

Perspectives and problems of the architectural lighting of Sofia

"The architectural lighting is incredible composition of technics and art!"

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Abstract

Sofia is one of the oldest European cities, historically documented as "Roman Serdika" in 7th century BC on the land of an ancient Thracian village. The 28 centuries history of Sofia is accompanied with dynamic and often dramatic development. The look of contemporary Sofia is characterized by extremely rich and diversified kaleidoscope of historical landmarks, old and contemporary cultural monuments and architectural masterpieces ancient Thracians and Hellenes, Roman Empire, Byzantium, Slavs, ancient Bulgarians, Ottoman Empire and the new Bulgarian state from 19, 20 and 21 century.

These landmarks are unique wealth and define the identity of the capital. Their architectural lighting is a mandatory prerequisite for the formation of esthetical, attractive and representative night picture of a contemporary European capital - Sofia.

In the current paper, a richly illustrated review of the architectural lighting in Sofia is presented. The problems and the future development of the architectural lighting are analyzed as well. These are:

- the need of a Master for sustainable coordinated and planned realization of the architectural lighting in Sofia;
- integration of the architectural, advertising, street and informational lighting;
- improvement of the energy efficiency of the architectural lighting;
- increase of quality and efficiency of the exploitation of architectural lighting;
- artistic and technical control of the quality of the designs for architectural lighting;
- perspectives of LEDs architectural lighting;
- RGB architectural lighting;
- contemporary tendencies in architectural lighting.

Introduction

The urban space as a whole changes dynamically and gets enriched with the time, uniting different architectural styles in an interrelated whole. The architecture itself reflects the cultural development of the cities, revealing their history and identity, which makes them unique. For getting visual impression about the urban space, there is a need of light. This light can be natural or artificial, which is a prerequisite for different visual impression of the architecture and the urban space during the day and the night. To allow viewing and perception of the urban landscape during the dark part of the day, artificial lighting is necessary. It forms the night vision of the city, by emphasizing the architectural masterpieces, historical and cultural monuments and simultaneously creating conditions for the safe movement of vehicles and pedestrians, reducing criminal activities and aesthetic and comfortable environment for various activities in the night [1]. Through architectural lighting it is possible to realize attractive and unforgettable night sight of the

urban space. The impression of a well lit city at night is often more interesting, exciting and memorable than it is during the day [3].

Architectural lighting of contemporary Sofia

Even though a little bit late, the architectural lighting in Bulgaria took its priority place in the practical lighting technique. Nowadays most of the significant public historical and architecturally valuable buildings are lit. In this respect Sofia has the look of European capital, which is in some degree due to the contribution of the Lighting Technique Laboratory of the TU – Sofia. Our team* designed and in some of the cases implemented the architectural lighting of the following buildings: The National Bank of Bulgaria (1999) – fig.1, The Parliament Building of Bulgaria (2001) – fig.2, Ministry of Defense (2005) –fig.3, Bulgarian Courthouse (2006) – fig.4, The Administrative Building of the Parliament (2007) – fig.5, Sofia Municipality Building (2010), the building of the Technical University of Sofia [2] (2002) – fig.6, the building of the Union of the Architects in Bulgaria (2007) – fig.7, The Art Gallery for Foreign Art (2003) and others.



Fig. 1 Bulgarian National Bank



Fig. 2 Building of the Parliament of Bulgaria



Fig. 3 Ministry of Defense

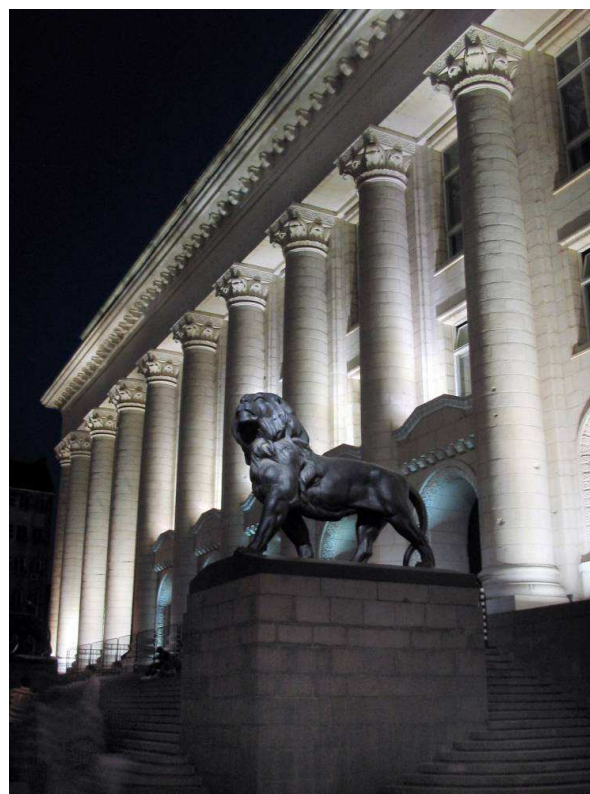


Fig. 4 Bulgarian Courthouse



Fig. 5 Administrative Building of the Parliament



Fig.6 Rectorate of the Technical University – Sofia

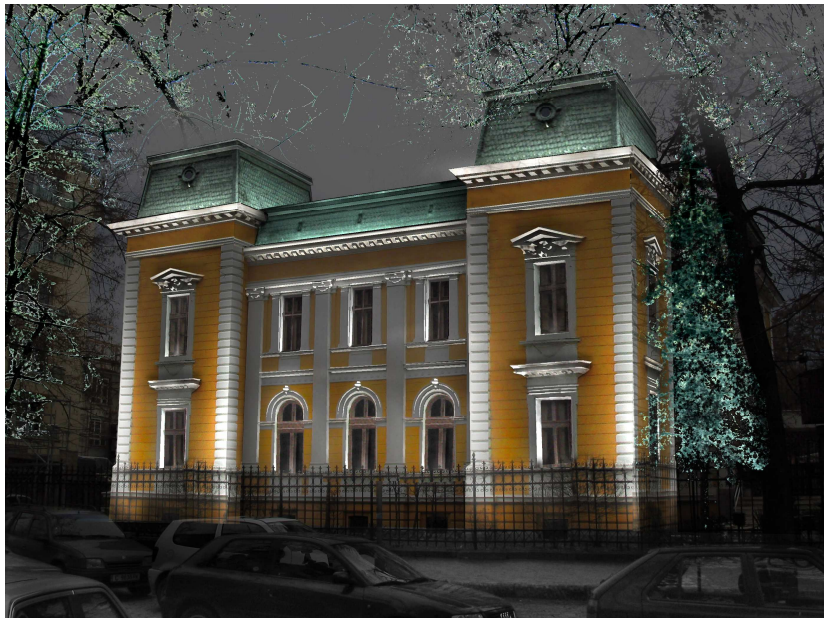


Fig.7 Union of the Architects in Bulgaria



Fig. 8 Art Gallery for Foreign Art

It must be mentioned that the above buildings have classical architectural layout. That is the reason why in the design of their light composition, the following visual requirements, architectural and aesthetic characteristics of the illuminated buildings:

- geometrical contours of the illuminated building;
- focus of the light composition – compositional center;
- symmetry and asymmetry of architectural design;
- metric (rhythmic) alternation of architectural elements and lighting effects;
- position of the observer to the object and visual angle, under which it is seen;
- ratio between the brightness of the illuminated object and its surroundings;
- light color formation and reflective characteristics of the object and its surroundings.

Very important and necessary stage of architectural lighting design is the computer visualization of the proposed light and color composition, through which preliminary information about the expected lighting and color effects is obtained.

Usually the lighting of such buildings is realized using one of the following manners:

- general lighting or „flooding” the building with light;
- selective ”localized” lighting;
- combination of “flooding” and “localized” lighting.

Besides the measured and professional realization of the above design decisions, they are not the only prerequisite for the quality of the architectural lighting of buildings with national significance. An essential role for the quality of the designed projects has the strict execution of the maintenance plans for the lighting and the electrical installations. Particularly important for the right exploitation of the architectural lighting is the timely replacement of defected light sources and luminaires with new ones having the same power, color temperature, light distribution and dimensions in order to keep the initial design idea. Fig. 9 shows the „dramatic” change of the architectural lighting of the façade of the building of the Council of Ministers of Bulgaria, because of the presence of defected lamps and also lamps replaced with light sources with different color temperature!



Fig. 9 Council of Ministers of Bulgaria

During the last 10 – 15 years, the modern architecture penetrates in Sofia– fig.10, fig.11.



Fig. 10 Modern glass building

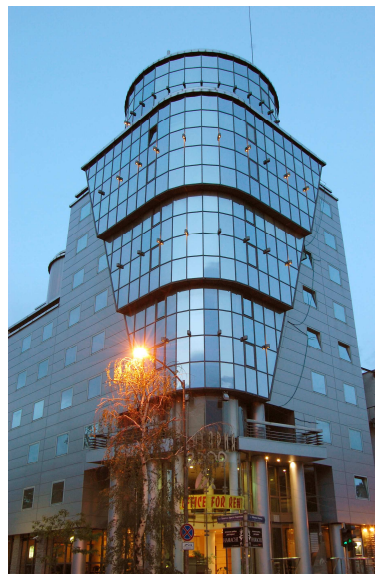


Fig.11 Irrelevant architectural lighting

The above-mentioned classical theory, the principles and the current practice for implementation of architectural lighting appear to be not applicable for the glass and covered with decorative metal elements facades of the new buildings. So far the visual demonstration of the whole volume of these buildings through “flooding” them with light appears unattainable. Usually separate architectural elements on the facades of these buildings are “locally” lightened. Fig.12 and fig.13 present example designs for new buildings, chosen by some design companies in Sofia.

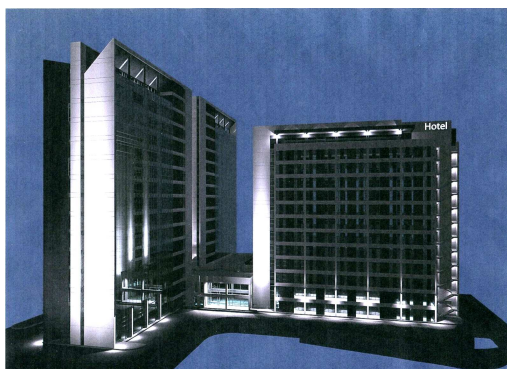


Fig. 12 Design decision - hotel

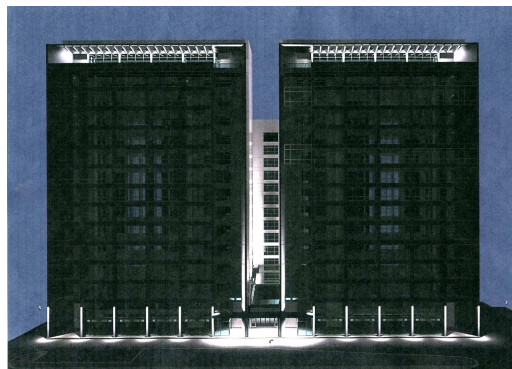


Fig. 13 Design decision – office building

Naturally one question appears – may this be acknowledged as architectural lighting or it is closer to decorative lighting? Certainly artistic and aesthetic impact is achieved in many cases, but it is a result of the realized lighting effects.

Another opinion also exists – that this is lighting architecture. This term is first introduced in 1927 by J.Teichmueller, and according to Koehler and Luckhard in many cases the role of the light exceeds the „expression of the architectural values” and acquires independence in the creation of artistic effects [4]. A lot of decorative constructions have two different visions – daytime and nighttime vision, and in many cases the nighttime vision is more important, built by artistic lighting effects.

There is a possibility that new conceptions and manners in the lighting of modern architecture will be introduced? An important prerequisite for this are the LEDs (Light Emitting Diodes) – the new light sources of the 21st century! They appear to be extremely suitable for architectural and decorative lighting, thank to their characteristics and qualities:

- long durability, which releases the difficult maintenance of the lighting system;

- compact size of the LED luminaires and floodlights. This allows for their discrete mounting on facades of buildings, which is of a great importance for preserving the appearance of the lightened buildings;
- effective implementation of “local lighting” of buildings, thank to the compact and directed light distribution of the LED luminaires;
- rich variety of LEDs with different color of the light;
- extremely high density (monochromacity) of the color of the, which makes possible the realization of interesting color effects;
- possibility for inertia-free regulating of the intensity of the LED lighting;
- rich variety of possibilities for creation of dynamic lighting and color effects with RGB LED floodlights and luminaires.

Our team first used LEDs in 2005 in our project for the architectural lighting of the building of the Ministry of Defense in Sofia (fig.14).



Fig.14 Ministry of Defense

In our last project – the building of Sofia Municipality the decision is intended to be realized only with LEDs (fig.15).



Fig.15 Sofia Municipality

Conclusions

This paper presents in short the contribution of our Laboratory for the creation of more beautiful and attractive night view of our capital during the last 12 years.

We are proud that we live in such an impressive city and with our activity in the field of architectural lighting we contribute for the self-esteem of the citizens.

“Light is magic, which can provoke pride in man about the place where he lives!”
Alain Guillon

“Perfection in the world does not exist, but we have to reach out for it (Fig.16)!”



Fig. 16 St. Alexander Nevski Monumental Church

References

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Appendix

Sofia is not only the capital, but the biggest in Bulgaria and 12th by size city in the European Union. It is a main administrative, industrial, cultural and university center in the country. It forms as a modern European capital with a lot of business and trade centers, dynamic night life and cultural landmarks. Sofia is a city with 7000 years historical wealth. In the 8th century BC on the place of a Neolithic village it occurs as an ancient Thracian town. At the time of the Roman Empire, the town, called Serdika is preserved as centre of the Roman province Lower Dakia. A lot of towers, fortress walls, administrative and religious buildings are built at that time. During the 5- 6th century the town resists multiple attacks of barbarian tribes and becomes an important administrative and economic center of the Byzantine Empire. In 809 it is affiliated to the boundary of Bulgaria and is called Sredets. From 1018 Sredets carries the name Triaditsa and is under Byzantine rule. With gaining the independence of Bulgaria from the Byzantine rule, the town is once again affiliated to Bulgaria and is named Sofia. Before the Ottoman rule, the town grows a lot of churches and public buildings are built. The ottoman conquerors however change the appearance of the town, the Christian temples are ruined, and the buildings are transformed to mosques, baths and trade centers. Sofia becomes an important cross road on the Balkans and gains the importance of a crafts and trade center. In 1878 Sofia is liberated from the Ottoman rule and in 1879 is proclaimed to be capital of Bulgaria. From this moment on the city acquires European look, and its really modern look, Sofia acquires during the 30 years of the last century. During the Second World War the city is partly ruined. After the political changes in 1944, urban style buildings are built. Contemporary Sofia has kept parts of the different historical periods, it passed through and at the same time it undergoes a lot of architectural changes to become a modern European city.

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