BUILDING MATERIALS USED IN MONUMENTS

Teshaboeva Nodira Djuraevna
senior lecturer at Fergana State Technical University
teshaboyeva53@.com. Uzbekistan. Fergana

Abstract: In the article, the durability of building materials in certain climatic conditions remains one of the most unsolved problems. Each place has its own characteristics, and they say that the surrounding materials are checked simultaneously and regularly under the influence of a number of factors.

Keywords: building materials, standards, laboratory conditions, climatic conditions.

The durability of building materials in certain climatic conditions remains one of the least solved problems. Each place has its own characteristics, and the surrounding materials are checked simultaneously and regularly under the influence of a number of factors.All impacts on materials during their appearance, normal functioning and obsolescence are taken into account in two ways: in the laboratory or by observing materials in nature in long-lived structures, that is, in architectural monuments.

In the complex and vibrant natural and climatic conditions of Central Asia, building materials are tested in various ways for many factors that somehow affect their durability. During the year (up to 60-70^{0}C) and throughout the day (up to 25^{0}C) there are sharp fluctuations in air temperature, frequent transitions from zero, summer temperatures that heat the surface of buildings (up to K70^{0}C), dry air, sand and strong high-speed winds that cause moisture, severe and almost complete salinization of soils, and the fact that most areas are in the seismic zone.

The long-term durability of building materials stored in the country's monuments is an object of constant work. A set of external influences on the materials is determined, their ability to withstand such influences is determined, and the reasons for the greater or lesser resistance of materials are explained. The main role in the study is to observe materials in architectural monuments in kind, followed by the study of selected samples in the laboratory. First of all, it is necessary to determine what components the material is made of, in what proportions and how.

Due to the lack of written sources, it is generally extremely difficult to restore the original composition of a wide range of building materials. The range of materials, various parts of the structure, the state of their individual types is restored, samples are taken for analysis in the laboratory. At the same time, information is collected about deposits, raw materials that can be used. In the laboratory, samples of materials are studied in detail: their strength, frost resistance, water resistance and other properties are determined, i.e. physical and technical parameters are determined.Chemical and spectrographic analyzes were carried out, their structure and mineral composition were studied. Based on the results of the analysis, the content is calculated.

Based on the obtained content calculations, analogies of the samples are created and the concentration is checked. A comparative study of old and new materials allows you to determine what changes have occurred over a long time of their use.

Based on the composition and characteristics of ancient materials, knowing what effects they affected during operation, we can draw conclusions about the durability of these materials, which, in turn, allows us to predict the durability of modern materials like them. It turned out that the studied materials of the architectural monuments of Central Asia include: Raw materials - cotton in the form of blocks and shelves; raw bricks of various sizes, fired from clay; clean and mixed with straw, sand and gravel.

Raw materials are one of the oldest building materials in Central Asia and have been regularly used for nearly 2000 years. Their storage largely depends on the humidity of the environment. Waterproofing and the foundation structure of a building rebuilt from raw materials are of great importance. The lower part of clay bases suffers greatly from its capillary rise as water evaporates.

1. The burnt brick is a brick-rectangular, square shape used for lifting columns, filling the upper parts of door frames and windows, making floors, and collecting water-resistant supports. Since the end of the ninth century, clay has been commonly used as a facing material and as a building material in the construction of large structures.

2. Square bricks are widespread almost everywhere. Rectangular bricks are typical for the construction of the cities of Osh, Uzgen, Samarkand and Tashkent in the XI-XII centuries.The strength of the brick when added is 100-200 kg / m^2, and its frost resistance is characterized by 15-25 cycles of freezing and thawing. Regardless of the climate zone, the storage is very high.

The durability of the fired brick directly depends on the degree of its firing: a well-fired brick will quickly collapse under the influence of cold, flood, moisture and wind. Brick with conventional calcination has good salt resistance compared to brick with good calcination, but moisture will be a capillary absorption zone. Therefore, if it is not protected, it will collapse.

Well-baked bricks can be stored everywhere. a brick wall begins to collapse as a result of wet freezing accumulated as a result of splashes of wind, rain and snow. 3. Among the unglazed ceramic tiles in ancient buildings, the following can be distinguished:

1. A brick covering the size of a polished dial. The cover is smooth, without patterns, and the decoration is only a kungurador, forming a different arrangement of bricks, a kungurador carpet (Samanid tomb, built in the 10th century in Bukhara) along the relief.

2. Kungradorsky tile is made by grinding burnt bricks.

3. Smooth tiles used for coatings used in combination with glazed bricks.

4. Bricks with deep relief before firing. The relief creates a prefabricated exterior. 5. Slabs, usually called terracotta, are carved in ornaments of various depths and subtleties. With the exception of embossed terracotta, unglazed cladding materials are usually no different from bricks, which are assembled according to the degree of preservation and physical and mechanical properties.

As with all unglazed ceramic products, ground terracotta material is healthy soil. If it is well prepared, the strength of the product will increase, and it will reach 600-800 kg / m. Frost resistance is 50 times higher than that of other paints and varnishes and can withstand wind and salt corrosion. Glazed ceramic tiles are as follows:

1. Various facing plates, which differ from the embroidered terracotta only in the glazing of the surface: one color and two different colors. Preparation and firing of the molded mass, as a rule, as in unglazed terracotta, firing usually has a strength of 180-300 kg / m allowed to obtain high quality ceramics.

2. Glazed tiles - wall and tomb. Tiles of the same color have a trapezoidal cross section and a rectangular front surface. The size varies depending on the place of use (Bibikhanim-550m.). The surface of the back side is decorated with various roughness (longitudinal deep line, grooves on both sides, etc.), so that the tiles integrate well with the reinforcing composition. Tile strength is in the range of 75-200 kg / m^2, withstands 12-20 freezing cycles. The tile is well preserved. Glazed ceramic (tile) based on silicate ceramic. From the XII-XIII centuries it was glazed in the decoration of the monuments of Central Asia.

LITERATURE:

1. Базарбаев, М. И., Эрметов, Э. Я., & Сайфуллаева, Д. И. (2022). Информационные технологии в образовании. Учебник, Ташкент, 453.
2. Nazikhovna, G. Y. (2022). Programming and robotics based in STEAM Learning. American Journal of Interdisciplinary Research and Development, 2, 58-87.
3. Yunusova, G. N. (2020). THE PROGRAM FRONT PAGE-PROGRAM OF MAKING WEB PAGE AND E-BOOK. Scientific Bulletin of Namangan State University, 2(3), 230-233.
4. Yunusova, G. N., Zakirova, N. S., & Abdullayeva, S. I. (2022). CREATION AND APPLICATION OF THREE EDUCATIONAL PLATFORMS IN THE PROCESS OF STRENGTHENING STEAM LEARNING. Confrencea, 4(4), 117-131.
5. Юнусова, Г. Н., & Кахаров, Р. Т. (2022). Три платформы для развития в непрерывном STEAM образовании. O'ZBEKISTONDA FANLARARO INNOVATSIYALAR VA ILMIY TADQIQOTLAR JURNALI, 1(11), 12-22.
6. Nazikhovna, G. Y. (2022). Strengthening the Integrated Steam of Technologies in the Environment of Information Technologies and Computer Programs. Texas Journal of Engineering and Technology, 7, 43-52.
7. Yunusova, G. N., & Abdullayeva, S. (2019). ARDUINO PLATPHORM PROCESSING THE MOVEMENT OF THE ROBOT. Scientific Bulletin of Namangan State University, 1(11), 79-83.
8. Юнусова, Г. Н. (2013). Компьютерно-интерактивное и индивидуально-групповое обучение предметов путём создания автоматизированной компьютерной программы. Молодой ученый, (12), 88-91.

9. Nazihovna, Y. G. (2022). CREATING A PLATFORM USING HTML, CSS AND JAVA SCRIPT METHODS AND STRENGTHENING EDUCATION WITH THIS STEAM. Confrencea, 5(5), 17-38.
10. Nazihovna, Y. G. Google AppsCloud Platformalari va ulardan Ta'limda foydalanish metodikasi. URL: Yunusova Gulshoda Nazihovna mybimm monografiya1-1-2. pdf.
11. Yunusova, G. Ota onalar, bolalaringizga Python dasturlashtirishdan murabbiy bo'ling. Python dasturlash., URL: http://library. ziyonet. uz/uz/book/121623.
12. Yunusova, G. Scratch dasturi orqali dasturlashtirishni usluksiz ta'lim bosqichlarida o'qitish metodikasi. URL: http://library. ziyonet. uz/uz/book/121624.
13. Nazihovna, Y. G. (2020). Maktabgacha yoshdagi bolalarni robotni terish EHM dasturi orqali STEAM texnologiyasi. In Mnemonika asosida til o'rganish bilimlarini rivojlantirish (Development of language)… TO URL: http://staviropk. ru/attachments/article/1023/CONFERENCE-Plenary% 20presentaions% 20and% 20Section% 20topics_Namangan. pdf., 10th June.
14. Юнусова, Г. Н. (2020). Методика подготовки в школу дошкольников новейшими технологиями и компьютерными программами. Интерактивная наука, (8 (54)), 7-15.
15. Nazihovna, Y. G., & Odiljon o'g'li, N. O. (2022). Organization of continuous learning and learning in programming and robotics using the concept of a person's whole life course. Galaxy International Interdisciplinary Research Journal, 10(11), 587-604.
16. Nazihovna, Y. G. (2022). STEAM TA'LIMINI ASOSI BO'LGAN INFORMATIKA VA AXBOROT TEXNOLOGIYALARNING YANGILIKLARI VA PLATFORMALARI YORDAMIDA RIVOJLANISHI. IJODKOR O'QITUVCHI, 2(23), 5-20.
17. Nazihovna, Y. G. (2022). MNEMONICS, INFORMATION TECHNOLOGIES AND SOFTWARE METHODOLOGY OF TEACHING "ENGLISH+ MATHEMATICS+ INFORMATICS"(STEAM EDUCATION). Conferencea, 444-450.
18. Туйчиев, А. Т. ПРОВЕДЕНИЕ ДЕБАТОВ ДЛЯ ПОВЫШЕНИЯ РАЗГОВОРНОЙ РЕЧИ СТУДЕНТОВ В ОБУЧЕНИИ ИНОСТРАННОМУ ЯЗЫКУ ПОСРЕДСТВОМ ВЕБИНАРОВ И ОНЛАЙН КОНФЕРЕНЦИЙ PhD, Юнусова Гулшода Назиховна. LBC, 94, 29.
19. Yunusova, G. Умумий о'рта ва олий таълим муассасаларида Стартап лойихалари ва тадбиркорлик фаолияти. Стартап-проекты и предпринимательская деятельность в системе общего среднего и высшего образования, 17.
20. Nazihovna, G. Y. (2022). ROBOTOTEXNIKA DASTURLASHTIRISH VA ALGORITMIZATSIYAGA O'QITISH VOSITASI YORDAMIDA FAN VA TEXNIKANING RAQAMLASHTIRISH MUAMMOLARINI YECHISH. Scientific Impulse, 1(4), 1-12.
21. Nazikhovna, G. Y. (2022). The Latest Digital Information Technologies and Computer Programs in Integration and in Improvement with the Method of Training and Education of Froebel and His" Gifts". Texas Journal of Engineering and Technology, 14, 38-55.

22. Гулшод, Ю. Н. (2022). ПРОГРАММИРОВАНИЕ И РОБОТОТЕХНИКА В ЦИФРОВЫХ ПЛАТФОРМАХ STEAM ОБРАЗОВАНИЯ. Finland International Scientific Journal of Education. Social Science & Humanities, 10(12), 109-125.
23. Юнусова, Г. Н. Cover article. Интерактивная наука, 7.
24. Nazihovna, G. Y. Scratch. URL: https://hemis. namdu. uz/static/uploads/21, 17.
25. Yunusova, G. (2023). O'ZBEKISTON RESPUBLIKASIDA AXBOROT TEXNOLOGIYALARI VA KOMPYUTER DASTURLARI YORDAMIDA STEAM UZLUKSIZ TA'LIMNI SHAKLLANTIRISH. Namangan davlat universiteti Ilmiy axborotnomasi, (7), 523-533.
26. Nazihovna, Y. G. (2023). MODELING PHYSYCAL PROCESSES WITH THE PROGRAM CROCODILE PHYSICS. Finland International Scientific Journal of Education. Social Science & Humanities, 11(1), 825-839.
27. Odiljon ogli, N. O., & Nazihovna, Y. G. (2024). MATEMATIKADAGI ORGANISH QIYIN BOLGAN MAVZULARGA VIZUAL-VIRTUAL OQITISHDA KOMPYUTER DASTURLARI MAJMUASINI TUZISH. INNOVATION IN THE MODERN EDUCATION SYSTEM, 5(40), 31-37.
28. Nazihovna, G. Y. (2023). Технологии Искусственного Интеллекта В Современном Образовании. Periodica Journal of Modern Philosophy, Social Sciences and Humanities, 20, 57-68.
29. Юнусова, Г. Н. (2023). РАЗВИТИЕ АЙТИ СФЕРЫ И ИНФОРМАТИКИ КАК ОДНА ИЗ СОСТАВЛЯЮЩИХ РАЗВИТИЯ СТИМ ОБРАЗОВАНИЯ. In АКТУАЛЬНЫЕ ИССЛЕДОВАНИЯ ВЫСШЕЙ ШКОЛЫ 2023 (pp. 214-224).
30. Nazihanovna, Y. G. (2025). STEAM YONDOSHUVDA RAQAMLASHTIRISH: DASTURLASHTIRISH VA ROBOTOTEXNIKA. AMERICAN JOURNAL OF EDUCATION AND LEARNING, 3(7), 16-22.
31. Nazihovna, Y. G. (2025). NARSALAR (BUYUMLAR) INTERNETI (IoT) VA UNING TEXNOLOGIYALARI. AMERICAN JOURNAL OF EDUCATION AND LEARNING, 3(7), 23-37.
32. Nazikhovna, Y. G. (2025). Steam Education in the Form of a Robotics Module by Means of Artificial Intelligence. Spanish Journal of Innovation and Integrity, 42, 552-557.
33. Юнусова, Г., & Гаффаров, А. (2024). Формирование базовых знаний и компетенций STEAM как условие подготовки конкурентоспособной личности. Общество и инновации, 5(4), 119-127.
34. Odiljon ogli, N. O., & Nazihovna, Y. G. (2024). MATEMATIKADAGI ORGANISH QIYIN BOLGAN MAVZULARGA VIZUAL-VIRTUAL OQITISHDA KOMPYUTER DASTURLARI MAJMUASINI TUZISH. INNOVATION IN THE MODERN EDUCATION SYSTEM, 5(40), 31-37.
35. Nazihovna, Y. G. (2023). MODELING PHYSYCAL PROCESSES WITH THE PROGRAM CROCODILE PHYSICS. Finland International Scientific Journal of Education. Social Science & Humanities, 11(1), 825-839.

36. Юнусова, Г. Н. (2023). РАЗВИТИЕ АЙТИ СФЕРЫ И ИНФОРМАТИКИ КАК ОДНА ИЗ СОСТАВЛЯЮЩИХ РАЗВИТИЯ СТИМ ОБРАЗОВАНИЯ. In АКТУАЛЬНЫЕ ИССЛЕДОВАНИЯ ВЫСШЕЙ ШКОЛЫ 2023 (pp. 214-224).
37. Тешабоева, Н. Д., & Кимсанов, З. О. О. (2019). Влияние высыхания Аральского моря и сухого жаркого климата Центральной Азии на несущие и ограждающие конструкции зданий и сооружений. Молодой ученый, (25), 170-172.
38. Djuraevna, T. N. (2020). Effect of chemical additives on the construction-technical properties of concrete mixture. ACADEMICIA: An International Multidisciplinary Research Journal, 10(5), 809-812.
39. Djuraevna, T. N. (2021). Loss of plasticity by cement systems during time. ACADEMICIA: An International Multidisciplinary Research Journal, 11(3), 1829-1833.
40. Мамажонов, А. У., & Тешабоева, Н. Д. (2019). ВЛИЯНИЕ ДИСПЕРСНОСТИ И КОЛИЧЕСТВА МИНЕРАЛЬНОГО НАПОЛНИТЕЛЯ НА АУТОГЕЗИЮ ЧАСТИЦ ЦЕМЕНТА. Евразийский Союз Ученых, (12-4 (69)), 7-10.
41. Yusupov, U. T., & Teshaboeva, N. D. (2020). CONSTRUCTION OF BUILDINGS AND STRUCTURES IN SALINE SOILS. Theoretical & Applied Science, (6), 223-226.
42. Мамажонов, А. У., Юнусалиев, Э. М., & Давлятов, Ш. М. (2020). БЕТОН С МИНЕРАЛЬНЫМ НАПОЛНИТЕЛЕМ-ГЛИЕЖЕМ, ЭЛЕКТРОТЕРМОФОСФОРЫМ ШЛАКОМ И ДОБАВКОЙ АЦФ-3М. In Энерго-ресурсосберегающие технологии и оборудование в дорожной и строительной отраслях (pp. 220-226).
43. Teshaboeva, N. D. (2021). Influence of Surface–Active Additives on the Physico–Technical Properties of Cement. Eurasian Journal of Academic Research, 1(05).
44. Djuraevna, T. N. (2020). Surface identification methods used in land management and land cadastre. ACADEMICIA: An International Multidisciplinary Research Journal, 10(8), 98-103.
45. Teshaboeva, N. D. (2021). Organic substance in receiving agloporite from raw materials importance. INTERNATIONAL JOURNAL OF DISCOURSE ON INNOVATION, INTEGRATION AND EDUCATION, 2(2), 63-66.
46. Djuraevna, T. N. (2021). Strength Indicators Of Cement Systems With Additives Of Surface-Active Substances. The American Journal of Applied sciences, 3(5), 203-209.
47. Гончарова, Н. И., Зикиров, М. С., & Кимсанов, З. О. О. (2019). Актуальные задачи проектирования общественных и жилых комплексов в центре Ферганы. Молодой ученый, (25), 159-161.
48. Djuraevna, T. N. (2020). Installing power collectors in repair of effective buildings. ACADEMICIA: An International Multidisciplinary Research Journal, 10(5), 823-826.
49. Djuraevna, T. N. (2021). Basic issues of the theory of hydrophobization of cement systems by additives of products of petrochemical synthesis. Oriental renaissance: Innovative, educational, natural and social sciences, 1(5), 475-479.
50. Мамажонов, А. У., & Тешабоева, Н. Д. (2020). Исспользование минеральных наполнителей и химической добавки АЦФ, ПАВ полифункционального назначения, при производстве цемента, монолитных и сборных железобетонных конструкций. Евразийский Союз Ученых, (3-2 (72)), 10-13.

51. Teshabaeva, N. D. (2021). Deformation Properties of Reinforced Concrete Structures in DDY Hot Climates. Eurasian Journal of Academic Research, 1(04).
52. Teshaboeva, N. D. (2019). A method for determining the capillary permeability of concrete in a dry hot climate. EURASIAN UNION OF SCIENTISTS (ESU) Monthly scientific journal, (10), 67.
53. Тешабоева, Н. Д. (2019). Способ определения капиллярной проницаемости бетона в условиях сухого жаркого климата. ЕВРАЗИЙСКИЙ СОЮЗ УЧЕНЫХ (ЕСУ), 70.
54. Teshaboeva, N. D. (2019). Effect of drying of the Aral Sea and the dry hot climate of Central Asia on the supporting and enclosing structures and buildings and structures. Young scientist, (20), 258.
55. Тешабаева, Н. Д., & Умирзаков, З. А. (2020). Значение физиологических свойств почвообразования. Проблемы современной науки и образования, (1 (146)), 22-24.
56. Djurayevna, T. N. (2020). Building Materials Determined In The Architectural Monuments Of Central Asia. The American Journal of Applied sciences, 2(12), 77-80.
57. Djurayevna, T. N. (2020). Influence Of Surface Additives On Strength Indicators Of Cement Systems. The American Journal of Applied sciences, 2(12), 81-85.