# VOLUME 3

# TECHNICAL SPECIFICATIONS

**CONTRACT TITLE: "Construction of Adrenaline Park With Associated Facilities (Temporary Structures)”**

**Identification number: AdventurePark 01-02**

**GENERAL REQUIREMENTS**

The Technical Specification is an integral part of the Tender Dossier (TD) together with the provisions of the Contract, the detailed design drawings, construction permits and the other project documents. The technical specification determinates and further develops the requirements for the implementation of the construction works under this Contract.

Implementation of construction (including electrical and hydro/sewerage) and assembly work must be consistent with all relevant execution of specific types of works legal and regulatory framework, technical rules and regulations and applicable standards following sequence and technology of the performance of different types of works in different parts of the site.

1. **STANDARDS**

As a minimum the Macedonian standards and codes shall always be satisfied. Other internationally acknowledged standards and codes may be used only if:

* They are more or at least equally stringent compared to the respective Macedonian standards and codes; or
* European technical approvals (with or without guidance).

If the technical specifications do not exist, building materials should meet recognized national technical specifications.

Where the technical specifications cannot be defined in the top row, including where they do not exist, have not been published or are not enforced, they are determined by:

* Macedonian standards transposing European or international standards, or equivalent;
* Macedonian standards or equivalent;
* In case that there are no published standards apply Macedonian technical approvals and regulations for the design, implementation and supervision of works or individual construction works.

The materials which are used must correspond to the requirements of the standardized documents asset in Macedonian standards and codes.

Standard related to specific and safety equipment for the adrenalin park should be executed in accordance with standard EN15567-1. The certification of the adrenalin park (installed equipment) and the training for safety measures should be conducted with the same standard EN15567-1.

If the Contractor should wish to supply material, equipment or execute work to an alternative national standard or international specification they shall give full details of his proposal in writing to the Contracting Authority.

1. **CONTROL OF WORKS**

The Contracting Authority will hire a consultant (supervisor) which will supervise construction according to the Macedonian legislation and other legal acts in construction works and installation actions. The Contracting Authority i.e. Municipality of Kriva Palanka and / or Supervisor may at any time inspect the work, control technology performance and issue instructions to remove the defects, according to the specified technology and method of implementation. If serious defects are found, errors and low quality performance, the Contracting Authority (Municipality of Kriva Palanka) shall notify the Contractor that breached the contract and should stop with further execution of the construction activities. The Contractor shall always provide access to the construction site of the legal representatives of the Contracting Authority and the Supervisor as authorized representative of the Contracting Authority with its technical and professional legal preferences.

**2.1 Contractor's equipment**

The Contractor shall furnish equipment which will be efficient and appropriate to secure a satisfactory quality of work and a rate of progress which will insure the completion of the works activities within the time stipulated in the Tender Dossier. If at any time such equipment appears to be inefficient, inappropriate or insufficient for securing the quality of work required or for the rate of progress, the Supervisor may be entitled to order the Contractor to increase the efficiency, change the character or hire additional equipment, and the Contractor shall conform the request and proceed according the requirements.

**2.2 Protection of existing structures and utilities**

The Contractor shall consider full responsibility for the protection of all buildings, structures and roads existing in the area of the construction site, public or private, whether or not they are shown on the drawings.

Any damage resulting from the Contractor's operations shall be repaired at its own expense.

* 1. **Requirements regarding the provision of safe and healthy working conditions. Plan for Safety and Health**

During the execution of construction works Contractor shall comply with the requirements of Macedonian Law on Construction, on minimum requirements for health and safety in line with the construction activities (works), as well as all other applicable regulations and standards for safety and hygiene, industrial and fire safety standards during construction and operation of such sites, and also to ensure the safety of all persons who are on site.

The Contractor shall comply with the Plan for safety and health for construction which has to be part of the Work Plan and Programme (Volume 1, Section 4, Form 4.6.3. Work Plan and Programme) approved by the Contracting Authority or other competent authority.

The preparatory works should be conducted in accordance with the Construction Law and an Elaborate on safety and health at work during construction works, in accordance with the Law on safety and health at work from Official gazette no. 92/2007, 136/2011, 23/2013, 25/2013, 137/2013, 158/2014, 15/2015.

The Contractor shall comply with acceptable standard related to procurement of specific and safety equipment for the adrenalin park in accordance with standard EN15567-1. The certification of the adrenalin park (procured and installed equipment) and the training for safety measures should be conducted with the same standard EN15567-1.

**2.4 Handling and storage of materials and plants**

All materials to be incorporated in the work shall be handled and stored in a manner, which prevents injury or damage of any kind whatsoever.

The construction waste is required to be disposed in accordance with a permit for disposal, technical documentation – main project (bill of quantities), national legislation, as well as exact location determined by the Contracting Authority (Municipality of Kriva Palanka).

Any materials or plants which, in the opinion of the Supervisor, have become too damaged to be fit for the use intended or specified, shall be promptly removed from the site, and the Contractor shall receive no compensation for the damaged material, its replacement or its removal.

Upon execution of the construction and assembly works, Contractor must confine its activities within just a construction site. Upon completion of the works, the Contractor is obliged to restore the building site in original form - to withdraw all their equipment and unused materials and leave the site clean from waste.

**2.5. Approval of sources, materials and plants**

All materials incorporated must originate in a Member State of the European Union or a country covered by the IPA III Programme and EDF. However, the goods to be purchased may originate from any country if the estimated intrinsic value of the products (of the tender procedure as a whole is below EUR 100 000. Material that originates from sources, which are not approved by the Supervisor, cannot be used for the Works.

Approval of a source does not mean that all material in the source is approved. The Contractor has to ascertain by continuous control check measurements that only material which complies with the requirements specified in the various clauses of these specifications will be used for the construction.

For all descriptions, where the characteristics of the material are detailed, it should be considered as "equivalent to...", but the product offered as a substitute must have the same or better characteristics than those specified in the description. The technical manual of the manufacturer is authoritative for demonstrating the required technical specifications.

**2.6 Requirements regarding environmental protection**

The Contractor shall clear way and remove from the site any wreckage, rubbish and temporary works i.e. facilities that are no longer required.

**2.7 Responsibility of the Contractor**

Approvals from the Supervisor do not relieve the Contractor from his obligations or responsibilities under the Contract and its offer.

The Contractor should follow and obey the standards stipulated in point 1 of this documents and to execute the work according the tender documents, technical documentation i.e. main project and instruction of the Supervisor.

**3. ADMINISTRATIVE SPECIFICATIONS**

**3.1 Work plan and programme**

Work plan and programme of the construction activities (works) shall be prepared consistent with the duration of the project’s implementation and the works activities implementation. The plan & programme shall be presented in a format which includes a bar chart of all the major activities. No later than five working days after the end of each month, the Contractor shall submit an updated plan & programme to the Supervisor (if there are changes). If not, the Contractor is obliged to present the progress of the construction activities:

* Progress made during the past month, compared with planned progress;
* Activities planned for the next period (monthly).

**3.2 Progress meetings**

The Contractor shall agree with the Supervisor and the Contracting Authority for dates for regular progress meetings.

These meetings shall normally be held monthly, no later than 10 working days after the completion of each month, including one meeting before the start of the construction activities i.e. Introduction meeting with Contracting Authority and opening a front for starting construction activities with the Supervisor.

**3.3 Quality assurance**

The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of this contract. The system shall be in accordance with the details stated in the Contract. The Supervisor shall be entitled to audit any aspects of the system and its implementation.

**4. GENERAL INFORMATION**

**4.1 General notes**

The objects covered by the technical documentation (main project) and the bill of quantities for the works are assembly and of temporary nature.

Generally, for all items that are presented in the bill of quantities, procurement, transportation, and installation of the respective materials apply, and all of this should be calculated in the total price of the item.

The bidder is obligated to provide an offer for all positions listed in the bill of quantities, including variations of positions.

During the execution process, technical instructions, recommendations, and details from manufacturers listed or, if not listed, those with similar or better characteristics should be used.

In all cases where scaffolding is required for execution, the position of procurement, transportation, assembly, and dismantling with transportation applies, and all of this should be calculated in the total price of the item.

All measurements necessary for the installation of the elements covered in the positions for construction-related works should be taken on-site.

Since the terrain at the subject location is stony, appropriate soil testing should be conducted, with a geo-mechanical engineer who will assess the construction pit and, if necessary, prepare a geo-mechanical report.

**5. IMPLEMENTATION OF THE WORKS**

**5.1 Materials and equipment**

The Contractor shall use only materials and equipment that conform to the technical requirements set forth in the clauses of this Technical Specification.

All materials and equipment supplied to perform the Permanent Works under the contract shall be new products. Second-hand materials and equipment are not to be accepted.

Supply of all materials and equipment required for the execution of construction - assembly work according to the approved investment project is the responsibility of the Contractor. Any change to the approved design must be communicated, coordinated and approved by the Supervisor and the Contracting Authority.

All materials that are going to be used in the construction must be accompanied by relevant certificates of origin and quality, instructions for use and a statement certifying the compliance of each of the nested construction products with the essential requirements for building works, in accordance with the Law on technical requirements for products and by-laws to it.

The Tender drawings constitute the documents & drawings issued for construction/ installation/ execution of this particular project.

**5.2 Testing**

Reliable shall be only the type and amount of tests performed in conformity with the prescription of this Technical Specification, except when this right is granted to the Contracting Authority.

The Contracting Authority may require additional tests when the results obtained are uncertain or discussable.

Beside the tests specified in this Specification, the Contracting Authority may require additional tests to establish possible hidden omissions and undesirable effects. Costs for these tests shall be entirely at the Contractor’s expense if such defects or undesirable effects are confirmed.

**5.3 Inspection and measurement of construction activities (works)**

In the process of construction and assembly i.e. installation works all the necessary documents and records must be developed which are required by the Macedonian legislation for preparation of documents and reports during construction works.

The Contracting Authority may at any time inspect the quality and measure the amount of works performed. If this cannot be done with the Contractor’s assistance, a deadline shall be fixed for hiring external specialists. In this case, the expenses shall be on the Contractor’s account.

**6. PREPARATORY WORKS**

Before starting the works the Contractor shall perform preparatory works at the site according the standards and the requirements of the Bill of Quantities (technical documentation – main project).

**6.1 Information & Visibility (boards and signs)**

The Contractor shall install and maintain in good condition an informational boards with dimensions and content accepted by the Contracting Authority (Municipality of Kriva Palanka) and Interreg – IPA III Programme, inscribed with content in accordance with the construction law and the programme, made of a metal frame and galvanized sheet metal. The information board should include name of the project and the co-financing institutions according to the Contract requirements and in compliance with EU visibility rules:

<https://international-partnerships.ec.europa.eu/knowledge-hub/communicating-and-raising-eu-visibility_en>.

**6.2 Construction site**

The Contractor shall in co-operation with the Contracting Authority set out the exact size and location of the site to be used for construction.

**6.3 Temporary facilities**

The Contractor shall effects all expenditure for establishing, operation and removal of temporary facilities if such are needed for the good performance of the Contract. All needs for establishing such facility shall be duly justified.

**6.4 General supply facilities**

***Sanitary Arrangements***

The Contractor shall provide for and maintain temporary sanitary facilities on the site for the use of all persons connected with the Works. The Contractor shall keep the facilities in a clean and sanitary condition, and shall post notices and take such precautions as may be necessary to keep the site clean.

***Water supply***

The Contractor shall provide for and maintain an adequate supply of potable water for its use. The water supply shall be used for construction purposes and for consumption.

***Power supply***

All electrical power required by the Contractor shall be provided as near as possible to the construction site. The costs of the el. power will be at its own expense.

**7. ADDITIONAL SPECIFICATIONS**

All provisions and clauses from the Macedonian Law on Construction (Official Gazette of the Republic of Macedonia No. 130/09, 124/10, 18/11, 36/11, 54/11, 13/12, 144/12, 25/13, 79/13, 137/13, 163/13, 27/14, 28/14, 42/14, 115/14, 149/14, 187/14, 44/15, 129/15, 217/15, 226/15, 30/16, 31/16, 39/16, 71/16, 132/16, 35/18, 64/18, 168/18, 244/19, 18/20 and 279/20) and other codes that are valid obligate the Contractor.

The project (works activities) to be executed are within of group II (according to the national legislation), or equivalent registration on the professional or trade register of the country in which he is established.

If the selected contractor has equivalent registration on the professional or trade register of the country in which he is established, before signing the contract it must provide evidence that it is authorized for execution of works in Republic of North Macedonia in accordance with the Law on Construction.

SPECIFIC REQUIREMENTS

**7.1 Introduction**

The specific requirements are prepared on the basis of the technical documentation i.e. main project “Construction of Adrenaline Park with Associated Facilities (Temporary Structures)” (no. 04-53/2022).

**7.2 Spatial scope - Location of intervention**

The spatial scope of the project i.e. location of the envisaged work activities are in Kalin Kamne (Cadastre municipality “Krklja” – Cadastre plot 5359).

**7.3 Technical – construction/architecture**

In accordance with the positive legal regulations, which were the basis for preparation of this project.

For the needs of the Municipality of Kriva Palanka, it is planned to build an adrenaline park with accompanying temporary prefabricated facilities - a ticket office, ground landscaping, and installation of urban equipment - benches, trash cans and water fountains, and design of streets around the adrenaline park with accompanying facilities for easier access to the facilities and ensuring access for auxiliary vehicles. The project scope is approximately 2092m2.

In addition, we are providing short insight into the current situation, as well as technical description of the planned operations, for each section separately.

**7.3.1 Location and traffic solution**

The urban and traffic solution has already been outlined with the Architectural Urban Design for the formation of a construction plot. According to the Architectural Urban Design, a connection to the existing infrastructure is envisaged, through a newly designed street on which parking space for 12 vehicles is provided, including a parking space for people with special needs, as well as a parking space for mothers with children. The construction area where most of the contents are located is surrounded by a one-way vehicular-pedestrian street to provide access for emergency vehicles and ambulances. The Basic Design envisages the entire construction will be fenced on all sides and the main access will be provided through an entrance gate on the southeast side of the newly designed street. It is also planned to fence the adrenaline trail with medium-high greenery to prevent children from running unprotected.

The entire complex, which is located in the construction area, will have two entrances - one main entrance accessed from the north-west side of the planned parking lot and one economic entrance on the back side accessed via the service internal street. All access paths, accessible to people with special needs, will be developed from the main entrance.

**7.3.2 Architectural functional solution**

Within the construction plot, the following facilities are planned: a info pult/kioskand a space for props, an adrenaline trail .

The size of the adrenaline trail is derived from the norms for this type of facility. 10 trails for adults with a total length of 50m (10x5m) and 5 trails for children with a total length of 25m (5x5m) are planned. A tower with stairs is planned next to the trails. In front of the tower are located the info pult/kioskand cloakrooms with lockers for visitors, for leaving personal belongings.

They are connected by a covered canopy, which is planned for preparing visitors with equipment for the adrenaline trail and through stairs, access is provided to the tower where the adrenaline trail begins.

In the central part of the construction area, surrounded by the accompanying temporary buildings on all sides. Green areas with horticultural landscaping are planned around the playground, along the perimeter of the designated protective zone for the toys.

Within the central part of the complex, paths in the form of ramps are planned to overcome the height difference and enable access and movement of people with special needs. The entire location is designed in a level manner with slopes for natural drainage of the ground floor areas.

Wooden benches for seating are planned in the ground floor, while along the perimeter of the fence of the construction area, street candelabra with solar panels and batteries on six-meter poles are planned.

**7.3.3 Construction**

The construction of the adrenaline park is planned as a temporary steel structure made of steel columns and connecting beams, on which appropriate elements are placed that form the movement paths.

The access tower to the adrenaline trail is planned as a temporary steel structure. It provides access for children at a lower level and access for adults at a higher level.

The steel structure is planned to be coated with an appropriate fire resistance coating. The foundation and dimensioning of the elements is according to an appropriate static calculation for this type of facility.

The foundation of all temporary steel facilities is planned with single foundations with dimensions according to a static calculation, additionally stiffened with foundation beams.

**7.3.4 Walls**

The external walls of the info pult/kioskbuilding are provided with a metal substructure of KNAUF galvanized profiles, filled with an intermediate thermal insulation layer of rock wool, a steel substructure of box profiles, internal finishing appropriate to the room - gypsum cardboard boards or ceramic tiles and external finishing of Aquapanel board and wooden beams.

The internal walls are provided with a metal substructure of KNAUF galvanized profiles with a finishing finish depending on the room - gypsum cardboard boards or ceramic tiles.

**7.3.5 Floors**

The floors are designed depending on the function of the room. Ceramic-granite tiles (type 1 for inside) are planned for the ticket office. Ceramic tiles (type 3) are planned for the other rooms. Concrete surfaces with cast concrete and concrete modular slabs with a pour are planned for the ground floor.

**7.3.6 Roof**

The roof of the info pult/kiosk building is made of thermal insulation panels placed on secondary steel beams supported on primary steel beams with appropriate thermal insulation. The open eaves and the tower are not covered with thermal insulation panels, but with textile canvases between the steel beams.

**7.3.7 Interior and exterior joinery**

The interior and exterior carpentry is made of anodized aluminum profiles. The glazing is made of thermopane with a thermal bridge.

**7.3.8 Materials**

All envisaged materials are in accordance with valid technical regulations, standards and norms for this type of facilities, durable, aesthetically pleasing and available on the market.

**7.4 Electrical installation**

**7.4.1 High-current installations**

***Power supply***

The electrical power supply as well as the system for protection against dangerous touch voltage shall be in accordance with the conditions defined by the electrical energy permit issued by EVN Macedonia, based on the single-pole scheme from the basic project.

***Electric lighting***

Lighting should be provided for all rooms in closed buildings. The choice of lamps should depend on the purpose of the room. When designing, the regulations provided for the level of illumination for the given rooms should be observed.

Electrical installation for panic lighting of evacuation directions in buildings should be provided.

Outdoor ground floor lighting with solar panels and batteries on six-meter poles should be provided. The street lighting fixtures should be placed on consoles on steel poles, while decorative ground floor lights should be placed throughout the ground floor.

***Electrical sockets and connections***

A sufficient number of Schuko sockets and connections outlets should be provided in the building according to the needs and interior of the buildings. Connections outlets for the needs of the water supply and sewage phase should also be provided.

**7.4.2 Low-current installations**

***LAN installation***

LAN installation should be provided for the needs of the restaurant, info pult/kioskand other facilities within the adrenaline park.

***Automatic fire alarm installation***

A fire alarm installation with conventional fire detectors should be provided. The fire protection control panel should be conventional and located in the restaurant area.

**7.4.3 Lightning shock installation and grounding**

An automatic foreseeing system from a classic lightning shock installation and a thorough grounding of the facilities, as well as grounding of the supporting elements in the adrenaline park should be provided.

**7.5 Water supply and sewerage**

**7.5.1 Sanitary plumbing**

The basic design for the internal sanitary plumbing should be developed based on an architectural solution and in accordance with existing standards and technical regulations.

The water supply to the facility with sanitary water supply shall be provided from the existing water supply line that passes in the immediate vicinity of the facility. Registration of the consumed water shall be carried out with a combined water-meter that will be placed on a water-meter shaft.

The internal sanitary plumbing installation shall be made of propylene pipes (distribution in the sanitary nodes) for internal plumbing. In the sanitary nodes, the hose network shall be installed in the wall, and a bypass valve with a nickel-plated cover shall be provided for each consumer.

Sanitary hot water should be provided locally with electric water heaters.

The plumbing installation inside the building should be thermally insulated.

If the pressure in the existing network does not meet the required pressure, a pressure boosting device should be provided.

**7.5.2 Fire-protection pipeline**

The water supply of the building with fire water supply system shall be provided from the existing city network. In accordance with Official Gazette No. 26 of 02.08.2018, for fire protection of the building an external fire-protection network with external fire protection hydrants and an internal fire-protection network with internal hydrants shall be provided.

For external protection of the facility with water, external underground hydrants should be designed, spaced apart according to regulations.

Internal fire-protection hydrants shall be placed in a metal box marked ''H'' with fire-protection hose l=15m. and automatic nozzle Ǿ 2''.

The internal fire protection network should be made of galvanized steel pipes and thermally insulated.

If the pressure in the city network does not meet the required pressure, a pressure boosting device should be provided.

**7.5.3 Sewerage system**

This project should solve the problem of wastewater, that is, fecal sewage should be solved as a separate system, with separate channels for fecal water and separate channels for storm water.

The basic project for fecal sewage should be developed based on an architectural solution and on the basis of applicable norms and regulations and technical regulations.

Since there is no city sewage system near the location, the wastewater from the facility - sewage system, together with the wastewater from the kitchen - technological sewage system, should be collected and led to a newly designed septic tank on the location itself. It should be designed and constructed from reinforced concrete MB 30 with waterproofing additives. The inner sides should be plastered with cement/mortar 1:2 with fine application to a black gloss, and the outer walls should be insulated with PVC foil protected by a brick wall above the ground. It should be planned that the septic tank should be cleaned once every 40 days by an organization authorized for this type of work using a special vehicle and transported to the nearest location appointed by the municipality and public utility company.

The installation of the fecal and technological sewage, the verticals, the sewage in the sanitary facilities and the kitchen, and the entire installation should be made of PVC sewage pipes. Inspection shafts should be provided along the length of the terrace at all connections, intersections and straight sections up to 40m.

The external installation up to the connection should be made of PVC pipes with an appropriate diameter, a slope for normal drainage and an appropriate number of inspection shafts.

**7.5.4 Atmospheric sewerage**

The drainage of stormwater from the building should be resolved depending on the architectural solution of the fifth facade and the architectural details.

Through atmospheric verticals, water from roof surfaces should be collected and freely discharged onto the terrain.

**7.5.5 Sanitary**

All materials, equipment and fittings shall be first class, and the color and type shall be at the Investor's choice.

All installations in this project should be designed according to the applicable standards and regulations for construction of this type of facility.