CONSTITUTION HILL

PART 8 PLANNING REPORT **11 NOVEMBER 2022**

SITE LIGHTING REPORT

ARUP

CONHIL-ARUP-ZZ-XX-RP-E-0001

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

ARUP

Dublin City Council

Constitution Hill Renewal

Part 8 Site Lighting Report

Reference: CONHIL-ARUP-ZZ-XX-RP-E-00001

C01 | 11 November 2022

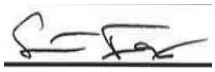
Job number 281677-00

Ove Arup & Partners Ireland Limited
50 Ringsend Road
Dublin 4
Ireland
arup.com

ARUP

Document Verification

Project title	Constitution Hill Renewal
Document title	Part 8 Site Lighting Report
Job number	281677-00
Document ref	CONHIL-ARUP-ZZ-XX-RP-E-00001
File reference	CONHIL-ARUP-ZZ-XX-RP-E-00001

Revision	**Date**	**Filename**	CONHIL-ARUP-ZZ-XX-RP-E-0001-Part_8_Site_Lighting_Report		
C01	11/11/2022	**Description**	Issued for Planning (Status S4)		
			Prepared by	**Checked by**	**Approved by**
		Name	Seán Fox	Joy Wong	Luke Stewart
		Signature			
		Filename			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			
		Filename			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

Issue Document Verification with Document ✓

Contents

Tables

Figures

Drawings

Pictures

Photographs

Attachments

Appendices

1. Executive Summary

This report details the proposed site lighting design for the Constitution Hill Renewal scheme. The scheme involves the phased redevelopment of the existing Constitution Hill residential site.

The existing site consists of three blocks of apartments. The existing site lighting consists of a combination of column mounted and façade mounted luminaires.

The existing site lighting in phase two will be maintained during the construction of phase one.

The proposed site lighting design will generally consist of new column mounted luminaires located throughout the site. Additional works to existing public lighting located external to the site will also be carried out.

The target lighting levels achieved by the proposed site lighting design is to lighting classes P3 as described by IS EN 13201:2015. Further guidance on lighting levels is obtained from BS EN 8300-1:2018 and IS EN 12464-2:2014.

Intrusive light on properties within the development is kept within the limits as set out in CIE 150 Table 2.

The proposed site lighting design is carried out using Lighting Reality software.

2. Design Criteria

Table 1: Target Lighting Levels

Lighting Class / Application	Horizontal Illuminance (lux)	
	Maintained Average (Ē)	Maintained Minimum (E_{min})
P3	7.5	1.5
Pedestrian routes in the external environment	5.0	-
Stairs and ramps in the open environment	30.0	15.0
Light traffic, e.g., parking areas of shops, terraced and apartment houses; cycle park	5.0	-

Table 2: Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness	Sparsely inhabited rural areas, village, or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

Table 3: Maximum Intrusive Light Values

Light Technical Parameter	Application Conditions	Environmental Zone				
		E0	E1	E2	E3	E4
Maintained Maximum Vertical Illuminance (E_{max})	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx	1 lx	2 lx	5 lx

3. Proposed Site Lighting

The proposed site lighting will generally consist of luminaires mounted on 5m high columns throughout the site. The design will ensure adequate illumination will be provided to all pedestrian routes whilst also limiting the amount of intrusive light falling on adjacent properties.

Four existing lighting columns and luminaires external to the site will be relocated to accommodate the new site layout and replaced with new luminaires. A formal application for the relocation of existing luminaires requires a planning permission reference number. This application will be made during construction stage.

The existing site lighting to all Phase 2 areas will be maintained during the construction of Phase 1. Any temporary power supplies required to ensure this will be provided by the Main Contractor as part of the enabling works for the site. Any lighting design required to ensure existing light levels are maintained to areas used by the public will be submitted to DCC's Public Lighting Department for approval prior to implementation.

A meeting between the design team and DCC's Public Lighting and Housing Departments took place in May, where maintenance responsibilities and luminaire specification was discussed.

New lighting fixtures and columns located along the Esplanade will be maintenance by DCC's Public Lighting Department. New lighting fixtures and columns located in the communal residential space will be maintained by DCC's Housing Department. Please refer to CH-GRA-XX-00-DR-A-00-02-03-Responsibility Boundaries for further information.

All lighting to be taken-in-charge by DCC's Public Lighting Department will comply with DCC's General Specification for Public Lighting Design and Installation in the Dublin City Council Area.

All new luminaires will utilise LED light sources with a correlated colour temperature of 3000K and will be capable of being remotely monitored and controlled using a CMS System.

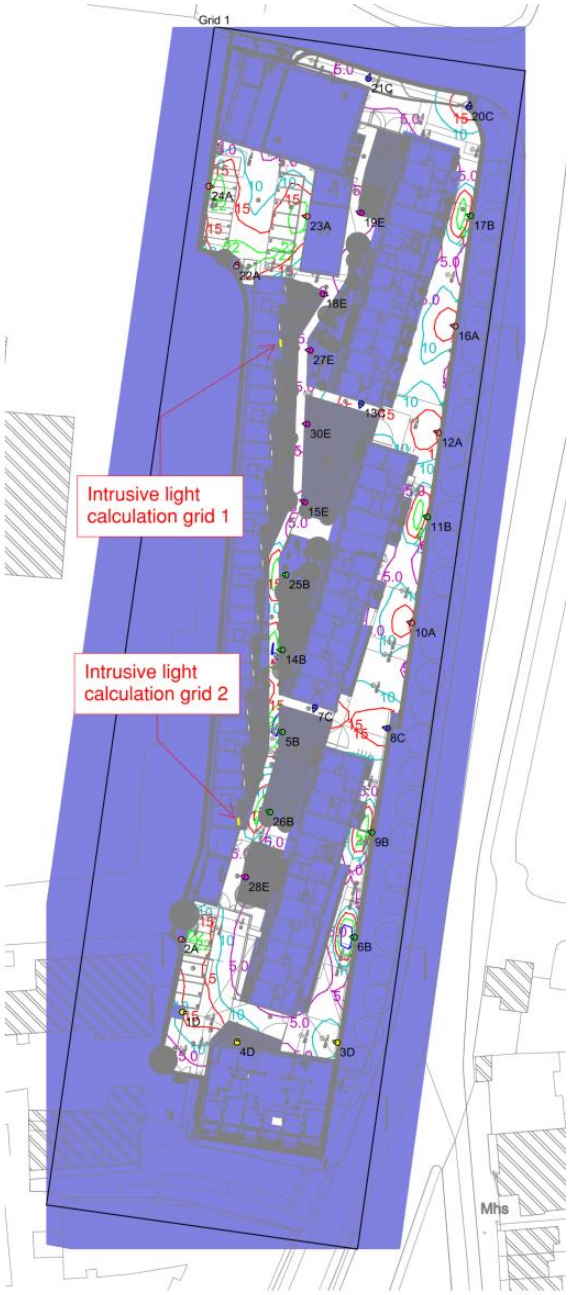
The proposed site lighting will receive electrical supplies from minipillars located throughout the site. The minipillars, in turn, will receive electrical supplies from the Main Distribution Boards located in the apartment blocks.

The electrical supplies to all proposed site lighting and associated minipillars will be made by armoured cables run in underground ducts.

4. Calculation Results

4.1 Pedestrian Walkways and Car Park

Figure 1 below illustrates the results of the lighting calculations to the pedestrian walkways and car park. The design achieves a lighting class of P3 in all areas in accordance with IS EN 13201:2015.



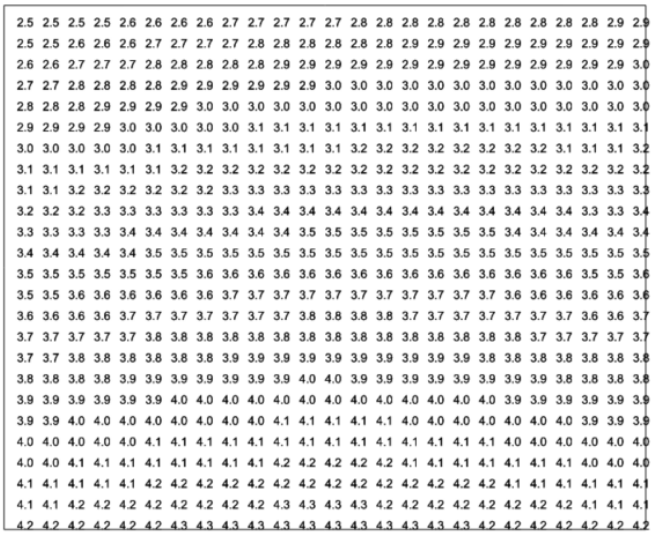
Results

Eav	11.17
Emin	1.51
Emax	36.95
Emin/Emax	0.04
Emin/Eav	0.14

Figure 1: Lighting Calculation Results

4.2 Intrusive Light

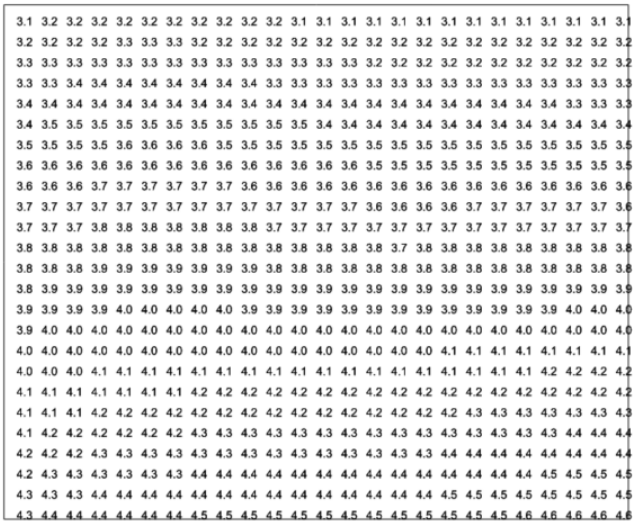
Two additional calculation grids were included in the design to determine the amount of vertical illuminance falling on selected properties within the development. These grids determine a maximum vertical illuminance (E_{max}) of less than 5 lux. This is in within the limits as set out in CIE 150 Table 2 for environmental zone E4.



Results

Eav	3.52
Emin	2.46
Emax	4.31
Emin/Emax	0.57
Emin/Eav	0.70

Figure 2: Intrusive light calculation grid 1



Results

Eav	3.83
Emin	3.10
Emax	4.59
Emin/Emax	0.68
Emin/Eav	0.81

Figure 3: Intrusive light calculation grid 2

Appendix A

Luminaire Schedule

A.1 Appendix Level 1

Luminaire A Data

Supplier	D W Windsor
Type	Sephora 450- 16LED- 3k- A1- CLO 250mA UMSUG 42 0038 0000 100
Lamp(s)	16 x 3k LED
Lamp Flux (klm)	4.07
File Name	Sephora 450- 16LED- 3k- A1- CLO_250mA UMSUG 42 0038 0000 100.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	442.4, 91.9, 0.0
No. in Project	7

Luminaire B Data

Supplier	D W Windsor
Type	Sephora 450- 16LED- 3k- B1- CLO 150mA UMSUG 42 0024 0000 100
Lamp(s)	16 x 3k LED
Lamp Flux (klm)	2.25
File Name	Sephora 450- 16LED- 3k- B1- CLO_150mA UMSUG 42 0024 0000 100.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	386.4, 4.3, 0.0
No. in Project	8

Luminaire C Data

Supplier	D W Windsor
Type	Sephora 450- 16LED- 3k- C3- CLO 250mA UMSUG 42 0038 0000 100
Lamp(s)	16 x 3k LED
Lamp Flux (klm)	4.14
File Name	Sephora 450- 16LED- 3k- C3- CLO_250mA UMSUG 42 0038 0000 100.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	248.4, 8.8, 0.0
No. in Project	5

Luminaire D Data

Supplier	D W Windsor
Type	Sephora 450- 16LED- 3k- A1- CLO 150mA UMSUG 42 0024 0000 100
Lamp(s)	16 x 3k LED
Lamp Flux (klm)	2.23
File Name	Sephora 450- 16LED- 3k- A1- CLO_150mA UMSUG 42 0024 0000 100.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	442.4, 91.9, 0.0
No. in Project	3

Luminaire E Data

Supplier	D W Windsor
Type	Sephora 450- 16LED- 3k- C3- CLO 100mA UMSUG 42 0017 0000 100
Lamp(s)	16 x 3k LED
Lamp Flux (klm)	1.41
File Name	Sephora 450- 16LED- 3k- C3- CLO_100mA UMSUG 42 0017 0000 100.ies
Maintenance Factor	0.84
Imax70,80,90(cd/klm)	248.3, 8.8, 0.0
No. in Project	6