# VOLUME 3

# TECHNICAL SPECIFICATIONS

|  |  |  |
| --- | --- | --- |
| Type of structure: | Outdoor sports facilities | |
| Type of works: | New construction | |
| Category of structure: | G | |
| Classification of individual parts of the structure: | Share in the total area of the structure: 100% | Classification code:  241100 |
| 42% | Surfaces of the main sports field – athletic running track |
| 58 % | Open spaces for other sports fields |
| Name of the spatial or urban plan: | Urban planning project for the urban-architectural development of cadastral parcel 10657, C.M. Kanjiža, in the People’s Park, for the construction of an athletic track, no. E-37/23-UP from April 2024. | |
| Settlement/Municipality | Municipality of Kanjiza, Kanjiza | |
| Cadastral parcel number / list of cadastral parcels and cadastral municipality of the structures/works: | Cadastral plot no. 10657 Cadastral Municipality Kanjiža | |
| Cadastral parcel number / list of cadastral parcels and cadastral municipality where the connection or access to the public road is located: | Zeleni Venac – cadastral plot no. 4991, Cadastral Municipality Kanjiža; Narodni Park, cadastral plot 4975/2, Cadastral Municipality Kanjiža; Nušićeva Street, cadastral plot 2880/2, Cadastral Municipality Kanjiža; and Ciganski Put, cadastral plot 103341/1, Cadastral Municipality Kanjiža, 24420 Kanjiža | |

**BASIC DATA ABOUT THE OBJECT AND LOCATION**

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| --- | --- | --- |
| Territory of the investment: | Total Area of the Plot/Plots: | 11.807 m2 |
| Total area of the running track with the adjacent grass field | 6.927 m2 |
| Absolute height of the structure | 78.60 height above mean sea level |
| Materialization of the object | Materialization of the athletic track | Synthetic surface on asphalt layers. |
| Percentage of the green area | Grass surfaces and grass sports field | 70 % |
| Other characteristics of the objecz | The project includes earthworks related to excavation and removal of material for the construction of the athletic track, followed by the construction of the athletic track from non-coherent materials, installation of the track’s curbs, asphalt layer construction, athletic fields, installation of athletic equipment, and the creation of a synthetic athletic surface with markings for the track. | |

**0.1. SUMMARY TECHNICAL DESCRIPTION**

The cadastral parcel intended for the athletics tracks currently consists of an unregulated grassy area. It is in direct contact on the southwest side with traffic roads, on the east side with the Wrestling Academy, on the north side with an existing football field and an old athletic track. On the west side, it borders private residential houses.

**PREPARATORY WORKS**

Given the current state of the location, where the surface layer consists of grass-covered terrain, no construction preparatory works are required.

**ATHLETIC TRACK, ASSOCIATED GRASS AREA, AND ATHLETIC FIELDS**

The athletic track, along with the associated athletic fields and grassy surfaces, is designed for high-quality, modern training for athletes. Considering the available space, the athletic fields have been designed in accordance with the rules of world athletics standards. The running track is functional, with curves aligned with athletic regulations, although smaller in scale compared to tracks designed for official competitions. The track allows for quality training activities and even competitions for younger categories of athletes.

The athletic track offers excellent conditions for training basic physical abilities for athletes from all other sports, as well as training and physical assessments for personnel from specialized public services—police, firefighters, and others.

The athletic track includes four running lanes. The length of one lap is approximately 230 meters. It also includes a sandpit for long jump, a pole vault area, a high jump area, a shot put sector, and javelin, discus, and hammer throw areas (which require a safety cage).

The track surface is designed as a synthetic certified athletic surface of the “Spraycoating” type. The track structure is designed to withstand frost effects, traffic loads, and includes final asphalt layers in accordance with construction regulations and global athletic standards. The design includes both inner and outer pre-cast concrete curbs and all necessary systems for the collection and drainage of surface water from all throwing circles, jumping board cassettes, and pole vault boxes.

The track is designed with a lateral slope of 1%, with the lowest elevation point at 78.65 meters above sea level.

Vehicle parking is planned to use the existing parking lots on Narodni Park Street and Nušićeva Street. The public-use land that provides access to the parcel is equipped with the following infrastructure: traffic, electrical energy, electronic communications, gas, water supply, and sewage networks.

The project includes works that do not harm the environment; air, water, and soil are not degraded. Stormwater from the athletic track (used exclusively for pedestrian purposes) will run off into the grassy areas within the track and infiltrate into the ground as unpolluted water. Solid waste will be collected in containers periodically emptied by the municipal utility company. The project complies with noise and vibration protection measures, fire protection measures, and energy efficiency is not applicable to an open sports field. There are no cultural monuments or protected heritage sites in the work area. The construction may proceed in phases—Phase 1: the athletic track, Phase 2: modular containers for changing rooms.

**1.1. TEXTUAL DOCUMENTATION**

**1.1.1. Technical Description**

**EXISTING CONDITION**

The cadastral parcel intended for the Athletics Track currently consists of an unregulated grassy surface. It is in direct contact on the southwest with traffic roads, on the east with the Wrestling Academy, on the north with an existing football field and an old athletic track, and on the west with private residential houses.

**DESIGNED CONDITION / PREPARATORY WORKS**

Given that the current surface consists of grass-covered soil terrain, no preparatory construction works are required.

**ATHLETIC TRACK, ASSOCIATED GRASS AREA, AND ATHLETIC FIELDS**

The athletic track and its associated fields and grassy areas are designed for high-quality and modern training. Due to space constraints, the athletic fields have been designed in accordance with the rules of World Athletics. The running track is functional with regulation-compliant curves but is smaller in scale and radius compared to competition-level tracks.

Training can be conducted under quality conditions, and even competitions for younger athlete categories are feasible.

The track provides excellent training conditions for general physical preparation across all sports, as well as conditioning and assessment for specialized public service personnel—police, firefighters, etc.

The track includes four running lanes, with a lap length of approximately 230 meters. It also contains a sandpit for long jump, pole vault area, high jump area, and throwing areas for shot put, javelin, discus, and hammer (requiring a safety cage).

The surface is designed as a synthetic certified athletics coating of the “Spraycoating” type. The track structure is calculated to withstand frost, traffic loads, and features final asphalt layers per construction and international athletic standards.

Pre-cast concrete curbs are planned both internally and externally, along with all necessary systems to collect and drain runoff water from throwing circles (shot put and discus), jump board cassettes, and pole vault boxes. The track is designed with a 1% side slope, with the lowest elevation at 78.65 m.a.s.l.

**2.1.6.1. DIMENSIONING THE STRUCTURE OF THE ATHLETIC TRACK**

According to the geotechnical report for this site, the terrain lies on the river terrace of the Tisa River, approximately 2 km away. The soil layers at depths of 3-5 meters consist of sands and silt:

* At a depth of 1.8–3.6 m: highly plastic clay CH, CIH
* At 5.6–6.2 m: medium plastic clay CI-CL, CIM–CIL
* Below 14 m depth: silt, medium to low plasticity MI–MLs
* The area falls within seismic zones VII–VIII
* Topsoil/humus layer thickness: 30–50 cm

The geotechnical report suggests the following parameters:

* For strip foundations, allowable stress is 115 kPa with settlements of 14–37 mm
* For isolated footings, allowable load-bearing pressure is 125 kPa

For access roads designed for light to medium traffic, the report defines layers as follows:

* 5 cm wearing asphalt layer (AB)
* 12 cm base asphalt layer (BNS)
* 22 cm crushed stone aggregate (DKA)
* 25 cm sand layer

Considering all data and calculation results from the Geotechnical Report, and the fact that the athletic track is for pedestrian use only, the selection of the track structure depends on:

1. Soil characteristics – confirmed as satisfactory by the geotechnical report
2. Traffic loads – negligible, as use is pedestrian-only with seasonal light vehicle loads under 2 tonnes per axle
3. Frost impact – a critical factor due to the climate zone

**FROST IMPACT**

Frost penetration into sensitive soil layers is checked in accordance with SRPSU.C4.016 based on the frost index for the area and soil material characteristics. Required pavement thickness as a function of the frost index (I = 270 °C-days) and soil characteristics results in a design frost depth of 70 cm.

For low traffic loads, the preliminary structure thickness provides partial frost protection, in accordance with SRPSU.B9.012, where the protective layer is 0.5–0.8 of the frost penetration depth—in this case, 35–56 cm.

The required structure thickness for the given zone is about 45–55 cm. The selected athletic track structure is:

* 1.3 cm synthetic athletic surface
* 3 cm AB8 final asphalt layer
* 5 cm BNS16 bearing asphalt layer
* 15 cm DKA 0–31.5 mm crushed stone
* 30 cm sand  
  **Total structure thickness: 54 cm**

TECHNICAL CHARACTERSTICS OF THE SYNTHETIC SURFACE LAYER:

The tenderer is responsible for the delivery, fabrication, and installation of a synthetic surface intended for athletic tracks. The synthetic surface has to be applied onto a prepared base. The first layer of the surface is made of SBR granules with a grain size of 1–4 mm and polyurethane binder, with a thickness of 10 mm. The second—final—layer of the synthetic surface is applied by spraying in two coats using a specialized machine, made of red EPDM granules with a grain size of 0.5–1.5 mm and polyurethane binder, with a thickness of up to 3 mm. The total thickness of the surface is 13 mm.

The surface must have a certificate of compliance according to EN 14877, which must be submitted with the offer.

**1.5.2. TECHNICAL CONDITIONS FOR CONSTRUCTION WORKS**

**GENERAL CONDITIONS**

To complete the construction of the facility as efficiently as possible, all participants must adhere to the conditions outlined in this project.

Before submitting a construction bid, the contractor must visit the site to become familiar with the terrain, climate, hydrogeological, geological, and other conditions relevant to determining realistic unit prices for the bidding process.

Before starting work, the contractor must understand the local conditions, regulations, access roads, potential landfills, and all other factors that could affect the smooth execution of works.

If the provided technical documentation lacks detailed situational plans, the investor or an authorized representative must carry out site surveys before work begins and create suitable drawings with adequate elevations, permanent points, profiles, and other elements necessary for construction.

The contractor must timely procure and deliver to the site all required construction materials, tools, machinery, and everything else necessary to start and complete construction within the agreed deadline.

The contractor is obligated to provide professional supervision throughout the construction period and beyond to ensure proper contract execution.

All materials and equipment used must comply with SRPS or other approved standards, be of first-class quality, best workmanship, and brand. All works must be carried out with care and expertise.

### 1. GEODETIC WORKS

**A. Geodetic marking of building outlines**  
Transferring all necessary data from the design to the field with staking out and continuous elevation control. Upon completion of works, an as-built survey must be conducted, data processed and mapped, and a Geodetic Survey Report (Elaborate) prepared and submitted to the competent cadastre authority.  
Billing is based on m² of marked and surveyed area.

### 2. EARTHWORKS

**Topsoil removal**  
Topsoil must be removed mechanically, within the designed widths and depths, or as instructed by the supervising authority. Removal may begin only after all required markings are completed.  
Excavated topsoil, in the quantity needed for landscaping, is to be temporarily stockpiled, while any excess shall be prepared for transport.  
Payment is based on cubic meters of excavated and stockpiled topsoil in its natural state.

**Bulk excavation**  
All excavation must be carried out precisely to the elevations indicated in the plans. The excavated levels must be checked and confirmed in writing via the site logbook by the supervising authority. Any data that will later be inaccessible must be documented with sketches, profiles, and a sufficient number of elevation points and measurements, all verified by the supervising authority.  
Side walls of the excavation must be clean-cut — either vertical or sloped — and the bottom must be leveled to the design elevation with an accuracy of ±3 cm. The contractor is responsible for protecting the excavation from surface water intrusion and for providing adequate drainage during all phases of the work.  
Incorrect excavation will not be accepted. Any over-excavation must be filled with gravel and properly compacted at the contractor’s expense.

All potential shoring, bracing, and conditions of staged excavation (e.g., obstacles due to underground/overhead utilities, roots, etc.) are included in the unit price.  
If soil categories are not specified in the BoQ, the contractor shall prepare their bid based on a site visit and information provided by the investor.  
Excavated soil required for backfilling around structures, for embankments, or other infill must be stockpiled in a suitable location on-site, within an average distance of up to 150 m. Surplus material shall be transported up to 5 km and deposited at a designated location.  
If off-site transport is not included in the BoQ (e.g., up to or beyond 5 km), it shall be considered that the surplus is to be stockpiled within the construction site, up to 150 m away. Spreading and rough grading at the stockpile location is included in the transport cost.

After excavation of the foundation pit to the designed level, the subsoil must be mechanically compacted to the required density. The achieved compaction must be at least 15 MPa. Where the required compaction cannot be achieved, compaction must continue with the addition of sandy-gravel material until the required compaction is reached.

Payment per m³ of excavated native soil includes all labor, materials, machinery, internal transport, necessary bracing and support, structure marking, survey for billing, correct shaping of side walls, leveling and compacting the bottom to the design elevations, and all other work listed in this description as well as all activities necessary for completion of the bulk excavation. Planning and shaping (terracing) of slopes and cuts is also included.

### A. Grading and Compaction of Subgrade

After the excavation is completed, the bottom of the working pit is to be graded according to the designed elevations and slopes, with the disposal of surplus material outside the working area, followed by mechanical compaction of the subgrade to the required level of compaction. The achieved compaction must be at least 25 MPa. If the required compaction cannot be achieved in certain areas, compaction shall continue with the addition of sand-gravel material until the specified compaction is reached.  
The calculation is made per square meter (m²) of graded and compacted subgrade.

### Construction of Gravel Base Layer

This item includes the supply, transport, and installation of granular stone aggregate as a base layer of the structure, compacted to the required degree. Works may commence only after the subgrade is accepted by the Supervising Authority in terms of levelness and compaction. The material used for the bearing layer is natural gravel. This item includes mechanical compaction of the gravel base layer using appropriate equipment, with the required compaction level of at least Ms = 40 MPa, unless otherwise specified.

The calculation is made per cubic meter (m³) of completed gravel base layer of mechanically compacted granular material, and includes all labor, material, supply and transport of the stone aggregate, and control testing.

### Backfilling

After the reinforced concrete structure is completed, the working pit shall be backfilled using soil from the excavation. Backfilling around the structure walls shall be carried out in 20–30 cm thick layers using soil of optimal moisture content, free of large clumps and organic material, and compacted to a degree that prevents future settlement.  
Filling is performed using excavated soil or alternatively sand-gravel material, and also serves as the foundation bed for the related structures.

The calculation is made per cubic meter (m³) of compacted soil (unless otherwise specified) or placed sand-gravel material, fully in accordance with the above description, including potential complications such as bracing, underground utilities, waterlogged ground, etc.

### 1. CONCRETE WORKS

#### A. General Conditions

The quality of concrete and its components must comply with the requirements of the following technical regulations and standards:

* "Regulation on Technical Measures and Requirements for Concrete and Reinforced Concrete" (=PБАБ)
* Serbian Standards (SRPS)

For each position and type of work, the designated concrete grade must be maintained, which the Contractor shall prove by preparing and testing the required and control specimens (cubes). The test cubes must be made in the presence of the Supervising Authority. The test results are binding for both the Contractor and the Investor. The cost of testing is included in the unit price of the works.

All works must be executed in accordance with the drawings, details, and structural calculations, properly and professionally, with adequate qualified labor, appropriate machinery, and under professional supervision. Concrete mixing shall be performed exclusively by mechanical means. The Contractor is obliged to provide evidence of material quality, including for cement, water, and aggregates.

Before the execution of reinforced concrete structures and elements, the Contractor must, based on the structural project and in accordance with Article 232 of the PБАБ, prepare a **Concrete Design**, which must be submitted to the Supervisor for approval. This document shall include:  
a) the composition of concrete mixes, quantities, and technical specifications for the designed concrete class,  
b) concreting plan, organization, and equipment,  
c) method of transport and placement of the concrete mix,  
d) method of curing the placed concrete,  
e) control testing program for concrete components,  
f) program for control, sampling, and testing of the concrete mix and concrete by batches,  
g) assembly plan for elements, scaffolding design for complex structures, and formwork design for special types of formwork.

The concrete plant must have sufficient production capacity, appropriately sized aggregate storage and silos, and must comply with Yugoslav standards SRPS U.M1.050, SRPS U.M1.051, and SRPS U.M1.052.

The concrete plant must also be equipped for production under special conditions, i.e., when the air temperature is below +5°C or above +30°C. The Concrete Design must state the distance between the concrete plant and each part of the structure, the number of concrete mixer trucks available, and the transport duration, also considering potential traffic congestion if public roads are used.

The plant must possess a **report on the production suitability of the concrete plant** and a **report on one-month testing of the dosing equipment**.

Aggregates must not be contaminated with other materials during transport and storage on-site. Transport and storage conditions must comply with Article 233 of the PБАБ.

For the transport of cement, required accompanying documentation, and storage conditions on-site, Articles 234 and 235 of the PБАБ and the commentary on those articles shall fully apply. Concrete admixtures must be designated according to Yugoslav standard SRPS U.M1.034 and stored according to the manufacturer's instructions.

Dosing of all concrete components shall be by weight, in accordance with Article 23 of the PБАБ, and must comply with the provisions of these Technical Conditions. The accuracy of dosing all components must comply with section 3.2 of the Yugoslav standard SRPS U.M1.050. Proposals for dosing must be based on trial mixes performed in advance by the Contractor, in accordance with Article 28 of the PБАБ, and approved by the Supervisor.

**No concrete shall be placed until 28-day test results confirm that the designed dosing is correct.** The maximum water-cement ratio stated is the **maximum allowed** for the relevant concrete classes (grades), including both water added to the mixer and free water contained in the aggregate.

**Minimum quantities of cement specified represent the allowable cement content for the respective concrete classes (grades).** If a higher quantity of cement is required to achieve the necessary strength and consistency, the Contractor must provide it at their own expense.

If quality control tests, as prescribed in these Conditions, indicate the need to change the mix composition, such a change must be carried out at the Contractor's expense.

The consistency of the concrete must be selected to enable good compaction using the available placing tools, easy placement without segregation, and a high-quality surface finish. Concrete consistency, as a measure of workability, is divided into four ranges: stiff, slightly plastic, plastic, and fluid. Consistency values of fresh concrete mix are given in Table 2, Article 2 of PBAB.

Concrete components for all concrete work items may be mixed in the concrete plant mixers for as long as necessary to achieve a homogeneous mixture. The degree of homogeneity of the fresh concrete mix must be determined according to Section 4.5 of SRPS U.M1.050. The mixer must always be in such functional condition that, after all components are loaded, it produces a homogeneous mixture within the prescribed mixing time. The required mixing time, defined as the time from when all components are in the mixer until discharge begins, must be specified in the concrete mix design tables and displayed prominently.

Regarding the conditions and method of concrete transport from the plant to the installation site, the provisions of the Yugoslav Standard SRPS U.M1.045 – Transported Concrete – Technical Requirements (1987) shall apply.

**Concrete placement –** Before concreting, the formwork and supports must be inspected for shape and stability, and constant monitoring must be carried out during concreting. Concreting may not begin until the supervising authority has inspected the reinforcement and issued written approval.

During concreting, care must be taken not to disturb the position of the reinforcement, which must remain in place and be completely surrounded by concrete.

Construction joints must be determined before concreting begins. Their layout depends on the working procedure, concreting equipment capacity, type of load on the structural element, and, where exposed surfaces are involved, the aesthetic requirements.

Continuation of concreting must be carried out as follows: if the working process allows, the contact surface for the continuation shall be washed 6–12 hours after placement with a water jet at 3–4 bar or with quartz sand (grain size 0.5–5 mm) at 7 bar pressure, once the concrete has reached a compressive strength of approximately 5 kg/cm². If these methods are not feasible, the contact surfaces must be roughened (scabbled). Loose material shall be removed, and the surface washed with water.

Construction breaks and continuations during concreting must be treated to match the surrounding areas, particularly vertical joints. The Contractor shall inject weak spots at their own cost using materials and methods prescribed by the supervising authority.

For structures requiring special treatment, concrete must be placed in accordance with the approved concrete mix design. The temperature of the fresh concrete during placement must not be lower than +5°C or higher than +30°C. If the average daily temperature is below +5°C or above +30°C, concreting is considered to be performed under special conditions, in which case measures must be taken for production, placement, and curing of concrete in accordance with Chapter VII-7 of PBAB.

The concrete must be of such consistency that it can be properly placed and compacted using the designated mechanical tools. No water may be added to fresh concrete on site.

If the concreting process is interrupted unexpectedly, steps must be taken to ensure that the break does not negatively impact the load-bearing capacity or other properties of the structure or elements. If the break is not properly executed or according to the project specifications, the Contractor must treat the joint as directed by the supervising authority.

Concrete must be properly compacted during and immediately after placement. Compaction must be done using mechanical vibrators, and the Contractor must provide a sufficient number of internal vibrators (pencil vibrators) and ensure adequate conditions for their relocation. The supervising authority may also require the use of external vibrators at specific locations.

Vibrators must be used in such a way that ensures full compaction of the concrete around reinforcement and in formwork corners and edges. Vibration must last long enough and be strong enough to compact the concrete thoroughly but must not be prolonged to the point of causing segregation. No surface laitance or mortar-rich areas may be allowed. Vibrators must be inserted and withdrawn slowly and must not be supported directly on reinforcement or directed at parts or layers of concrete that have already set and are no longer plastic.

Concrete must be placed in layers not exceeding 30 cm in thickness, or up to 50 cm for large volumes. Each layer must be placed and compacted before the previous layer begins to set. Construction joints may only be placed where indicated in the drawings or in the concreting plan approved by the supervising authority. In urgent situations, joints may be placed only according to the supervising authority's instructions.

Before placing new concrete against hardened concrete, the formwork must be retightened, the surface of the hardened concrete roughened, thoroughly cleaned of foreign matter and cement laitance, and moistened with water.

Immediately after concreting, the concrete must be protected from:

* excessive drying,
* precipitation and running water,
* high and low temperatures,
* vibrations that may disrupt the internal structure, and
* mechanical damage.

Concrete surfaces exposed to environmental effects must be protected with a cover. The type of cover must be the most suitable in the opinion of the supervising authority, considering the actual conditions. If, in the opinion of the supervising authority, covers are not required, surfaces must be kept moist by watering or spraying with water. Unless otherwise specified in the concrete mix design, curing duration shall be as prescribed in Article 267 of PBAB.

**CONCRETE CURING MUST BE PERFORMED FOR AT LEAST 15 DAYS FROM THE DATE OF PLACEMENT** **SURFACE FINISHING AND TOLERANCES** –

All concrete surfaces must be thoroughly finished at the time of placement. The finishing must ensure that coarse aggregate is pressed below the surface and that the mortar fully contacts the formwork to create a smooth final surface without water and air bubbles or voids. As soon as the concrete is sufficiently hardened and the formwork is removed, the entire surface must be thoroughly cleaned, and any traces of the formwork or protruding parts must be removed to maintain a flat surface without depressions or irregularities.

For horizontal slabs, once the concrete is placed and compacted, it must be leveled to the dimensions and elevations indicated in the cross-section and finished to a smooth, flat surface. The quality of the finish must be such that, when checked using a 4 m straightedge, the final surface does not deviate more than 10 mm from the specified cross-sectional height.

**Sampling and Testing** – The Contractor is responsible for conducting and analyzing the appropriate tests prescribed by the PBAB and relevant Yugoslav standards, as well as for obtaining necessary data from these tests during the execution of works. In accordance with this section, the Contractor is required, at the request of the Supervisor, to take and store concrete test specimens under construction conditions during the execution of concrete works. The Contractor must include in the unit price for relevant work items all costs related to the procurement and operation of equipment for sampling and testing, as well as the costs of sampling and testing itself, in accordance with this section and the Supervisor’s requirements.

Subsequent verification of the quality of the concrete placed in the structure shall be performed only in specific cases, such as when compressive strength testing is not feasible, or when the results are not satisfactory, or when there are other serious doubts about the compressive strength of the concrete in the structure. The procedure for testing the compressive strength of concrete cores extracted from hardened concrete is regulated by the Yugoslav standard **SRPS U.M1.040 – Determination of Compressive Strength of Concrete Cores Extracted from Hardened Concrete.**

**Formwork will not be measured or paid for separately**, nor will the required scaffolding; these are included in the unit prices for the corresponding work items. The formwork material must be of the specified quality and type, and the formwork must be built strictly according to the project dimensions, sufficiently braced and secured to ensure dimensional and shape stability during concrete placement and setting.

If the formwork is made of wood, it must be professionally constructed from healthy and dry timber that complies with applicable technical regulations. The boards used for the formwork must not be thinner than 24 mm. The Contractor shall supply the formwork material, and it remains their property after the completion of works. The formwork must be stable, well braced, and supported with props of adequate dimensions to carry the weight of the concrete and the workers. The use of wooden spacers is prohibited. The internal surfaces of the formwork must precisely match the shape of the concrete structure as per the design, and the resulting concrete surfaces, after formwork removal, must be completely flat, with sharp and clean edges.

**Props must not be placed directly on the ground or the structure** – planks must be placed underneath. The formwork must be thoroughly wetted before concrete placement. Formwork and scaffolding are not paid separately; their value is included in the unit price of concrete.

**Installation of all pipes and fittings within the formwork, and concreting around them, is also included in the unit price of the item.**

**1. REINFORCEMENT WORKS**  
**A. General Conditions**  
Reinforcement works include procurement, cutting, shaping, splicing, bending, cleaning, placing, and fastening of steel reinforcement according to the project and specifications.  
The contractor is obliged, prior to the start of reinforcement works, to thoroughly review the reinforcement plans, verify their accuracy based on the structural calculations, check quantities and dimensions, and in case of any objections, consult the designer for clarification or possible amendments.  
For reinforcement works, smooth reinforcement GA 240/360, high-grade naturally hard ribbed steel RA 400/500-2, or reinforcement meshes MAG 500/560 will be used, as clearly defined by the work item. The quality of steel and its characteristics must meet all the conditions and requirements established by the Regulation on Technical Measures and Conditions for Concrete and Reinforced Concrete, as well as the Regulation on Technical Regulations for the Use of Ribbed Concrete Steel for Reinforced Concrete.  
Each bar/profile must maintain uniform thickness along its entire length within factory tolerances, be sufficiently clean, and perfectly straight in sections that are required by the project to remain straight.  
With each reinforcement delivery, the contractor is obliged to provide the supervisory authority with the corresponding certificates of steel quality. Delivery and storage of any reinforcement without the appropriate certificates or reinforcement that does not meet the prescribed and required quality based on the certificates is not permitted.  
Prior to placement, each reinforcement bar must be cleaned of rust, oil, grease, soil, or any other material that could reduce the bond between the steel and the concrete.  
Reinforcement must be solidly fixed and tied in place. Fixing the reinforcement into the designed position can be done using steel or concrete spacers, architectural frames, and chairs, noting that the use of steel spacers on exterior surfaces is not allowed. Reinforcement tying and fastening shall be carried out using annealed wire and tack welding—short welds.  
The unit prices include all labor, materials, machinery, and all other costs related to procurement, transport, storage, splicing, cutting, bending into all shapes, cleaning and placing of reinforcement, including all welding for grounding needs and all auxiliary frames, chairs, and other reinforcement needed by the contractor and for testing purposes, all in accordance with the provisions of this contract and technical specifications.  
The price per 1 kg includes reinforcing steel with waste, tying wire, nails for spacers or iron spacers, labor with all contributions, transportation, and tools.

**11. METALWORKS**  
**B. General Conditions**  
Materials and elements supplied and installed by the contractor on the structure must be new (unused), and must comply with applicable regulations or come with appropriate certificates.  
All metalwork must be performed exclusively by qualified and skilled personnel, exactly in accordance with the project, approved details, verified measurements, and instructions of the supervising authority.  
Before starting the works, the contractor must verify whether the connections of structural elements and the planned metalwork are aligned. All welds must be even, seams ground with a grinding stone; surfaces smooth, corners square and sharp, surfaces without warping. When joining different materials, it must be ensured that corrosion or any other harmful effects do not occur.  
Metal building elements must not have any irregularities on surfaces that remain visible. Finished parts must be delivered to the construction site either primed or galvanized, depending on the description of the final treatment. Each part must be equipped with the required number of elements for installation and connection. Acceptance of the elements is done in the workshop in the presence of the supervising authority and measuring if delivery is contracted by weight.  
Assembly of individual elements at the site must be carried out professionally, at the designed locations and in the positions specified in the project.  
Payment for installed metalwork will be made per unit of measure, as specified by the corresponding item. The offered unit prices include the cost of required materials and labor, specified painting works and protection, all chiseling, embedding, appropriate locking and closing mechanisms, and all other direct and indirect costs related to the metalwork.

**12. OTHER WORKS**  
**Other Construction Works**  
All construction works listed in the bill of quantities must be performed entirely in accordance with the applicable technical and legal regulations (laws, rules, and standards) related to the specific types of work. Special conditions related to other work items are given in the corresponding descriptions.

**Final Note**  
The contractor is obligated to perform both basic and finishing works using qualified and professional labor, ensuring quality and compliance with current technical regulations, standards, and norms in construction. The investor is obligated to provide continuous and professional supervision during the execution of works. The designer is not responsible for any changes made without his prior written consent.

**1.1.5.2 TECHNICAL CONDITIONS FOR THE CONSTRUCTION OF THE ATHLETICS TRACK**  
**GENERAL CONDITIONS**

To ensure that the construction – implementation of the subject facility – is completed as efficiently as possible, all participants in the construction process must adhere to the conditions provided in this project.  
Before submitting a bid for the construction of the facility, the contractor should visit the site to familiarize themselves with the terrain, climatic, hydrogeological, geological, and other conditions, characteristics, construction possibilities, and other elements essential for determining realistic unit prices for participation in the bidding.  
Before the commencement of works, the contractor must become familiar with local conditions, regulations, access roads, possible disposal sites, and all other factors that could affect the uninterrupted execution of the works.  
If the technical documentation provided to the contractor does not contain detailed situational plans, then, before starting any works, the investor or an authorized representative must perform site surveying and produce the appropriate base drawings with sufficient benchmarks, fixed points, profiles, and other elements essential for the upcoming works on the facilities.  
The contractor is obliged to timely procure and deliver to the construction site all necessary construction materials, tools, machinery, and everything else needed to begin construction on time and to complete it within the contracted deadline. The contractor must ensure professional supervision throughout the duration of the works and thereafter, in order to properly fulfill the obligations under the contract. All materials and equipment used in the contracted works must comply with SRPS or other approved standards, be of first-class quality and best craftsmanship and brand; and all works must be carried out carefully and professionally.

### 1. PREPARATORY WORKS

#### 1. STAKING OUT AND MARKING OF THE ALIGNMENT AND STRUCTURES

Before the commencement of works, the Contractor is required to carry out the necessary marking of the axes of the structures. Marking shall be done based on the marking plan provided in the project documentation. During execution, the Contractor must ensure the protection and preservation of polygon points, benchmarks, and permanent points.

#### 2. CONSTRUCTION OF THE BEARING LAYER FROM MECHANICALLY COMPACTED GRANULAR STONE MATERIAL

This activity includes the procurement and installation of granular stone material in the bearing layer of the pavement structure. Works may commence only after the supervising authority has accepted the subgrade in terms of smoothness, design elevations, slopes, and compaction. Materials for the bearing layer may include: natural gravel, crushed stone aggregate, a mixture of natural gravel and crushed aggregate, or mixtures composed of several fractions. All materials must meet specific requirements regarding mechanical characteristics, granulometric composition, bearing capacity, and other criteria in accordance with applicable standards.

The granular stone material is placed on the graded and rolled subgrade, spread using a grader or other suitable equipment, watered, and compacted to the required density using appropriate static and vibrating rollers. The bearing layer is constructed in layers up to 15 cm thick. The material must meet frost resistance requirements. The top surface of the bearing layer must conform to the designed elevations and slopes. Surface evenness is controlled using a 4-meter-long straightedge, with an allowable deviation of ±1 cm. Compaction control is performed using a circular plate with a diameter of 30 cm, and the minimum compressibility modulus must be:

* For natural gravel: Me = 40 MN/m²
* For a mixture of natural gravel and crushed aggregate: Me = 50 MN/m²
* For crushed stone aggregate: Me = 60 MN/m²

The executed works are measured in cubic meters of completed bearing layer made from mechanically compacted granular material, including all work, material, procurement and transport of stone material, and control testing.

#### 3. CONSTRUCTION OF THE LOWER BITUMINOUS BEARING LAYER (BNS)

The lower bituminous bearing layer (BNS) is a load-bearing layer within the pavement structure, composed of a mixture of stone aggregate, stone dust, and bitumen as a binder.

Based on the maximum grain size, the types are: BNS 16, BNS 22, BNS 32, and BNS 45.

Depending on the type of stone aggregate used and the design structure/load capacity, the following categories are defined:

* **BNS A**: made from crushed and separated stone aggregate according to SRPS B.B3.100, with the addition of stone dust as needed.
* **BNS B**: made from crushed and separated stone aggregate with at least three fractions and a maximum grain size of 45 mm, with the addition of stone dust as needed.
* **BNS C**: made from unseparated crushed stone material with composition adjusted by adding crushed aggregate, or unseparated natural unbound material with the addition of at least 30% of crushed grain mixture between 4 mm and 45 mm, adjusted with sand or stone dust.
* **BNS D**: made from unseparated natural unbound material with a maximum grain size of 45 mm, with the composition adjusted by adding sand or stone dust.

The stone aggregate, sand, and stone dust must meet the requirements prescribed by SRPS. The mineral mixture must be free from organic matter. The granulometric composition must meet the specified grading curves according to the standards.

Binders used are bitumen types BIT 60 and BIT 90. The exact bitumen content is determined through preliminary mix design, typically ranging from 3.3% to 5.2% depending on the type.

Before starting work, all materials to be used must be laboratory tested in accordance with the technical specifications for sub-base construction (SRPS.U.E9.020). The mixture is prepared in modern asphalt plants and laid using pavers, followed by compaction with combined rubber-tired and steel drum rollers.

The mixture is transported using tipper trucks with metal beds. During preparation and laying, all control tests must be performed in accordance with standards, including material and asphalt mixture testing.

Layers must be constructed to the designed thicknesses and cross slopes. The evenness of the finished surface is controlled using a 4-meter-long straightedge, with an allowable deviation of ±8 mm.

Control tests of the asphalt mixture are performed for every 1,500 tons of produced mixture and include: bitumen content, granulometric composition, stability, stability-to-deformation ratio, air void content, and voids filled with bitumen. Control tests on the installed layer are conducted every 2,000 m² and include: air void content, degree of compaction, and layer thickness.

The executed works are measured in square meters of the actual finished top surface. The price includes all costs related to material procurement, production and installation of the asphalt mixture, transport, equipment, preliminary and control testing, and all other expenses necessary for execution.

Exceptionally, when leveling the existing pavement during reconstruction of traffic areas, billing may be based on the tonnage or volume (m³) of the installed mixture.

### CONSTRUCTION OF FINAL ASPHALT LAYER – ASPHALT CONCRETE (HS)

The wearing course made of asphalt concrete is composed of a mixture of crushed stone material, stone dust, and bitumen as a binder. According to the nominal grain size, it is divided into: AB 4, AB 8, AB 11, AB 16, and AB 22.

Based on the granulometric composition of the stone mix, asphalt concretes are classified into:

* Wearing course with a wider granulometric range: AB4 – AB16
* Wearing course with a narrow granulometric range: AB11s

Stone material, sand, and stone dust must comply with the requirements prescribed by SRPS standards. For roads with heavy traffic loads, the stone material must be of eruptive origin. No organic materials are allowed in the mineral mix. The granulometric composition must conform to the specified grading curves as per the standards.

Bitumens BIT 60 and BIT 90 are used as binders, while for fine-grain asphalt concretes AB 4 and AB 11, bitumen BIT 130 is also used. The exact bitumen content is determined by preparing the preliminary mix design and typically ranges between 4.5% and 8.0%, depending on the asphalt concrete type.

Before starting works, all materials to be used must undergo laboratory testing in accordance with the technical requirements for asphalt concrete production. The asphalt mix is produced in modern asphalt plants and laid using finishers with compaction performed by combined rubber and smooth rollers. The mix is transported using tipper trucks with metal beds. All quality control testing must be conducted during mix production and laying, including material and mix testing in accordance with standards.

Layers must be constructed to the designed thickness and cross slopes on a clean base. The evenness of the finished layer is controlled using a 4-meter-long straightedge, with a permitted deviation of ±6 mm.

Control testing of the produced asphalt mix is performed every 500 tons (5,000 m²) for heavy-traffic roads, and every 600 tons (6,000 m²) for other roads. Tests include: bitumen content, granulometric composition, stability, stability-deformation ratio, air void content, and voids filled with bitumen.

Control testing of the installed layer is performed every 2,000 m², including air void content, compaction degree, and layer thickness.

The executed works are calculated per square meter of the actual constructed top surface. The price includes all material procurement, asphalt mix production and installation, transport, equipment, preliminary and control testing, and all other costs necessary for the execution of works.

Exceptionally, for leveling existing pavement surfaces during reconstruction of traffic areas, measurement can be done per ton or per cubic meter of the installed mix.

### INSTALLATION OF CONCRETE KERBS

This work includes the installation of concrete kerbs of dimensions 12/18 cm. Kerbs are laid on a prepared concrete bed made of MB 20, according to the project design. Details regarding excavation, the concrete bed, concrete placement, joint sealing, and other elements must be executed entirely in accordance with the project documentation.

Joint gaps of 1 cm should be filled with cement mortar in a 1:3 ratio. The height and horizontal position of the kerbs must comply with the project. Kerbs must be MB 40 and accompanied by quality certificates. Only sound and undamaged kerbs may be used.

The executed works are measured per linear meter of installed kerb, including all labor and materials, as well as procurement and transport of kerbs.

### INSTALLATION OF SYNTHETIC COATING FOR ATHLETICS TRACK

The project specifies a “Spray coating” type synthetic surface system – a two-layer, water-permeable base, bonded with polyurethane adhesives. The base layer consists of recycled black SBR granules (diameter 1–4 mm), mixed with a synthetic binder, installed using a finisher at a thickness of 10 mm.

The top layer consists of EPDM granules (0–0.5 mm) with polyurethane adhesive, applied using a compressor in two passes at a total thickness of 3 mm, for a total system thickness of 13 mm.

### TRACK LINE MARKINGS

There are the following restrictions for the installation of the system:

* If the substrate is new concrete, it must cure for 28 days, with a maximum moisture content of 3%, which is verified using a calcium carbide meter. At the time of primer application, the concrete surface must not be wet, damp, or dewy. New concrete surfaces must be prepared by sandblasting or grinding with vacuuming. All irregularities greater than 1 mm must be removed. Cement laitance must not be present. The surface texture must be open.
* If the substrate is old concrete, it must also be prepared by vacuum blasting or grinding followed by vacuuming. All cracks and irregularities must be repaired before applying the primer.
* Open-graded asphalt does not require pretreatment.
* Dense-graded asphalt must be ground and vacuumed.
* New asphalt must cure for at least 2 weeks before primer application.
* In accordance with EN 14877:2013, the surface flatness of the substrate measured with a 4 m straightedge must not deviate more than 5 mm.
* Do not apply any layer on a wet, dewy, or damp surface.
* Do not apply over a substrate that is evaporating.
* The minimum substrate temperature at the time of application and curing is 5°C.
* The maximum substrate temperature for application is 40°C.
* The minimum curing time of the substrate is 28 days for new concrete and 14 days for new asphalt.
* Before applying each layer, the substrate must be clean and free of dirt such as stones, sand, dust, leaves, grass, etc. In this regard, the substrate (asphalt or concrete) must be washed at least one day in advance using a special high-pressure water machine. Immediately before the application of any synthetic layer, the surface must be treated with compressed air cleaning.
* The maximum moisture content of the substrate (asphalt or concrete) at the time of application is 3%.
* The substrate temperature must be at least 4°C above the dew point temperature, depending on the air temperature and relative humidity.
* Do not apply layers under unfavorable weather conditions.
* The next layer must be applied after the previous one has cured, and as soon as possible afterward.

**A. Primer Application**

The substrate is covered with primer using a compressor or rollers, and the operator must wear protective clothing and a breathing mask.  
The applied primer can be covered with the next layer once the chemical reaction is complete and it has bonded with the substrate. Under adequate weather conditions and an average air temperature of 20°C (depending on humidity), this occurs within 4 hours.

The next layer must be applied within 4 to 48 hours after the primer has been applied, which is why the primer is applied successively depending on the size of the facility and the feasible installation dynamics of the next base layer.

**B. Track Lining – Marking the Track**

In accordance with the planned layout of athletic facilities and WA rules, and based on a prepared marking plan, the track is measured and marked using two-component polyurethane paints (white for running lane borders and run-up areas, then yellow, blue, green, and burgundy for markings of specific positions on the athletics track), which are part of a certified system by the selected manufacturer.

Marking is performed with a specialized machine equipped with a compressor, guides, shields, sprayers, etc., and operated by a trained and experienced technician.

The warranty on line markings must be a minimum of 2 years.

### 1.5.2 Appendix – Occupational Health and Safety Measures

In accordance with the Law on Occupational Safety ("Official Gazette of the RS" no. 42/91), the Law on Amendments to the Law on Occupational Safety ("Official Gazette of the RS" no. 5/92), and the Law on Amendments to the Law prescribing monetary penalties for commercial offenses and misdemeanors ("Official Gazette of the RS" no. 67/93 and 48/94), the potential hazards during the construction of the facility and the necessary safety measures are as follows:

#### Potential Hazards During Construction:

* Due to damage or contact with electrical or other utility lines and installations.
* Hazards from tools and machinery.
* Other risks of injury during handling, transport, installation, and assembly of construction materials.

#### Measures to Eliminate Risks During Construction:

* Prior to the commencement of works, determine the exact location of all installations, both above and below ground. Any protective work or potential relocation of installations must be carried out in accordance with applicable regulations and instructions from the competent installation owners and supervisory authority.
* At intersections or parallel routes with existing installations, manual trenching must be carried out with extreme caution, especially near electrical installations.
* Construction works must be executed by an organization registered for performing the types of work required for the realization of the project as defined in the technical documentation.
* The contractor is required to prepare a special construction site management and work plan.
* The contractor must prepare a health and safety report and must inform workers about all potential hazards.
* The company is required to notify the labor inspection authority at least 8 days before the start of works.
* The manufacturer of mechanically operated tools must provide operating instructions for safe use and confirm that the prescribed safety measures and regulations have been implemented, or provide a certificate of compliance with safety standards.
* During the procurement of work tools and devices, the accompanying documentation must include acoustic characteristics showing that noise levels at the workplace will not exceed permissible limits.
* If meeting noise limits requires special measures (e.g., silencers, elastic foundations, etc.), these measures must also be stated in the accompanying documentation.
* The construction site must be properly organized and secured, both for workers and for any persons who may accidentally enter the site. The contractor assumes responsibility for organizing the site, work performed on it, and implementation of safety measures.
* In cooperation with the relevant authorities, it is necessary to ensure unobstructed traffic flow on access roads to the construction site.

This technical documentation prescribes standard materials as well as materials that must be tested prior to installation. The required quality of works is defined. Relevant regulations, standards, and technical requirements applicable to this type of work have been implemented.

### 1.5.3 List of Regulations and Standards Used in Design

#### 6.1 Regulations

* Law on Planning and Construction of Structures
* Rulebook on Technical Measures and Conditions for Concrete and Reinforced Concrete (Official Gazette of the SFRY 51/71; 11/87)
* Rulebook on Technical Measures and Conditions for the Use of Mesh Reinforcement in Reinforced Concrete Structures (Official Gazette of the SFRY 32/69)
* Rulebook on Yugoslav Standards for Welded Reinforcement Meshes (Official Gazette of the SFRY 11/87)
* Rulebook on Occupational Safety in Construction (Official Gazette of the SFRY 42/68 and 45/68)
* Rulebook on General Occupational Safety Measures and Norms for Construction Structures Intended for Work and Auxiliary Premises (Official Gazette of the SFRY 26/67; 29/69; 21/78; 29/87)
* Law on Fire Protection (Official Gazette of the SR Serbia 53/86)

#### 6.2 Standards

* SRPS U.B1.010 Geotechnical Testing
* SRPS U.M1.004 Concrete Testing
* SRPS U.M8.020 Aggregate Grading for Concrete Production
* SRPS B.C1.009 Cement
* SRPS B.C1.010 Portland Cement
* SRPS G.K6.020 Reinforcing Steel

**By the decision dated 21.05.2024, it was determined that it is not necessary to initiate the environmental impact assessment procedure for the project involving the construction works on the athletic track in Kanjiža on cadastral plot no. 10657, municipality of Kanjiža.**

**SPECIFICATION OF SPECIAL PARTS**

|  |  |  |  |
| --- | --- | --- | --- |
| NAME AND DESIGNATION OF THE SPECIFIC PART | FLOOR | STRUCTURE | NET AREA |
| Athletic track | Ground floor | 4 running lanes and athletic fields | 2.351 m2 |
| Grass field inside the athletic track | Ground floor | Unified field | 4.576 m2 |

**BILL OF QUANTITIES**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **description** | **unit** | **quantity** |
| 1 | Geodetic marking of the structure, transferring project data to the site, calculation by point | piece | 48 |
| 2 | Mechanical excavation, loading, and removal of soil for the athletic track base, average depth 45 cm | m3 | 1175 |
| 3 | Planning and rolling of the bedding layer | m2 | 2.611 |
| 4 | Procurement and installation of sand in a 30 cm layer, leveling and compacting to elevations defined by the project | m3 | 783 |
| 5 | Procurement and installation of crushed stone (gravel) DKA 0/31.5 mm in a 15 cm layer, leveling and compacting | m3 | 392 |
| 6 | Installation of cast concrete curbs 12/18 in fresh concrete mass, including procurement of all necessary materials | m1 | 649 |
| 7 | Bituminous base layer BNS 16 A, thickness = 5 cm, procurement of materials and installation using a finisher with flatness tolerance of ±5 mm | m2 | 2.351 |
| 8 | Installation of asphalt concrete layer AB8, thickness = 3 cm, procurement of materials and installation using a finisher with flatness tolerance of ±4 mm | m2 | 2.351 |
| 9 | Procurement and installation of a box for  inserting the pole according to WA rules, material stainless steel, thickness 3 mm | piece | 1 |
| 10 | Procurement and installation of the cassette, cover, and take-off board for long jump and triple jump according to WA rules; cassette and cover made of stainless steel 3 mm, take-off board base made of plastic material | piece | 2 |
| 11 | Construction of landing area for the long jump including materials, labor, sand, preparatory works, demolition, excavation—all according to project details; concrete C25/30 and reinforcement included in the price | piece | 1 |
| 12 | Construction of shot put and discus throwing circles with rings according to athletic rules; rings made of galvanized iron flat bar 80/6 mm, concrete C25/30 with fine finishing of the shot put circle | piece | 2 |
| 13 | Materials and labor for the foundation of the cage for discus and hammer throw with anchors; construction according to project details, compatible with the safety cage | set | 1 |
| 14 | Procurement and installation of a safety cage for hammer throw in accordance with World Athletics rules; structure made of galvanized iron, synthetic protective netting according to World Athletics regulations | piece | 1 |
| 15 | Procurement and spreading of sand on the grass field inside the track in a layer thickness of 3 cm | m3 | 132 |
| 16 | Installation of synthetic surface, spray system thickness 13 mm | m2 | 2.351 |
| 17 | Marking of the athletic track according to world athletics regulations | m2 | 2.351 |