

## KYIV ST. NICHOLAS ROMAN CATHOLIC CHURCH: PROBLEMS OF RESTORATION AND POST-WAR RENOVATION OF A UNIQUE MONUMENT OF THE NEO-GOTHIC STYLE

Olena GORBYK<sup>1\*</sup>, Galyna SHEVTSOVA<sup>1</sup>, Tetyana KASHCHENKO<sup>1</sup>,  
Volodymyr STARCHUK<sup>2</sup>, Oleksandra YEZHOVA<sup>1</sup>, Yaroslav STARCHUK<sup>3</sup>

<sup>1</sup> Kyiv National University of Construction and Architecture, 31, Povitroflotskyi Avenue, Kyiv, 03037, Ukraine.

<sup>2</sup> Board of Trustees of the Roman Catholic Church of St. Nicholas in Kyiv, 75, Velyka Vasylykivska Avenue, Kyiv, 03150, Ukraine.

<sup>3</sup> “NVP-FIRMA “BUDINDSERVIS” LLC

### **Abstract**

*St. Nicholas Roman Catholic Church is one of the main centers of the Roman Catholic community of Ukraine, an architectural monument of national significance, a neo-Gothic building of the beginning of the 20th century, unique for Kyiv, built in the innovative for that time material of reinforced concrete and experimental structures. As a result of problematic soils, design miscalculations, destructive to the structures of the building city transport communications (vibrations from subway traffic), a catastrophic fire in the building in 2021, deterioration of the stability of the building as a result of the barbaric Russian bombing of the civilian center of Kyiv, the church building is in a critical condition, and currently is no functioning. An urgent survey and restoration is needed to prevent the church ruining. The restoration should apply new practical technological measures to correct the critical situation. This publication sheds light on the current issues of the state of the monument and presents proposals for priority measures for its preservation, highlights the role and significance of St. Nicholas Roman Catholic Church in the history of Kyiv and in the formation of stylistic architecture of the late 19th and early 20th centuries.*

**Keywords:** *Kyiv St. Nicholas Roman Catholic Church; Neo-Gothic; Restoration technologies; Post-war reconstruction of Ukraine; Catholic architecture; History of Kyiv; Vibration absorbing structures*

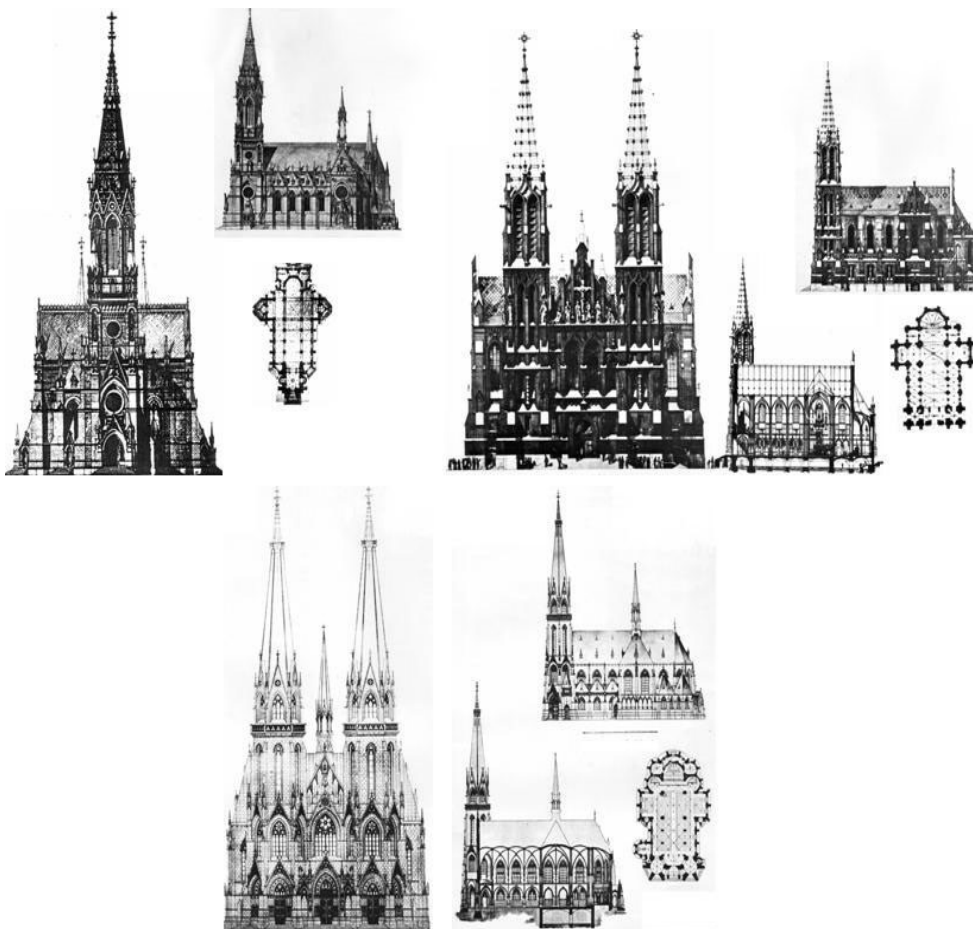
### **Introduction**

The current humanitarian and material crises caused in Ukraine by Russia's military aggression, leads among other consequences to the ceasing of programs for the maintenance of monument protection activities, the suspension of works on the restoration or conservation of civil buildings, namely centers of public communication supporting the ideas of humanism and spirituality, in particular, active temples and classical music concert halls. New damage and destruction of architectural objects as a result of bombings of civilian centers of peaceful cities, including the capital Kyiv, add to the burden on scientific and design organizations that were supposed to take care of those objects of historical architectural heritage that had a critical state of preservation. Such objects include a landmark of sacred architecture of the Neo-Gothic style unique to Kyiv – the Roman Catholic Church of St. Nicholas, which, in addition, from 1981 until

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\* Corresponding author: gorbyk.oo@knuba.edu.ua

the devastating fire of 2021, was also the House of Organ and Chamber Music, a center of refined urban culture and art (Fig. 1). The role of this building as a center of spiritual post-war revival of Kyivan can be significant if scientific research and practical implementation of measures to stop the destruction of the building's structures and restoration measures are carried out in time. Practical construction works should be preceded by scientific work on the generalization of recommendations for the preservation and restoration of the Roman Catholic church building, and for the actualization of such actions, scientific substantiation of the architectural and cultural value of this monument is extremely important. This publication is dedicated to solving these problems.



**Fig. 1.** Competition projects of the Kyiv St. Nicholas Roman Catholic Church, 1898. Project of architect S. Shpakovsky, St. Volovsky, P. Hippus [1]

The purpose of the study is to clarify the cultural content of this unique for Kyiv sacred building of the Neo-Gothic style and to identify ways of restoring the building of this architectural monument. The scientific novelty of the study consists in the introduction into the wide scientific circulation of analytically generalized cultural, historical-architectural and restoration information about the monument of national importance of Ukraine – the Roman Catholic Church of Saint Nicholas, the introduction into the scientific circulation of the European scientific discourse of data on the peculiarities of the formation of Neo-Gothic architecture of Kyiv and the

phenomenology of cult Roman Catholic architecture of Kyiv. The expected result of the research is the creation of well-founded comprehensive proposals for restoration measures for the church building using the latest technologies.

The church was designed from 1887, built according to the project of Vladyslav Horodetski in 1899 - 1914. The church had a number of constructive innovations: complex sandy and wet soils led to the innovative on a pan-European scale application of rammed concrete pile foundations according to the method of the Kyiv engineer Anton Strauss. Concrete and reinforced concrete, innovative for that time, were widely used – not only in decoration, but also in overlap structures: the vault of the central nave covers a 17m span with a structure thickness of only 8 cm. The church was consecrated in 1906, but did not functioned as a temple from 1937 to the beginning of the 1990s when St. Nicholas church housed warehouses and then an archive. In the 1970s, restoration works (supervised by architect O.O. Grauzhis) were held to adapt the church to the needs of the Republican House of Organ and Chamber Music. At that time, the church building had already received circumstances threatening its existence: the situation with unreliable sandy soils under the church was complicated by the laying of the city metro line near the church, which caused constant vibrations that shook the building; in addition, the subway tunnel cut the channels of underground small rivers, which created a dangerous accumulation of moisture in the soil. During the restoration, a Czech organ was installed in the church, cloakrooms were arranged in the lower part of the church. With the restoration of Ukraine's independence, Catholic services were resumed in the upper church and in the crypt.

Since the 1970s, due to constant vibrations from the movement of the subway and unresolved water drainage, the church building has been subject to incessant subsidence and cracking of structures, damage and falling of the decor. The design decision of the 1980s to install subway rails within the church on vibration-absorbing pads was not implemented. Repair of the facade and drainage work were carried out last time in 2013. Technical inspection records were drawn up about the unsatisfactory and even emergency condition of the building. On the evening of September 3, 2021, a fire broke out in the church, the area of which reached 80m<sup>2</sup>. As a result of the fire, which spread to two floors of the church and the roof, the roof of the building was badly damaged, and the unique organ was completely burnt. After the fire, emergency work in the church was hindered by a lack of funds and the beginning of the active phase of Russia's war against Ukraine on February 24, 2022. According to the Act of inspection of the technical condition of the temple building, drawn up on April 12, 2023, the condition of the building is unsatisfactory and requires immediate repair, restoration and, in part, emergency work: it was recorded that the foundation is sinking, the temple is collapsing under the influence of vibration, the condition of the tower structures and roofs is unsatisfactory (corrosion of metal and destruction of wooden structures), which leads to the leaks. The authors of the publication have personally verified that seasonal freezing and accumulation of moisture in the building structures, the lack of seasonal heating leads to the non-functionality of the building, surface and deep cracks of structures developing as well as mildew and fungus spreading.

The European cultural and political integration of Ukraine is based on the national-ethnic, political, cultural, spiritual and religious tolerance that actually exists in Ukraine. The manifestation of the latter is the presence of a dialogical history of Orthodox and Catholic confessions in Kyiv, and one of the physical expressions of this is the stylistic diversity of architectural monuments. Among the most significant churches of Kyiv, which have become symbols of the two leading historic Christian denominations for generations, the architectural manifesto of stylistic variations in the formation of sacred architecture is the Cathedral of St. Sophia of Kyiv which presents the greatest embodiment of the Kyiv-Russian style of cross-domed architecture. Dialectically complements it in the cultural and historical landscape of Kyiv – the Neo-Gothic basilica of the Church of St. Nicholas which most clearly presents the classical style of sacred Catholic European architecture in the city. The universality and uniqueness of the architectural style of the Cathedral of St. Sophia of Kyiv is noted in the works of G. Shevtsova *et*

al. [2], instead, the definition of the universality of the architectural style of the St. Nicholas Roman Catholic Church will take place in this article.

## Experimental part

### Materials

In Ukraine, several journalistic reports have been published in the press, but there are no scientific publications concerning the current state of the church building. The analysis of the problems of the church's building structures and functioning current situation is based on the data of "Act of inspection of the technical condition of the architectural monument of Ukraine – main building, adjacent land plot and technical building of the Church of St. Nicholas of Roman Catholic Parish of Kyiv" [3]. The understanding of requests for restoration work and the search for technological solutions in this publication is the result of author's in-situ surveys including interviews with construction work executors and scientific specialists, members of the church's board of trustees. The authors used the materials of their own scientific research, author's photos of equipment elements and structures, as well as photofixation of the current state of the building and the previous state of its interior fixed in 2000s, before the fire in 2021 took place. There were also some old drawings of the church published in professional periodical architectural magazines in 1896 and 1906 [3, 4].

A number of studies by M. Orlenko *et al.* [5, 6], I. Sandu *et al.* [7] and Y. Ivashko *et al.* [8, 9] have been devoted to issues of Neo-Gothic Kyiv and the preservation of historical architecture, where the Polish and German components of the appearance of this style of architecture in the context of Orthodox Kyiv during the late Russian Empire have been ascertained. Yulia Ivashko's academic supervisor, professor Viktor Chepelyk, a luminary of the Kyiv Pedagogical and Scientific School of Architectural Studies, noted that the centers of Poles and Germans manifested their presence in the city by consciously ordering the architectural style of their own residential buildings in the neo-Gothic style, which is the most noticeable and contrasted with the ordinary buildings of Kyiv. In the mentioned studies devoted to the Neo-Gothic style of Kyiv, certain related details of the Neo-Gothic style of Kyiv and a number of Polish cities and schools of architecture are noted. But in these studies there is no analysis of the stylistic content of the Neo-Gothic sacred architecture of Kyiv. The history of the appearance of the stylistic line of European Catholic architecture in Kyiv during the 9th-20th centuries is partially revealed in the research of O. Gorbyk [10], where changes in the stylistic forms of new buildings of sacred Roman Catholic architecture in each historical epoch of Kyiv are traced; a separate section is devoted to the history and architecture of the St. Nicholas Roman Catholic Church. Also, separate sections of Kyiv reference, historical and architectural publications are devoted to the architecture of the St. Nicholas Roman Catholic Church [11, 12]. In a certain way, the content of historicism, historical stylizations, and, in particular, the phenomenon of Neo-Gothicism in general world architecture are devoted to the research of S. Linda *et al.* [13, 14] and E. Remizova [15]. In this publication, it is planned to develop all these topics to a conscious ascertainment of the connection between the styling of the Neo-Gothic church built by the Polish community of Kyiv at the turn of the 19th and 20th centuries with the multicultural content of Kyiv at that time and, at the same time, with the context of European historicism in architecture.

### Methods

Scientific methods corresponding to the tasks were used to solve the tasks. The method of phenomenological and iconological analysis of art history, descriptive method, historical analysis and comparative analysis was used to study the Neo-Gothic architectural style of the Kyiv St. Nicholas Roman Catholic Church, its artistic-stylistic and cultural-content characteristics. The methods of system analysis, field survey, historical analysis and comparative analysis, analog method regarding the practical experience of building restoration were used to research and develop concluding recommendations regarding the priority measures for the preservation and

restoration of the church building, its structures, materials, functionality of space and the immutability of forms and details of this period.

## Results and discussion

At the end of the 19th century in Kyiv, the Catholic community was quite numerous, more than 35,000 townspeople professed Catholicism. The Catholic community adhered to the same religious and cultural interests and was sufficiently united: private educational and professional schools for Polish Catholic youth operated in Kyiv (in particular, in the house of K. Yaroshynska), charitable and volunteer events were organized, in which such figures of the Kyiv cultural circle took part as K. Ivanytskyi, S. Turkivskyi and O. Kotlyarevska. In honor of the visit to Kyiv by Nicholas II, Monarch of the Russian Empire in April 1896, the Catholic community requested permission to open a new church named after Nicholas in Kyiv. Having received permission in 1897, the Kyiv City Catholic Committee turned to the Imperial Petersburg Society of Architects with a request to hold a design competition. Among the total number of projects, four were awarded, and their publication was carried out in the professional press of the time. After that, the city commission entrusted the Kyiv architect Vladyslav Horodetski with the creation of a new project based on the materials of the competition. In all cases, the church was developed in neo-Gothic, Romanesque, their combination (Fig. 2).

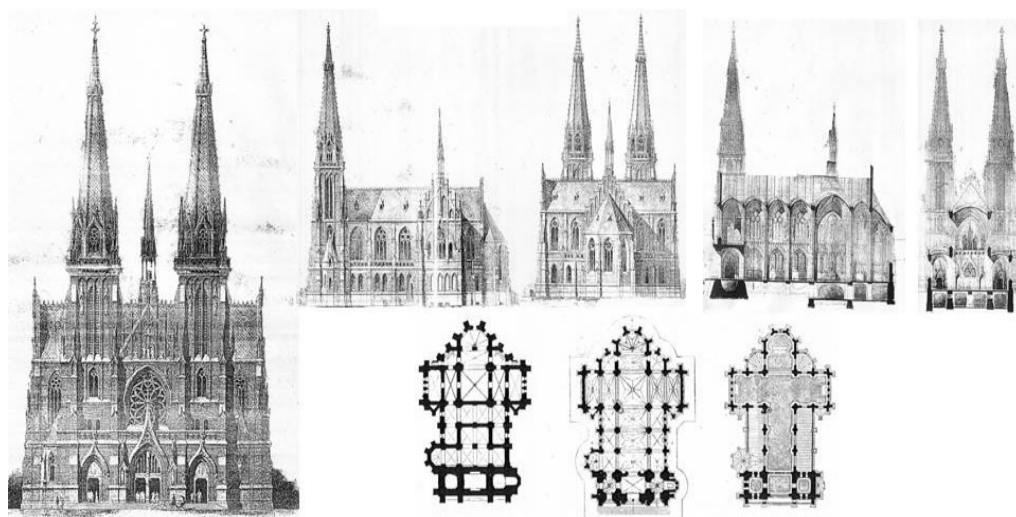


Fig. 2. The project of the Kyiv St. Nicholas Roman Catholic Church by architect Vladyslav Horodetski, 1906 [4]

This was in line with the romantic mood of the national climb of the Polish community in Kyiv, because neo-Gothic in the context of Kyiv filled with Orthodox-baroque and international-classicist forms became a symbolic heraldic sign of belonging to the Polish mentality. Neo-Gothic style, impressive to the Polish circles of Kyiv, appeared on private and income houses of representatives of the Polish urban community, designed Roman Catholic chapels in the city and the Baikovo cemetery of Kyiv. Vladyslav Horodetski did not take part in the project competition, but he was a well-known architect of Polish origin and Catholic faith in the city, an innovator and experimenter in new materials and forms, a subtle stylist of historical styles of architecture, the author of the city museum in the neo-Greek style, the Karaitekenasa in the Moorish style. He developed the project St. Nicholas Roman Catholic Church in the Neo-Gothic style.

Among the awarded competition projects, on the basis of which Vladyslav Horodetski had to develop a working project of the church, the project of the St. Petersburg civil engineer S.

Shpakovsky was recognized as the best, but due to an error in the decision of the master plan, the work did not receive the award. In the project of S. Shpakovsky, a three-nave three-apsed basilica with a developed, projecting transept and a narthex was designed, above which a fairly tall and thin tower with a spire-tent finish rose on the facade. Arched Gothic portals, openings were emphasized with brickwork. Buttresses, pinnacles, roses, ribbed vaults and stained-glass windows clearly testified to the neo-Gothic style of the structure. The first prize was awarded to the project of the architect P. Hippius. According to this project, the three-nave nave of the basilica had certain features: the naves were separated by only four pairs of buttresses, which created a spatial unity of the side nave and the main nave, the developed nave was emphasized not only by the protrusions of the transept, but also by the thickening of the buttresses and the increase of the span, the altar part imitated the Romanesque-Gothic ambulatory and apsidioles, and the chapel was asymmetrically located at the side wall in the western part of the temple. The narthex was also solved in an interesting and original way - the facade towers (two of them were designed) were arranged above the hexagonal risalites. The design of the facades in this project was richer and more refined than in the project of S. Shpakovsky discussed above. The second prize of the competition was won by St. Petersburg, a Catholic of Polish origin, a student of the Imperial Institute of Civil Engineers, 24 years old Volovsky. In the final project of Vladyslav Horodetski, certain basic features of architecture, established by St. Volovsky - stylistic character, structural components (in particular, 2 belfry towers under a tent covering on the facade), outline and proportions of the building. But Vladyslav Horodetski replaced the arched windows on the second tier of the facade with a corner one, radically changed a number of details, finding his sophisticated "flaming" thin neo-Gothic style and, most importantly, created a new planning system.

Vladyslav Horodetski, in developing the plan of his church project, which was implemented by construction, in a certain way synthesized the proposals of Shpakovsky (apsidal completion of the side naves), Hippius (asymmetric side chapel), Volovsky (solution of the transept and choir with some change in their proportions). Vladyslav Horodetski created an independent composition of a trina-apsed six-pillar cross basilica with a developed middle cross. The chorus is relatively shallow with a pointed ending. The narthex is flanked by two belfry towers up to 60m high, a small signature above the central cross. On the main facade, there is a three-temporal five-tiered composition: three perspective Gothic portals of the first tier (the main middle one is distinguished by its size and decoration), a stained-glass rose occupying the entire floor of the middle part of the second tier, high narrow pointed windows and decorative arches on the towers and a triangular pincer on of the center in the third tier, the fourth and fifth tiers - the arched completion of the towers and their high tent covering. A progressive and experimental approach to the introduction of concrete and reinforced concrete was represented by the ceiling of the upper church designed by Vladyslav Horodetski - a reinforced concrete cross vault along the ribs. A traditional brick vaulted ceiling was used in the basement (crypt, lower church). The roof structure was designed to be metal, and the rafters of the tower frame were wooden.

According to the project of Vladyslav Horodetski, the church was built of brick and concrete. Bearing structures of walls, frame elements, pylons and vaulted ceilings of the lower temple's basement were made of brick with concrete covering; the vaulted ceilings of the upper church were made of concrete. The church received a two-color solution - background ceramic plates and red brick and the gray color of the details and artificial stone, namely from the concrete promoted by all the architectural works of Vladyslav Horodetski, innovative for Kyiv construction at the time in the historical styling of concrete. Decoration of buttresses, pinnacles, sculptural and ornamental reliefs of the church, profiling of arches, portals and vaults, details in the exterior and interior designed by Vladyslav Horodetski were cast in monolithic cast concrete, covered with terracotta cladding. Plastic details (cross-flowers, cartouches, canopies and pedestals, arabesques, Gothic ornaments, a sculptural group of the Virgin and Child in the tympanum of the central portal, a sculpture of the Archangel killing the Serpent on the crowning

pediment, sculptures of Stanislaus and Wojciech at the main portal, sculptures of the four Apostles on the towers of the main facade, etc.) were developed in the Kyiv workshop of the sculptural decor of the Milanese Elio Sal, with whom VladyslavHorodetski collaborated in the creation and implementation of a number of his other most outstanding projects. The decoration of the church was made of cast concrete and, partly, of zinc. The plinth was covered with a layer of concrete, forming an "artificial stone". The floor in the temple was terracotta, laid in a checkerboard pattern. Stained glass windows were supposed to be ordered in the city of Riga (dark tones "in the German spirit", with images of Christ, apostles, Roman soldiers). The main altar was dedicated to St. Nicholas of Myrlyky, the side altars - Pr. Virgin and St. Joseph. The church had dimensions of 55 x 24m (10 and 5.5m wide) and could accommodate 1,800 people. D. Malakov, a researcher of Kyiv architecture and works of VladyslavHorodetski, notes the similarity of the church project to the Votive (Obitnytskyi) temple of H. von Ferstel built in 1853 in Vienna [16]. Such a statement seems dubious, the Neo-Gothic style, widespread in the architectural practice of the middle of the 19th and early 20th centuries. in the countries of Central and Eastern Europe, the facade solutions of newly built Roman Catholic churches had a balance of stylistic similarity and originality in each specific case, and any examples of newly designed neo-Gothic church facades of the time with the same set of structural components are stylistically similar in a certain way. Therefore, the Kyiv St. Nicholas Roman Catholic Church has the original author's style of the architect-artist Vladyslav Horodetski. However, we should note that the civil engineer I. Padlevsky took an active part in the development of the final project, in the magazine in 1906 he was named as the author of the church project, and the printed facade projection and plan of the church are the same graphic sheets that were published later as "project Vladyslav Horodetski".

The construction of the church was started on August 8, 1899. The church was built for 10 years with donations from private individuals, but due to a lack of funds, the project was simplified: the lower church, provided for in the project, was never completed, a marble altar with rich ornaments and mosaic images in the Gothic style, which was supposed to be performed in Florence was replaced by a wooden one. The church was put into operation in an unfinished form - without interior decorations of the church. The church was consecrated in 1906, and construction work continued until the First World War.

Regarding the architectural history of Catholic buildings in Kyiv, we note the interesting feature of Kyiv history that with each cultural phase, Kyiv not only completely changed its stylistic and architectural face in accordance with a new stylistic way of life and thinking, but also changed the territorial center of settlement each time. The urban and cultural center, which corresponded to the name "Kyiv" at different times, migrated from the Starokyiv ridge of Ancient Russia to the medieval (XII-XVII centuries) Podol, then, during the construction of the Russian fortress, to Pechersk, once again taking over in the period of classicism "Upper Town", later, in the period of eclecticism, it was embodied in "New construction" along VelikaVasylykivska, where the St. Nicholas Roman Catholic Church was built. Each era singled out and nurtured its own district, and it was he who set the cultural and stylistic tone of the urban environment.

We consider the fact that in each of the listed periods and in each of the listed districts of Kyiv, the Catholic theme arose and asserted itself as a phenomenon of the temple to be symptomatic. Each time, in accordance with the general history of Catholicism, a new driving force led to its construction - trade and craft groups, monastic (order) missions, the episcopate, and the Polish nobility. As a rule for Kyiv history, we can consider that each of the eras (and, accordingly, successively, each of the districts) maintained no more and no less than one Catholic church. The only exception is the pre-Baroque period beginning of the 17th century, when four Catholic churches (cathedral, Bernardine, Jesuit, and Dominican) were built in Podil almost simultaneously; these new buildings in Kyiv were the beginning of Catholic development for the entire Kyiv diocese), but already in the early 50s years of the 17th century only one of the Catholic church buildings remained in the city.

In each stylistic context of the city, a corresponding style of church arose, and it is through the temple, its semantics and morphology that we can investigate what exactly Catholicism of one or another period was in the city, which throughout history and in each of its periods from the 11th century. had dozens, and sometimes hundreds of newly built monumental Orthodox churches every century. So, the history of the Catholic presence in Kyiv consists, in our opinion, in a series of successively individual new buildings of Roman Catholic churches: each time a new church in a new historical and stylistic center: XIII century, Upper Town - the church of the Blessed Virgin; 15th-17th centuries, Podil - Gothic-style Dominican church of the Holy Trinity; 1799-1814, Pechersk - St. Nicholas Church; 1817-1840, Starokiiiv plateau - St. Alexander Church in Empire style; 1899-1914, "New construction" - neo-Gothic St. Nicholas Roman Catholic Church.

This diversity, loneliness, but obligation is very indicative - the singular does not dominate the environment, but argues with it, and its presence-reminder is a statement of the Western culture present in the city. The architectural form, its stylistic characteristics, are always the materialization of the lifestyle and thinking style of certain cultural communities, generations, and regions. Dialogicality of the Orthodox and Catholic tradition of temple building in the historical building of Kyiv at the turn of the 19th and 20th centuries. transformed into a polylogue of historicism (traditionalism, Orthodox and Catholic stylization) and modernism (formation of updated functional scenarios, possibilities of new building materials and technologies, structures). The dialectic of historicism and modernism, traditionalism and innovation, the individual style of the architect Vladyslav Horodetski and the style of the era is revealed in the architectural forms of the St. Nicholas Roman Catholic Church: the innovative building materials designed by Vladyslav Horodetski and incorporated into neo-Gothic style forms did not simply imitate and quote historical volumetric and spatial solutions and details, but created certain associative series, were an ideological didactic means of raising a conscious cultural and spiritual Polish Roman Catholic community. The Kyiv cultural society of that time was an amalgamation of imperial officials and professorships, Polish nobility and Russian nobility, Ukrainian national and socially oriented associations of the intelligentsia, circles of mystics and spiritualists, artistic bohemian societies. Each of these social groups had its own center of gravity, manifested itself in a certain architectural style manifesto. In the architectural and stylistic landscape of Kyiv buildings of the late 19th and early 20th centuries national Ukrainian baroque prevailed, universal supranational elitist and imperial classicism, sprouts of Ukrainian architectural modernism were observed, searches for aesthetic new-fashioned secession and mystical and spiritual practices of symbolism were present. Architectural formation of the 19th century this is the "architecture of choice" (according to E. Kyrychenko), the facade forms of the architecture of the cities of the era of historical stylization became multi-meaningful meaningful manifestos, entered into a polylogue and formed the worldview and cultural horizons of the citizens.

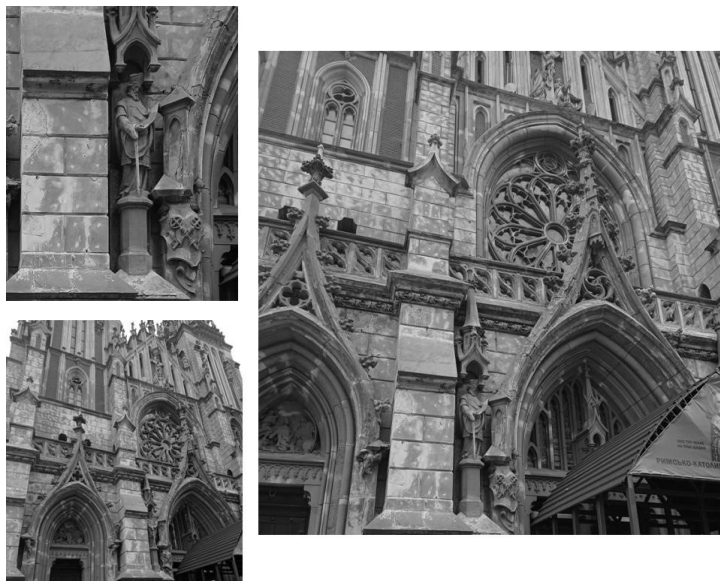
The Polish Kyiv community of the end of the 19th century - the beginning of 20th century chose the Neo-Gothic style for self-identification and marking of its originality and difference in relation to the context of Orthodox Kyiv. In the history of Catholic Europe, two styles had signs of the most creative shaping of the full of spiritual Catholic worldview searches of their time - scholastic medieval Catholic Europe formed a Gothic style that was original in relation to all previous world experience, and counter-Reformation and Renaissance Europe formed a somewhat less original Jesuit Baroque style. It was these two styles that were embodied in the construction boom of temple construction that swept Europe - it was in these styles that the largest number of Catholic churches were built and reconstructed. But since Baroque had a tangible legacy of Renaissance elements, and Renaissance forms, like their ancient prototypes, embodied a timeless and supraregional world-humanistic, human content, as well as due to the rather large presence of Baroque and Neo-Baroque styles in the construction of Kyiv at that time, the Polish community chose it as the desired prototype of the style of the new building of the St. Nicholas Roman Catholic Church, the most clearly embodying Catholic traditions in architectural forms,



the Gothic style, which is not trivial for Kyiv. This indicates sufficient conservatism of the Polish Roman Catholic community. The Neo-Gothic style of the church perfectly embodied the dialectic of aesthetic and ethical, traditional historical forms and romantic-national elevation and Catholic spirituality. The construction of such a stronghold of Catholicism had the level of pathos of the time of the original construction of Gothic cathedrals, the church not only "represented" Gothic in the city (and in its forms and through them - the cultural and spiritual content of the Western Christian world), but also was Gothic - from the time of its construction until now the townspeople of Kyiv read the semantic (content) and syntactic (compositional) language of the forms of the St. Nicholas Roman Catholic Church precisely as a materialized Gothic.

"Neo-gothic" expanded the horizon of resident of Kyiv to the European expanses, presented and showed Europe in Kyiv. Ideological-didactic (propaganda) functions and possibilities of art and architecture were consciously used by architects-stylists and if art as a removed form of consciousness was a mirror of the style and worldview of its creators, then architecture as a form of existence itself shaped the worldview and taste of those who interacted with it, with its form imposed a certain style of behavior and mood, demonstrated artistic logic as an example of a certain logic of thinking, which became a skill and formed a lifestyle. It is interesting to note that the only authentic Gothic landmark in Kyiv - the former Dominican church of St. Nicholas in Podil, which was rebuilt and re-consecrated as an Orthodox church at the end of the 17th century, was destroyed by the Soviet authorities in 1935, but this event was not noticed in any way neither the Polish nor the architectural communities of the city. Instead, the church of St. Nicholas, built in non-Gothic forms, was and remains a cultural reflection on Kyiv's belonging to European history and culture.

All the more important is the preservation of the church building, which is currently in a state of emergency. Currently, the periodicity of capital repairs is violated. According to the "Act of inspection of the technical condition of the architectural monument of Ukraine - the structure, adjacent land area and technical building of the Church of St. Nicholas of the Roman Catholic Parish of Kyiv", drawn up on April 12, 2023 [2] to ensure strength in extremely complex, excessively on moistened soils, 335 concrete driven piles, a reinforced concrete slab and a brick foundation are arranged at the base of the foundation (Fig. 3).



**Fig. 3.** Photofixation of the current state of the building of the Kyiv St. Nicholas Roman Catholic Church

To protect against the ingress of pressure water, clay waterproofing was made around the perimeter of the building, which, as a capillary-porous material, causes the capillary movement of moisture against the force of gravity, rises along the brickwork, seeps through the walls and reaches the inner layer of plaster. Basement structures are subject to permanent soaking by atmospheric moisture and capillary rise of groundwater, which negatively affects the walls of the basement and crypt. Vapor-tight cement plaster, which slows down drying and normal vapor exchange, deepens the negative processes.

The built-up area is in the zone of possible manifestations of landslides, subsidence of unfortified soils and flooding. The drainage system is broken, part of the elements are lost, the water is dumped on the paved surface around the perimeter of the building directly under the base of the walls. The plinth is faced with concrete slabs that have significant cracks and dents, traces of destruction along the entire perimeter. At the moment, peeling of the protective layer of concrete, corrosion of fittings, the formation of salt deposits and rust spots have been detected on the walls and ceiling. The result of destructive processes of building materials due to moisture is a gradual loss of strength and load-bearing capacity of structures. In a wet state, plaster and decoration are covered with mold, a network of cracks and falls off.

During the construction of two branches of the subway, the foundation compacted under the piles was disturbed, a monolithic reinforced concrete covering of the tunnels was arranged, and rails were laid without vibration isolation, which created a danger of constant vibrational impact on the foundation and supporting structures of the church and uncomfortable noise in the building.

The commission states that during the construction of the subway, the soil compaction under 335 reinforced concrete piles, which are the most loaded parts of the foundation, were damaged. The design decision regarding the installation of rails on vibration-isolating structures was not implemented. During the movement of trains, a significant vibration load occurs, which is destructively transmitted through the crushed stone-reinforced ground base to the piles, foundation slab and all structures of the building. The building vibrates as the subway passes. If the amplitude of foundation vibrations is insignificant, then the vibrations of the spires are dangerous and when they enter into resonance, their catastrophic destruction is inevitable.

The walls are brick, lined with concrete slabs and ceramic tiles. The cladding has significant damage: peeling, chipping, macro- and micro-cracks, falling pieces of concrete. The destruction of the facade continues. Decorative concrete has mechanical chips, cracks, exposure and corrosion of reinforcement. In the interior, the entire plane of the walls is covered with spots, fungal damage is developing. Cracks were recorded on the inner surface of the outer walls and on the base of the inner support pillars. The biggest damage was found on the support pillars at the intersection of the longitudinal nave and the transept, on the surface of the ceiling and walls of the sacristy. The decoration of the columns and ceiling of the basilica is lost, some of the concrete elements have significant cracks, all internal surfaces at a height of more than 4m are covered with combustion products. On the second floor, the Austrian organ is completely lost. The destruction of the decoration and the need to carry out restoration work is recorded.

The decoration of the facades is peeling off and crumbling. All decorative and architectural details were made of cement-sand mixture over 113 years under the influence of natural factors, especially those that were exposed to rainfall and cyclical freezing and thawing, suffered significant damage and require significant repair and restoration work. Window structures and stained-glass windows that need to be restored or replaced require special attention. Thus, the frame structures and glass stained-glass roses, the glass and frame of the stained-glass window above the portal have cracks and require restoration work. The overlapping of the arrow

windows in the highest (and weakest) part have cracks, are collapsing and need strengthening. The roof of the side balconies of the second floor, fences with cracks and corrosion of concrete and fittings need major urgent repairs (Fig. 4).



**Fig. 4.** Photofixation of the current state of the building of the Kyiv St. Nicholas Roman Catholic Church

In the central volume of the roof, wooden purlins are laid along the trusses, to which wooden rafters with ceramic tile cladding are attached. Deformations of wooden beams were found in places; some beams have longitudinal cracks and need urgent replacement. The roof of the main volume of the building is ceramic tiles. The general condition of the roof tiles is unsatisfactory - cracks, mechanical damage, breaks. The gaps between the tiles allow precipitation to moisten the wood of the roof's supporting structures. Inconspicuously missing drainage pipes lead to jamming of supporting structures. In the elements of the metal trusses there is corrosion damage to the metal, the deflection of the lower belt of the trusses, in the support nodes of the diagonal trusses there is significant corrosion of the metal shapes, the general condition of the supporting structures of the roof is unsatisfactory. In the tents of the towers, the wooden bearing elements have cracks along the entire length, the wood is rotten in places.

The complex design of the spire, where the elements are fastened on notches, bolts, the connection of the elements is significantly broken. The roofs of the tower tents are metal sheets, their deformation, separation of nodes and falling off from the surfaces of the faces, exposure of wooden scaffolding, jamming and rotting of the supporting structures are observed. Due to the dominant height of the building, its blocks do not fall into the protection zone of adjacent high-rise buildings when struck by lightning.

After the fire on September 3, 2021, the power circuit of the building was significantly disrupted, the strength, stability, rigidity and durability of the 1st tier of the portal, the basement and the first tier of the basilica were reduced. After the fire and emergency work, such damages

as burning of electric cables, electrical networks (installed in 1980 and expired), lighting, ventilation, and heating systems were noted. The coating of the surfaces with a layer of soot, the destruction of the internal stained glass windows of the apse by fire, all the window frames were corroded and need to be replaced. In the attic, damage to the rafter support unit.

The general stress-deformation state of the supporting structures of the building remains complex. The destruction and unsatisfactory condition of the structures, which require urgent repair and restoration work, were revealed. The building's useful life time is 93% over. With its own funds, the parish repaired the scaffolding and carried out rainwater drainage, which stopped water from entering the basement, installed temporary electrical wiring and a heating system, removed fungus on the walls of the basement, and stopped the flow of water from Cherepanova Mountain that flowed under the building.

The building of the St. Nicholas Roman Catholic Church is undergoing destruction and needs immediate emergency repair and restoration works. The work that the parish of St. Nicholas Roman Catholic Church is doing on its own only in the basement part of the building is not systematic for the entire building.

Main problems are presented as following:

- destruction of concrete, macro and microcracks in plinth structures, facades, roofs and elements of architectural and sculptural decoration;
- high level of groundwater, unreliability of waterproofing and increased humidity of underground structures;
- non-compliance with sound and thermal insulation standards.

For the normal functioning of the building, it is necessary to ensure the strength, stability, reliability, durability of building structures, restoration of operational qualities, improvement of sanitary and technical parameters, level of general and fire safety, to develop instructions for the staff to take care of the condition of the building, the condition and resistance of the lightning protection and grounding systems should be monitored, the impact of flooding, landslides, vibration loads should be reduced. It is necessary to carry out work on the monolithization of macro- and microcracks with deeply penetrating mineral-polymer compositions.

It is urgent to solve the issue of strengthening the foundation, which is sinking, the church is collapsing under the influence of vibration due to the laid subway. Expedient measures include strengthening the soil foundation, determining the reliability of the monolithization of piles in the subway tunnel ceilings, and, if possible, arranging vibration and sound insulation of the subway structures within the church building. According to the recommendation of Antoniuk A.E., it is necessary to implement the design decision of the 80s to install the subway rails within the St. Nicholas Roman Catholic Church on vibration-absorbing pads.

It is recommended to install effective ventilation in the basement, dry the structures, remove the old decoration from them, inject waterproofing and perform other restoration works. In addition, it is important to perform reliable waterproofing of underground and above-ground external parts of the foundations using the latest durable, high-quality waterproofing materials and the possibility of drying basement structures and their protection against wetting, arranging a fundamentally new drainage system and ensuring reliable drainage of groundwater and precipitation. Unorganized surface drainage along the slopes of the planned surface should take into account the predominant direction of drainage of atmospheric precipitation, taking into account the natural topography of the area as southwest and west. Atmospheric precipitation should be removed from the roof and towers through downpipes along the eaves and cantilever outlets of downspouts.

Restoration of the sections of inverted brick arches under the openings of the walls of the basement of the foundation part of the building should be performed by methods of strengthening the sections with the creation of the initial design stress. If it is necessary to strengthen the vaults, as one of the most effective methods, it is recommended to use carbonate grids by analogy with the experience of Italy to increase the seismic resistance of architectural monuments.

To create a comfortable microclimate in the church building, it is advisable to consider the scientific and practical issues of thermal insulation of the enclosing structures while preserving the authentic appearance; insulation and heating of floors in the premises of the basement and the first floor, proposals and solutions for the restoration of ventilation, the installation of effective supply and exhaust, including forced ventilation.

To ensure the fire resistance of wooden and open metal structures, they should be treated with flame retardants [8, 17], if possible, abandon the use of parquet and unprotected wooden structures, update the electrical wiring. It is necessary to envisage project decisions regarding the provision of premises with electronic equipment and relevant programs, in particular, for audio and video accompaniment of the service of God, as well as the educational process of Sunday schools, etc. It is necessary to pay attention to the complex lightning protection - installation of lightning receivers in the highest points (spires, signature, tent crabs, fronton, etc.). Due to the considerable height and difficult accessibility (the height of the spires is 65 m, the crest of the basilica is 53.4m, the apse is 26.5m), it is necessary to provide for and ensure the unhindered access of fire and special rescue equipment along the entire perimeter of the building. It is necessary to carry out a number of measures to increase the overall seismic resistance of the building.

It is necessary to provide for the improvement of the territory with the provided restriction of access to dangerous zones along the sections of the walls, where the falling of icicles, snow, and damaged decorative elements is possible. It is important to revitalize the area near the church and humanize it by means of art [18]. Important in the refurbishing of the shrine is the reproduction and repair of the architectural and sculptural decoration of the building, the execution of repairs, the restoration of the entrance group and stairs of the church, the restoration of the altar part, side altars and the pulpit, as well as the manufacture and installation of lost equipment elements - stained glass windows, ornaments, the altar, marble statues and icons, candelabras, candlesticks, chandeliers, etc. according to the project of Vladyslav Horodetski.

## **Conclusions**

St. Nicholas Roman Catholic Church is a unique landmark of the neo-Gothic architecture of Kyiv, its historical, cultural, ideological significance, it is the affirmation of the fact of its existence and the style of architectural forms that Kyiv belongs to the European cultural community. The church is a manifestation of the tolerance of religious, ethnic, cultural and aesthetic contents and forms, their dialogical coexistence in the city's cultural and social space, both in the past historical eras (the end of the 19th and the beginning of the 20th centuries, when the church was built), and in the present. Preservation of the church building, its recovery and restoration is a guarantee and a material expression of the European modern geopolitical development of Ukraine.

Priority measures are:

- ensuring the strength, stability and reliability of the building by strengthening the foundation, the vaults, sealing cracks, installing effective waterproofing, drying structures;
- installation and modernization of engineering equipment and networks;

- fire safety - ensuring fire resistance of structures, installation of lightning protection;
- provision of appropriate requirements for a comfortable stay (microclimatic conditions, acoustics, fulfillment of requirements regarding inclusivity);
- restoration of certain parts of the church, restoration of the decoration of the building, including lost elements of decoration;
- development, planning and implementation of research, design, experimental, practical works on the restoration of the architectural monument of national importance, St. Nicholas Roman Catholic Church.

For the Ukrainian architectural heritage, the church building is a monument, included in the register of monuments of national significance. But due to the expiration of the building's useful life, the catastrophic fire of 2021, man-made urban destructive factors (the negative impact of the metro line on the stability and strength of the church structures) the building is in an emergency and critical state. Church requires immediate scientific and practical reconstructive and restoration measures, and in the future, the phased implementation of a complex of scientific research, design, repair and restoration works.

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