

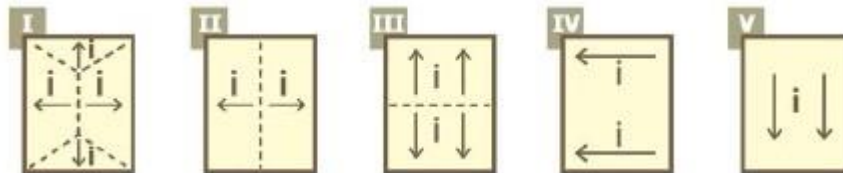
TECHNICAL SPECIFICATIONS FOR THE CONSTRUCTION OF AN ASPHALT SUBGRADE FOR SPORTS FIELDS WITH A POLYURETHANE SURFACE

1. Preparation of the subgrade.

1.1. All work involving the removal of plant covering, soil compaction, and grading must be performed with the understanding that the entire surface of the subbase must be flat, and the slope of the finished subbase should be approximately 1 cm for every 3 m of length in the direction of the surface slope (in indoor facilities, the slope is +0.00). Treat with herbicides.

1.2. To ensure the durability of the structure, a 10 – 15 cm thick layer of crushed stone or gravel with a particle size of 10–20 mm is laid on the graded soil, with a compaction rate of at least 95%.

1.3. It is recommended to install a concrete grillage (20 cm wide) or to lay curbstones around the perimeter of the site, with the stones protruding no more than 10–15 mm above the surface of the future asphalt layer, depending on the thickness of the pavement.



Note: Slope options III or IV are generally used for basketball, volleyball and badminton; slope option III is used for tennis (according to DBN V.2.2.-13-2003)

2. Asphalt layer.

2.1. Asphalt is laid in two layers with a total thickness of at least 6.5 cm: the first layer is a binder course, and the second layer is high-quality, fine-grained, hard asphalt. Binder type B 60–B 80 (bitumen).

2.2. At least 14 days must elapse between the completion of asphalt paving and the start of synthetic surface installation (degassing period). Sprinkling the surface with cold water accelerates degassing. The presence of bitumen, diesel fuel, engine oil, etc. on the surface is not permitted.

3. Surface Requirements.

3.1. The surface must have a slope of approximately 1 cm per 3 m toward the drainage outlet (in indoor facilities, the slope is +0.00).

3.2. Level variations must be within 3 mm per 3 m of length in any direction. Bumps, waves and potholes are not permitted. To level the surface, special adhesive compounds with a low shrinkage rate may be used (this should be done only if leveling by other means is not possible, as it results in additional costs).

4. Drainage.

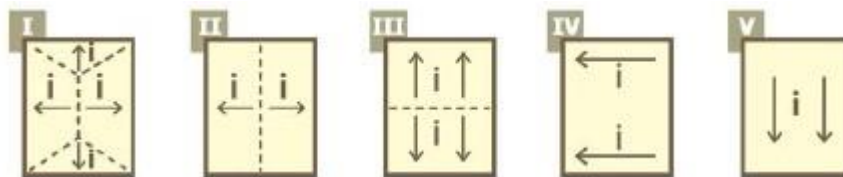
4.1. To drain water from the surface of the pavement, a drainage system must be installed around the perimeter of the site; its design is determined on a case-by-case basis.

Note: The site must be cleared of debris, foreign objects, and dust, and must have electrical outlets (220 V) and, if necessary, water connections. Before the contractors arrive, all materials delivered to the customer must be on site and securely protected from the elements. Ensure that no unauthorized persons are present at the site. The self-leveling coating is applied to a dry substrate (moisture content not exceeding 5%); therefore, the timeframe for applying the coating after substrate preparation is determined based on weather conditions (approximately 10–20 days).

TECHNICAL SPECIFICATIONS FOR THE CONSTRUCTION OF CONCRETE SUBSTRATES FOR SPORTS COURTS WITH POLYURETHANE COATINGS

1. Preparation of the Soil Subgrade.

1.1. All work related to the removal of vegetation, soil compaction, and grading must be carried out in accordance with the requirements of DBN 3.02.01-87, and the compaction and grading of the site must ensure that the entire surface of the subgrade is level, with the finished subgrade having a slope of at least 1–2 cm per 3 m of length in the direction of the surface slope (in halls, the slope is +0.00). Treat with herbicides.



Note: Slope options III or IV are generally used for basketball, volleyball, and badminton; slope option III is used for tennis (according to DBN V.2.2.-13-2003)

1.2. The remaining compacted soil should be treated with special agents for sterilization (sanitation).

1.3. To ensure the durability of the structure, a 10–15 cm thick layer of crushed stone or gravel (SNiP 3.06.03-85) is laid on the graded soil, with a compaction rate of at least 95%, and leveled with a thin layer of sand and watered.

1.4. If soil moisture is moderate, one or two layers of polyethylene film with a minimum overlap of 15 cm are laid as a separating layer beneath the concrete foundation.

2. Design of the concrete foundation (DBN 3.03.01-87).

2.1. The concrete mix class must be at least B20 (M 350);

2.2. The thickness of the concrete layer must be at least 10 cm;

2.3. Reinforcement—as specified in the design, depending on the physical properties of the soil (welded steel mesh 5Vr1 (100x100));

2.4. Binder: Portland cement M400;

2.5. Aggregates for concrete must be graded and washed, with a maximum particle size of 1.5 cm;

2.6. Air content up to 8% by volume of the concrete;

2.7. A 1.5 cm wide expansion joint must be located in the center of the pad and filled with an elastic material (acrylic sealant). If multiple platforms are arranged in a row, expansion joints must be provided between the platforms. When constructing the foundation for enclosed platforms, it is recommended to provide a 2.5 cm wide expansion joint around the perimeter.

3. Preparation of Concrete.

3.1. When preparing concrete mix, the requirements of DBN 3.03.01-87 must be followed.

4. Placement of Concrete Mixes, Curing, and Concrete Maintenance.

4.1. All concrete placement work must be carried out in accordance with the requirements of DBN 3.03.01-87.

4.2. All work involving the placement and compaction of concrete mixtures must be carried out without interruption, at least until the middle of the site area, to avoid joints.

4.3. During the initial hardening period of the concrete (7–10 days), it must be protected from precipitation and moisture loss; thereafter, temperature and humidity conditions must be maintained to ensure the concrete's strength develops properly.

4.4. If necessary, it is recommended to perform the finishing treatment using self-leveling floor screeds such as UZIN, Betonit 3000, Anker, etc., taking into account their intended use—for interior or exterior applications.

Requirements for the Concrete Substrate Surface.

4.5. The surface must have a slope of 1 cm per 3 m toward the drainage area (in halls, the slope is +0.00).

4.6. The evenness of the surface is checked using a 3-meter straightedge or level. Gaps and irregularities of up to 3 mm per 3 m of length in any direction are permitted.

4.7. The moisture content of the subfloor prior to installation of the polymer coating must not exceed 5% (DEN 3.04.01-87, Tables 24, 25).

4.8. The strength of the substrate must be at least 30 MPa.

5. Drainage

5.1. To drain water from the surface of the coating, a drainage system must be installed around the perimeter of the site; its design is determined on a case-by-case basis.

Note: The site must be cleared of debris, foreign objects, and dust, and must have electrical connections (380 V and 220 V) and, if necessary, a water supply. Before the contractors arrive, all materials delivered to the customer must be on site and securely protected from the elements. Ensure that no unauthorized persons are present at the site. Provide the work area with overhead lighting for work during twilight and at night, as well as concrete for embedding the anchor elements under the posts, in an amount of approximately 0.08 m³ per court. The self-leveling coating is applied to a dry concrete subbase (no more than 5% moisture content); therefore, the timeframe for applying the coating after the concrete subbase has been prepared is determined based on weather conditions (approximately 10–20 days).

**Recommendations for Constructing a Crushed Stone Base
(with a top layer of screened aggregate)**

The site is typically fenced off. The fence is 3–4 m high. A strip foundation must be constructed along the perimeter, or the perimeter must be bordered by a curb or edging that elevates the top layer of crushed stone by 2–3 cm.

1. The surface on which the artificial turf is to be installed must be level, compacted, and permeable;
2. The height difference measured along a 4-meter straightedge must not exceed 5 mm;
3. During heavy rainfall, water must drain freely and completely into the subbase without forming puddles.

General recommendations for preparing a base of crushed stone and screened gravel:

1. Dig a trench 25–30 cm deep, extending 0.5–1 meter beyond the dimensions of the field on each side;
2. Spread a 5-cm-thick layer of river sand on the bottom of the trench as the first layer;
3. As the second layer, spread 20–40 mm crushed stone to a depth of 15 cm;
4. The third layer consists of 10–20 mm crushed stone to a depth of 10 cm;
5. The fourth layer consists of 0.5–5 mm screened gravel, 5–6 cm thick; level it and compact it 2–3 times, sprinkling water in between.

Each layer must be compacted to a density of at least 95% (according to the Proctor test) using a 7-metric-ton road roller or a vibratory plate with a mass of at least 100 kg.

Structure of the base for “artificial grass”:

Artificial grass
5 cm - coarse screenings, 0.5–5 mm fraction
10 cm – 10 – 20 mm crushed stone
15 cm – 20 – 40 mm crushed stone
5 cm - river sand
Flat clean, compacted soil

RECOMMENDATIONS FOR INSTALLING THE FOUNDATION
for playgrounds and exercise areas:

with a top layer of crushed stone (with the option to later install artificial turf or rubber tiles)

The playground is typically fenced off. The fence is 2 m high. A strip foundation must be constructed along the perimeter, or the perimeter must be bordered by a curb or edging. Its height above the top layer of crushed stone should be 2 cm

1. The surface for installing playground or exercise equipment (synthetic surfacing) must be level, compacted, and permeable;
2. The height of any unevenness measured along a 4-meter straightedge must not exceed 5 mm;
3. During heavy rainfall, water must drain freely and completely into the subgrade without forming puddles.

General recommendations for preparing a base of crushed stone and screened gravel:

4. Dig a trench 20 cm deep, extending 0.5 – 1 meter beyond the dimensions of the area on each side;
5. Spread a 5-cm-thick layer of river sand on the bottom of the trench as the first layer;
6. The second layer should consist of 10 – 20 mm crushed stone, 15 cm thick;
7. The third layer should consist of 0.5 – 5 mm screened aggregate, 5 – 6 cm thick; level and compact it 2 – 3 times, sprinkling water in between.
8. Each layer must be compacted to a density of at least 95% (according to the Proctor test) using a 7-metric-ton road roller or a vibratory plate with a mass of at least 100 kg.

Structure of the foundation for a fitness area:

20 mm synthetic “artificial grass” surface / 500 x 500 x 35 (30–50) rubber tiles
5 cm - coarse screenings, 0.5–5 mm fraction
15 cm – 10 – 20 mm crushed stone
5 cm - river sand
Flat clean, compacted soil