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TECHNOLOGY OF CONSTRUCTION OF PATHS AND PLAYGROUNDS IN PARKS

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Abstract
This work discusses modern technologies and methods for the construction of paths and playgrounds in parks. The article covers the main stages of the construction process, such as marking the paths and playgrounds, preparing the base, selecting materials, establishing the profile, and working with high-quality concrete or paving tiles. Additionally, the factors that should be considered when constructing paths under different soil conditions and the careful selection of materials are discussed. The construction technologies used for paths and playgrounds in parks help create a stable and aesthetically pleasing environment for people.

Keywords: Parks, path construction, playground construction, construction technologies, base preparation, paving tiles, geotextile, drainage system, profile laying, concrete coating, dry mix, material selection, quality construction, stable environment, aesthetic appearance.

Introduction

The construction of paths and squares in parks and gardens is an essential and inseparable part of modern architecture and landscape design. The primary goal of these works is to provide comfort and aesthetic appeal to users, while ensuring functionality at the same time. Paths and squares in parks, the paving tiles used, the stability and durability of the walkways, as well as their harmony with the surrounding environment, are directly related to the quality of the landscape and how well each element meets public needs.

The materials, technologies, and every phase of construction used in building walkways and squares must aim to create stable, durable, and functional spaces. Achieving this goal requires proper application of the technologies used, from the marking of the area to the final placement of tiles. For rapidly developing cities and agricultural communities, the correct use of practical technologies will lead to effective results not only for users but also for the surrounding nature and ecological systems.

This article provides detailed information on the key technologies, stages, materials, and their effective use in the construction of paths and squares in parks and gardens.

Materials and Research Methods

Materials. For the construction of walkways and squares in parks, the selection of materials is crucial to ensure the long-term durability, stability, and aesthetic quality of the spaces. The materials used for paving, base layers, and finishing elements must be suitable for the specific environmental conditions and functional requirements of the park. Below are the main materials used in the construction process:

Paving Tiles (Troutar Tiles). Paving tiles, particularly those made from natural stone, are preferred due to their durability and aesthetic appeal. These tiles are used to form the surface of the paths, offering a long service life if properly installed. The quality of the tiles depends on the method used to lay them, which includes whether dry mix, cement mixture, or sand is used in their installation.

Gravel (Shchebenka). Gravel is commonly used as the base layer under the tiles to distribute the load evenly and improve drainage. Typically, a 15 cm thick layer of gravel is applied as the first base, providing support and preventing the path from settling over time.

Sand. Sand is used as a secondary layer above the gravel, generally about 10 cm thick. It serves as a stabilizer and enhances the drainage system. It also ensures that the paving tiles sit evenly.

Dry Mixture. A dry mixture of cement and sand (usually in a 1:4 ratio) is used as an additional layer to strengthen the base. This 3 cm thick layer further stabilizes the path and helps secure the tiles.

Geotextiles. Geotextile fabrics are often used between layers of gravel and sand. They help prevent the mixing of materials, improve the overall stability of the construction, and facilitate better load distribution.

Topsoil (if required). If the pathway is being constructed in an area that will eventually be landscaped, topsoil may be added to raise the ground level. This layer typically has a thickness of about 15 cm and needs to be considered in the overall profile calculation.

Cement Mixture. A cement-based mortar is sometimes used for setting the tiles, especially in areas requiring additional strength. The mixture is typically applied in a 2 cm layer to provide an even and stable base.

Research Methods. The construction of walkways and squares in parks involves various phases, each of which requires specific methods to ensure the correct application of materials and technologies. The research methods employed in this context include both practical construction techniques and the analysis of material performance.

Site Survey and Layout Planning. The first step in the research process is the survey and layout of the area. The dimensions and layout of the paths are marked out according to the project plans using measurement tools, strings, and construction wires. This ensures that the construction follows the intended design and meets the required functional and aesthetic standards.

Soil and Ground Testing. Before beginning construction, soil tests are carried out to understand the characteristics of the ground. These tests determine whether the soil is suitable for the type of construction being planned. If the soil is too loose or unstable, additional stabilization measures, such as compacting the soil or adding a stronger foundation, may be required.

Layering and Compaction Tests. As various layers (gravel, sand, dry mixture) are laid down, it is crucial to monitor the compaction levels. Compacting each layer properly ensures that the path remains stable over time. The effectiveness of compaction is tested using mechanical tools or a penetrometer, which measures the firmness of the layers.

Tile Laying and Stability Testing. Once the base layers are prepared, the tiles are laid down. Researchers test the tiles' alignment and evenness using levels or laser tools. After installation, the stability of the tiles is tested to ensure that they are secure and will not shift over time. This involves applying pressure and assessing the tiles' ability to withstand traffic.

Drainage Performance Assessment. Effective drainage is vital for the long-term stability of walkways. Research methods involve monitoring the drainage capabilities of the path, especially under various weather conditions. Water permeability tests and flow simulations are carried out to ensure that the path will not suffer from water accumulation, which could lead to settling or erosion.

Longevity and Wear Resistance Studies. Long-term durability is essential for walkways and squares in parks. Researchers observe the wear and tear of the materials over time under different environmental conditions, such as high foot traffic or exposure to the elements. The performance of paving tiles, base materials, and the effectiveness of drainage systems are regularly monitored to predict future maintenance needs.

Aesthetic and Functional Evaluation. Beyond the structural and functional aspects, the aesthetic appeal of the pathways and squares is evaluated. Researchers assess whether the paths contribute to the visual appeal of the park, whether they blend well with the surrounding landscape, and if they meet the practical needs of users. User feedback and satisfaction surveys are often part of this evaluation process.

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Results of Research

Technology of Building Paths and Areas in Parks and Gardens. The technology of constructing paths and areas in parks and gardens, including paving slabs and their fundamental elements, plays an important role in ensuring the long-term durability and stability of landscape structures. Each stage of this process requires precise marking, the correct materials, and proper methods to achieve high-quality results. The success of each stage directly affects the quality of subsequent work.

1. Marking Paths and Areas

The first and most important stage in building paths and areas is marking them correctly. This step defines the future appearance and usability of the structure.

- **Marking According to the Project**: The first step in the construction of paths and areas is to mark them precisely according to the design plan. This is usually done using marking ropes and stakes for accuracy.
- **Review and Adjustment**: After completing the marking, it is recommended to walk along the future path or inspect the area to evaluate its usability and placement. This helps assess the design's practicality and ensures all project requirements are met. If necessary, adjustments to dimensions or location can be made to ensure full alignment with the project's goals.

Figure 1. Marking Paths and Areas

According to the findings, precise marking is essential for ensuring that paths and areas meet design requirements and maintaining high-quality work throughout the process.

2. Preparing the Base

The construction of paths begins with preparing a reliable base, which is a crucial element for ensuring the long-term durability of the structure. Depending on the functional purpose of the path and the specific characteristics of the land, either a mixture of sand and gravel or a concrete base is used as the foundation. A properly prepared base prevents the path or area from sinking and ensures its stability and longevity.

A path consists of several layers, each serving a specific purpose. The lowest layer consists of 15 cm of high-strength crushed stone (gravel), which helps evenly distribute the load. On top of this, a 10 cm layer of sand is placed, which serves to provide additional stabilization and improve drainage. Often, geotextile material is placed between these layers to protect them from mixing and to increase the overall strength of the structure.

This research investigated the construction of walkways and the necessary materials and techniques to make them durable and long-lasting. According to the findings, the following key conditions were highlighted for the effective and durable construction of walkways:

Conductive Mix: A conductive mix (reinforced layer) with a thickness of 3 cm was considered necessary for securely placing tiles, ensuring long-lasting and sturdy walkways.

Walkway Profile Depth: It is crucial to correctly calculate the depth of the walkway profile. Layers of 15 cm crushed stone, 10 cm sand, and 3 cm dry mix create a solid and stable foundation for the walkway.

Tile Layer: The tile layer has a thickness of 7 cm, which completes the walkway surface and enhances its durability.

Total Depth of Walkway Profile: According to the results of the research, the total depth of the walkway profile is 35 cm. This ensures the walkways' strength and long service life.

Walkways in Complex Development: When the area is being developed as part of a complex project, especially if fertile soil is added or the general surface is raised, the profile depth calculation differs from the standard. It is essential to account for the upper soil layer, as it is critical for proper drainage and stability of the walkway.

The process of digging the profile for the walkway includes the following stages:

Crushed Stone (Gravel): The crushed stone layer is 15 cm thick and remains unchanged, serving as the foundation for drainage. This prevents water from accumulating under the walkway.

Sand: A 10 cm sand layer helps to level the surface and creates a stable base for the next step, which is tile placement.

Dry Mix: A 3 cm dry mix layer consisting of cement and sand strengthens the base and makes it stable.

Tile: A 7 cm tile layer is the final stage, ensuring the walkway's strength and long-term durability.

Fertile Soil Layer Underneath the Lawn: If the area is covered with fertile soil, its depth is approximately 15 cm. This needs to be considered when calculating the depth of the walkway profile, as this layer will be above the surface where the tiles are laid.
Thus, when fertile soil is added and the area level is raised, the profile depth for the walkway is calculated as follows:

15 cm (crushed stone) + 10 cm (sand) + 3 cm (dry mix) + 7 cm (tile) - 15 cm (fertile soil layer depth) = 20 cm.

This calculation allows for the correct design of the walkway, ensuring its stability, while also taking into account future changes in the site's level.

Figure 2. The process of building the road base of the corridor

Soil Waste Formation During the Digging of the Walkway Profile. During the process of digging the profile for the walkway, a certain amount of soil waste is generated per square meter of area, which must be taken into account when planning the works. Depending on the conditions, depth, and type of profile, the volume of waste may vary.

Case 1: If the walkway is being laid on an existing lawn or other surface, the depth of the profile is 35 cm. In this case, the soil waste generated per square meter is approximately 0.35 cubic meters.

Case 2: If the walkway is being installed as part of a complex site development project, where the soil surface is being raised, the depth of the profile is 20 cm. In this case, the soil waste generated per square meter is approximately 0.2 cubic meters.

The Use of Soil Waste. It is important to consider in advance how to use the soil waste generated during the digging of the walkway profile. Removing the waste from the site requires additional time and financial costs. However, it is possible to use the soil waste effectively and conveniently. For example, the waste can be used in the following ways:

Landscape Leveling: The soil waste generated during the profile digging process can be used to level the ground, create landscape features, or raise certain parts of the area.

Filling Unwanted Holes or Depressions: Soil waste is suitable for filling pits, depressions, or other holes, which improves the overall landscape and prevents water accumulation.
This approach helps in organizing the work efficiently and can reduce additional costs.

Effective Use of Soil Waste. Thus, there is no need to remove the soil waste from the site. This not only reduces costs but also helps improve the condition of the area.

Formation of the Walkway Base. Once the profile digging and preparation works are completed, the stage of shaping the walkway base begins:

Laying Crushed Stone (Gravel): A 15 cm layer of crushed stone is spread over the depth. The crushed stone serves as the foundation for drainage, preventing water accumulation and ensuring the stability of the walkway.

Layer of Sand: Next, a 10 cm layer of sand is spread over the depth. The sand helps level the surface and creates a convenient base for tile installation in the next stage.
These steps ensure the walkway's stability and long-term functionality.

The Importance of Quality Compaction in Base Formation. The compaction of each layer, especially the crushed stone (gravel) and sand, is crucial to ensure the strength and durability of the walkway base. Proper compaction prevents the walkway from sinking over time. Compaction can be done using manual or mechanical equipment, depending on the size of the area and the complexity of the work.

Figure 3. Forming the base of the corridor

Drainage System and Water Distribution: The use of the fine gravel layer along with geotextile significantly improved the drainage system. Geotextile allowed efficient water passage while preventing the mixing of fine gravel and sand. This ensured that water did not accumulate beneath the pathway and reduced issues caused by water pooling, thus enhancing the overall stability of the structure.

Stability and Durability: The geotextile layer helped maintain the stability of each layer even under heavy or small loads. Additionally, the composition or structure of the geotextile material contributed to increased stability and prevented the loss of strength or wear over time. The research results clearly demonstrated that geotextile played a crucial role in ensuring the long-term durability of the pathway.

Long-Term Performance: The use of geotextile contributed to the long-term performance of the pathway. The non-mixing of fine gravel and sand helped keep the pathway stable and reliable. The research showed that the use of geotextile in the base construction notably extended the lifespan of the pathway.

Economic Efficiency: The economic efficiency of using geotextile was significant. The research findings indicated that the inclusion of geotextile helped reduce additional costs during construction. By preventing the mixing of fine gravel and sand, the materials were used more efficiently, and the construction process was streamlined.

Faster Construction and Lower Costs: The application of the geotextile layer facilitated faster and more efficient construction. The combination of fine gravel, sand, and geotextile accelerated the process and reduced overall time spent on construction. According to the research, using geotextile led to quicker and more accurate completion of the project.

Additional Analysis: Different types of geotextiles (such as long or full geotextile materials) could be used in pathway construction depending on specific requirements. Therefore, extending the research to determine the effectiveness of various geotextile types would be necessary.

Figure 4. Geotextile laying between layers of fine stone and sand

Laying the Sand Layer After Geotextile. After laying the geotextile, a 10 cm thick layer of sand is spread on top. The sand performs the following functions:

- **Smoothing the surface**: The sand layer helps to level out any unevenness in the base and ensures a smooth surface.
- **Creating a stable and level base for paving**: The sand layer provides a solid foundation for the installation of paving materials, such as tiles, by ensuring stability and a uniform surface.

The Importance of Compaction. Each layer, including the sand layer, must be properly compacted. Quality compaction ensures:

- **Good layer densification**: Proper compaction makes sure that the sand layer and other layers are densely packed, which is crucial for structural integrity.
- **Stability of the foundation**: Compaction helps in achieving a firm foundation, preventing settlement and shifting over time.
- **Long-term performance of the pathway**: A well-compacted base helps the pathway withstand regular use, environmental stress, and changing weather conditions.

Proper compaction of the base, including the sand layer, prevents the pathway from sinking and ensures it remains resilient under load. This guarantees that the shape and quality of

the pathway are maintained even under challenging conditions, providing a long-lasting, stable surface.

3. Laying the Pavement Tiles

Dry Mixture Method

For laying pavement tiles, a special bedding mixture is used. This mixture can either be pre-made (purchased from a store) or prepared independently using the following ratio:

- **1 part cement**
- **4 parts sand**

Preparation and Application of the Mixture:

1. The mixture is prepared before laying the tiles. This ensures it is clean and of good quality.
2. The thickness of the mixture layer should be 3 cm.
3. The mixture serves as a firm foundation to level the surface and provide stable placement for the tiles.

Key Points During Laying:

- The mixture should be spread evenly across the surface.
- A proper and stable base prevents the tiles from shifting and ensures their long-lasting performance.

This approach guarantees the quality and aesthetic appeal of the pavement tiles, ensuring they are properly placed and durable for extended use.

Figure 5. The final stages of the foundation of the corridor

Laying Pavement Tiles Process. Laying the tiles requires careful attention and precision. The horizontal alignment of the tiles should be checked using a level (or spirit level), and if necessary, the tiles should be adjusted. If the tiles are not at the same level, they can be aligned by gently tapping them into place or adding dry mixture underneath certain areas to level their height.

This approach helps ensure the **long-term durability** of the pathway, preventing deformation and subsidence of the tiles, and it also maintains the **aesthetic appearance** of the path over time.

Final Stage of Laying Pavement Tiles:

1. **Filling the Gaps with Sand**:
   - After the tiles are laid, sand should be spread into the joints between the tiles. This sand should be well-distributed, as it will help stabilize the tiles in place.
2. **Removing Excess Sand**:
   - Any excess sand on the surface should be removed using a broom or a brush, ensuring that only sand remains between the joints.
3. **Watering**:
   - After watering the surface, if the sand in the joints shifts or settles, additional sand should be added, and the area should be watered again. This process helps to compact the sand and secure it in the joints, further stabilizing the tiles.

By following these steps, the tiles will be properly placed, secured, and stabilized, ensuring the **longevity** and **aesthetic appeal** of the pathway.

Figure 6. The final stage of laying pavement tiles

Final Stabilization and Cement Mixture Laying. After all the work is completed, the tiles require several days for **settling and stabilization**. During this time, the tiles will fully bond, and the sand in the joints will compact and harden, remaining in place without weakening. Once this period has passed, the pathway can be used, and its shape will remain intact.

Laying the Cement-Based Mixture:

• The **cement mixture** should be laid with a thickness of 2 cm. The process of applying this mixture requires **care** and **precision**.

1. **Checking the Alignment**: After laying the tiles, the **construction level** (spirit level) should be used to verify the correct alignment of the tiles. This ensures they are laid evenly and properly.
2. **Adjusting the Tiles**: If necessary, the tiles can be slightly adjusted to the correct position. This can be done by gently lifting them and making any necessary adjustments.

By following these steps, the tiles will be properly aligned and stabilized, ensuring the long-term durability and proper functioning of the pathway. The use of a cement-based mixture in this stage helps provide additional support and ensures the tiles are securely in place.

Figure 7. Laying in a cement mixture

This process helps create a **stable and properly leveled horizontal surface**, which is essential for ensuring **long-term durability** and for **withstanding mechanical loads**, such as **vehicular traffic** or **intensive use**.

By ensuring the surface is even and well-compacted, it enables the pathway to resist the stresses and strains imposed by continuous use and heavy loads, such as car movement or frequent pedestrian traffic. This results in a more resilient and long-lasting surface that can maintain its shape and integrity over time.

Discussion of Results

The study focused on identifying the key stages and materials in the technology of constructing paths and areas, analyzing their impact on the quality of the work.

1. **Marking Paths and Areas**: The marking process helps define the future usability and appearance of the structure. The accuracy of the marking is essential for ensuring high-quality work throughout the construction process.
2. **Preparing the Base**: For the path, layers of **15 cm gravel**, **10 cm sand**, and **3 cm dry mix** ensure stability and long-term durability. Geotextile improves water passage and strengthens the overall base.
3. **Laying Pavement Tiles**: Precision is crucial in laying tiles. Using a **level** ensures the tiles are placed correctly. Spreading sand between the tiles helps secure them in place.
4. **Cement-Based Mixtures**: Using a **cement-based mixture** helps the tiles stay securely in place, ensuring long-term durability and stability.
5. **Compaction and Stability**: Proper **compaction** of the base and tiles ensures the path remains stable and durable over time.
6. **Importance of the Research**: The use of geotextile, sand, cement-based mixtures, and proper compaction ensures the durability and aesthetic appearance of the path. Using the right materials accelerates the construction process and improves economic efficiency.

Conclusion

The study's results demonstrate the importance of each stage in the construction of paths and areas. Accurate marking, proper base preparation, quality tile laying, and the use of geotextile contribute to creating stable and long-lasting paths.

References

1.Bakhtiyarullaevich, Ubaidullaev Farkhod, and Majidov Abdulaziz Norqobilovich. "Vegetative propagation of black mulberry (Morus, nigra L) recommended for landscaping roads and city streets." Texas Journal of Agriculture and Biological Sciences 12 (2023): 37-40.

2. Bakhtiyarullaevich, Ubaydullaev Farkhod, Xaitov Farhod Djuraevich, and Ubaydullayev Abbosjon Azimjon Ogli. "TOSHKENT SHAHAR MIRZO ULUG'BEK TUMANIIDAGI DAHALARNI KO'KALAMZORLASHTIRISHDA DARAXTLARNING SANITAR GIGIENIK VA XUSUSIYATLARI." Conferencea (2023): 149-153.

3. Ubaidullaev, F. B., A. N. Majidov, and S. K. Khudaybergenov. "AGROTECHNICS OF CULTIVATION AND USE OF MULBERRY SEEDLINGS FOR PICTURESQUE

LANDSCAPING OF HIGHWAYS." GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ) ISSN (E): 363-370.
4. Bakhtiyarullaevich, Ubaidullaev Farkhod, Majidov Abdulaziz Norqobilovich, and Khudaybergenov Sardor Kamaraddinovich. "Agrotechnics of cultivation and use of mulberry seedlings for picturesque landscaping of highways." Galaxy International Interdisciplinary Research Journal 11.1 (2023): 363-370.
5. Bakhtiyarullaevich, Ubaidullaev Farkhod, and Ubaydullayev Abbosjon Azimjon OGLi. "SANITARY-HYGIENIC PECULIARITIES OF GREENING OF STREETS AND AUTOMOBILE STATIONS AND NATIONAL POINTS." Galaxy International Interdisciplinary Research Journal 11.2 (2023): 53-58.
6. Убайдуллаев, Ф. Б. "Влияние стимуляторов на рост сеянцев конского каштана." Актуальные проблемы современной науки 3 (2018): 115-119.
7. Bakhtiyarullaevich, Ubaydullaev Farkhod, et al. "LANDSCAPE COMPOSİTİONS BASED ON EVERGREEN SHRUBS İN THE LANDSCAPİNG OF CİTY STREETS." American Journal of Research in Humanities and Social Sciences 10 (2023): 40-43.
8. Убайдуллаев, Фарход Бахтияруллаевич, and Фарҳод Джураевич Хаитов. "TYPES OF ORNAMENTAL PLANTS RECOMMENDED FOR BALANCE AND LANDSCAPING OF PARKING AREAS ON HIGHWAYS AND WALKS IN CITY STREETS FOR TASHKENT OASIS." Science and Innovation 1.4 (2022): 95-100.
9. Khatamovich, Yuldashov Yakubjon, Ubaydullaev Farkhod Bakhtiyarullaevich, and Khatamov Bakhramjon Yakubjanovich. "FEATURES OF PRODUCTIVITY, RIPENING AND GERMINATION OF JUNIPER SEEDS." American Journal of Pedagogical and Educational Research 10 (2023): 85-92.
10. Bakhtiyarullaevich, Ubaydullaev Farkhod, Ubaydullayev Abbosjon Azimjon Ogli, and Aripov Xojiakmal Xojiakbarovich. "CHARACTERISTICS OF DECORATIVE AND POISONOUS GAS- RESISTANT TREES FOR THE STREETS OF TASHKENT." Open Access Repository 4.02 (2023): 85-94.
11. Убайдуллаев, Фарход Бахтияруллаевич, et al. "АВТОМОБИЛЬ ЙЎЛЛАРИ ВА ШАҲАР КЎЧАЛАРИДАГИ САЙИЛГОҲ ҲУДУДИНИНГ ТОШКЕНТ ВОҲАСИ УЧУН БАЛАНСИ ВА ЯШИЛ ЭКИНЗОРЛАРИГА ТАВСИЯ ЭТИЛАЁТГАН МАНЗАРАЛИ ЎСИМЛИК ТУРЛАРИ." UIF-2022 8: 95-100.
12. Ubaydullaev, Farxod, et al. "Irrigation regime Influence on the growth and seedlings development of common fake chestnut (Aesculus hippocastanum L.) and Japanese safflower (Sophora japonica L.) in the highways landscaping." E3S Web of Conferences. Vol. 264. EDP Sciences, 2021.
13. Ubaydullayev, F., and Sh Gaffarov. "Selection of prosperous varieties of rosehips (rosa L.) And their seed productivity in Tashkent oasis, Uzbekistan." E3S Web of Conferences. Vol. 258. EDP Sciences, 2021.
14. Ubaydullaev, Farxod, Bakhramjon Khatamov, and Abdulaziz Majidov. "AVTOMOBIL YO'LLARINI KO'KALAMZORLASHTIRISHDA TUT (MORUS, NIGRA L) KO'CHATLARINI PARVARISHLASHDA MINERAL O'G'ITLARNI QO'LLASH VA

SUG'ORISH ME'YORLARI." Евразийский журнал академических исследований 3.4 (2023): 75-81.
15. Baxtiyarullaevich, Ubaydullaev Farxod. "CHINORBARGLI ZARANG (Acer platanoides L.) va SEMENOV ZARANGI (Acer semenovii Rgl. Et Herd.) TURLARINING BIOEKOLOGIK XUSUSIYATLARI, MANZARAVIYLIGIi VA KO ‘CHATLARINI YETISHTIRISH TEXNOLOGIYASI." Science Promotion 1.1 (2023): 36-39.
16. Baxtiyarullaevich, Ubaydullaev Farxod, and Rafiqov Rustamjon Azamjon-o'g'li. "Toshkent shahri Uchtepa tumani mahalliy ahamiyatdagi “Farxod” ko‘chasida harakat xavfsizligini oshirish." Science Promotion 1.1 (2023): 28-31.
17. Baxtiyarullaevich, Ubaydullaev Farxod, and Abduraximov Muhammadali Muhammadibroxim o‘g‘li. "Pensilvaniya shumtoli (Fraxinus pennsylvanica Marsh.) tur va shakllarining bioekologik xususiyatlari, manzaraviyligi va ko ‘chatlarini yetishtirish." Science Promotion 1.1 (2023): 32-35.
18. Bakhtiyarullaevich, Ubaydullayev Farkhod, and Gulamkhodjaeva Shakhnoza Fakhritdinovna. "EFFECT OF IRRIGATION ON GROWING TWO-YEAR-OLD MULBERRY SEEDLINGS USED IN HIGHWAY LANDSCAPING." British Journal of Global Ecology and Sustainable Development 25 (2024): 33-38.
19. Bakhtiyarullaevich, Ubaydullayev Farkhod, and Khomidova Nargiza Isaqulovna. "THE STANDARD OF DIFFERENT WATERING REGIMES OF MULBERRY SEEDLINGS EFFECT ON SEEDLING EMERGENCE." American Journal of Interdisciplinary Research and Development 25 (2024): 220-225.
20. Baxtiyarullaevich, Ubaydullaev Farxod, and Rafiqov Rustamjon Azamjon-o'g'li. "Toshkent shahridagi M39 yo‘lidan M39b" Toshkent xalqa yo‘li" shahobcha avtomobil yo‘lining 12-22 km bo‘lagini ko‘kalamzorlashtirishda bir yillik va ko'p yillik gullardan klumbalar barpo etish." Science Promotion 1.1 (2023): 40-44.
21. Bakhtiyarullaevich, Ubaydullaev Farkhod, Khomidov Jalaldin Oktamkhoja ogli, and Abdurakhimov Muhammadali Muhammadibrokhim ogli. "BIO-ECOLOGICAL CHARACTERISTICS, ORNAMENTAL FEATURES AND TECHNOLOGY OF GROWING SEEDLINGS OF MAPLE (ACER PLATANOIDES L.), MAPLE (ACER SEMENOVII RGL. ET HERD.) AND PENNSYLVANIA ASH (FRAXINUS PENNSYLVANICA MARSH)." American Journal of Pedagogical and Educational Research 15 (2023): 173-186.
22. Kuchkarovich, Kasimkhodjaev Bokhodir, Ubaydullaev Farkhod Bakhtiyarullaevich, and Nishonov Umid Toir ogli. "THE USE OF GABIONS IN THE LANDSCAPE DESIGN OF HIGHWAYS AND CITY STREETS." American Journal of Technology and Applied Sciences 11 (2023): 11-17.
23. Isan ogli, Alisher Kholikov, Kasimkhodjaev Bokhodir Kuchkarovich, and Ubaydullaev Farkhod Bakhtiyarullaevich. "DETERMINING THE INFLUENCE OF CHANGES IN THE QUANTITY, SPEED AND COMPOSITION OF VEHICLES AND HIGHWAYS IN THE CITY AND THE DISTRIBUTION OF TRANSPORT." American Journal of Pedagogical and Educational Research 10 (2023): 167-174.

24. Убайдуллаев, Фарход Бахтияруллаевич, et al. "АВТОМОБИЛЬ ЙЎЛЛАРИ ВА ШАҲАР КЎЧАЛАРИДАГИ САЙИЛГОҲ ҲУДУДИНИНГ ТОШКЕНТ ВОҲАСИ УЧУН БАЛАНСИ ВА ЯШИЛ ЭКИНЗОРЛАРИГА ТАВСИЯ ЭТИЛАЁТГАН МАНЗАРАЛИ ЎСИМЛИК ТУРЛАРИ." UIF-2022 8: 95-100.
25. Bakhtiyarullaevich, Ubaidullaev Farkhod, and Majidov Abdulaziz Norqobilovich. "Vegetative propagation of black mulberry (Morus, nigra L) recommended for landscaping roads and city streets." Texas Journal of Agriculture and Biological Sciences 12 (2023): 37-40.
26. Bakhtiyarullaevich, Ubaydullayev Farkhod. "EFFECT OF IRRIGATION ON ONE-YEAR GROWTH OF MULBERRY SEEDLINGS USED IN HIGHWAY LANDSCAPING." American Journal of Interdisciplinary Research and Development 25 (2024): 214-219.
27. Bakhtiyarullaevich, Ubaydullaev Farkhod, and Aripov Xojiakmal Xojiakbarovich. "STUDY OF THE STRUCTURAL COMPOSITION OF GABIONS IN LANDSCAPE DECORATION OF AUTOMOBILE ROADS AND CITY STREETS." British Journal of Global Ecology and Sustainable Development 25 (2024): 70-80.