

Securing Large-Scale Works to the Ground



Fixing large-scale sculptures to the ground is not merely a matter of aesthetic placement. This task is also a significant issue of engineering and safety. Improperly securing works that can reach hundreds of kilograms in weight brings the risk of toppling due to earthquakes, wind, or human contact, threatening both the safety of the artwork and the people around it.

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The first step before starting the fixing process is soil analysis and load-bearing capacity calculation. Any intervention performed without knowing whether the ground can support the weight of the work is risky. Soft, damp, or filled ground can cause sinking and tilting over time. Therefore, a ground survey must be conducted for large-scale installations, and ground reinforcement should be planned if necessary.

Anchoring Systems and Application Methods

The most common fixing method is the anchoring system. The base of the sculpture is locked to the ground through steel rods or plates embedded in concrete. In the chemical anchoring method, an epoxy-based filler is used to secure the steel rod within the concrete; in mechanical anchoring, fastening is achieved through an expanding sleeve system. Chemical anchoring generally provides a stronger bond but presents much more difficulty compared to mechanical anchoring if removal is required in the future. The choice of method is determined by the soil structure, the weight of the work, and whether it will be moved in the future.

Center of Gravity Calculation and Overturning Risk

A sculpture that appears stable can easily topple under unexpected conditions if secured without a correct center of gravity calculation. The overturning moment should be calculated by proportioning the distance of the center of gravity from the ground to the width of the base. This calculation is critically important, especially for sculptures where the upper part is heavier than the base. Wind load must also be included in this calculation; the lateral force created by wind cannot be ignored for large-surface works placed outdoors.

Pedestal Design and Structural Function

The pedestal beneath the sculpture is not just an aesthetic element; it is also a structural component that balances weight distribution. If the loads on the pedestal are not distributed evenly, cracks can form on the concrete surface, leading to the loosening of the fixing over time. The pedestal material is also important in this regard; porous or low-density concrete can freeze and crack in high-humidity conditions. Granite and high-strength concrete are among the most preferred materials for outdoor pedestals.

Durability Against Earthquake and Climate Conditions

In regions with earthquake risks, fixing systems must go far beyond standard calculations. Horizontal forces transmitted to the work under earthquake loads can be much larger than the vertical weight load. Special seismic isolators used in such regions absorb the effect of the earthquake and reduce the force transmitted to the work. Additionally, all metal fasteners used in outdoor fixings exposed to freeze-thaw cycles must be stainless steel or galvanized; otherwise, corrosion will weaken the connection points over time.

Removability and Future Relocation Possibility

When performing the fixing, the possibility of future removal should also be considered. Especially for works placed in temporary exhibition areas or private collections, reversible fixing details should be designed from the start. A work installed with permanent chemical bonds will present great difficulty and may even be damaged if it needs to be moved. Therefore, even in seemingly permanent installations, a specific dismantling plan should be prepared in advance and kept documented.

Fixing large-scale works to the ground is a comprehensive process requiring engineering calculations, material selection, and long-term planning. When this process is managed correctly, the work stands safely in place for decades. When mismanaged, serious risks arise for both the artwork and its surroundings. Therefore, obtaining expert support for large installations is not a choice, but a necessity.

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