

# The Place Of Orthogonal Projections In Landscape Design. Visual Tools

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**Abstract:** As described in this article thus, orthographic projection in landscape design is: "The most important methodological tool that allows for the scientifically sound depiction of a spatial landscape on a plane, in precise dimensions and correct proportions".

**Keywords:** Orthographic projections, landscape design, development, architectural monuments, entertainment services, Integration, engineering graphics, design, technology, art, architecture, education, methodology.

**Introduction:** The Republic of Uzbekistan, with its independence, has entered a new era of development. Our people have acquired a rich historical, cultural, and spiritual heritage. Ample opportunities have been created not only for visiting the millennia-old architectural and urban development history, even architectural monuments whose visits are prohibited, but also for their study and restoration. The time has come to objectively introduce students to the rare architectural monuments created in our country since ancient times, the history of urban development, and the methods and rules of construction.

Landscape design objects include open and semi-open spaces of varying layouts and functional purposes. These include lands used by cities, towns, industrial facilities, recreational spaces, environmental protection, and other sectors of the national economy. Only through landscape improvement can lands be made socially, ecologically, aesthetically, and compactly comfortable. Landscape design provides opportunities for the use of urban recreational lands, as it enhances the attractiveness and beauty of these spaces, attracting residents of cities and towns and taking advantage of their recreational opportunities. Recreation is used for recreation, health improvement, strengthening, and improving public health, among other purposes. Landscaping, and improving the quality of cultural and entertainment services lead to increased monthly revenue from trade and other services, increasing the profitability of these spaces for the municipal economy and the national economy as a

whole. Landscape architecture is so closely linked to the landscape design of open spaces that the history of landscape architecture is inextricably linked with landscape design. If landscape architecture is a general term, then landscape design is the architectural forms, models and elements of landscape design that complement it, give quality and meaning to all its objects, each of which is associated with the landscape.

The word "orthogonal" comes from the ancient Greek words meaning "straight" and "angular." This course will only consider the case where the projection direction is perpendicular to the projection plane. In each case, parallel projections with oblique angles are considered separately. The essence of orthogonal projections is that they project an object at right angles onto two mutually perpendicular projection planes.

A drawing is a technical illustrative document, so it must be understandable and visual, serving as a basis for the builder in implementing the architect's and designer's vision. A drawing must have its own scale, dimensions, and symbols. The section of construction drawing that teaches how to create building drawings (residential, school, industrial, hospital, etc.) is referred to as architectural and construction drawing.

Projecting figures onto two mutually perpendicular planes at right angles is called an orthographic projection. Sometimes, to improve a drawing, a plane (profile plane) perpendicular to both the horizontal and frontal planes is used. Drawings are easily produced using orthographic projections, and the dimensions

(length, width, height) of the depicted object in an orthographic projection (isometric) can be determined directly. Therefore, an image of an object created using an orthographic projection is often compared to its axonometric projection. In engineering construction, a method called numerical projections is often used. In this case, points are projected orthogonally onto the projection plane, and numbers—elevations—are placed next to the projection, reflecting the point's position on the plane. For clarity in the drawing, a line of elevations is drawn through points of equal elevation. If the drawing requires depicting the Earth's surface (relief), a horizontal projection plane is used.

Specific rules for depiction techniques, accumulated over many years, were systematized by the French scholar Gaspard Monge in his book "Geometric descriptive" published in 1799, and the method of rectangular projections was developed. Drawings, executed in several orthogonal projections, have their own style, arrangement, and cut. Each of these images represents an orthogonal projection of a specific aspect of a three-dimensional surface or structure. These orthogonal projections are abstract images, meaning they do not correspond to optical reality. The conceptual basis of construction is based not on what we see, but on our knowledge of the subject. The culture of construction arose in our region in ancient times. According to archaeological excavations, we can testify that powerful fortresses and cities were built even before the common era, and abundant harvests were achieved thanks to irrigation through various canals.

If an object is placed in a transparent projection box, it is possible to determine the primary image planes and the images projected orthogonally to these planes. Each image is oriented to a certain degree toward the viewer. Each image is important for the creation of an architectural design. Landscape designers use orthographic projection to accurately depict the layout, topography, and structure of a site during the design process. This method preserves true dimensions, meaning all distances, directions, and proportions are displayed at a realistic scale.

Three types of orthographic projections are commonly used in landscape design:

Horizontal projection (plan) – a view of the entire landscape from above (location of roads, trees, bodies of water, structures).

Vertical projection (façade or elevation) – a vertical section of the terrain, including the height of buildings, walls, and trees.

Profile (section) – for analyzing changes in ground level, such as hills and valleys.

A set of interconnected drawings of buildings under construction, based on compositional perspective and having a clear scale and dimensions, is called an "architectural drawing" or "architectural project." In addition to orthogonal drawings of various types, depending on their nature and stage of completion, a project may also include axonometric, perspective, model, or landscape drawings in geometric science.

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