

Materials of Conferences

**TO THE CHALLENGE
OF THE REGULATORY INSOLATIONAL
REGIME OBSERVANCE
AT THE BUILT – OVER AREAS**

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The regulatory insolation regime observance challenge at the built – over areas, lands, and territories has been considered in this paper. The insolation regulations have been reflected.....Also have been shown.

In the modern world, the urbanization pace is continued to be gone forward at the steady gait. With the industrial production rising growth, the towns and the cities are growing, the existing buildings are compacted, in connection with which there is the regulatory insolation regime observance challenge of the residential, the apartment buildings and the surrounding areas, lands, and territories.

So, the insolation terms and the conditions are determined by the natural factors number: the Sun's passage height, depending on the country's geographical latitude, and the season of the year, as well as the atmospheric transparency. So, the planning and the building factors are exerted their strong and the considerable influence upon the following: the buildings techniques, the premises and the buildings orientation to the cardinal points throughout the world's countries, the light apertures dimensions, the walls thickness, the windows frames design, especially the architectural façade solution peculiarities and the special features (e.g. the balconies, the terraces, etc.). The insolation intensity of the solar radiation total flux, and its ultraviolet rays' intensity from the Sun's height over the horizon are taken into account in the insolation calculations. So, the maximum intensity of the solar radiation flux at the Sun's position is possessed just at its zenith; then, the radiation intensity is slowly decreased, as the Sun is approached to the horizon.

The regulatory conditions observance purpose of the natural light and the insolation is the necessary conditions provision for the normal life of the comfort in the various states light of the sky. So, the natural lighting facility conditions are determined by the natural illumination factor (NEF) for the diffuse light of the cloudy sky. The solar radiation influence conditions are determined by the insolation time duration in the cloudless sky. So, all these indices and the figures are quite independent from each other, that is, for one and the same premises performance standards are not the insolation duration means that the natural light rules, and vice versa.

So, at present, the legal need for the research carrying out on the insolation established regimes observance and the significance of the works to be ensured the population necessary insolation has been legislated by the Federal Law articles and the regulations «On the Sanitary and Epidemiological Population Welfare» № 52-FL dated from 30.03.99.

Thus, the main documents, having governed the criteria and the requirements to be insured people the necessary insolation regime, are the following:

- The building norms and the regulation RF BN&R 23-05-95(2003) «The Natural and Artificial Lighting» (hereinafter referred by the text RF BN&R 23-05-95(2003)) are the fundamental document, having set the standards of the natural, the artificial and the combined buildings and the structures lighting, and also, as well as the norms of the artificial lighting residential areas, the enterprises' playgrounds, and also the places of the business work outside the buildings.

- The sanitary rules and the norms «The Hygienic Requirements for the Insolation and the Sun Protection Premises of the Residential and the Public Buildings and the Areas. SanR&N 2.1/2.1.1.1076». The sanitary and the health regulations are established the hygienic requirements for the insolation and the sun protection of the residential and the public buildings and the housing areas. So, the hygienic evaluation of the insolation and the sun protection of the residential and the public buildings, and the areas of the residential buildings is carried out to be determined the observance with these current Sanitary Rules.

So, the Sanitary Rules observance is the compulsory one for the citizens, the individual entrepreneurs, and the legal entities, having engaged in the design, the construction, the reconstruction, and the maintenance of the facilities.

Their local territorial building norms (TBN) may be accepted on the Federation subjects'

territory. Such kinds of the documents are lost their legal force, and they can only be taken into account, and can be considered, as the recommendations on the Russian Federation other subjects territory. The example can be served «The Natural, the Artificial, and the Combined Lighting. MFCH 2.06-99» and «The Outdoor Lighting Standards in the Urban and the Rural Settlements. TBN 23-330-2002 XMAO».

At the present time, the architectural and the urban development solutions, having built-up areas, lands, and territories in the South of the Tyumen region, are accepted by the established federal standards of the insolation.

At the new and reconstruction design of the existing buildings for the various purposes for the nor-

mal human life, it is very significant to be observed the insolation hygienic standards and the premises' natural lighting, as having set forth in the regulations.

The lighting and the insolation regulatory parameters provision is the measure of the consumer quality housing. At the same time, the quite new buildings and the facilities construction should not impair the lighting performance of the already existing building. So, the gaps magnitude between the buildings is, mainly, determined, on the basis of the conditions for the insolation and the lighting regulatory values provision. Thus, it is obligatory to be followed the SanR&N, the BR&R, the TBN, having defined the insolation and the natural lighting required level.

So, the main requirements to the premises insolation in the various climatic regions are not quite the same, they are constantly varied. In the Southern regions, where over the long hot period there is the solar radiation excess, the premises' insolation in the Summer months is the negative factor. In these areas, the insolation is quite favorable, mainly, in the relatively cold period of year. In the middle zone of the Russian Federation, the insolation apartment houses, nurseries, children and the medical Institutions, and the hospitals is considered the mandatory one from March up to September, the rest period – it is considered the quite desirable one. In the Northern regions, where the acute shortage of the solar radiation is felt much, it is necessary, to fully possible, to be used the favorable premises areas insolation effect.

The residential and the public buildings placement and their orientation (except for the kindergartens, the secondary schools, the boarding – schools) must be provided the continuous duration of the insolation, and the residential areas and the territories for the following zones:

- further North 58° N.L. – at least, 3 hours per day for the period from 22 April to 22 August;
- further South 58° N.L.–at least, 2 hours per day for the period from 22 March to 22 September.

In the building houses terms in the 9 floors and more, it is allowed one – off intermittence of the insolation permitted premises, having provided, under condition the total increase in the duration of the insolation during the day at 0,5 hour, respectively, for each zone.

The kindergartens, the nursery and daycare facilities, the secondary schools, the boarding – schools, the health – care facilities and the agencies, and the recreation buildings placement and the orientation must to be provided the continuous 3 – hour duration insolation in the premises, having provided by the Sanitary regulations and the rules to be ensured insolation of the residential and the public buildings and the areas of the residential buildings, having approved in the prescribed manner.

The insolation normalized duration, it should be provided not less, than in one living room, 1-, 2-, 3-room apartments, and not less, than in two living rooms of 4- and 5-room apartments; dormitories in the bedrooms (e.g. not less, than in 60 %).

According to the experts' and the specialists' opinion, having given the significance of the light comfort conditions ensuring, through the natural light and the insolation rules implementation in the new buildings and the in the existing building, and the fact, that all these factors are the crucial ones in the gaps determining between the buildings, in the framework of the projects the appropriated section is deserved to be distinguished, which could be included and be named the lighting passport of the construction site. So, in this section, the TBN developers' project are advised to bring the contingency plan, the planned and the existing buildings plans, and the sections, their lighting characteristics and the studies results of the lighting and the insolation regimes of the specific premises.

Thus, in order to be ensured the buildings regulatory insolation, it is necessary the following:

1. The residential and the public buildings' placement and the orientation must be provided the continuous and the non-stop insolation, having prescribed by the sanitary standards.
2. The distance between the residential buildings on the light conditions may be taken, in accordance with the opposing building number of its storeys, but not less, than 2,5 heights.
3. At the buildings insolation calculation, the separate towering building's parts shall not to be considered. So, the smallest distances between the residential buildings on the light conditions (e.g. at the high reflection coefficients) have been shown in the Table.

The Smallest Distances between the Buildings on the Light Conditions

The Indicator (distance)	The distance (m) between buildings (the number of storeys)					
	5	9	12	16	22	23
Between the buildings' long sides of 150 m length	27	48	64	74	90	95
Between the buildings' tower block type (the length < 150 m)		42	52	60	70	72
Between the buildings' long sides and the buildings' ends with windows	15	28	32	35	38	40
Between the buildings' ends without residential rooms' windows	According to the fire-prevention distances standards					

In the case of the third building's location, the distance between two parallel buildings facing should be increased by the 20 %, perpendicular to the latter ends. When buildings have their complex configurations, the distances between them are determined by the calculation, having taken into account the natural light rules.

The insolation measurement and the calculation are now, perhaps, the most severe lighting, the economic, and social and legal challenge. With the land use and the building transfer on the market basis, the housing insolation rates have been become the main factor, having constrained the investors', the owners', the land plots lessees' tendency to the urban areas development compaction, in order to get their maximum profits.

It is very significant the calculation method for the competent natural light and the buildings' insolation organization, it is quite able correctly to be identified the gaps between the buildings on the natural light conditions, which is especially important, in connection with the mass buildings, having carried out in the towns and the cities of the Tyumen region. Thus, it can be concluded, that the insolation calculation has been presented in one of the sections in the planning area, the land, and the territory projects, and it, moreover, has been contained the necessary recommendations on the building height limitation.

The insolation period accounting in the building area has the positive impact on the

health and the working efficiency population, which is greatly reduced the sick leaves and the adults and the children medical treatment cost.

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