

**UNDERWATER LUMINAIRE**

U. Bassov - Russia

**ПОДВОДНИ ОСВЕТИТЕЛИ**

Ю. Басов - Русия

**EXISTING STATE AND APPROACH OF LUMINAIRES  
MANUFACTURING - "SVETLINA" Co - St. Zagora**

N. Nikolov, Bulgaria

**СЪСТОЯНИЕ И ПЕРСПЕКТИВИ НА ПРОИЗВОДСТВОТО НА  
ОСВЕТИТЕЛНИ ТЕЛА ОТ "СВЕТЛИНА" АД гр. СТАРА  
ЗАГОРА**

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## EXTERNAL LIGHTING OF THE SACRAL BUILDINGS SPOLJNO OSVETLJENJE SAKRALNIH OBJEKATA

Grozdana Popovic

The external lighting of the sacral buildings from the urban point of view is what this presentation is about. The accent is on illuminance of the Orthodox churches with the examples.

"Serbian temples are the spiritual vertical columns which support Serbs to hold themselves up through the centuries"

### PREFACE

The church has been – by its origin and development – the connection between the religion and the culture. It has been the strongest spiritual, physical, symbolic and esthetic referent in the space of a town.

The building of the Orthodox churches, in our country from the Second World War till now, was completely "frozen".

That's why, after a half of century without any new experience, it becomes the great architectural challenge.

According to the important Church's building rules, the orientation east – west and the continue of the church's building complex – are prescribed. The main items are:

- temple, itself
- bell – tower
- building for the priests
- external yard – court
- spring – fontaine,
- entrance road
- parking

But, during several decades after the Second World War, the building of the churches did not exist in Serbia. Therefore, we are short of the theoretical studies in the field of illuminance of the churches.

### LIGHTING

By the lighting of the church, you can emphasize its architectural and artistic qualities. The interior, as well as the exterior of the church, has to be under the tender and holy light.

Some details have to be especially marked out: the tower, the shell, the windows and the bell – tower.

The church yard, its pedestrian ways and the fountain – ought to have the park lighting. In the extraordinary halls of the church, beside religious services, some cultural performances may take place (concerts, dramas). For those exceptional events, it is necessary to provide some extra lights.

The main directions for the church lighting are:

- the general principles of the lighting requirements
- the selection of the light sources
- the choice of the reflector lamps

Reflector lamps and equipment are evaluated according to the requirement of designed light levels.

The specification of the recommended light levels which are depending on the materials and the brightness of the building, are presented in the table.

### Guide to surface illuminances

Reflectance of material	Brightness of surroundings		
	Low eg poorly lit rural area	Medium eg small town or outer suburb	High eg city centre commercial or leisure
High eg white marbre	20 lux	30 lux	60 lux
Medium eg grey concrete	40 lux	60 lux	120 lux
Low eg red brick	80 lux	120 lux	240 lux

Values are given in lux for average illuminance of total subject. Details of architecture and small elements such as sculpture often require illuminances made more than double shown in the table. Bronze and gold require extremely specific illumination.

Lighting projectors have to be installed in that way that they are discrete under the day light.

In choosing the illuminance sources, all kinds of illuminance could be under the consideration, but having on mind that:

- for the yellow colored materials, the sodium source of illuminance is preferable;
- for the pink and red materials, incandescent and halogen sources of illuminance are suitable;
- for the light colored and white materials (marbre, stone, concrete), each source of illuminance can be used, except the sodium with the low pressure;
- for the green (as the church yard is) the most convenient is metal halid source of the illuminance.

External illuminance of a church is specific for each one, depending on the location (city center or the village), on the style of building (medieval or modern) and on the other surrounding lights (street, parc...).

### EXAMPLES OF THE ILLUMINANCE

#### Orthodox Cathedral Church

The Cathedral Church was built in Belgrade in the last century and was opened to the people in 1845. It is a dominant monument on the valley of Sava river. Its tower and its shell could be perfectly seen from many Belgrade places.

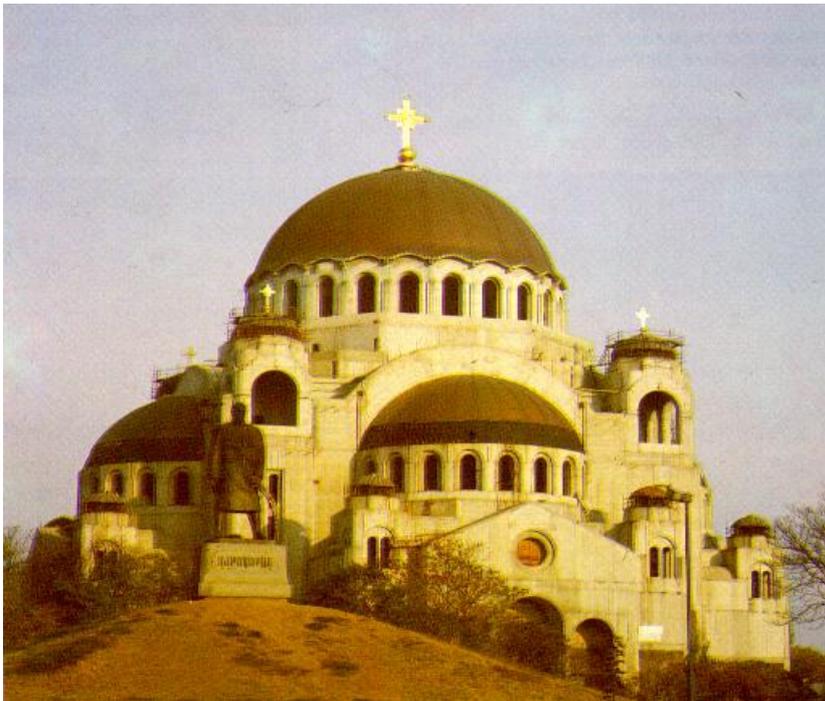
The exterior walls are made of stone, the Baroque's tower has got the golden decoration. The required values of the average illumination are 100 – 150 lx for the external walls and for the tower – 200 – 250 lx. Regarding to the color of the facade and the tower, the light bulbs that are chosen – are those under the high pressure by the natrium steam SON-T. For the main fasade, the lighting projectors, that are used, are the type RT3NB/150/83.

For the tower – there are 8 projectors all together: four of them – the type RT4N/1000/1103 – have been installed on the balcony of the existing buiding on the opposite side of the street, but the other four – the type RD4N/1000/1103 are situated on the existing iron columns of the public light which have been put on the lateral position to the church tower.

By this simple and not so expensive solution, the aim has been reached. The Cathedral church can be better seen now, and the view is more expressive during the night than by the day light.

### Saint Sava's temple

Saint Sava's Temple is one of the most important monuments in the romantic Belgrade scenery.



The existing design is completed with the decorative illuminance design. But, the illuminance will be installed on the end of finishing works. So, it is temporarily lighted for the moment.

On each of four 14 m' high columns, there are two narrow-rays lighting projectors. Each reflector has 2.000 W and all together, they are 16.000 W strong. That is illuminance for the cross and all the roof of temple. Illuminated by the strong white lights, the temple is dominant on the plateau of Vrachar. But, it is also seen from all the higher parts of the city: Zvezdara, Crveni krst, Banjica...

## The Church in Valjevo

The decorative illuminance, made last year in the Serbian town Valjevo, has done many buildings to look more attractive. The new lighting of the Church and the belonging yard – is also important. It was achieved by 12 special lighting projectors, put into the soil up to the grass-level, with the metal-halogen lights of high standards.

### **RESUME**

The approach to the illuminance of the orthodox temples in our country is still on the beginning.

Today's level of science, knowledge and the experience of experts is the base for the good quality of the church – illuminance design. Properly illuminated church in the city by night, becomes a part of the main city repers.

### **LITERATURE**

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Tradition and the modern Serbian building of churches  
B. Stojkov and Z. Manevic

DOS documents, published for the conferences