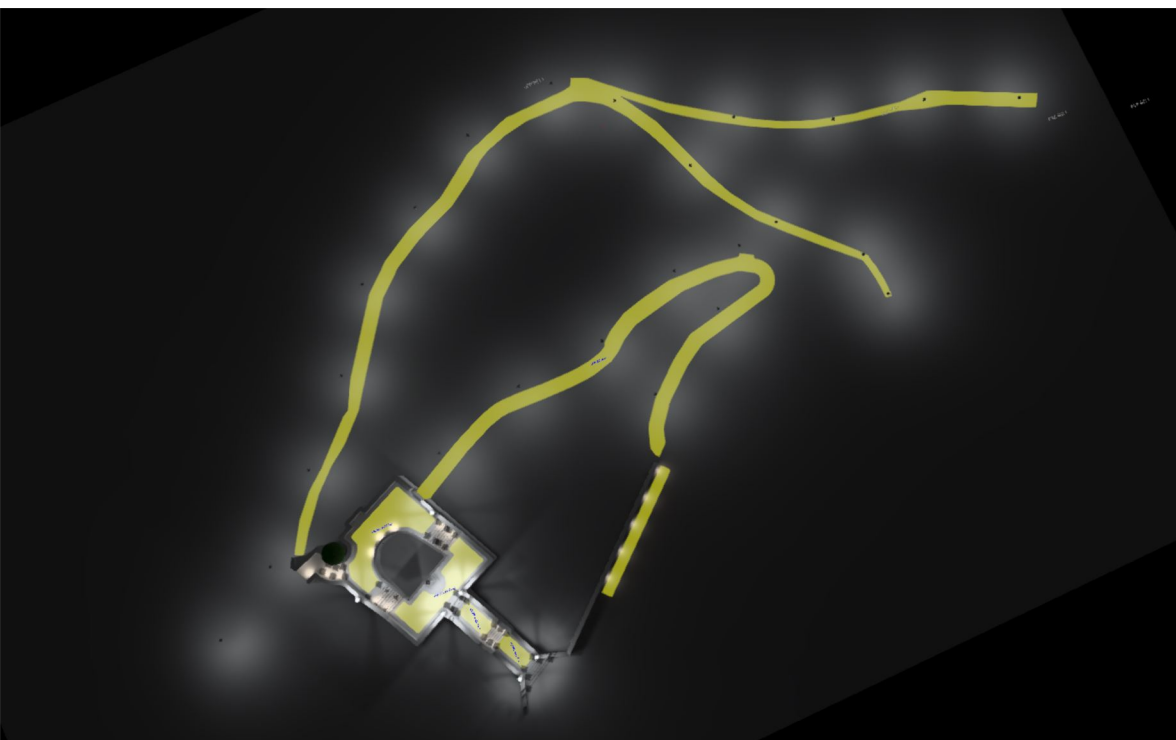




Broadfield Slopes

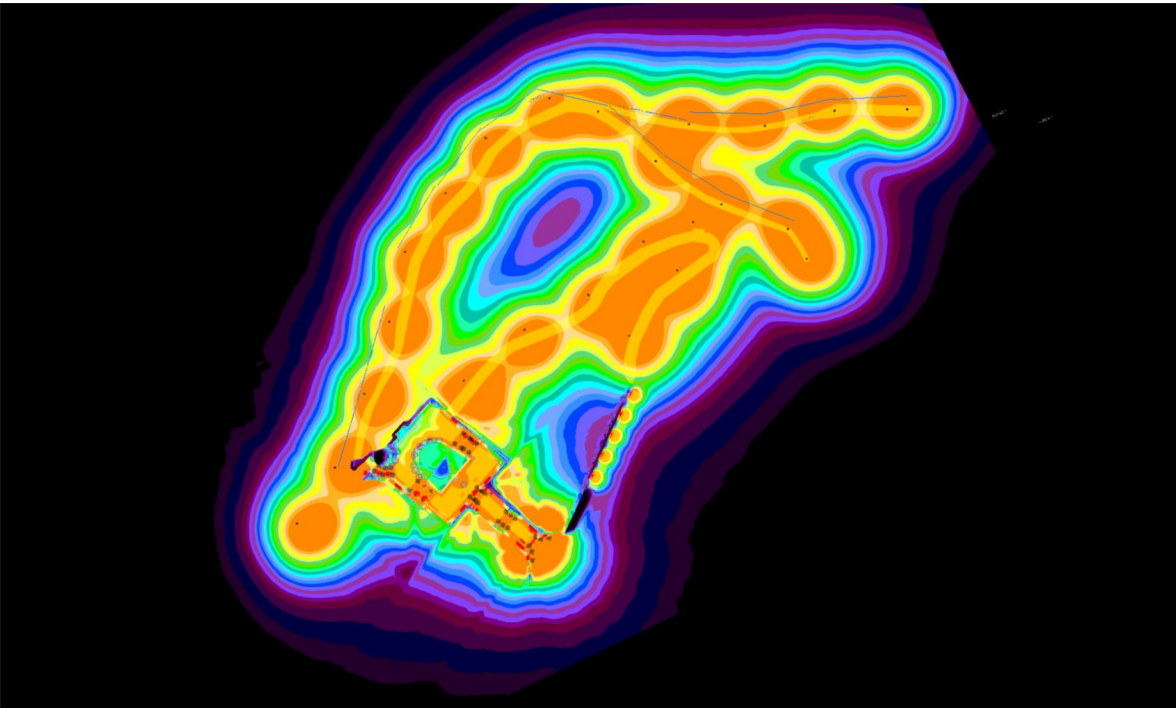
Stage 3 Report

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Description

Design strategy

The external lighting strategy is as follows:

- Pathways through the landscape to be illuminated via column mounted lanterns with column top luminaire with no upwards light spill to 20 lux average.
- Walkways and steps within the Packer Spout area to be illuminated via re-instating historic obelisk mounted lanterns supplemented by lighting recessed or surface mounted to walls. Close liaison required with historic lantern manufacturer to ensure light spill is minimised whilst keeping design of historic lantern intact. 30 lux average.
- Market cross to be illuminated via a spotlight concealed within a new replacement lantern located on top of existing stone obelisk

Control

The exterior lighting is to be operated from a lighting controls system. The lighting control system will operate with an astronomic clock scheduled to function from dusk to dawn or within any stipulated curfews by the local planning authority. With lighting control automation, the exterior lighting scheme only operates as and when required so the lighting can be dimmed/off outside of core hours. This can be adjusted when occupancy of the space and required light levels are better understood.

Design Illuminance Levels

The lighting levels for the external areas have been informed by the following guidance:

- ILP Guidance Note 01/21 – The reduction of obtrusive light
- ILP Guidance Note 08/18 – Bats and artificial Lighting
- CIBSE Lighting Guide 6 – The exterior environment
- BS 8300-2/2018 – Design of an accessible and inclusive built environment
- Building regulations L2A
- Secured by Design – Lighting against crime

After liaison with Rochdale Borough Council's Environmental Management department, it was advised that light levels across Broadfield Slopes should be higher than advised in BS 8300-2/2018 – Design of an accessible and inclusive built environment, due to on-going problems with anti-social behaviour. After further consultation with "Secured by Design, Lighting Against Crime – A guide for crime reduction professionals" with the council representative, it was decided to use the classification of Broadfield Slopes as a Public Space with pedestrian only traffic resulting in a light level of 20 lux on the pathways.

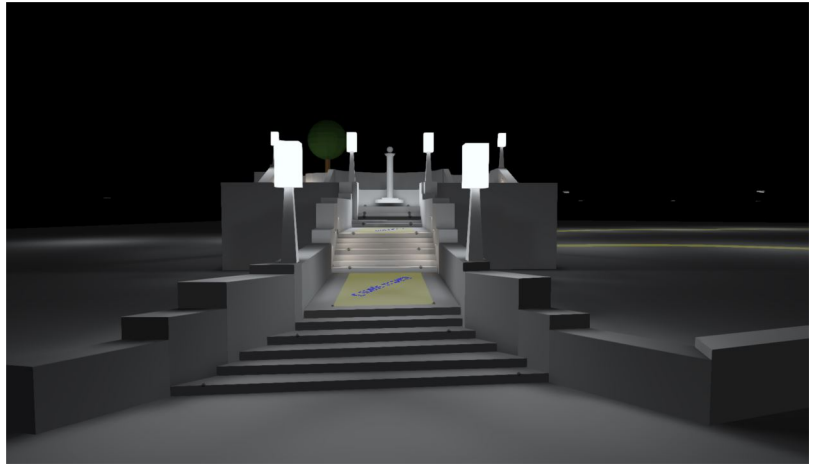
Light levels across the site are:

- Pedestrian pathways – 20 lx ave 0.25 Uo
- Steps – 30 lx ave, min 15
- Ramps – 30 lx ave

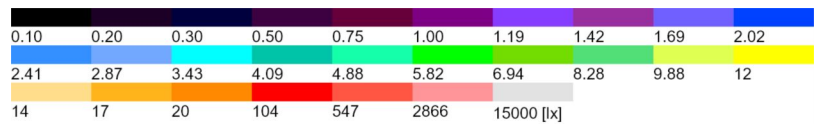
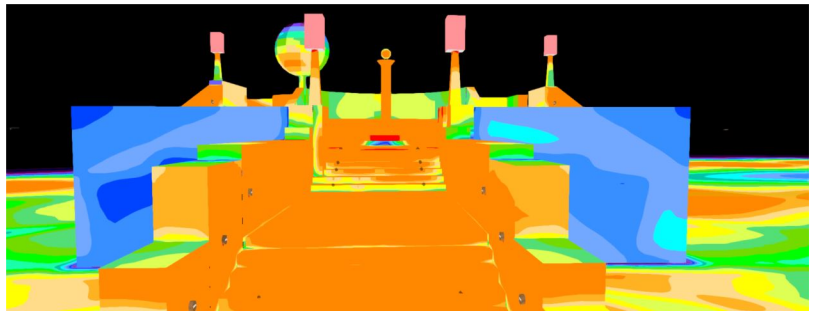
Images

Packer Steps 1

View to Mercat Cross from entrance to Packer Steps



Broadfield Slopes (132)



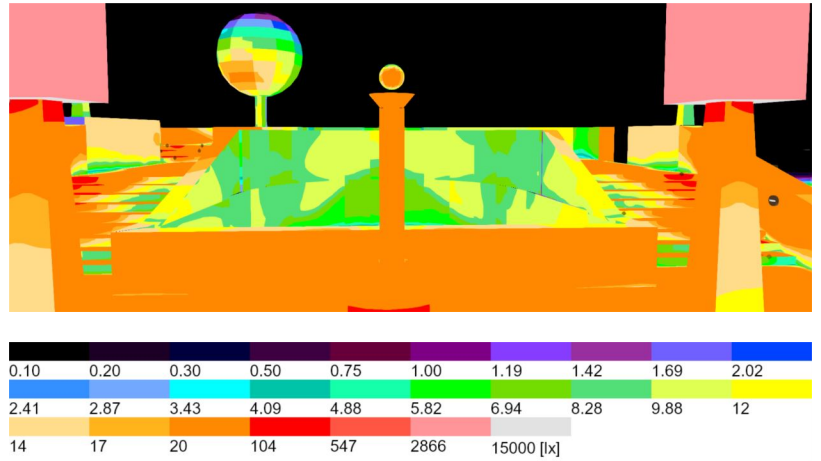
Packer Steps 4

The Mercat Cross



Images

Broadfield Slopes (130)

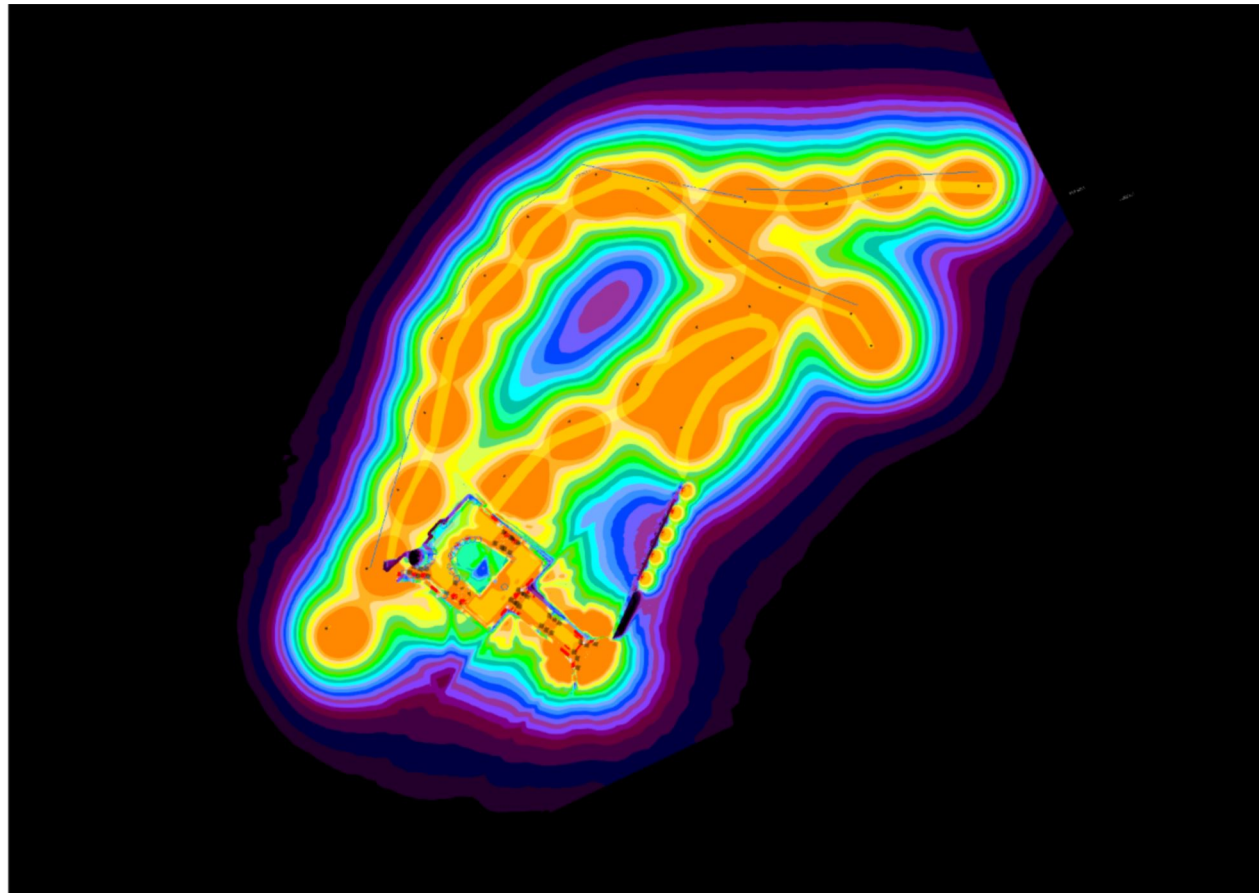


Packer Steps 6

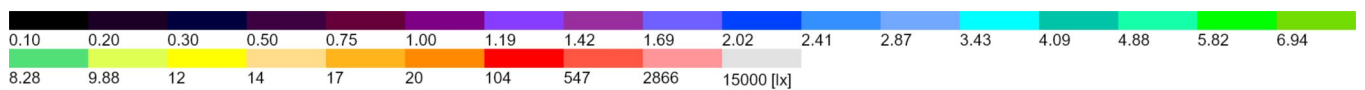
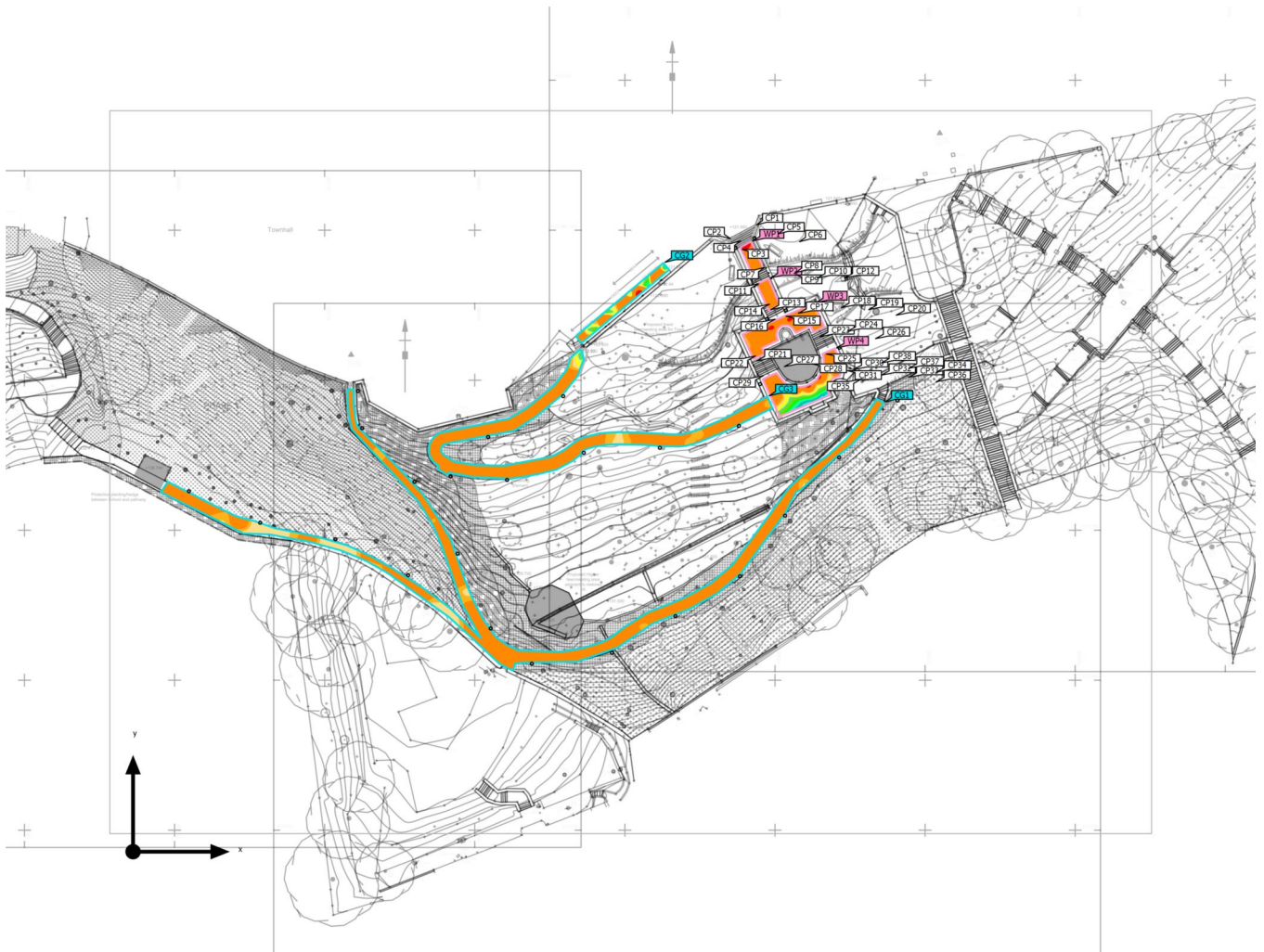
View back towards Rochdale Town Hall



Images



Broadfield Slopes (Light scene 1)

Calculation objects

Broadfield Slopes (Light scene 1)

Calculation objects

Working planes

Properties	$\bar{E}$ (Target)	E_{min}	E_{max}	$U_o (g_1)$ (Target)	g_2	Index
Packer Spout lower walkway Perpendicular illuminance (adaptive) Height: 0.000 m, Wall zone: 0.000 m	82.4 lx (≥ 5.00 lx) ✓	31.4 lx	119 lx	0.38 (≥ 0.25) ✓	0.26	WP1
Packer Spout middle walkway Perpendicular illuminance (adaptive) Height: 0.000 m, Wall zone: 0.000 m	59.4 lx (≥ 5.00 lx) ✓	40.2 lx	89.7 lx	0.68 (≥ 0.25) ✓	0.45	WP2
Packer Spout walkway in front of Mercat Cross Perpendicular illuminance (adaptive) Height: 0.000 m, Wall zone: 0.000 m	54.8 lx (≥ 5.00 lx) ✓	17.9 lx	107 lx	0.33 (≥ 0.25) ✓	0.17	WP3
Packer Spout rear walkway Perpendicular illuminance (adaptive) Height: 0.000 m, Wall zone: 0.000 m	26.8 lx (≥ 5.00 lx) ✓	3.39 lx	329 lx	0.13 (≥ 0.25) ✗	0.010	WP4

Calculation surfaces

Properties	$\bar{E}$	E_{min}	E_{max}	$U_o (g_1)$	g_2	Index
Zig zag path Perpendicular illuminance Height: 0.000 m	30.9 lx	15.4 lx	49.2 lx	0.50	0.31	CG1
Ramp from car park at base of slopes Perpendicular illuminance Height: 0.000 m	31.2 lx	3.42 lx	165 lx	0.11	0.021	CG2
Pathway ramp to top of packer spout Perpendicular illuminance Height: 0.000 m	31.2 lx	8.33 lx	50.9 lx	0.27	0.16	CG3

Calculation points

Properties	Calculated	Index
Packer Spout steps Horizontal illuminance Height: 0.151 m	39.9 lx	CP1

Broadfield Slopes (Light scene 1)

Calculation objects

Properties	Calculated	Index
Packer Spout steps Horizontal illuminance Height: 0.151 m	57.5 lx	CP2
Packer Spout steps Horizontal illuminance Height: 0.001 m	92.0 lx	CP3
Packer Spout steps Horizontal illuminance Height: 0.901 m	91.3 lx	CP4
Packer Spout steps Horizontal illuminance Height: 0.601 m	64.2 lx	CP5
Packer Spout steps Horizontal illuminance Height: 0.601 m	65.9 lx	CP6
Packer Spout steps Horizontal illuminance Height: 1.051 m	80.1 lx	CP7
Packer Spout steps Horizontal illuminance Height: 1.051 m	79.4 lx	CP8
Packer Spout steps Horizontal illuminance Height: 1.501 m	81.0 lx	CP9
Packer Spout steps Horizontal illuminance Height: 1.501 m	82.0 lx	CP10
Packer Spout steps Horizontal illuminance Height: 0.001 m	79.5 lx	CP11
Packer Spout steps Horizontal illuminance Height: 0.001 m	78.3 lx	CP12
Packer Spout steps Horizontal illuminance Height: 2.101 m	67.7 lx	CP13

Broadfield Slopes (Light scene 1)

Calculation objects

Properties	Calculated	Index
Packer Spout steps Horizontal illuminance Height: 2.101 m	62.2 lx	CP14
Packer Spout steps Horizontal illuminance Height: 2.851 m	74.4 lx	CP15
Packer Spout steps Horizontal illuminance Height: 2.851 m	92.4 lx	CP16
Packer Spout steps Horizontal illuminance Height: 2.401 m	73.9 lx	CP17
Packer Spout steps Horizontal illuminance Height: 2.401 m	62.9 lx	CP18
Packer Spout steps Horizontal illuminance Height: 2.551 m	66.8 lx	CP19
Packer Spout steps Horizontal illuminance Height: 2.551 m	80.4 lx	CP20
Packer Spout steps Horizontal illuminance Height: 3.001 m	90.0 lx	CP21
Packer Spout steps Horizontal illuminance Height: 3.001 m	34.9 lx	CP22
Packer Spout steps Horizontal illuminance Height: 4.201 m	45.2 lx	CP25
Packer Spout steps Horizontal illuminance Height: 3.601 m	135 lx	CP27
Packer Spout steps Horizontal illuminance Height: 3.601 m	28.4 lx	CP28

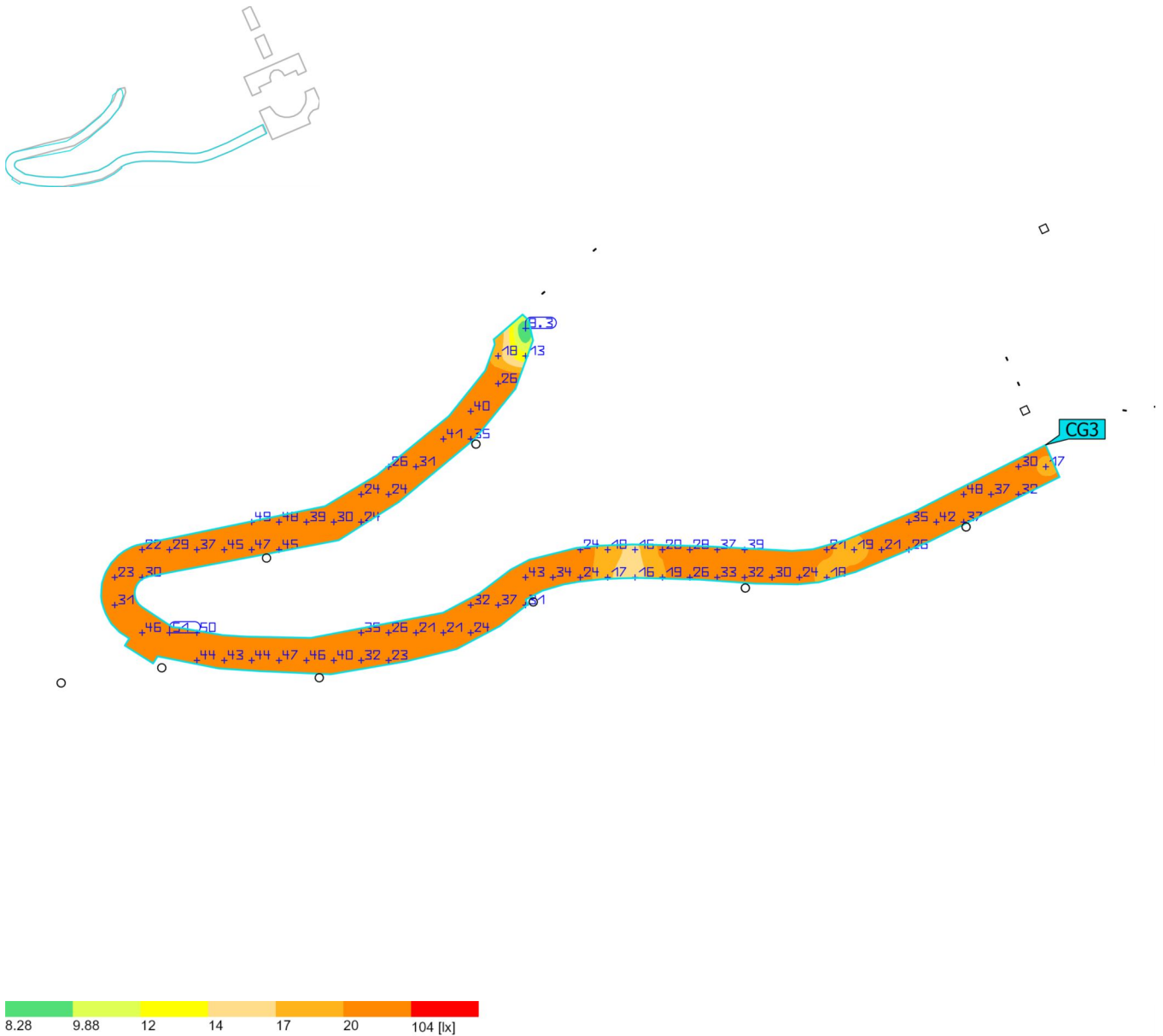
Broadfield Slopes (Light scene 1)

Calculation objects

Properties	Calculated	Index
Packer Spout steps Horizontal illuminance Height: 4.201 m	122 lx	CP29
Packer Spout steps Horizontal illuminance Height: 4.201 m	48.5 lx	CP30
Packer Spout steps Horizontal illuminance Height: 4.350 m	75.5 lx	CP31
Packer Spout steps Horizontal illuminance Height: 4.350 m	48.4 lx	CP32
Packer Spout steps Horizontal illuminance Height: 4.500 m	49.7 lx	CP33
Packer Spout steps Horizontal illuminance Height: 4.500 m	82.6 lx	CP34
Packer Spout steps Horizontal illuminance Height: 4.650 m	43.5 lx	CP35
Packer Spout steps Horizontal illuminance Height: 4.650 m	24.9 lx	CP36
Packer Spout steps Horizontal illuminance Height: 3.750 m	75.8 lx	CP37
Packer Spout steps Horizontal illuminance Height: 3.750 m	34.1 lx	CP38

Utilisation profile: General circulation areas at outdoor workplaces (5.1.1 Walkways exclusively for pedestrians)

Broadfield Slopes (Light scene 1)

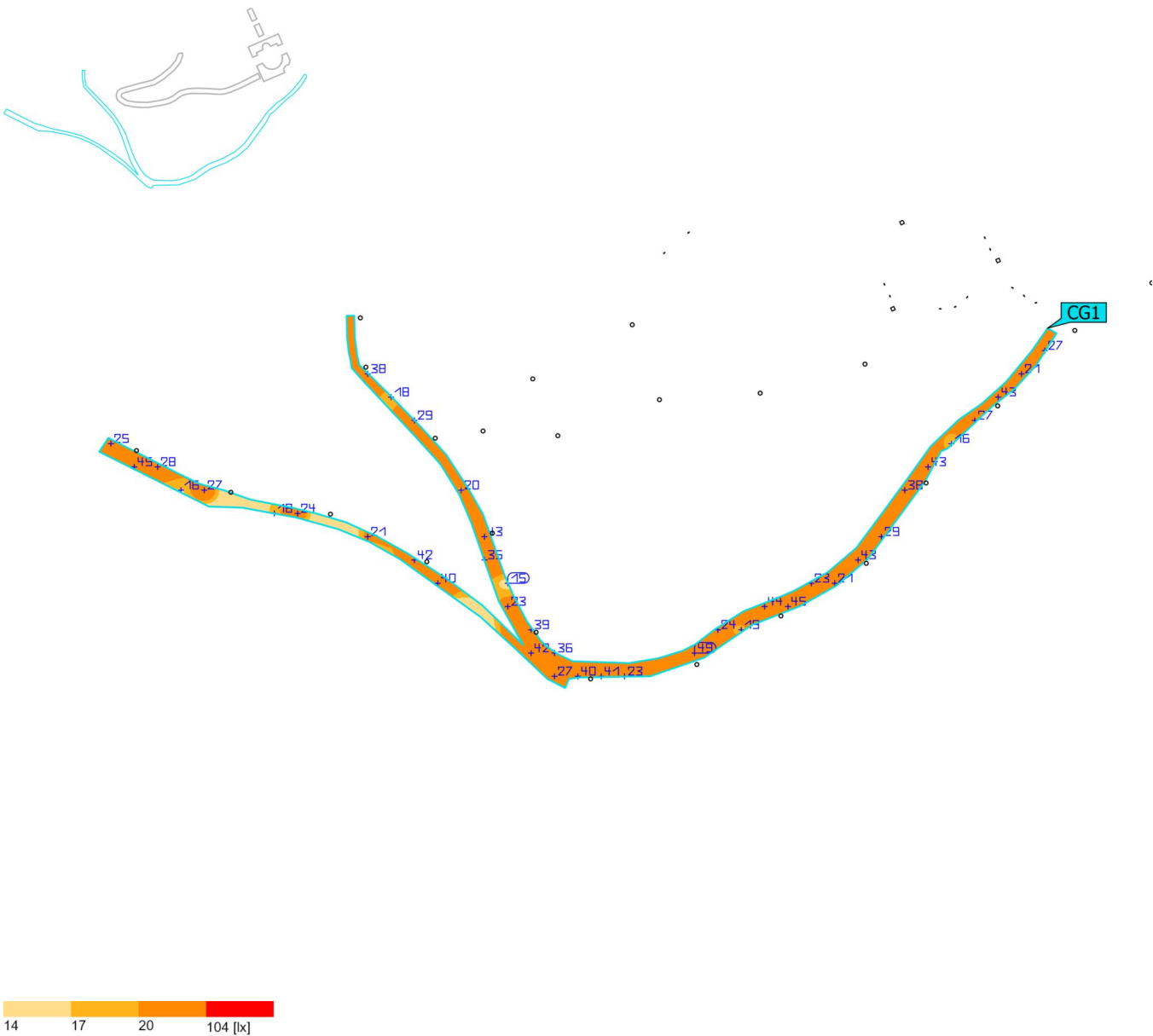
Pathway ramp to top of packer spout

Properties	$\bar{E}$	$E_{\min}$	$E_{\max}$	$U_o (g_1)$	g_2	Index
Pathway ramp to top of packer spout	31.2 lx	8.33 lx	50.9 lx	0.27	0.16	CG3
Perpendicular illuminance						
Height: 0.000 m						

Utilisation profile: General circulation areas at outdoor workplaces (5.1.1 Walkways exclusively for pedestrians)

Broadfield Slopes (Light scene 1)

Zig zag path

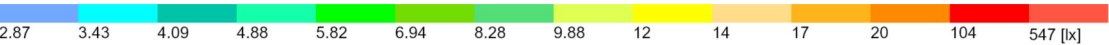
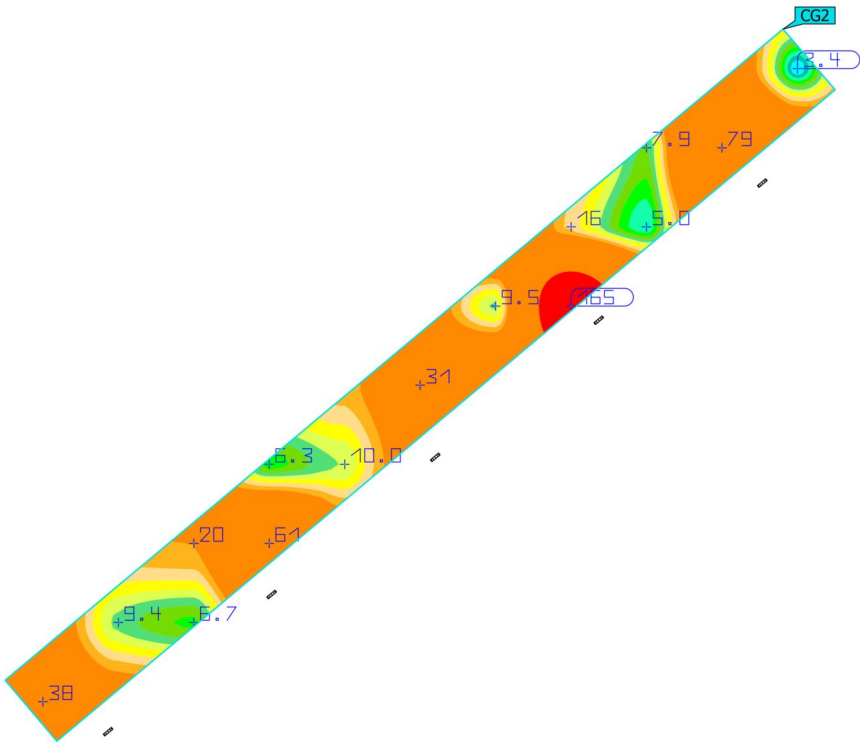
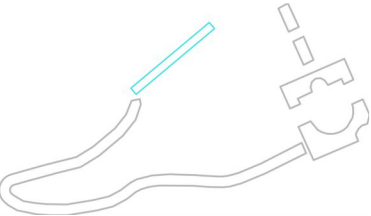


Properties	$\bar{E}$	E_{min}	E_{max}	$U_o (g_1)$	g_2	Index
Zig zag path	30.9 lx	15.4 lx	49.2 lx	0.50	0.31	CG1
Perpendicular illuminance						
Height: 0.000 m						

Utilisation profile: General circulation areas at outdoor workplaces (5.1.1 Walkways exclusively for pedestrians)

Broadfield Slopes (Light scene 1)

Ramp from car park at base of slopes



Properties	$\bar{E}$	E_{min}	E_{max}	$U_o (g_1)$	g_2	Index
Ramp from car park at base of slopes	31.2 lx	3.42 lx	165 lx	0.11	0.021	CG2
Perpendicular illuminance						
Height: 0.000 m						

Utilisation profile: General circulation areas at outdoor workplaces (5.1.1 Walkways exclusively for pedestrians)