

## **Trends in the Development of the Architectural and Landscape Environment of Zoos**

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### **Annotation:**

Trends in the development of an environmentally friendly, functionally organized, socially and aesthetically comfortable environment in zoos are considered. The features of the architectural and landscape organization of territories, methods of creating favorable living conditions for animals, safe viewing of expositions of enclosures and comfortable rest of visitors are revealed.

**Keywords:** architectural and landscape organization, ecology, safety, comfort of the environment, mixing of styles, exposition, aviary

**I. INTRODUCTION.** Since the 18th century, the traditional organization of the functional and planning structure and exposure of animals on the territory of zoo-parks has been formed according to a systematic or zoological feature. The animals were kept in cages and corrals, and sometimes in architecturally designed pavilions. In the 19th century, a zoogeographic approach began to be used - according to the country of origin of animals: Africa, Asia, Australia, Congo, Patagonia and other countries. From the middle of the 20th century, discoveries in the field of ecology and zoology led to the organization of exhibitions on an ecological basis with the allocation of zones of humid tropics, forests, mountains, deserts, etc.

Nevertheless, despite the evolution of methods of demonstrating animals from their keeping in traditional cages, pens and pavilions, pre-progressive methods of forming man-made landscapes of expositions and aviaries, including inspection of animals in their natural habitat - national and natural parks, most modern zoos in the world, including zoos in Uzbekistan, continue to remain within the traditional framework. Therefore, including the requirements of sustainable development, which also apply to zoos, predetermine the search for opportunities to go beyond the traditional framework. This determines the study and identification of progressive experience in the development of modern zoos.

**II. MAIN PART.** Modern trends in the development of zoos are aimed not only at the preservation and reproduction of animals endangered by destruction, but also at creating the most comfortable environment for animals and visitors. If earlier, zoos were located on free areas of cities, now they are created on the doorstep and outside cities, including the territory of national and natural parks.

In general, the modern approach to the creation of zoological expositions involves the use and combination of various forms: zoological and botanical gardens, museums, animal breeding and rescue centers, theme parks, dolphinariums, aquariums, amusement parks, national parks [2]. All of the above methods of presenting animal displays are used by zoos all over the world, mixing the historical styles and modern trends in the architectural and landscape organization of zoos. These changes also lead to a change in the requirements for the design of zoos. At the same time, a new understanding in the organization of zoos depends on the level of education of the staff and the ability of architects to find new non-standard solutions.

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Today there are about 1500 zoos in various countries and cities of the world [3]. The oldest and most famous zoos in the world are located in London (Regency Zoo); Paris (zoo-Plants and zoo-Acclimatization, zoo-Bois de Boulogne); Berlin (Tiergarten-zoo); Toronto (at Metro Zoo); New York (in the Bronx Zoo); Chicago (Lincoln Zoo, Brookfield Zoo); San Diego (Balboa-zoo) and the zoos of the same name in Cincinnati, Detroit, Philadelphia, St. Louis and others. cultures of the regions of the world. Among the exposition of the zoo are the "Thai Temple", "Indian Palace", "African Village", "Dinosaurs" and others.



Park landscape overlooking the city of Sydney, a fragment of a monkey roll and an exposition of dinosaur sculptures at the Taronga Zoo in Australia.

Themed zones of domestic animals are organized in different zones of the zoo: "On the farm", "Pets", "Young animals' playground", "Horse breeds" and the exhibition "In the back yard". Based on the suggestions of visitors, family recreation corners are formed, accompanied by various educational programs.

The Zoo in Regens Park London [5], opened in 1826, covers an area of 15 hectares. The zoo has a multi-center planning structure. Its organization uses the techniques of the palace zoos of ancient China and Egypt. But the main principle of organizing the zoo is the demonstration of animals among the picturesque landscape. Of particular interest is the original structure in the form of terraces, towering one above the other. Observation platforms are located on several levels above the animal exposition, which opens up a wide view from top to bottom and safe observation of the animals for visitors. Terracing of the territory allows the most rational use of the small size of the territory of the park. In addition, in the pavilions of Regens Park, new achievements of science and technology are used - renewable energy supply, artificial daylight, ventilation. It is important to note a clear system for orienting visitors - at all turns in the zoo facilities there are plans and answers to questions that visitors may have.

The Berlin zoo "Tiergarten" [6], opened in 1844 on the basis of the old Friedrichsfelde park, has an area of 35 Hectares. Various structures for animals have been built here: an elephant house, reminiscent of an Indian temple, pavilions for antelopes and giraffes, decorated with minarets, etc. fascination of European architects with oriental architecture. The modern landscape, pens and open-air cages of the zoo are as close as possible to the natural conditions of animal habitat. The artistic value of the landscape is increased by the harmonious unification of the territory by a system of green spaces and the maximum use of their decorative qualities. Wide open spaces of meadows are surrounded by shady massifs, animals and birds live on "islands", reservoirs and canals are framed with decorative groups, and low plants are placed along the perimeters of exposition sites and recreation areas, which generally creates a complete picture of natural nature.

Another feature of the zoo is vast water areas with a complex closed system of streams, channels, canals and lakes, which, along with their functional purpose, enrich the decorative appearance of the zoo. Goose ponds, aviaries of monkeys, ostriches, giraffes, elephants, lions and hippos look

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interesting and varied. Along the enclosure of polar bears, there is a pond surrounded by rocky shores, which, reflecting in the water, create a wonderful dark background for light bears. The landscape character of the zoo is well combined with the free outlines of pedestrian and transport alleys and roads.



Entrance, scheme and enclosures of the Berlin zoo "Tiergarten".

The children's zone of the zoo is organized in miniature, with a small scale of sites and small architectural forms, taking into account children's perception, and the safe movement of children in sustainable zones. In the alleys of the zoo, there are tamed animals and many songbirds, which both adults and children are happy to feed.

The reconstructed zones of the Paris Zoo [7], opened in 1934, are distinguished by scenarios of "immersion" of visitors in a landscape that maximally imitates the natural habitat of animals. Here animals can roam freely in spacious enclosures, and visitors can observe animals and nature in solitude. The principle of "true nature" reigns here.



Reconstruction of antelope and giraffe enclosures at the Paris Zoo.

The Singapore Zoo [8], with an area of over 28 hectares, is based on the concept of an open zoo. Visitors also observe the animals in their "natural" habitat. Among the wide variety of species, it contains animals that are endangered. The most interesting part of this zoo is "night safari" and "breakfast with animals".



Aviaries of flamingos and white tigers at the Singapore Zoo.

It should be noted here that the first zoos with elements of "safari" became world famous on the territory of the Czech Zoo, where on an area of more than 100 hectares were formed areas of the "island", as close as possible to the natural living conditions of numerous African animals [3]. Similar conditions are called "The Animal Kingdom" was also created in the Disneyland theme park in Orlando, Florida, USA [9]. Here, many animals live in realistic safari-style environments where human presence is minimized in most of the space. The Animal Kingdom is home to over 1,500 exotic animals and hundreds of amazing collections of fish and birds. The park also has areas for games, entertainment and life-size displays of prehistoric animals.



Animal Kingdom Zoo near Orlando, USA.

**III. RESULTS AND DISCUSSION.** Unlike the above examples, in Uzbekistan, where there are two state zoos (in Tashkent and Termez), apart from small zoos in separate parks in Samarkand and Tashkent, only the Tashkent Zoo [10] is the only large zoo in the republic. A feature of the territory of the zoo, with an area of 21.5 hectares, is its location between the Boz-Su and Salar canals. The planning principle is systematic. A collection of rare and endangered animal species is collected here, cultural, educational and research work is being carried out on the preservation, breeding and reintroduction of rare and valuable species of animals. Much attention is paid to the conservation and breeding of animal species in the Central Asian region. The Tashkent Zoo is a full member of the Euro-Asian Regional Association of Zoos and Aquariums - "EARAZA".

The demonstration zone contains aviaries, a recreation area, two lakes, ponds, canals and the only one in Central Asia "Aquarium" - the main attraction of the zoo. It contains not only freshwater but also marine fish species, including two shark reservoirs. The aquarium, terrarium, primates and exotic birds are housed in the "Klimatron" building. All animals requiring water are provided with reservoirs (predators, ungulates, waterfowl, crocodiles, water turtles, etc.).

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Panorama, fragments of the climatron and aviaries of the Tashkent zoo.

A feature of the zoo's landscape is a decorative lake for waterfowl. However, not all zones of the zoo are comfortable for animals and visitors. Most of the pens are cramped for animals, the open-air cages are environmentally friendly. the zoo environment lacks vegetation and elements of landscape design.

But in comparison with many zoos in the world, the Tashkent zoo is quite "young" - it is only about 20 years old, which gives hope that some shortcomings will be eliminated and over time the zoo will reach a high level of development. not only for the development of the Tashkent zoo, but also serves as an example for the formation of new zoos not only in the capital, but also in other cities and regions of Uzbekistan.



Scheme of the existing zoo in Tashkent



Project proposal

Currently, the republic is undergoing extensive restoration and reconstruction of parks and, in particular, zoos, and project proposals are also offered by 4th year students of the Tashkent Institute of Architecture and Civil Engineering. This proposal revealed: the architectural and planning composition of the zoo, competent zoning of the territory according to pedestrian accessibility for visitors and belonging to various species and classes of animals kept in enclosures, taking into account sanitary and hygienic standards and harmless environmental technologies for comfortable keeping and caring for animals. In addition, the maintenance of the zoo requires considerable funds that are collected from visitors, so they have the right to see the animals. Before the visitor's gaze there should be a minimum of obstacles in the form of nets, gratings, fences, etc., taking into account, of course, the safety of viewing a particular object. In my opinion, to overcome the contradiction between the natural conditions of the existence of animals and the accessibility for viewing, a positive effect would be brought by the use of ultra-strong one-sided transparent glass, which has sound-insulating properties as a fence structure.

The architectural and planning composition of the zoo should take into account the profile of animal husbandry, biological, climatic, sanitary and hygienic, urban planning and aesthetic requirements.

**IV. CONCLUSION.** Thus, modern zoos are multifunctional complexes that perform not only the tasks of studying and exhibiting animals, but also creating a favorable living environment for animals, and comfortable conditions for safe viewing of expositions and recreation of visitors. The use of natural landscape elements of trees, shrubs, flowers, lianas, grasses, stones, pebbles, rubble, sand, clay, etc.

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