

Design of lighting techniques for works of art

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Abstract: *This paper introduces a case study regarding exhibition and art gallery lighting techniques. In order to design the lighting system, we used the DIALux program, which allowed for computer simulation so as to get visuals on the setting to be lighted. The advantage of the computer-assisted design lies first of all in the increase of the quantitative and qualitative analysis accuracy of related lighting systems, under fast performance conditions of necessary complicated calculations.*

Key-words: *lighting; gallery; art; design*

1. Introduction

In the galleries and exhibitions special illumination development, two factors must be corroborated: the performant illuminating technical systems with the art exhibits and their particular features. A dedicated illuminating system, thus, must take into account of both the adequate lime light for the exhibits to protect them and special illuminating systems performances, so that these should be fit and adapted including to other types of exhibits or other arrangement typologies to exhibits in the halls.

2. Material and Methods

In this particular paperwork we studied the case of illuminating screenplay, uniform light washing of a wall, simulation generated by Dialux program. We hang six chalk paintings on a wall. The paintings were distributed at equal distances from one another with the purpose of uniform and evenly illuminating the entirety of the wall. The light also should not disturb the beholder, avoiding direct and indirect blindness through paintings' surface reflection. The light also must not harm the paintings.

We explain technically the way we chose the illuminating devices as well as the sources. We also mentioned their characteristics. We used the OPTEC Wallwasher illuminating device with its specific features.

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Fig. 1. - *Illumination device*

Properties

- Aluminium box
- 3P rail adaptor
- 360 degrees horizontal move
- Silvered aluminium reflector
 - Anti-blindness tin frame
 - 230 V power supply

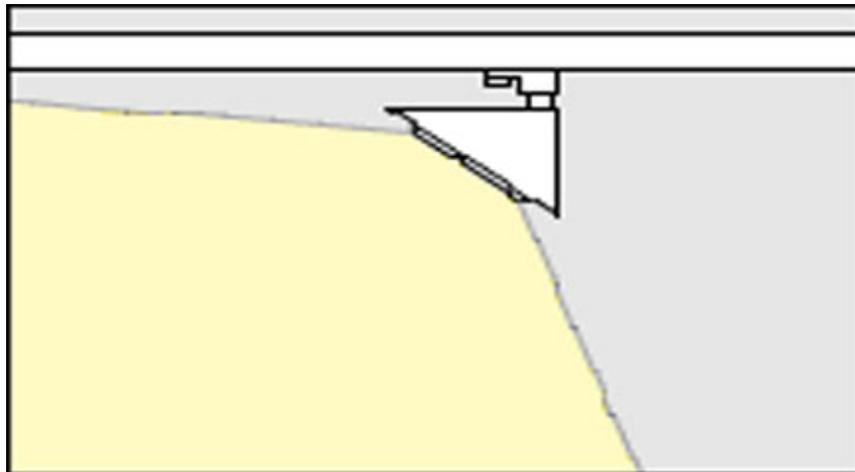


Fig. 2. - *Illumination technique*

Illumination technique:

- Asymmetrical illuminating flow distribution
- Equal distances distribution to get a properly uniform illumination

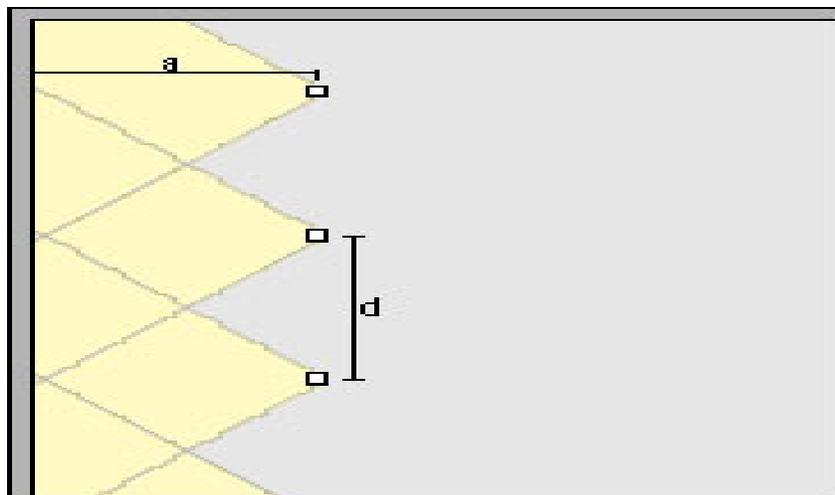


Fig. 3. - *Illumination technique*

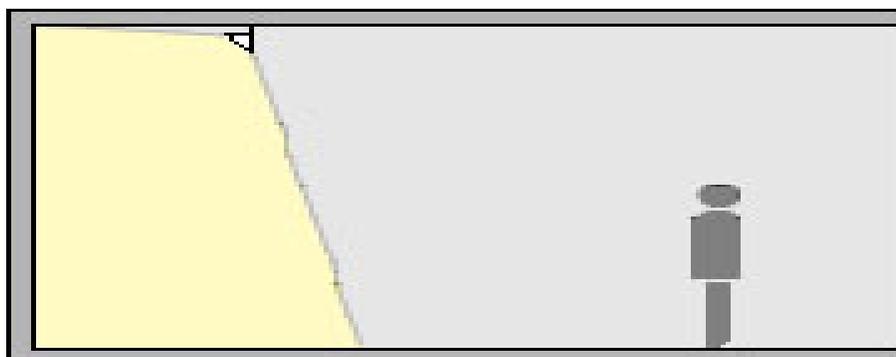


Fig. 4. - *Illumination technique*

Light source for OPTEC Wallwasher



Fig. 5. - *Source of light*

Name: QT32/m

Properties:

- Iridescent halogen lamp
- Power supply 230 V
- Power 100W
- Support type E 27
- Luminiscent flow 1430 lm
- Color temperature 2900 K
- Life time: 2000h
- Blurred glass
- U.V. blocking

The light source properties - combined with Optec illuminating device performances and its positioning modus and optimum positioning distances, both between the illuminating devices and the exhibited objects-offer the expected effect: a uniform illumination to underline and highlight the paintings value as well as protecting them against any damage due to harmful light effects.

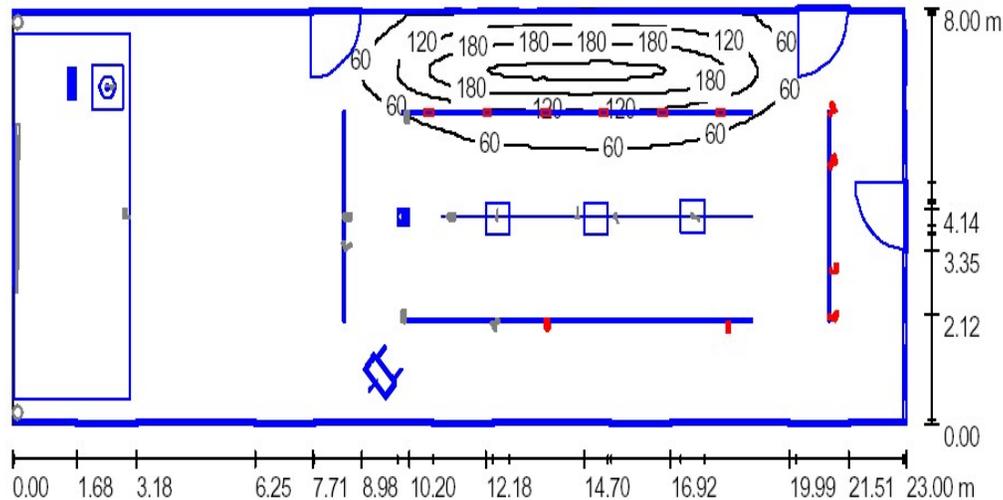


Fig. 6 - Illumination level sketch – top view – (generated by Dialux program)

Medium illumination of the wall is: $E = 100 \text{ lx}$.

Room's height: 4.250m, Light loss factor: 0.50

Surface	$\rho \%$	$E_{av} [\text{lx}]$	$E_{min} [\text{lx}]$	$E_{max} [\text{lx}]$	E_{min}/E_{av}
Working plan	/	28	0.94	252	0.03the
The floor	20	25	0.00	196	0.00
Ceilling	80	8.57	0.90	38	0.11
Walls (4)	50	13	0.24	373	/

Table 1. Lux value, scale 1:165

Working plan:

Height: 0.760m

Grid: 128x128 points

The limit area (in which the room is fitted): 0.000 m

Illumination coefficient (the report of different surfaces illumination): Wall/Working plan: 0.566, Ceilling/ Working plan: 0.300

Nr.	Parts	Name (correction factor)	$\Phi [\text{lm}]$	P [W]
1	4	Optec Spotlight 1 x QR-LP111 100W /45° (1.000)	1423	105
2	2	Pollux Spotlight 1 x QT12-ax 50W (1.000)	950	53
3	6	Optec Wallwasher și o lampă tungsten cu halogen (1.000)	2400	150
Total			21992	1426

Table 2. Illuminating devices list

Specific load: $7.79 \text{ W/m}^2 = 27.36 \text{ W/m}^2/100 \text{ lx}$
(Surface: 183.08 m^2)



Fig. 7. - *Uniform illumination*

3. Conclusions

The paintings were distributed by equal distances between them, the purpose of this being that they will be uniformly illuminated and together all of them. Also the light must not disturb the beholder, so the direct or indirect blinding by reflexions from the surface of the paintings must be avoided. The light must not damage the paintings.

4. References.

Book

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