

Architectural Lighting Fundamentals (ALF)

January 2010

Introduction

Lighting design as a profession combines the art and science of designing with daylight and electric light to support the creation of good quality living and working spaces for human beings. The human being, of whatever age, cultural background, state of health or occupation is the focus of all architectural lighting design. To be able to create the desired atmosphere and the right balance of light and shadow requires experience and sensitivity as well as insight and an understanding of the client's wishes, the users' needs and the three-dimensional space. Such skills take some years to acquire.

In the course of the process of establishing the Lighting Design profession a number of education programmes and initiatives have been set up around the globe. Some of the schools and universities programmes involve practising lighting designers with the above-mentioned skills, others do not. The results of a special working group formed from the PLDA Educators Network, which includes educators from many countries around the world are incorporated in a document entitled Architectural Lighting Fundamentals, ALF. The objective of the ALF is to acknowledge a platform of basic skills and content required for young professionals worldwide to practice as architectural lighting designers. The ALF are suggested guidelines. They are not mandatory and they are not a curriculum. The six topics do not represent six equally balanced parts of a syllabus. The contents can be incorporated into any didactic approach. They can be taught as individual modules and/or woven into the teaching of lighting design methodology. The ALF can serve as a checklist for educators and students as well as young practising lighting designers pursuing continual professional development.

1. HISTORY AND THEORY

- 1.1 History of architectural lighting design (ALD)
- 1.2 Theory and current practice of ALD

2. PERCEPTION

- 2.1 Perception
- 2.2 Health and human factors

3. LIGHTING PHYSICS

- 3.1 Lighting physics

4. LIGHT SOURCES

- 4.1 Daylight
- 4.2 Electric light sources

5. LIGHTING EQUIPMENT

- 5.1 Optical systems
- 5.2 Types of luminaires
- 5.3 Electronic controls
- 5.4 Specifications

6. PRACTICE

- 6.1 Lighting principles
- 6.2 Design concepts
- 6.3 Layout and documentation
- 6.4 Calculation
- 6.5 Codes, standards and energy

The above **topics** serve as a guide and outline basic themes. The more detailed **content** below provides a general description of each topic, but is not intended as a curriculum. The content aims to highlight essentials. The author of a curriculum is free to extract appropriate elements from the "content" and weave them together to create the respective syllabus.

1. HISTORY AND THEORY

1.1 History of architectural lighting design (ALD)

Content: An overview of the history of architectural lighting design.

1.2 Theory and current practice of ALD

Content: Theory and current practice of ALD's (people, projects), historians, theorists and critics.

2. PERCEPTION

2.1 Perception

Content: The physiological interaction of light and space; architecture and interiors, atmosphere, impact of finishes and materials; quality of light, brightness, colour and glare. The psychology of light and space.

2.2 Health and Human Factors

Content: The impact of light on health and human behaviour.

3. LIGHTING PHYSICS

3.1 Lighting physics

Content: Lighting terminology, units and relations (wattage, voltage, flux, efficacy, luminance, illuminance, lux/ footcandles, colour temperature, colour rendering index).

4. LIGHT SOURCES

4.1 Daylight

Content: Quantity, quality and cultural conditions, use of fenestration, control of daylight and shading systems.

4.2 Electric light sources

Content: Lamp types and characteristics; incandescent, fluorescent, discharge and solid state light sources.

5. LIGHTING EQUIPMENT

5.1 Optical systems

Content: Principles of controlling light (reflection/refraction) reflectors & lenses

5.2 Types of luminaires

Content: Luminaire evaluation, components, features and accessories

5.3 Electronic Controls

Content: Basic dimming/control logic and equipment.

5.4 Specifications

Content: The lighting specification process, various specification formats and written specifications.

6. PRACTICE

6.1 Lighting Principles

Content: Concepts and guidelines for general lighting, wallwashing, floodlighting, orientation lighting and beam angle studies for accent lighting.

6.2 Design Concepts

Content: Geographic context and client program requirements; visualization, communication techniques (hand sketch, computer modelling and/or rendering), lighting simulations, mock-up and lighting design narrative.

6.3 Layout and documentation

Content: Basics of architectural drawings, lighting drawings, reflected ceiling plans, luminaire schedule, specifications and typical lighting details.

6.4 Calculations

Content: Light level calculations via basic formulas and computer simulation for electric lighting and daylighting; photometry and beam studies.

6.5 Codes, standards and energy

Content: Light level guidelines, codes and standards of practice (e.g. IESNA Handbook, LEED, CIBSE, etc.); energy usage and sustainable design issues.

Please note:

A. Working as an architectural lighting designer by nature suggests a working knowledge of 'AutoCAD' and an ability to read plans, sections and elevations, since these are routine and daily communications instruments.

B. As with any design profession, practical training such as an internship, practical workshop experience (one or two PLDA workshops during the period of studies) or mentorship is beneficial to optimize academic learning.