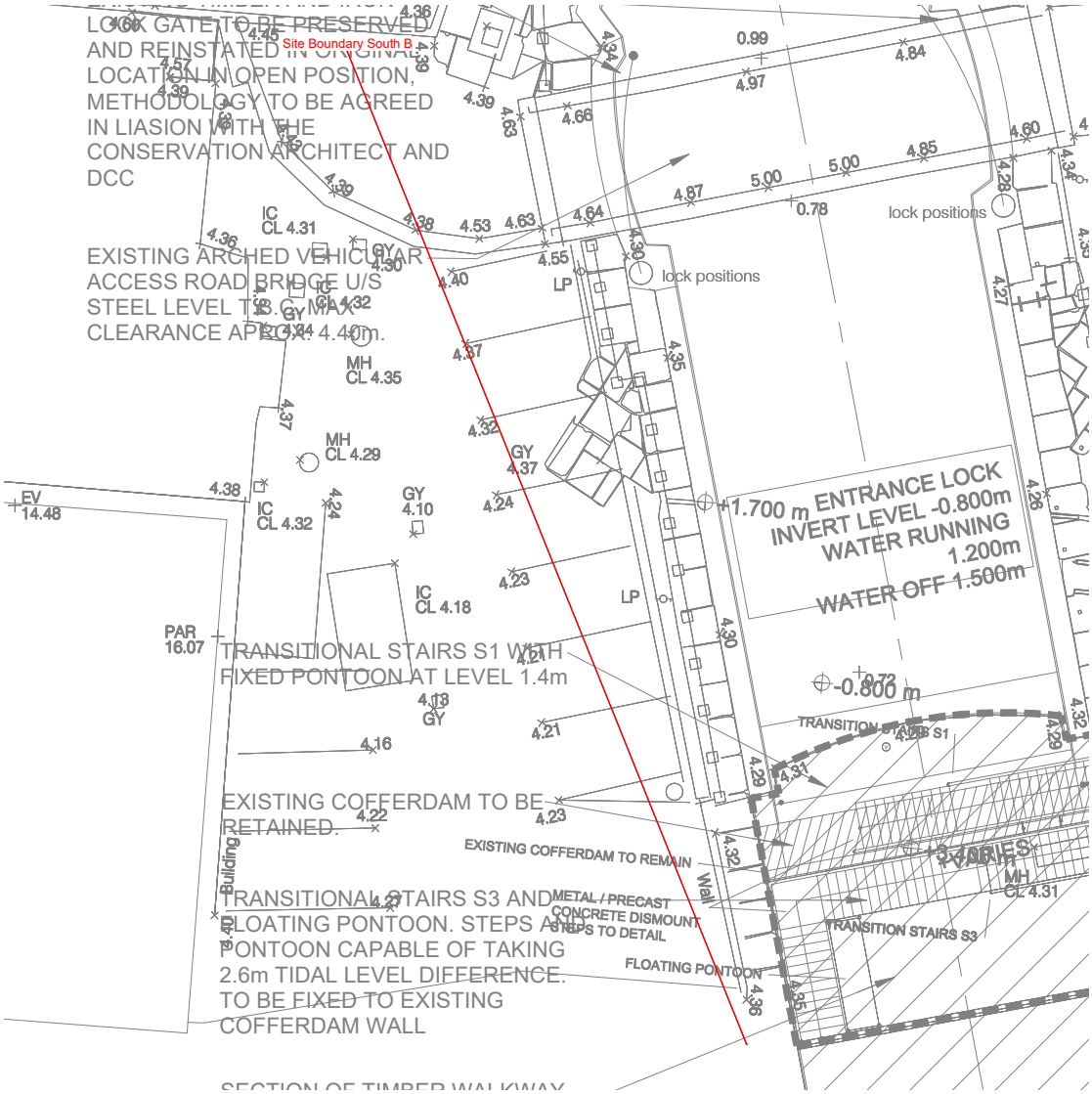
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

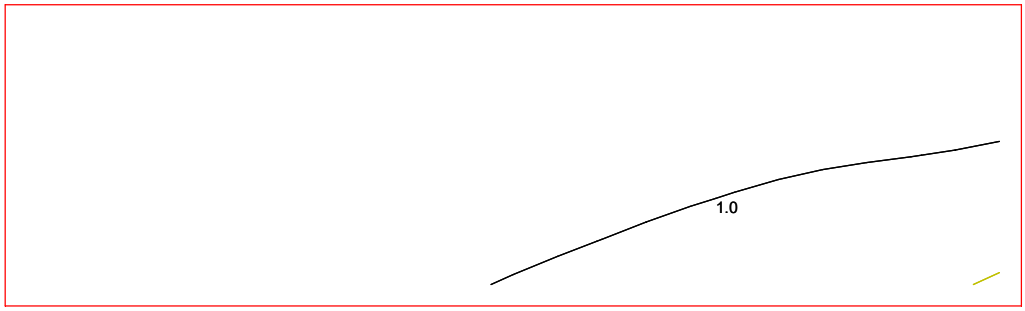
Observer direction = 0 deg. Height = 0.00

Site Boundary South B



Illuminance (lux)

Site Boundary South B



Results

Eav	0.60
Emin	0.00
Emax	5.42
Emin/Emax	0.00
Emin/Eav	0.00

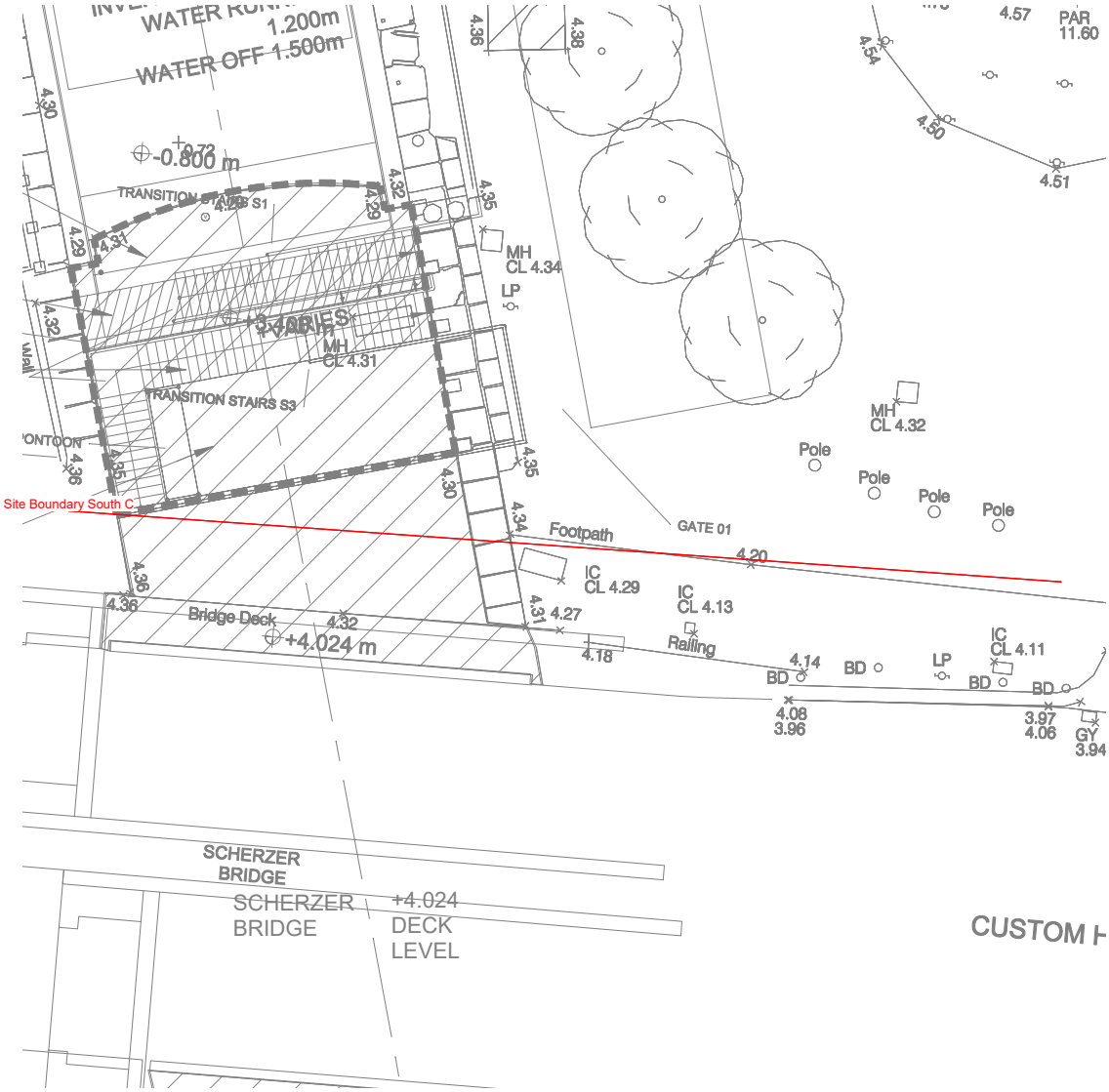
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

Observer direction = 0 deg. Height = 0.00

Site Boundary South C



Illuminance (lux)

Site Boundary South C

Results

Eav	0.16
Emin	0.00
Emax	0.65
Emin/Emax	0.00
Emin/Eav	0.01

7462821506

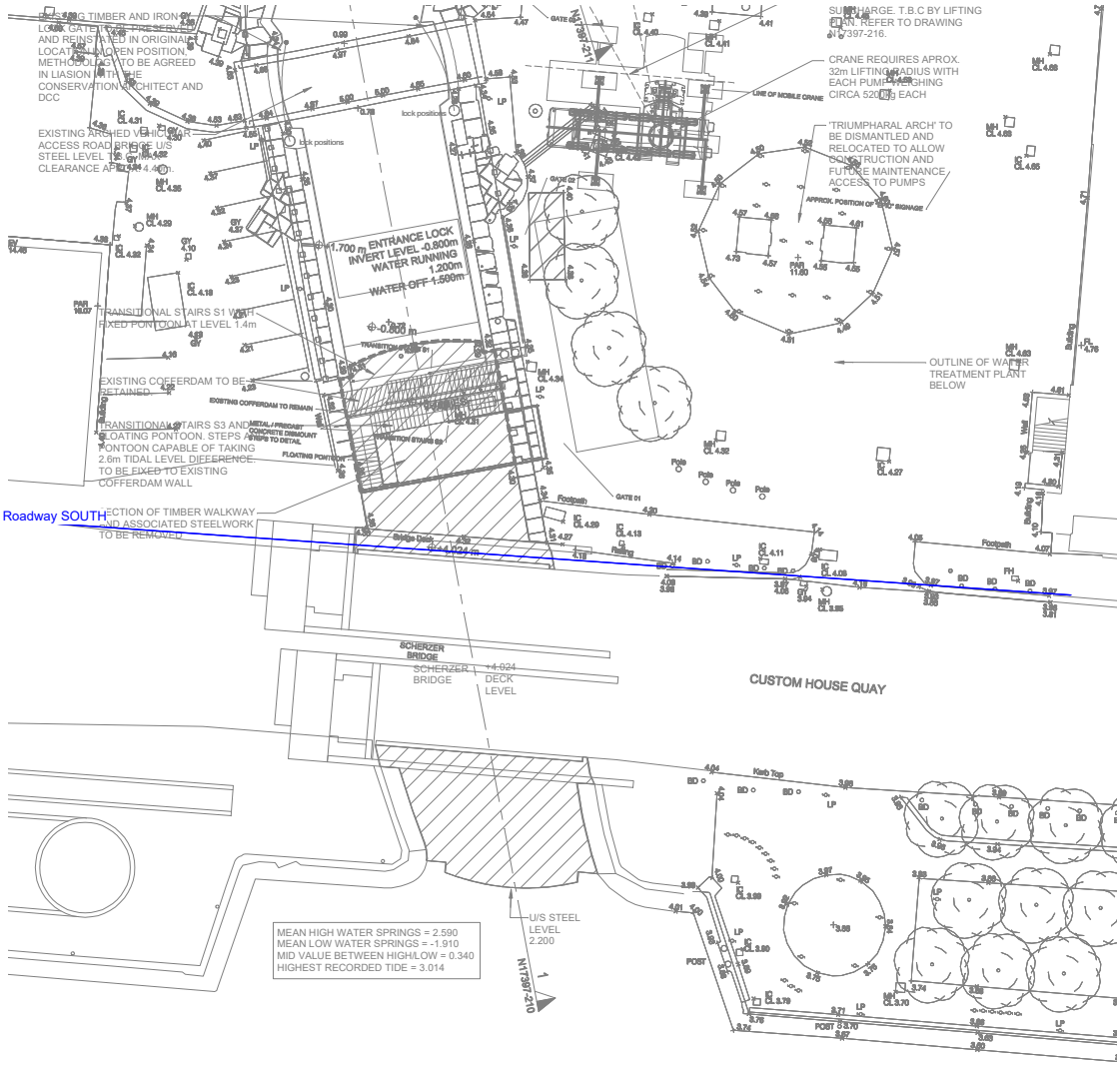
DATE: 15 May 2019 **DESIGNER: J Robinson-Hoare**

PROJECT No: N17397 **PROJECT NAME: Dublin White Water Course**

Vertical Illuminance (lux)

Observer direction = 0 deg. Height = 0.00

Roadway SOUTH



Illuminance (lux)

Roadway SOUTH

Results

Eav	0.12
Emin	0.00
Emax	0.60
Emin/Emax	0.00
Emin/Eav	0.00

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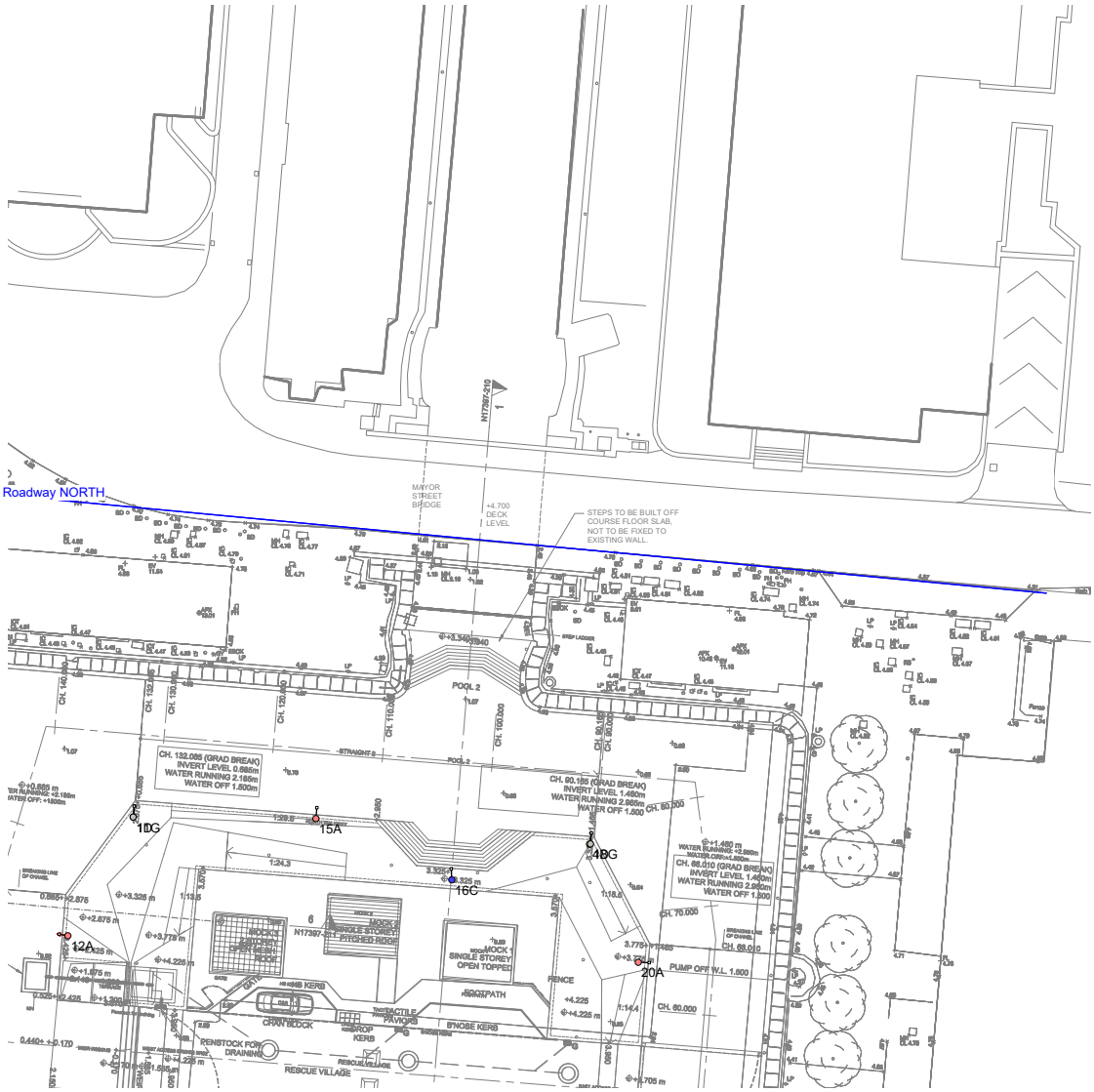
DATE: 15 May 2019 **DESIGNER: J Robinson-Hoare**

PROJECT No: N17397 **PROJECT NAME: Dublin White Water Course**

Vertical Illuminance (lux)

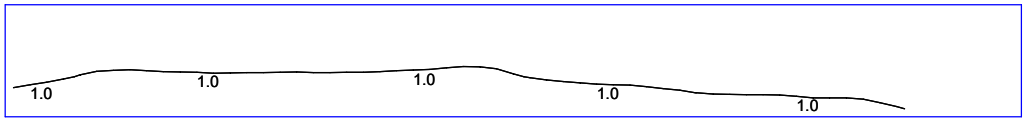
Observer direction = 0 deg. Height = 0.00

Roadway NORTH



Illuminance (lux)

Roadway NORTH



Results

Eav	0.72
Emin	0.00
Emax	3.40
Emin/Emax	0.00
Emin/Eav	0.00

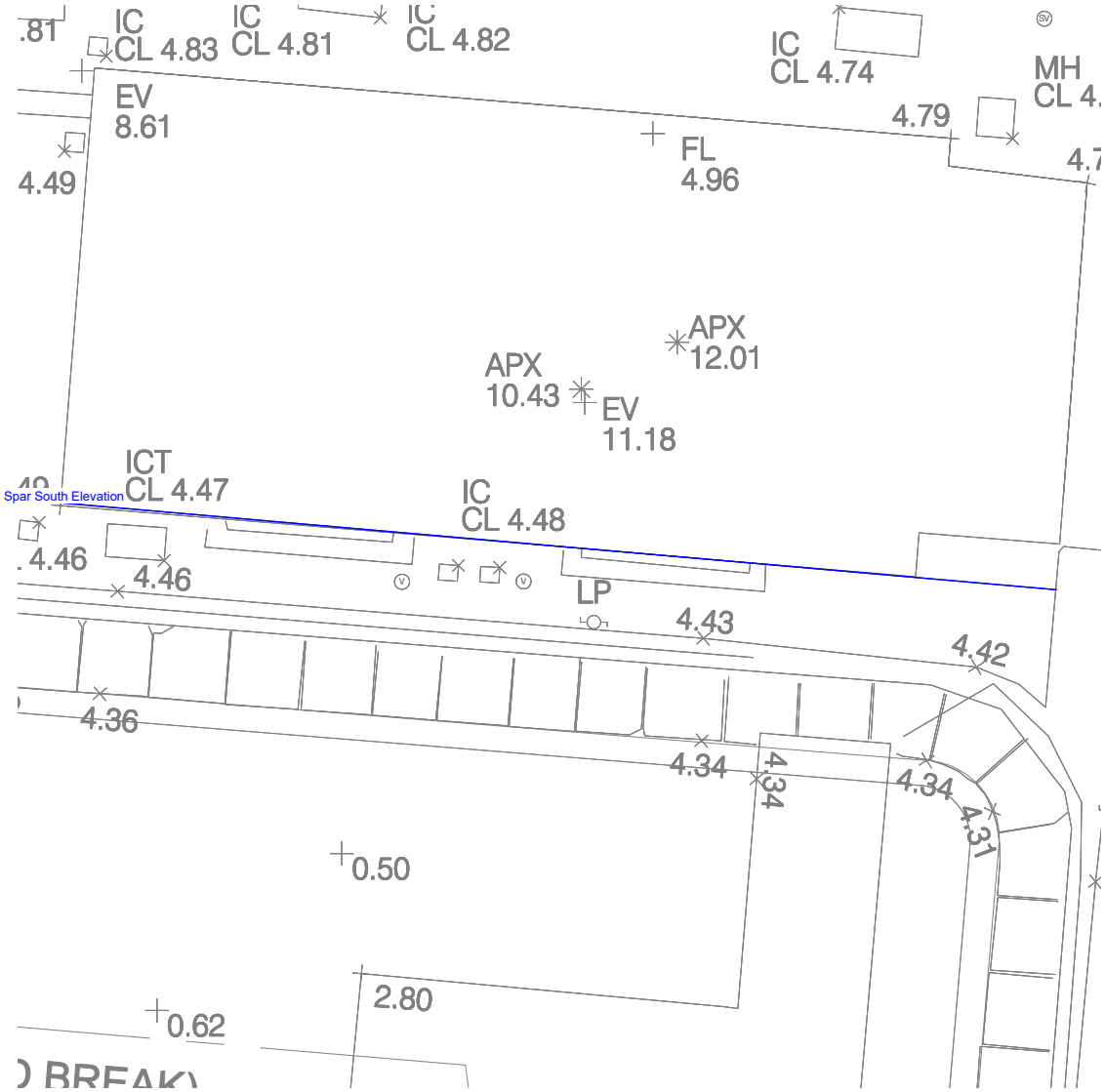
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

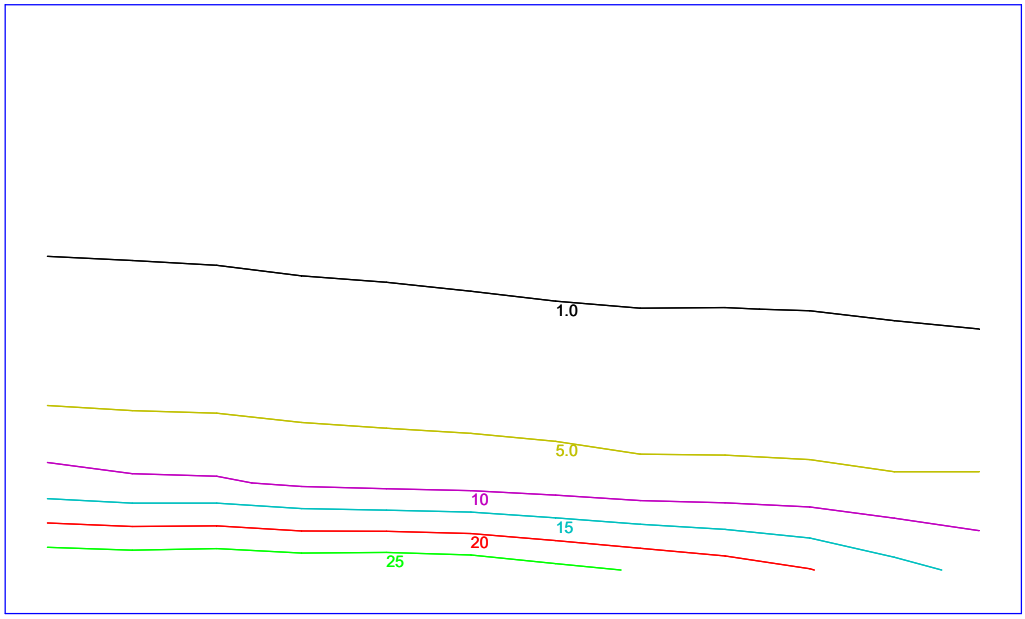
Observer direction = 0 deg. Height = 0.00

Spar South Elevation



Illuminance (lux)

Spar South Elevation



Results

Eav	5.34
Emin	0.02
Emax	29.77
Emin/Emax	0.00
Emin/Eav	0.00

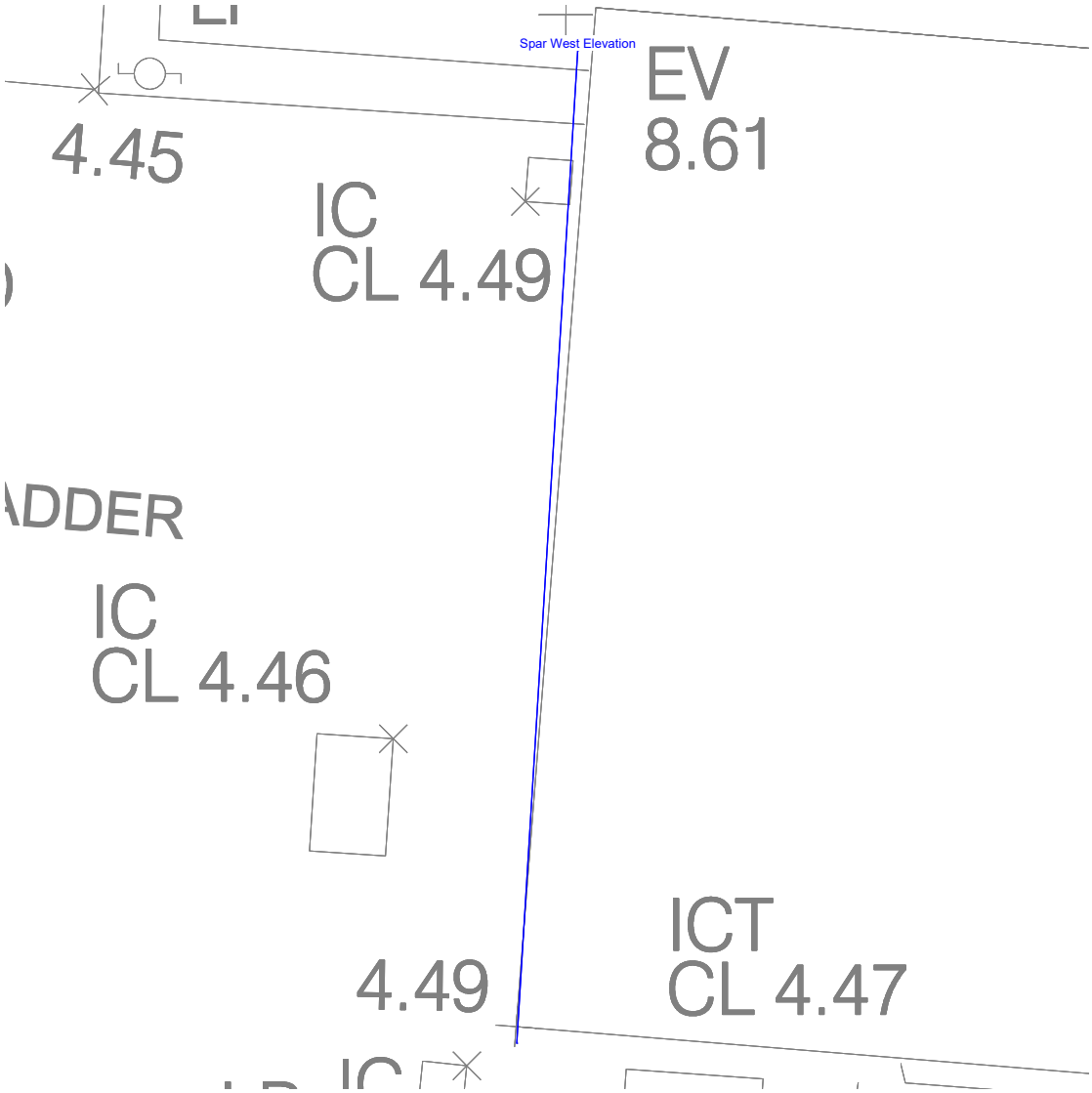
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

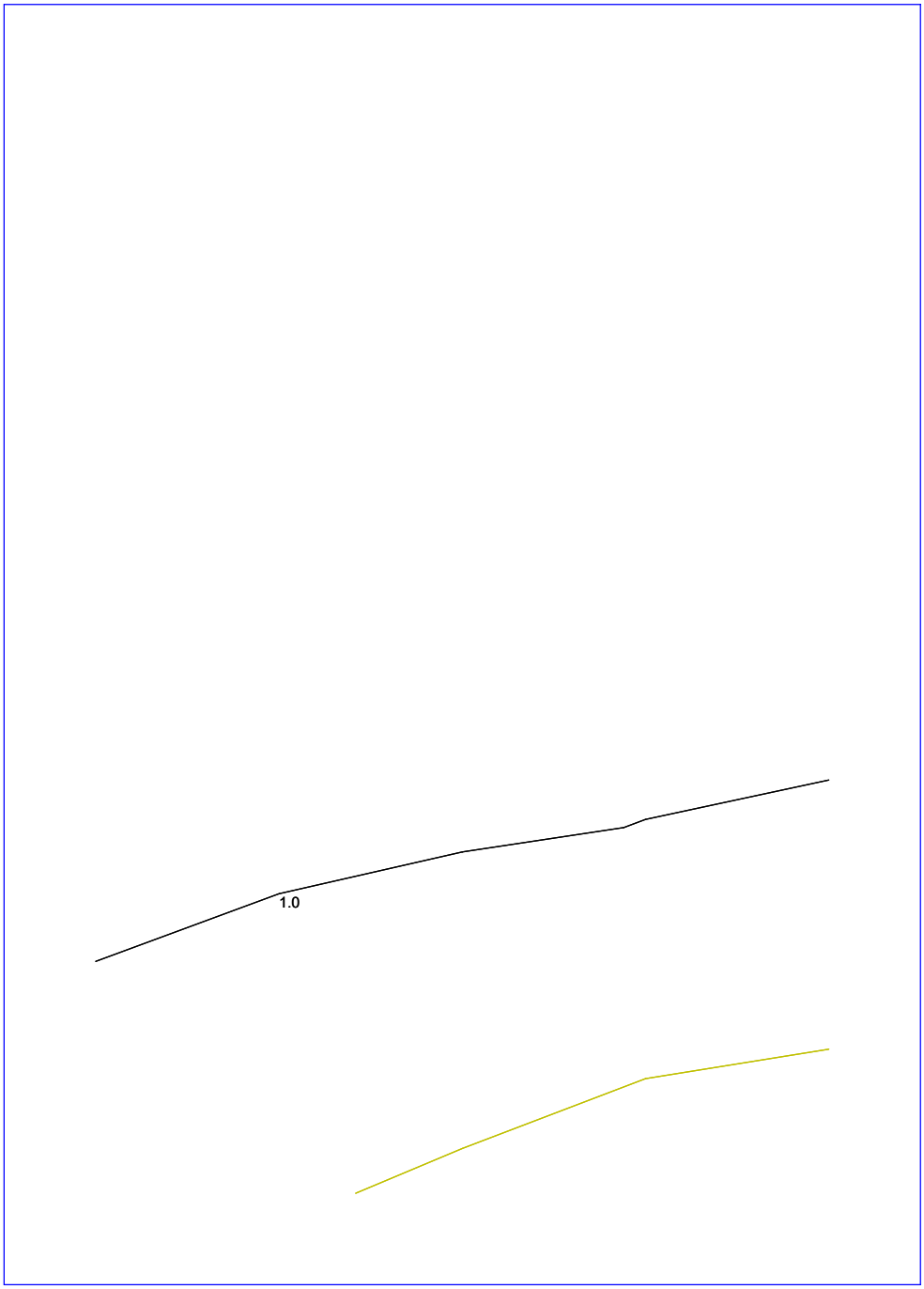
Observer direction = 0 deg. Height = 0.00

Spar West Elevation



Illuminance (lux)

Spar West Elevation



Results

Eav	1.43
Emin	0.01
Emax	9.56
Emin/Emax	0.00
Emin/Eav	0.01

7462821506

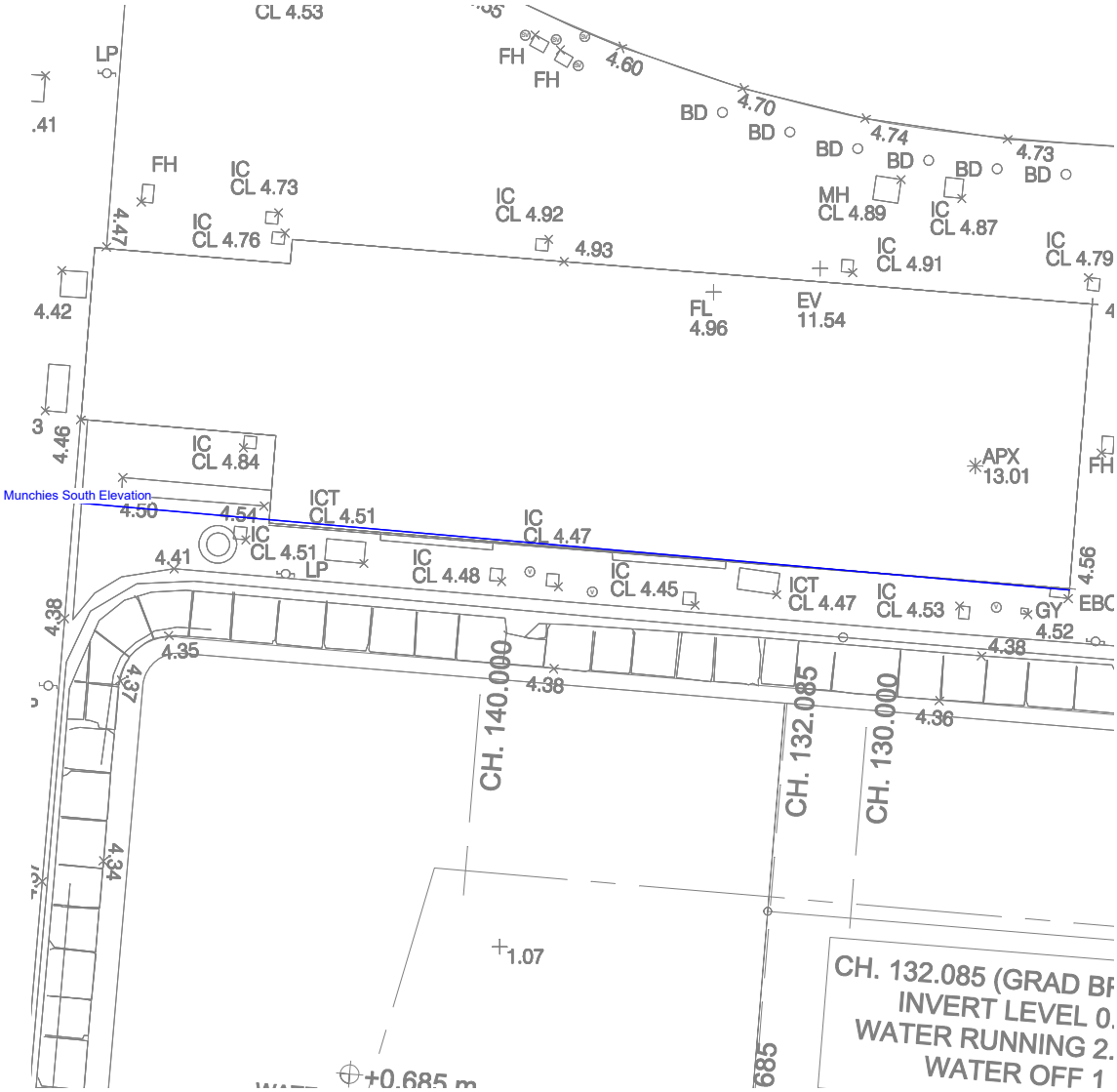
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

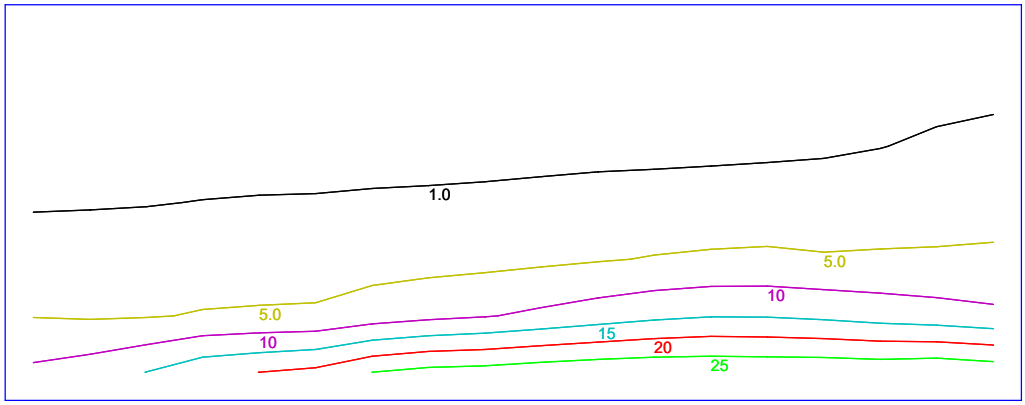
Observer direction = 0 deg. Height = 0.00

Munchies South Elevation



Illuminance (lux)

Munchies South Elevation



Results

Eav	5.72
Emin	0.02
Emax	29.34
Emin/Emax	0.00
Emin/Eav	0.00

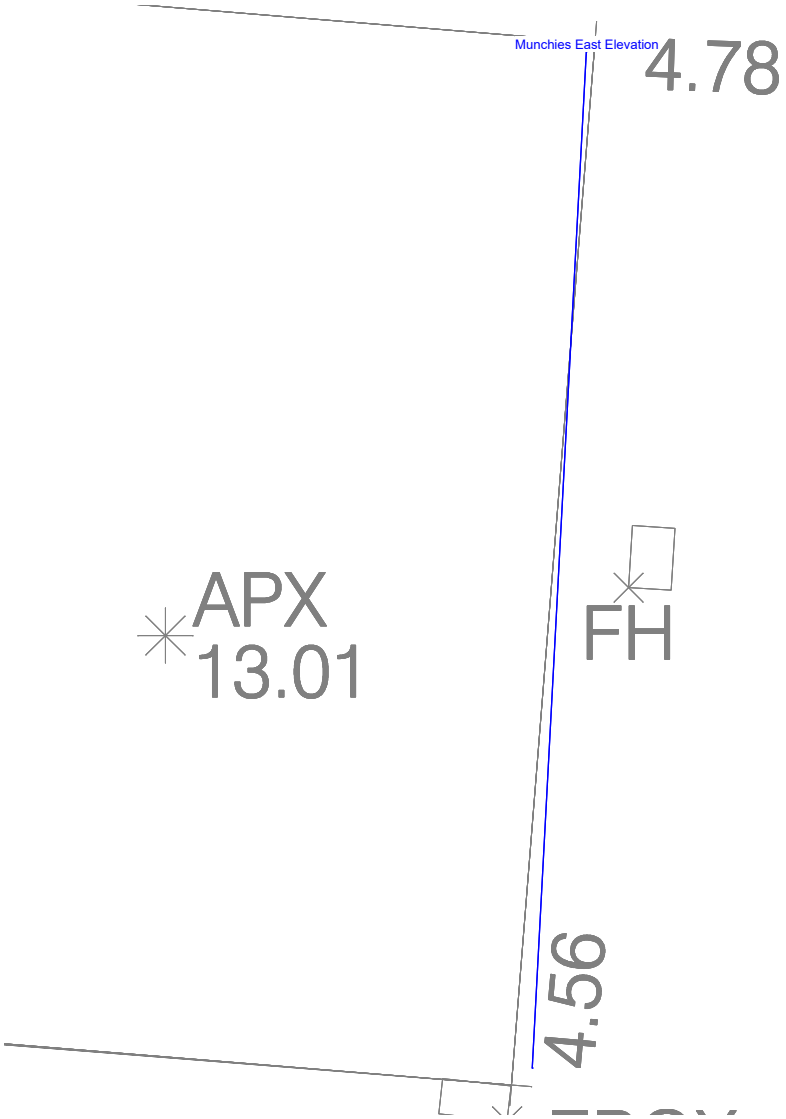
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

Observer direction = 0 deg. Height = 0.00

Munchies East Elevation



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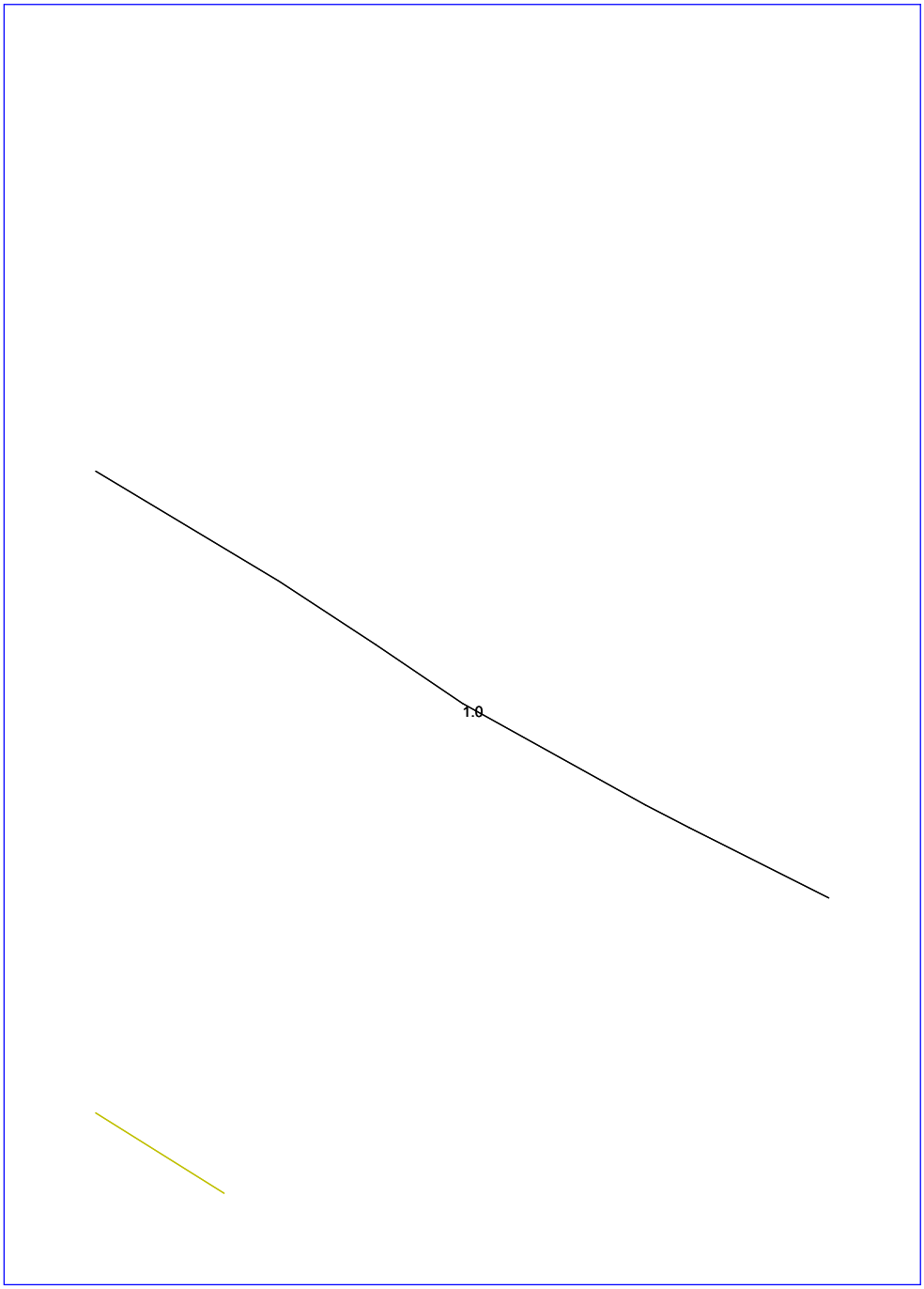
Illuminance (lux)

Munchies East Elevation



Results

Eav	1.21
Emin	0.00
Emax	6.58
Emin/Emax	0.00
Emin/Eav	0.00

7462821506

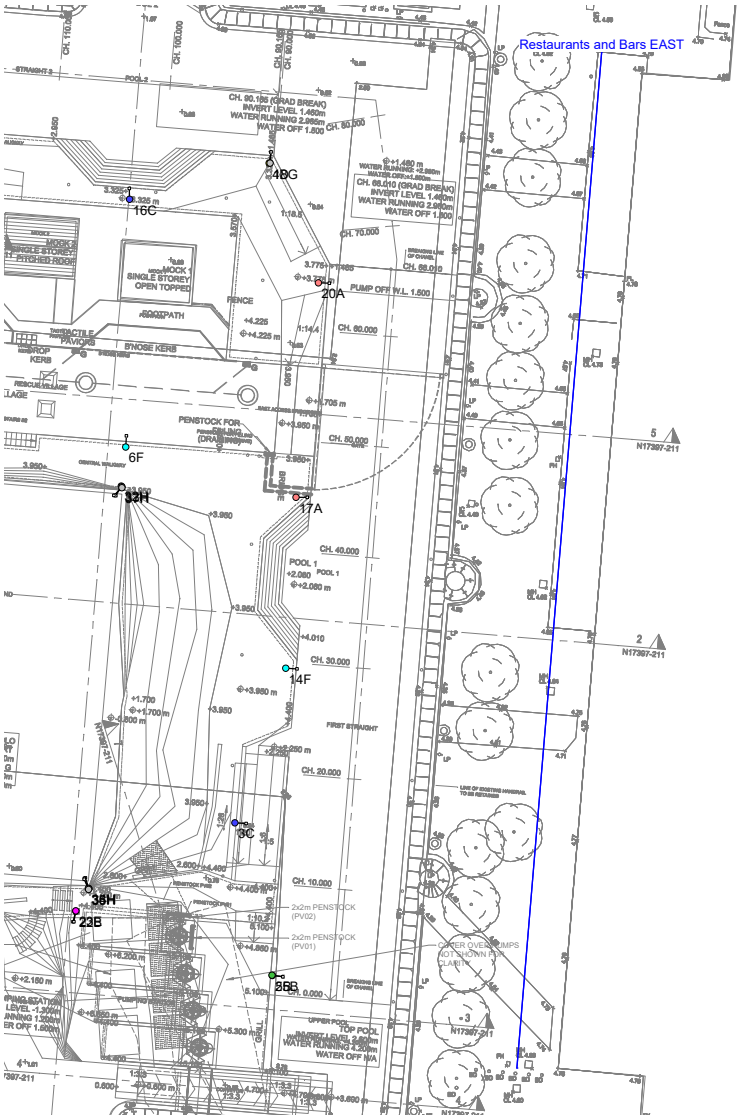
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

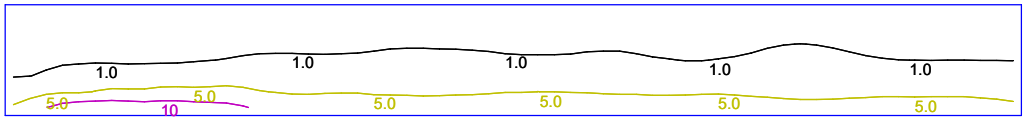
Observer direction = 0 deg. Height = 0.00

Restaurants and Bars EAST



Illuminance (lux)

Restaurants and Bars EAST



Results

Eav	2.41
Emin	0.00
Emax	13.39
Emin/Emax	0.00
Emin/Eav	0.00

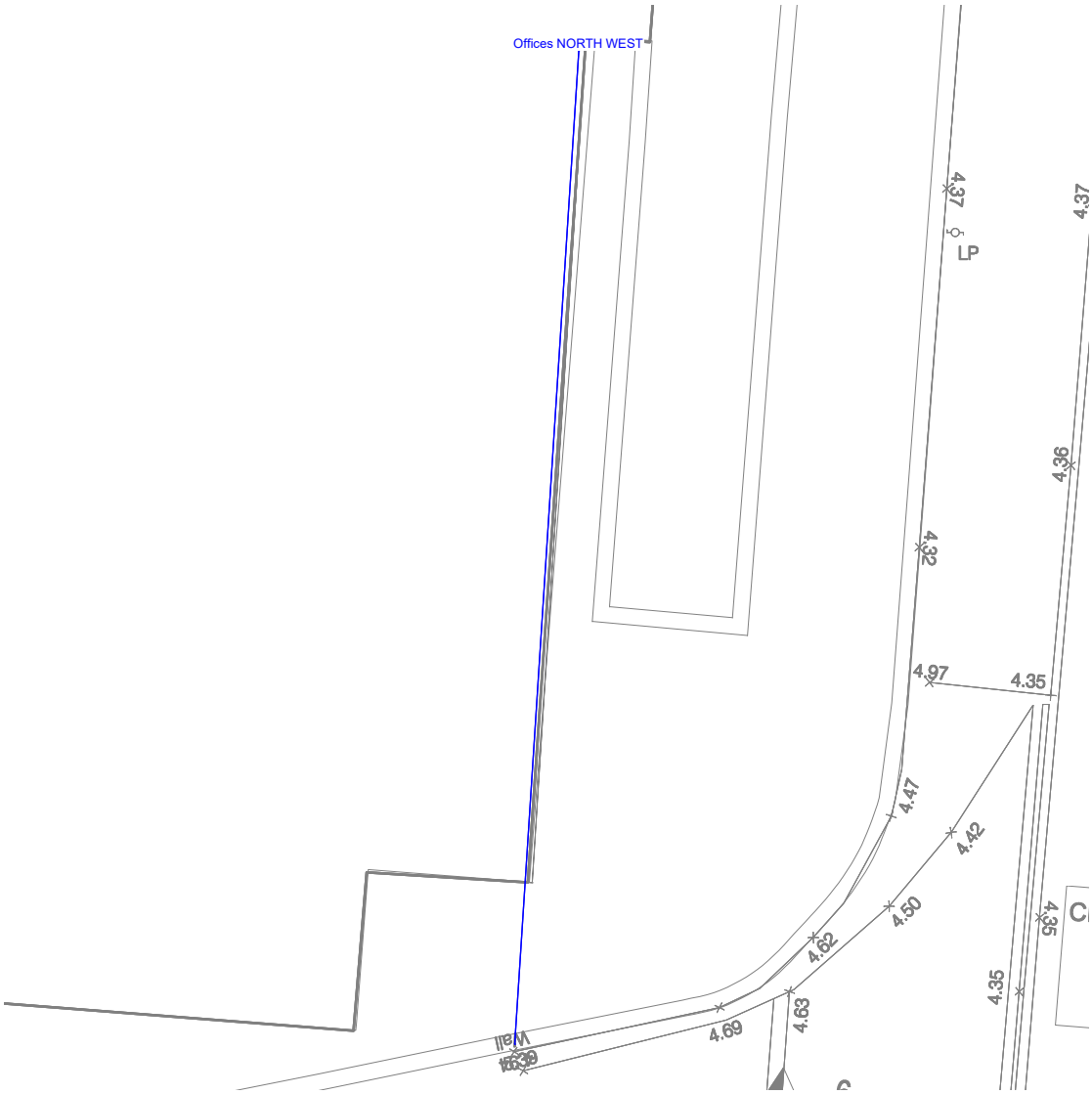
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

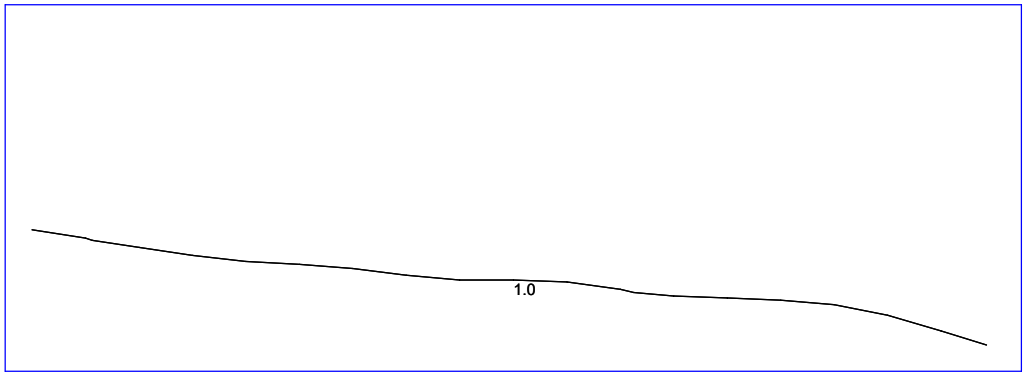
Observer direction = 0 deg. Height = 0.00

Offices NORTH WEST



Illuminance (lux)

Offices NORTH WEST



Results

Eav	0.71
Emin	0.00
Emax	4.25
Emin/Emax	0.00
Emin/Eav	0.00

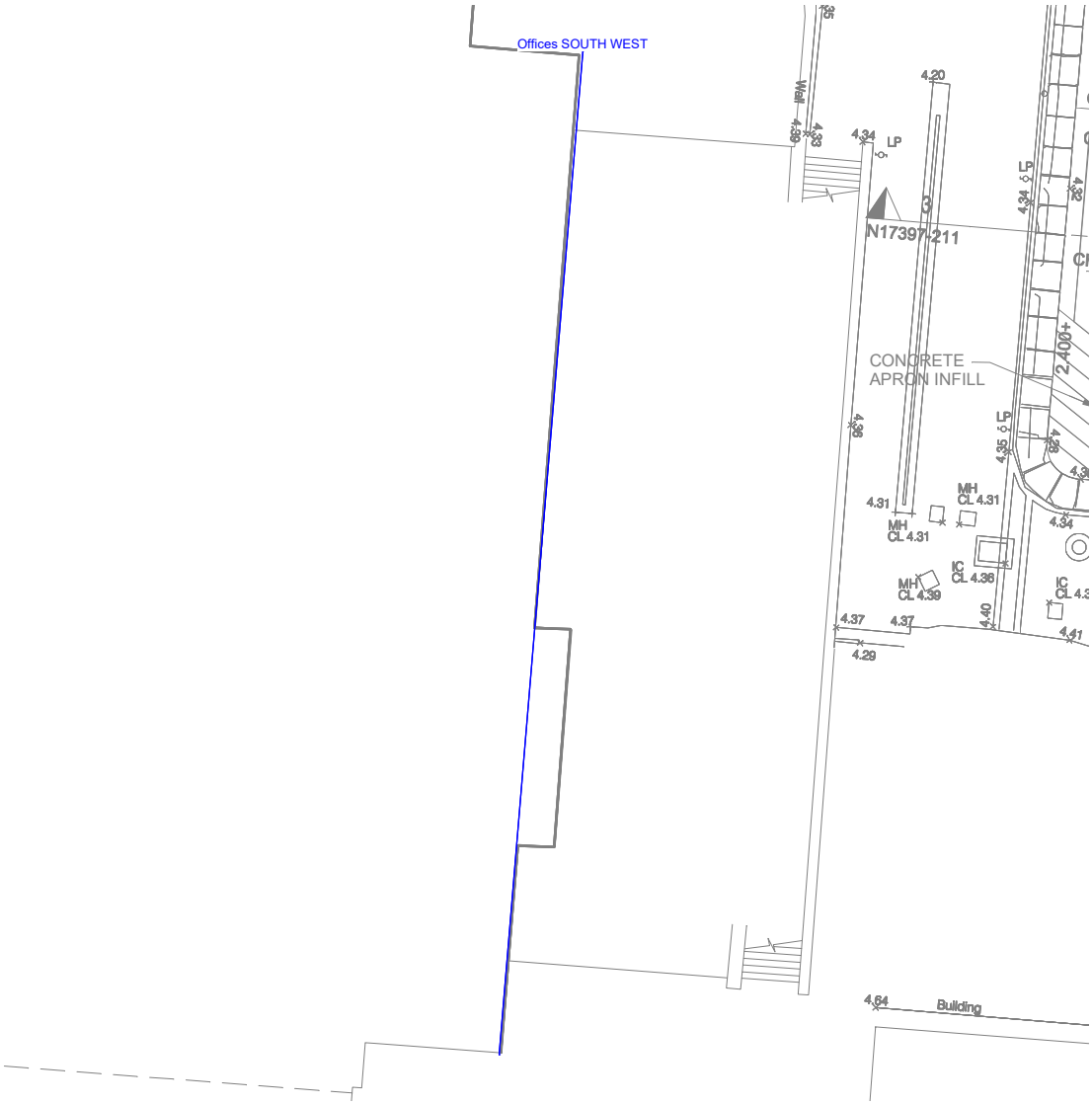
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

Observer direction = 0 deg. Height = 0.00

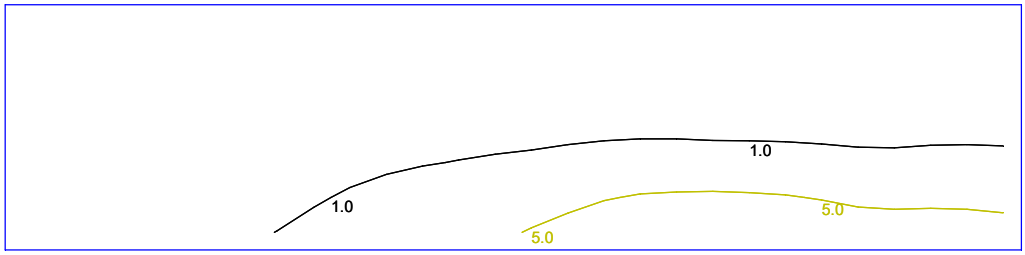
Offices SOUTH WEST



7462821506

Illuminance (lux)

Offices SOUTH WEST



Results

Eav	1.25
Emin	0.00
Emax	8.88
Emin/Emax	0.00
Emin/Eav	0.00

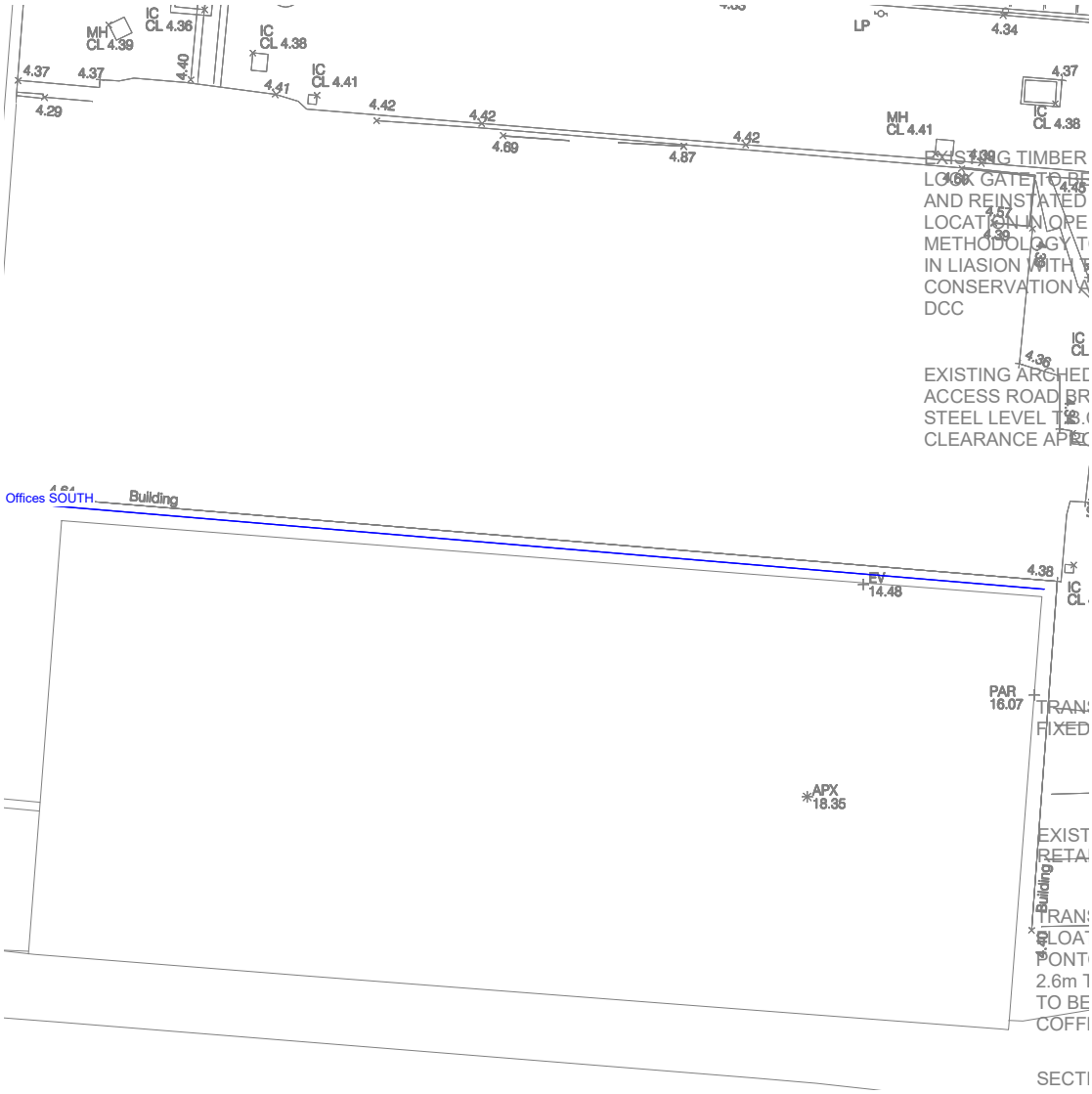
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

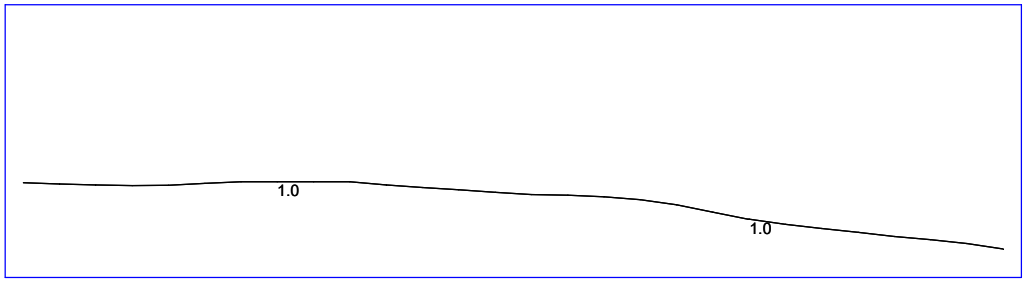
Observer direction = 0 deg. Height = 0.00

Offices SOUTH



Illuminance (lux)

Offices SOUTH



Results

Eav	0.65
Emin	0.00
Emax	2.63
Emin/Emax	0.00
Emin/Eav	0.00

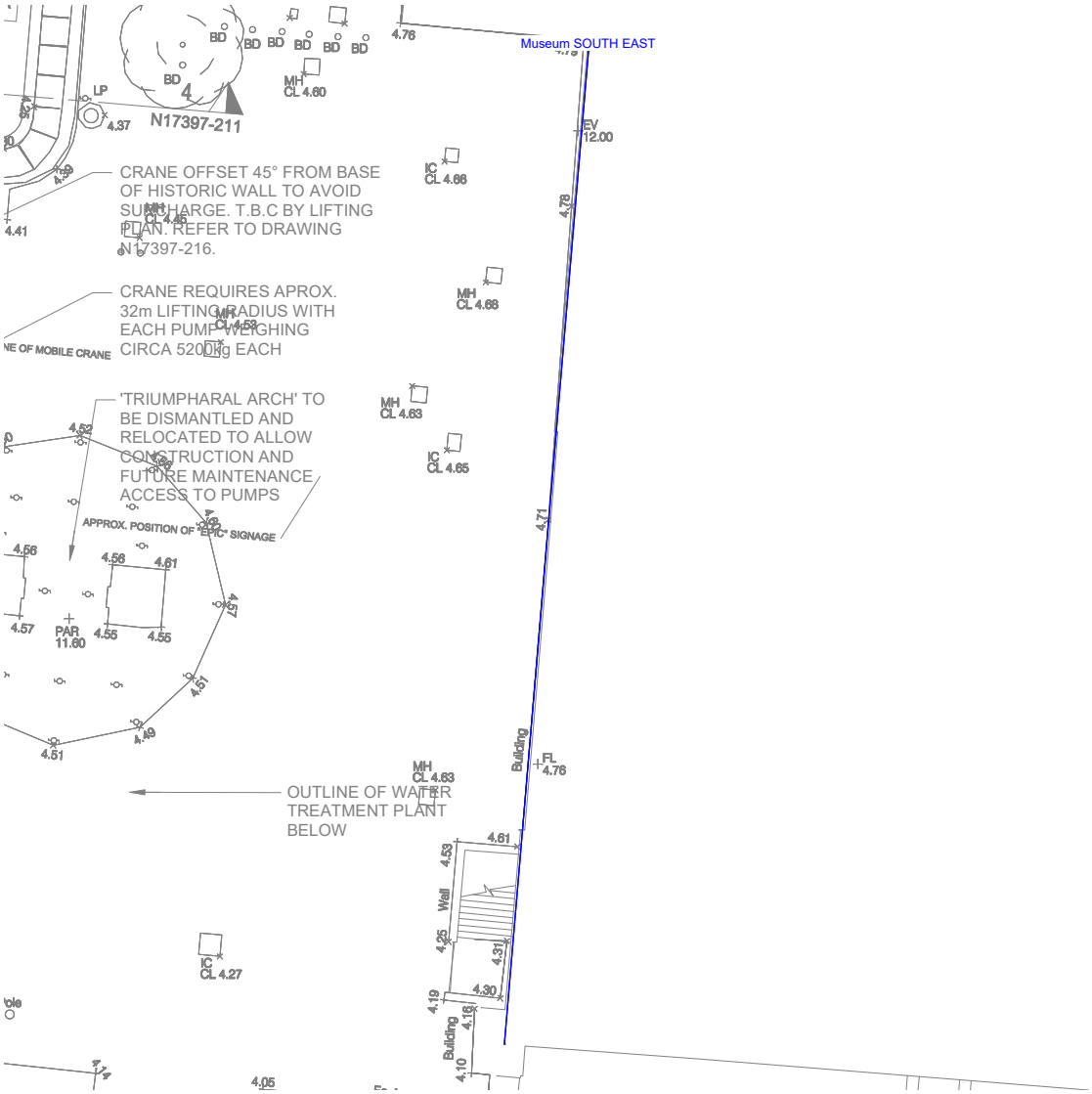
DATE: 15 May 2019 DESIGNER: J Robinson-Hoare

PROJECT No: N17397 PROJECT NAME: Dublin White Water Course

Vertical Illuminance (lux)

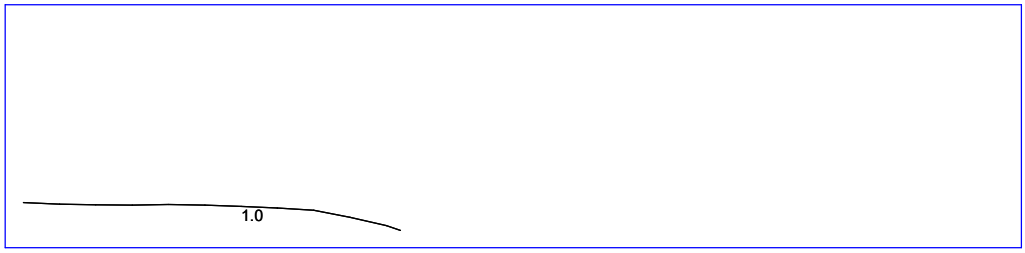
Observer direction = 0 deg. Height = 0.00

Museum SOUTH EAST



Illuminance (lux)

Museum SOUTH EAST



Results

Eav	0.27
Emin	0.00
Emax	1.43
Emin/Emax	0.00
Emin/Eav	0.00

9.0 Conclusion

Patrick Parsons have been commissioned to propose a conceptual design and subsequent report for the purpose of planning application on the proposed external lighting scheme. The proposed scheme serves as external lighting to the Water Rafting Leisure Facility.

The effect of the proposed lighting scheme on the existing lighting levels (assumed) when the course is in operation is a significant increase in light within ~7m of the water edge, however levels fall into the region of assumed existing levels within ~10m of the water edge or within a few meters of the site boundary. When the course is not in operation, the dimming of the lighting provides a light level equal to the assumed existing levels having no significant effect on the existing lighting levels.

This report concludes that, provided the specified lighting design is implemented, the ILP Obtrusive light limits have been satisfied by the design. Luminaires have been selected with no upward light component and Sky glow levels associated with the development will not have a significant effect on the surrounding environment. A fully functional artificially illuminated Water Rafting Facility should be achievable with relatively minimal over spill of light into adjacent properties and the public highway.

PATRICK PARSONS

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