

Construction techniques and technologies

APPLICATION OF AUGMENTED REALITY TECHNOLOGIES IN THE FIELDS OF DESIGN AND CONSTRUCTION

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This article analyzes the experience of using modern augmented and virtual reality technologies in the fields of design and construction. The most popular types of computer programs and technical devices are also considered

Keyword: modern technologies, construction, design, augmented reality (XP) in construction and design, augmented reality (AR), virtual reality (VR), XP programs.

References

1. Ivanova A.V. Tekhnologii virtual'noj i dopolnennoj real'nosti: vozmozhnosti i prepyatstviya primeneniya [Tekst] / A.V. Ivanova // Nauchnyj zhurnal. Strategicheskie resheniya i riskmenedzhment - 2018. - №3. - S. 96-102.
2. Obvinceva E.O. Dopolnennaya real'nost' v proektirovanii i stroitel'stve [Tekst] / Obvinceva E.O., Ryazanov I.YU., SHavva A.A. // Nauchnyj zhurnal, Konferenciya. Sankt-Peterburgskij politekhnicheskij universitet Petra Velikogo, Inzhenerno stroitel'nyj institut, Vysshaya shkola promyshlennno-grazhdanskogo i dorozhnogo stroitel'stva – 2020. - №6. – S. 1-6.
3. Microsoft. Trimble XR10 s HoloLens 2 [Elektronnyj resurs]. – URL.: docs.microsoft.com/ru-ru/hololens/hololens2-options-trimble-xr10-edition (data obrashcheniya: 25.11.2021).
4. App Store. MagicPlan [Elektronnyj resurs]. – URL.: <https://apps.apple.com/ru/app/magicplan/id427424432>.
5. Ve Group. BIM-CAVE [Elektronnyj resurs]. – URL.: <http://ve-group.ru/amerikanskiystroitelnyiy-gigant-ispolzuet-virtualnuyu-realnost> (data obrashcheniya: 25.11.2021).
6. Knyazeva L.L., Fyodorov O.P. Dopolnennaya real'nost' kak sredstvo kommunikacii v arhitekturnom proektirovanii. [Tekst] / Knyazeva L.L., Fyodorov O.P. // Mezhdunarodnyj nauchnyj zhurnal «Sinergiya nauk» - 2019. - № 31. - S. 764-774.

RESEARCH OF ENERGY-EFFICIENCY OF LIGHT TRANSPARENT CONSTRUCTIONS OF CIVIL BUILDINGS.

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In our time, it is especially important to use less energy to ensure the same level of energy supply to buildings or technological processes in production for the rational use of energy resources. This article analyzes the indicators of an energy-efficient building and the energy efficiency of translucent enclosing structures. Their features, types and elements, as well as advantages and disadvantages are considered.

Keywords: energy-efficient translucent designs, zenith skylights, lighting, K-glass, I-glass.

References

1. Federal Law of 23.11.2009 N 261-FZ "On Energy Saving and On Improving Energy Efficiency and on Amendments to Certain Legislative Acts of the Russian Federation" [Electronic source]/http://www.consultant.ru/document/cons_doc_LAW_93978
2. Kutukhtin E. G., Korobkov V. A. Constructions of industrial and agricultural buildings and structures: Ucheb. Manual for technical schools. – M.: Arkhitektura. – 2007. – 272
3. Gorshkov A.S., Gladkikh A.A. Measures to improve energy efficiency in construction // Architecture and construction. – 2010. – № 3. S. 246-250.

4. Davydova E.I., Gnam P.A., Tarasova D.S. Translucent structures and methods of increasing their energy efficiency // Construction of unique buildings and structures. – 2015. – № 5 (32). – S. 112-128.
5. Semenova E.E., Bogai V.A. Research of energy-saving technologies in the design of translucent structures of public buildings on the example of low-emission glasses // Collection of scientific works on the results of the international scientific and practical conference. - Novosibirsk. – 2018. – № 5. – S. 73-74.
6. <http://ru.wikipedia.org>

Architecture and urban planning

THE CURRENT STATE AND PROJECT PROPOSAL FOR THE DEVELOPMENT OF AN INTRA-BLOCK LANDSCAPING SYSTEM OF VOROSHILOV SQUARE

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In this article, an analysis of the quality of the territory of the Voroshilov intra-block square was carried out, problem areas were identified, physical parameters, the quality of landscaping were studied, the strengths and weaknesses of the space were determined, existing scenarios for the use of the place, the main pedestrian flows, points of attraction were established, the spatial context was assessed. After the analysis and identification of weaknesses of the territory, the concept of landscaping of the square is proposed.

Keywords: landscaping system, landscaping, recreation, city square, the level of provision of landscaping

References

1. Aleksandrova, Ya. N. Sovremennye tendencii preobrazovaniya goroda / YA. N. Aleksandrova, T. O. Citman // Inzhenerno-stroitel'nyj vestnik Prikaspiya. – 2021. – № 2(36). – S. 67- 71. – DOI 10.52684/2312-3702-2021-36-2-67-71. Инженерные системы и сооружения Выпуск №1 (47), 2022 25
2. Mironov, V.M. Gradostroitel'nye tendencii formirovaniya otkrytyh obshchestvennyh prostranstv sovremennykh zhilykh kompleksov / V. M. Mironov, T. S. Haleeva // Nauchnyj zhurnal. Inzhenernye sistemy i sooruzheniya. – 2021. – № 1(43). – S. 36-49.
3. Dolotkazina, N. S. Osobennosti renovacii gorodskih territorij s uchetom sushchestvuyushchih ogranicenij / N. S. Dolotkazina, YU. G. Kozhevnikova // Inzhenernostroitel'nyj vestnik Prikaspiya. – 2020. – № 2(32). – S. 36-40.
4. Prokshits, E.E. Problema otsutstviya obshchestvennyh mest v novyh stroyashchihsyah rajonah G. Voronezh / E. E. Prokshits, Y . A. Zolotukhina, D. S. Andreeva, A. A. Matveeva // Nauchnyj zhurnal. Inzhenernye sistemy i sooruzheniya. – 2021. – № 1(43). – S. 50-55.
5. Pimenova, E. V. Tendencii razvitiya «universal'nogo dizajna» v formirovanii obshchestvennyh prostranstv gorodskoj sredy / E. V. Pimenova, A. S. Anikina // Aktual'nye problemy nauki i tekhniki. 2021 : Materialy Vserossijskoj (nacional'noj) nauchno-prakticheskoy konferencii, Rostov-na-Donu, 17–19 marta 2021 goda. – Rostov-na-Donu: Donskoj gosudarstvennyj tekhnicheskij universitet, 2021. – S. 114-115.
6. Pashchenko, YU.O. Umnye sistemy ulichnogo osveshcheniya: budushchee nashih gorodov / YU. O. Pashchenko, E. S. Vetrova, E. E. Prokshits, Ya. A. Zolotukhina // Budushchee nauki -2021 : Sbornik nauchnykh statej 9-j Mezhdunarodnoj molodezhnoj nauchnoj konferencii. V 6- ti tomah, Kursk, 21–22 aprelya 2021 goda / Otv. redaktor A.A. Gorohov. – Kursk: YUgo-Zapadnyj gosudarstvennyj universitet, 2021. – S. 448-451.
7. Enin, A. E. Sistemnyj podhod k rekonstrukcii landshaftno-rekreacionnyh prostranstv / A. E. Enin, T. I. Grosheva // Stroitel'stvo i rekonstrukciya. – 2017. – № 4(72). – S. 101-109.

PROSPECTS FOR REVITALIZATION OF A «ROUND STABLE» IN TAMBOV

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In this article approaches to modeling spaces in the urban environment of the Tambov are considered. The current situation of the territory in need of revitalization is being studied. The basic principles of planning public open spaces are being developed on the example of the Round Stable.

Keywords: revitalization, «Round stable», Tambov

References

1. Zolotuhina Ya.A. Revitalizatsiya starogo zhilogo fonda / YA. A. Zolotuhina, D. N. Kaz'mina, K. S. Kotova [i dr.] // Regional'naya energetika i energosberezhenie. – 2017. – № 1. – S. 79. Инженерные системы и сооружения Выпуск №1 (47), 2022 31
2. Pashchenko Yu.O. Analiz i puti razvitiya, renovatsii i revitalizatsii landshaftnorekreationsnykh prostranstv zheleznodorozhnogo rajona goroda Voronezh / YU. O. Pashchenko, YA. A. Zolotuhina, E. E. Prokshits, A. A. Matveeva // Nauchnyj zhurnal. Inzhenernye sistemy i sooruzheniya. – 2021. – № 3-4(45-46). – S. 54-59.
3. Prokshits E.E. Redevelopment promyshlennykh territorij na primere shinnogo zavoda G. Voronezha / E. E. Prokshits, A. A. Matveeva, T. V. Malyuzhenko, D. S. Andreeva // Nauchnyj zhurnal. Inzhenernye sistemy i sooruzheniya. – 2021. – № 2(44). – S. 49-55.
4. Prokshits E.E. Renovatsiya promyshlennykh zon v usloviyah ustojchivogo razvitiya / E. E. Prokshits, T. V. Malyuzhenko, YA. A. Zolotuhina // Innovatsionnye metody proektirovaniya stroitel'nykh konstruksij zdaniy i sooruzhenij : sbornik nauchnykh trudov 2-j Vserossijskoj nauchnoprakticheskoy konferentsii, Kursk, 20 noyabrya 2020 goda. – Kursk: YUgo-Zapadnyj gosudarstvennyj universitet, 2020. – S. 225-230.
5. Tsitman T.O. Renovatsiya promyshlennoj territorii v strukture gorodskoj sredy / T.O. TSitman, A.V. Bogatyreva // Inzhenerno-stroitel'nyj vestnik Prikaspiya, 2015. – (4 (14)). – S. 29-35.
6. Elektronnyj resurs: https://www.abok.ru/for_spec/articles.php?Nid=7309
7. Elektronnyj resurs: <https://pravonagorod.ru/revitalizatsiya-promyshlennykh-zonkaznit-nelzya-pomilovat/>

INFLUENCE OF THE USE OF DOME COVERINGS IN THE FORMATION OF THE ARCHITECTURAL APPEARANCE OF PUBLIC BUILDINGS

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The article discusses the relevance of the use of dome structures in the design of modern public buildings. The world experience of using thin-walled reinforced concrete dome structures in buildings of cultural and social orientation is analyzed.

Keyword: domed structures, architectural appearance, public buildings

References

1. Semerikova M.L. Istoriya vzniknoveniya kupol'nykh konstruksij [Tekst] / M. L. Semerikova, E.A. Veselova // Mezhvuzovskij sbornik statej laureatov konkursov / Nizhegorodskij gosudarstvennyj arhitekturno-stroitel'nyj universitet. – Nizhnij Novgorod : Nizhegorodskij gosudarstvennyj arhitekturno-stroitel'nyj universitet. – 2010. – S. 93-95.
2. [Elektronnyj resurs]. – URL: <http://tehne.com/event/arhivsyachina/g-cvingmanosnovnye-tipy-kupolov-ih-konstrukciya-i-arhitektura-1936>
3. [Elektronnyj resurs]. – URL: <https://tourismlondon.ru/rim/panteon.html>
4. [Elektronnyj resurs]. – URL: <https://planetohotels.com/guide/ru/italiya/florenciya/santa-mariya-del-fore>
5. [Elektronnyj resurs]. – URL: https://pl.igotoworld.com/ru/poi_object/37698_zalstorichchja.htm
6. Prokshits E.E. Implementation of the principles rational designing of dome structures / E. E. Prokshits // Antropotsentricheskie nauki: innovatsionnyj vzglyad na obrazovanie i razvitie lichnosti : Materialy Xiv mezhdunarodnoj nauchno-prakticheskoy konferentsii, Voronezh, 19–20 aprelya 2021 goda. – Voronezh: Izdatel'sko-poligraficheskij tsentr "Nauchnaya kniga". – 2021. – S. 348-350.

7. Gridnev S.Yu. CHislennyye issledovaniya vliyaniya parametrov tonkostennykh kupol'nykh obolochek pri ih optimizatsii [Tekst] / S. YU. Gridnev, O. A. Sotnikova, E. E. Prokshits // Nauchnyy zhurnal stroitel'stva i arhitektury. – 2020. – № 4(60). – S. 11-21.

DEVELOPMENT OF APPROACHES TO THE MODERNIZATION OF PEDESTRIAN AND ROAD SYSTEMS IN THE CENTRAL PART OF THE CITY

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This article analyzes approaches to the reorganization of pedestrian and commercial networks both in the central district and in the city as a whole. The main stages and trajectories of the organization of the pedestrian arteries have been identified. Possible ways of solving issues related to pedestrian and commercial flows in the city are excluded.

Keyword: pedestrian and transport network of streets, modernization, urban centers

References

1. Isabaev G.A. K innovatsionnym voprosam razvitiya transportnoj seti g. Almaty [Tekst] / G.A. Isabaev, Z.F. Tazetdinov // Nauka i obrazovanie segodnya. – 2017. – № 5 (16). – S. 99-102.
2. [Elektronnyy resurs]. – URL: <https://studfile.net/preview/10028644/page:5/>
3. Programma razvitiya OON Ustojchivyy transport g. Almaty 2013 - 2023. Vklad v «zelenuyu ekonomiku» Kazahstana // Proekt GEF-PROON, Almaty, 2011 - 2016. 66 s.
4. Parshin V.Yu. Transportnye problemy goroda i puti ih resheniya na primere G. Voronezh [Tekst] / V. YU. Parshin, K. V. Novgorodskaya, E. E. Prokshits, YA. A. Zolotuhina // Innovatsionnye metody proektirovaniya stroitel'nykh konstruksiy zdaniy i sooruzhenij : sbornik nauchnykh trudov 2-j Vserossiyskoj nauchno-prakticheskoy konferentsii, Kursk, 20 noyabrya 2020 goda. – Kursk: YUgoZapadnyj gosudarstvennyy universitet. – 2020. – S. 204-208.
5. Bakirej A.S. Razvitie ustojchivyykh gorodskih transportnykh sistem v Rossii [Tekst] / A.S. Bakirej, N.V. Haritoshkin // Transport Rossiyskoj Federatsii. Zhurnal o nauke, praktike, ekonomike. – 2014. – № 4 (53). – S. 3-7.

PUBLIC PEDESTRIAN SPACES AS A MEANS OF SUSTAINABLE DEVELOPMENT

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This article revealed the main techniques and methods that can improve the system of pedestrian communications, assess the effectiveness of pedestrian spaces in the context of existing urban development, and identify the classification of types of pedestrian activity that are necessary in the implementation of urban pedestrian spaces in a comfortable environment.

Keywords: architectural environment, pedestrian spaces, efficiency; quality assessment, pedestrian processes, sustainable development.

References

1. Vagner E.A. Velo-peshekhodnye kommunikatsii krupnykh gradostroitel'nykh sistem // Zhurnal SFU. Tekhnika i tekhnologii. 2010. №2.
2. Daggers T., Makotina S.A., Umnova T.V. Peshekhodnaya i transportnaya mobil'nost' v gorodakh Gollandii i v Irkutske // Izvestiya vuzov. Investitsii. Stroitel'stvo. Nedvizhimost'. 2018. №2 (25).
3. Prokshits, E. E. Perspektivy primeneniya gradostroitel'nykh reshenij i ustojchivogo razvitiya eko-goroda na territorii Rossiyskoj Federatsii / E. E. Prokshits, D. A. Zyкова // Nauchnyy zhurnal. Inzhenernye sistemy i sooruzheniya. – 2019. – № 3(36). – S. 35-44.
4. Dolotkazina, N. S. Osobennosti renovatsii gorodskih territorij s uchetom sushchestvuyushchih ogranichenij / N. S. Dolotkazina, YU. G. Kozhevnikova // Inzhenernostroitel'nyy vestnik Prikaspiya. – 2020. – № 2(32). – S. 36-40.

5. Ivashkina, I. V. Ekologicheskie priority sozdaniya komfortnogo goroda / I. V. Ivashkina, N. V. Firsova // Gradostroitel'stvo. – 2020. – № 5(69). – S. 26-31.

Management in technical systems

ANALYSIS OF THE APPLICATION OF RECUPERATORS IN BUILDINGS FOR EQUESTRIAN

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The article discusses the effectiveness of the use of recuperation systems in equestrian buildings in the Russian Federation in the current economic and environmental conditions and analyzes recuperators using a mathematical model associated with the design of air conditioning systems.

Keywords: recuperator, equestrian center, energy efficiency, energy saving, alternative energy sources

References

1. Rodin A.K. Ventilation of industrial buildings of the agro-industrial complex / Textbook / A.K. Rodin. Saratov.: SSAU named after N.I. Vavilov, 2002. - 51s.
2. Draganov B.H. Heat engineering and the use of heat in agriculture / Textbook / B.H. Draganov, A.V. Kuznetsov, S.P. Rudobashta. M.: 1990– - 327s.
3. Grinkrug M.S. Criterion for the selection of parameters of elements of autonomous power supply systems. URL: <http://www.science-education.ru/ru/article/view?id=483>
4. Kravchenko E.A. Unconventional and renewable energy sources / E. A. Kravchenko. - Belgorod : V.G. Shukhov BSTU, 2009. - 30 p.
5. Messenger R. Photovoltaic Systems Engineering / R. Messenger, J. Ventre // CRC Press. — 2004. — № 2. — P. 335–339.