# VOLUME 3

# TECHNICAL SPECIFICATIONS GENERAL

# CONSTRUCTION SITE

## 

## FENCING AND SIGNBOARDS AT THE CONSTRUCTION SITE

The Contractor must maintain the security of its activities, including fencing of the construction site according to the regulatory requirements;

1. The Contractor shall install commemorative plaques at the main site in line with the of the Interreg VI-A IPA Hungary-Serbia Programme manual and in agreement with the Contracting Authority after Provisional Acceptance.
2. Construction site board prepared in accordance with the Law on Planning and Construction shall be placed on the temporary fence adjacent to the entrance gate to the site;
3. The Contractor shall provide the whole information concerning the regulations and procedures governing the use of local facilities for access, transport, storage facilities and in compliance with them to take measures for providing the necessary documents;
4. The Contractor shall be aware of existing restrictions and shall be responsible for their observance during construction;
5. The Contractor shall be liable for all damages on the existing infrastructure caused by him - they shall be repaired at its expense;
6. The Contractor will be responsible for ensuring the control of any access or the right to leave the boundaries of the construction site, so that it does not lead to interference with the locals or damage to public or private property as a result of the entry or exit of its employees and subcontractors;
7. The Contractor shall indemnify and hold harmless the Contracting Authority against any accusations arising from its failure to comply with the above point, including legal fees and costs.

## TEMPORARY SITE FACILITIES

1. The Contractor, prior to the start of construction works, shall submit a draft *Design for the organisation and execution of construction.* The Design must be submitted no later than 15 days before the planned start of construction works. The design must indicate the work zones, as well as areas for temporary storage of necessary construction materials and goods, and areas for temporary settlements for the personnel of the Contractor and Supervisor.
2. The Contractor shall provide and install all necessary facilities/installations for accommodation of its staff, including dressing and rest containers, toilets, drinking and washing water, electricity, etc. All costs for temporary facilities shall be included in the Bid.

## FACILITIES FOR THE CONTRACTOR AND SUPERVISOR

1. The Contractor shall hand over the fully equipped office to the Supervisors within 2 weeks of being ordered to do so.
2. The cost of office and accommodation shall be paid by the Contractor and shall be included in the unit prices in the Bill of Quantities.
3. The Contractor shall procure, at its own risk and expense, all additional facilities outside the site that may be necessary for its work.

## OFFICES FOR THE SUPERVISOR

All offices for the Supervisor shall have at least two grounded electrical sockets, rooms exceeding 10 m2 floor area, having at least one additional socket per 5 m2 of floor area or part thereof.

The Contractor shall supply, install and maintain in the offices, equipment and furniture which shall be new, undamaged and complete with all necessary keys.

The Contractor shall supply, install and maintain furniture such as desks, cupboards, drawing tables and plan chests, chairs and shelves, etc. in the numbers, trademarks and quality as approved by the Beneficiary and the Supervisor.

The Contractor shall arrange internet connection.

## FACILITIES FOR THE CONTRACTOR

The Contractor shall provide and maintain on site suitable site offices for its own use. It shall also provide and maintain on approved sites, sufficient stores, tanks and workshops for the proper storage of materials, fuel plant and equipment.

The stores shall be of such size and construction to provide adequate storage and protection of stocks of material, fuel, spares, etc. in quantities ensuring uninterrupted progress of the work. Workshops shall be suitably equipped to ensure carrying out of major repairs, overhaul or modification by the Contractor of all plant and equipment in or on the Works. The Contractor shall allow in its rates for all costs related to provision of the offices and workshops for its own use.

## SITE CLEANING

The Contractor shall make every effort to keep the site tidy and in orderly manner and to take at any time every possible precaution against the contamination of subsoil and groundwater.

The Contractor shall be responsible for making all arrangements for the disposal of solid and liquid wastes from the site. Furthermore, it shall give strict instructions to all its employees to use the sanitary accommodation provided at the site.

## STORAGE OF EQUIPMENT AND MATERIALS IN PUBLIC SPACE

Construction materials and equipment shall not be stored outside the site borders.

Where Works are to be completed in public spaces, all plant and excess material shall be removed immediately from the site upon completion of the relevant task so as to limit public objections and complaints.

## TRAFFIC ARRANGEMENTS

The Contractor shall as far as required, comply with all requirements and recommendations of the Police and Authorities regarding traffic arrangements and road safety measures on public roads outside the construction sites.

The Contractor shall, where necessary, provide all barriers and traffic signs agreed by the Supervisor.

Traffic diversions, if necessary, shall be planned and arranged with the responsible Authorities by the Contractor and harmonized with the Supervisor. No diversion shall be implemented without a written consent of the responsible Authority and after given information to the Supervisor. Access to the site shall be available to vehicles of emergency services and residents in the areas.

All traffic signs and traffic control signals, as necessary and/or may be required by the Police Authority for the safe direction and control of the traffic shall be provided, placed and maintained by the Contractor on the appropriate sites and locations on the access to the sites. The location and size of all such signs and the lettering thereon shall be agreed by the Supervisor before placement of the signs.

The Contractor shall reposition, cover or remove signs as required during the progress of the works.

# CONTRACTOR`S GENERAL RESPONSIBILITIES

## MANAGEMENT OF THE PROJECT BY THE CONTRACTOR

1. The Contractor shall provide the Quality Assurance Plan (QAP) for the management and execution of construction works;
2. The QAP should reflect the management structure and clearly describe the duties, responsibilities and powers of each member of the Contractors' staff;
3. The representative of the Contractor and its staff must possess experience and qualifications according to the contract, RS Law and type and scope of works;
4. This QAP will be updated and provided again whenever there is a change in personnel.

## APPROVAL AND INSTRUCTION BY THE SUPERVISOR

Where reference is made in this Specification, the Bills of Quantities or in the drawings for approval, instruction or direction, they shall be given by the Supervisor.

Approvals, instructions or directions by the Supervisor shall not relieve the Contractor from its liabilities and responsibilities under the Contract.

## QUALITY ASSURANCE PLAN

1. The Contractor shall be responsible for assuring such quality of materials, works and processes that shall comply with the requirements of the Specifications.
2. In order to meet the specified requirements, the Contractor shall implement Quality Assurance System presented in Quality Assurance Plan containing the following details:

* Quality control procedures;
* Personnel responsibilities;
* Procurement procedures;
* Testing procedures;
* Equipment and measurement devices;
* Frequency of testing, measurements etc.;
* Holding points in production for inspection;
* Rejection and corrective procedures;
* Documentation and communication
* H&S and Environmental Plan.

1. The Contractor shall be liable to keep a register of all materials delivered on site or implemented in the construction to be accessed for review upon request by the Supervisor or Contracting Authority. Also, the Contractor shall maintain archive of the whole correspondence and instructions.

The Contractor shall within 28 days of the date of the Letter of Acceptance provide the Supervisor with the Organisation chart containing names, CVs and duties of all key personnel whether or not they are related to quality assurance directly.

## WORK PROGRAMME FORM OF SUBMISSIONS

The Work Programme presented by the Contractor shall consist of a detailed schedule of all construction works and phases. Once approved, the Work Programme shall be binding for the construction works on site.

### REQUIREMENTS

The Contractor shall present a Work Schedule for execution of the works with distribution of resources and manpower, including volume of works, number of workers for the stage, coordination of activities, interaction with different participants in the process, time limit for execution and sequence of the works all in accordance with Contract.

### WORK PROGRAMME

Pursuant to the requirements, the Work Programme to be submitted by the Contractor shall show the planned monthly rates of progress between the programme dates for commencement and completion of each major item or work for the various stages of construction, in accordance with the Conditions of Contract.

The Work Programme shall take into account climatic conditions, groundwater, geo-technical data, completion of critical components by the Contractor or other contractors, water supply service conditions and other conditions, to ensure the completion of the works in accordance with the Contact.

The Contractor shall not be permitted to commence any construction work on that part of the works until the Supervisor has no objection to the method statements, drawings and calculations. Sufficient time for approval of drawings materials and method statements must be allowed for in the Work Programme for each component.

The Contractor shall allow in its Programme a reasonable period for work to be carried out by Public Utility Services, Authorities and the Beneficiary where necessary. The Beneficiary will provide all necessary assistance in liaising with such Authorities.

The Contractor shall also allow in its Programme sufficient time required for provisional acceptance and for the maintenance periods (Defects Notification Period) as stipulated in the Contract.

## MONTHLY PROGRESS REPORTS

During of the execution of the Contract, the Contractor shall follow the progress of activities relative to the time schedule and shall submit to the Supervisor Monthly reports for the results of its activities, conforming to the following requirements:

1. The Report to be provided to the Supervisor in 1 hardcopy in Serbian and English languages as well as digitally (on CD enclosed to the Report);
2. Diagrams with detailed progress description, Contractor’s documents, delivery, construction works, assembly and tests;
3. Digital photos (on CD enclosed to the Report);
4. Linear chart (schedules) for the current Stage, showing the actual and the planned progress;
5. Provision of resources - actual and planned;
6. Diagram for labour flow - actual and planned;
7. Report, reflecting all considerable differences from the construction programme, and if necessary, explanation for the proposed steps to be undertaken for the completion of the approved programme;
8. Statistics on safety and environment protection;
9. Financial Statement.

When actual work progress differs from that shown in the Construction Programme, the Contractor shall submit an updated schedule to the Supervisor. The updated time schedule shall be current to the last day of a calendar month and shall show the detailed “work-as-executed” programme in respect of work carried out. They shall be submitted within ten working days of the following month at the latest.

## PROGRESS PHOTOGRAPHS

Digital colour photographs showing the progress of the Works in detail shall be taken by the Contractor every week, from positions to be selected by the Supervisor.

The Contractor shall hand over the corresponding electronic files to the Supervisor on a CD, as well as an electronic list numbering and labelling each photograph (location, date when taken and a brief description or title).

## CONTRACTOR’S DOCUMENTATION GENERAL

1. For design, works and supply use of metric units is compulsory.
2. All documents will be issued in English. Official documents, which are to be presented to state or municipality authorities, will be also issued in Serbian.
3. Works documentation (see Chapter 3.1.4.) will be in English and in Serbian, except Construction Log, which will be in Serbian.
4. Reports and correspondence documentation will be in English and in Serbian.
5. When submitted as computer files the documents shall be under Windows, compatible with following formats: texts in MS Word, Tables in MS Excel, drawings in ACAD, time schedules in MS Project.

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### WORKS DOCUMENTATION

The Contractor shall be liable to provide the Supervisor with due documentation as per local Regulations. The Contractor shall keep/maintain the following Works documentation:

1. Inspection Book (forms laid down by the Law of the Republic of Serbia),
2. Construction Log (forms laid down by the Law of the Republic of Serbia),
3. Measurement Book (forms laid down by the Law of the Republic of Serbia),
4. All necessary certificates (for material, equipment and other) during the works execution.

The Works Site Manager shall keep the Construction Log and submit the Measurement Book sheets of the executed works along with each invoice. The Measurement Book has to be verified by the Supervisor.

The Construction Manager has to enter the following data into the Construction Log:

* Number and qualification of workers executing the works,
* Number and type of construction machinery used for works execution,
* Weather conditions under which the works are executed,
* How the works are executed and if there is any deviation from the design, contract and regulations in doing so.

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### AS-BUILT DESIGN

1. Based on a survey of executed works, as-built technical documentation will be prepared by the Contractor and delivered to the Supervisor (in accordance with Law on Construction and Planning).
2. As-built drawings for all executed works must be delivered in digital form and 3 (three) printed and bind hard copies, signed by the Responsible Designer and the Supervisor.
3. Contractor is obliged to support the Beneficiary during technical acceptance and make necessary corrections in the submitted documentation and designs upon the request of Authorities in order to obtain a use permit.

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# HEALTH & SAFETY AND ENVIRONMENT PROTECTION

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## HEALTH & SAFETY

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### GENERAL REQUIREMENTS

Without limiting the Contractor's obligations under the Conditions of Contract, the Contractor shall take all measures and precautions necessary to ensure the health, safety and welfare of staff, labour, and other persons authorised to be on the Site, as well as visitors and third parties. The Contractor shall prepare H&S Plan and develop detailed sequence and safety measures in the Organisational plan for the management and execution of the works.

The Contractor shall:

1. Fully comply with the *Law on Safety and Health at Work.*
2. Appoint a member of staff responsible for all matters related to health and safety for the duration of the Contract according to RS regulations.
3. Provide and maintain equipment in a safe working condition and adopt safe methods of work.
4. Adopt methods for the use, handling, storage, transport, and disposal of materials, and substances which are not injurious to health and safety.
5. Provide and maintain adequate lighting, signing, and fencing of the Works.
6. Provide adequate protective clothing and safety equipment, including such information, instruction, training and supervision as are necessary to ensure the health and safety of all persons employed on or entering on the Site in connection with the Works.

Safety equipment shall include but not be limited to:

* safety helmets,
* protective footwear with integral steel toe-caps,
* safety glasses, welding goggles and other eye protectors,
* ear defenders,
* safety harnesses,
* high visibility reflective vests,
* Fire extinguishers.

1. Provide and maintain access to all places on the Site in a condition that is safe and without risk of injury.
2. Provide and maintain adequate water, waste water and waste collection, for all offices, workshops, and laboratories erected on the Site.
3. Provide and maintain adequate sanitary units at locations where works are in progress.
4. Appoint a member of its staff to be responsible for the safety of the Works throughout any shutdown period and notify the Supervisor of the name and contact telephone number of the responsible person.
5. Report all accidents to the Supervisor and appropriate authorities at the time of occurrence or as soon as possible thereafter.

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### TESTING AND CERTIFICATION OF MECHANIZATION AND EQUIPMENT

1. The Contractor shall provide and maintain equipment for lifting, embedding and transporting materials and must comply with all relevant requirements of the standards in Serbia;
2. All equipment must be regularly maintained in accordance with the recommendations and standards of the manufacturer, according to local laws and recommendations of the relevant authority;
3. The Contractor shall prepare and update a register of certificates of testing of the equipment used on construction sites according to RS Law;
4. The Contractor must appoint competent personnel responsible for the operation of all kinds of equipment. They must provide evidence that they have passed training and have respective license for operating the specific equipment;
5. All the technological equipment (with test certificates) used on or around the site must be equipped with the necessary protective devices that will be in continuous readiness;
6. Should the Supervisor consider the Contractor’s method of working unsafe or that there are insufficient or inadequate safety barriers or other devices or that there is insufficient safety or rescue equipment, the Contractor shall change its method of working or install or strengthen safety and rescue equipment if so instructed. Such instructions shall not relieve the Contractor of any of its responsibilities under the Contract.
7. The Contractor shall immediately notify the Supervisor about any accident that occurs, whether on site or off site, in which the Contractor is directly involved, and which resulted in any injury to any person whether directly concerned with the site or a third party. Such initial notification may be verbal and shall be followed by a written comprehensive report within 24 hours of the accident.
8. Transportation of any material by the Contractor shall be in suitable vehicles, which do not cause spillage when loaded, and all loads shall be suitably secured. Any vehicle shall be removed from the site, which does not comply with this requirement or any of the local traffic regulations and laws.
9. The Contractor shall ensure access to sites at all times to any authorised external institutes or experts carrying out safety inspections.

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### FIRE PROTECTION

During the performance of the Contract the Contractor shall make arrangements to the agreement of the Supervisor for the protection of the permanent works and any temporary works and any adjacent property from fire and, if required, it shall give the Fire Authority access to all facilities periodically to inspect the fire prevention arrangements.

Particular care must be exercised in connection with the operation of electric arc welding equipment, oxyacetylene cutting equipment and other processes involving the use of naked lights. Special arrangements will be necessary for the storage of highly flammable liquids on the site.

The Contractor shall remove all waste and material of a flammable nature and take other steps as the Supervisor may require but this shall not relieve the Contractor of any of its obligations under the Contract.

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## ENVIRONMENT PROTECTION

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### GENERAL

1. The Contractor shall take all necessary measures and precautions and otherwise ensure that the execution of the Works and all associated operations on or off site are carried out in conformity with statutory and regulatory environmental requirements.
2. The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of the Works. This shall be achieved wherever possible by suppression of the nuisance at source rather than abatement of the nuisance once generated.
3. The provisions of these Sub-Clauses shall only be disregarded in respect of emergency work required for the saving of life or property or the safety of the Works.
4. In the event of any spoil or debris or silt from the Sites being deposited on any adjacent land, the Contractor shall immediately remove all such spoil debris or silt and restore the affected area to its original state to the agreement of the Supervisor.
5. The Contractor should comply with the guidelines of the Banks in this regards as well as those for resettlement and rehabilitation of the affected population.

The offer should include appropriate cost-effective mitigation measures, which should form part of the project cost.

*Environmental Management Plan (EMP*) shall be prepared by the Contractor incorporating proposals concerning the implementation, management and monitoring of the environmental components of the project.

Within two (2) weeks from the commencement of the works, the Contractor shall submit an EMP with operational details of its proposals to the Supervisor for approval.

### ENVIRONMENTAL PROTECTION DURING CONSTRUCTION PERIOD

The Contractor shall use such construction methods and shall maintain all borrow/stockpile/spoil disposal area so as to assure the stability and safety of the Works and any adjacent feature, to assure free and efficient natural and artificial drainage and to prevent erosion.

The Supervisor has the power to disallow the methods of construction and/or the use of any borrow/stockpile/spoil disposal area if in their opinion the stability and safety of the Works or any adjacent features are in danger, or if they disturb natural or artificial drainage, or if the method or use of the area will promote undue erosion.

Following excavation for the works, the Contractor shall take all steps necessary to complete drainage and slope protection works in advance of each rainy season. Erosion or instability or sediment deposition arising from operations not in accordance with the Specifications shall be repaired immediately by the Contractor at its expense. The Contractor shall also take all steps necessary to complete drainage in advance of each winter rainy season in the areas excavated for borrowing materials.

Notwithstanding approval of the intended method of working, the Contractor shall at all times be responsible for constructing the earth works in accordance with the Specifications, the Design and drawings.

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### PREVENTION OF POLLUTION

The Contractor shall ensure that its activities do not result in any contamination of land or water by polluting substances.

The Contractor shall implement physical and operational measures such as: oil and grease traps in drainage systems from workshops, and service and fuel ingress and kitchens, the establishment of sanitary solid and liquid waste disposal systems, the maintenance in effective condition of the same assures, the establishment of emergency response procedures for pollution events, and dust suppression, all in accordance with normal good practice and to the agreement of the Supervisor.

### ENVIRONMENTAL CONSIDERATIONS

The following environmental protection measures shall be observed during the execution of the construction of the works:

* **Demolition material** - Reuse of demolition materials as backfill for trenches and excavations or/and hard fill for construction foundations and roadways is possible, unless contaminated or hazardous materials such as asbestos are identified. The Contractor will be responsible for environmentally safe disposal of any material resulting from the demolition and other site materials with approval from the relevant local Authorities at a designated licensed disposal facility.
* **Excavated soil** - Reuse of excavated natural soil, which is free of cohesive components, salt, sulphate and/or clay materials, may be used as backfill for trenches and excavations. The Contractor will be responsible for environmentally safe disposal of surplus materials with approval from the relevant local Authorities at a designated licensed disposal facility.
* **Ground water** - Temporary and/or permanent groundwater lowering may be required. The Contractor shall apply appropriate dewatering measures as required and shall also ensure that adequate measures are implemented to control surface water discharge.
* **Air pollution** - Construction may give rise to dust and construction equipment exhaust emissions. Due note shall be taken of the proximity of residential housing to the works. The normal health and safety controls will be required to safeguard the residential and passing population.
* **Noise pollution** - Construction works may cause annoyance caused by noise. The normal health and safety controls will be required to safeguard the residential and passing population.
* **Maximum noise levels** - During construction works the Contractor shall comply with the local and national requirements. The Contractor shall be legally responsible and financially liable to observe Serbian environmental legislation.

The noise levels shall be in accordance with the relevant Serbian noise environmental legislative.

Noise and disturbance shall be kept to the reasonable minimum as far as required for this project. The Contractor’s attention is drawn to the close proximity of some residential areas. All plant and tools used at such sites above or near ground level shall be silenced or of a silent type.

The Contractor shall take all necessary steps to ensure that its workmen carry out their duties in a quiet manner particularly when working at night.

* **Pollution prevention -** The Contractor shall not pollute or unnecessarily disturb lands, roads and other places on and around the Site. No trees or other vegetation shall be removed except to the extent necessary for the Works.

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### AIR QUALITY

1. The Contractor shall devise and arrange methods of working to minimize dust, gaseous or other air-borne emissions and carry out the Works in such a manner as to minimize adverse impacts on air quality.
2. The Contractor shall utilize effective water sprays during the delivery and handling of materials when dust is likely to be created, and to dampen stored materials during dry and windy weather.
3. Stockpiles of materials shall be sited in sheltered areas. Stockpiles of friable material shall be covered with clean tarpaulins, and sprayed with water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement, except where this is contrary to the Specification.
4. Any vehicle transporting no coherent material shall not be loaded to a level higher than the side and tail boards, and shall be covered with a clean tarpaulin in good condition. The tarpaulin shall be properly secured and extend at least 300 mm over the edges of the side and tail boards.
5. In periods of high wind, dust generating operations shall not be permitted within 200 m of residential areas having regard to the prevailing direction of the wind.
6. Construction vehicles and machinery shall be kept in good working order and engines turned off when not in use. Appropriate measures shall be taken to limit exhaust emissions from construction vehicles, machinery and plant.
7. An advance warning shall be given to potentially affected persons, so that some measures can be taken by them before commencement of works, especially before dismantling/demolition.

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### NOISE

1. The Contractor shall consider noise as an environmental constraint in its planning and execution of the Works.
2. The Contractor shall take all necessary measures to ensure that the operation of all mechanical equipment and construction processes on and off the Site shall not cause any unnecessary or excessive noise, taking into account applicable environment requirements. The Contractor shall use all necessary measures and shall maintain all plant and silencing equipment in good condition so as to minimize the noise emission during construction works.

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### MEASURES FOR DECREASING THE NEGATIVE ENVIRONMENTAL IMPACT

In order to mitigate negative environmental impact, the Contractor should propose necessary actions in its Environmental Management Plan (EMP), such as:

1. to create adequate organisation for execution of construction works which shall comply with local construction regulations;
2. to provide water sprinkling of the construction site
3. to create organisation for control on the facilities storing fuel and lubricants and on the technical condition of the machines in order to avoid accidental oil spills;
4. along the construction site, waste water should be treated and sedimentation tanks and oil separators should be placed if needed;
5. to foresee the necessary maintaining and drainage measures for the construction site, access roads and service roads, in order limiting the erosion processes;
6. to specify the quantity and type of waste and how its disposal is intended to be transported and removed from the site area;
7. Measures for fast conservation of unfinished works at unfavourable conditions.

# 

# MATERIALS

## GENERAL

1. All materials used shall be of the best quality as specified and described in the Specification, Design, Drawings and the Bills of Quantities. Where in the Design Drawings and/or BoQ the products are brand named, this should be understood as supplemented by 'or equivalent'. These materials shall be procured from approved manufacturers or suppliers.
2. The Contractor must secure the compliance with the Specification of materials or plant to be provided under this Contract before the supplier or manufacturer is proposed for approval to the Supervisor.
3. The Contractor shall take into consideration the local climatic and other environmental conditions when selecting and proposing the materials. The quality of the material has to be confirmed by the attests and suppliers certificates, all according to TS and RS regulations.
4. Whenever possible, the Contractor shall provide equipment of a similar nature from the same manufacturer, e.g. electric motors;

The Contractor shall note that particular attention will be paid to these requirements. In cases where the proposed equipment is not standardized with regard to manufacturer and type, the Contractor shall be required to provide conclusive technical justification; considerations of price alone will not be accepted. Equipment and components that have not been standardized will not be accepted.

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## ORIGIN

Certificates of origin have to accompany the products proving that supplies originate from an eligible country as stated in GC of the Contract.

## CONFORMITY OF MATERIALS

All materials implemented during construction shall be in compliance with the requirements of:

* Requirements of the local legislation;
* REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonized conditions for the marketing of construction products;
* The present Technical Specifications;
* Requirements of the design documentation.

All materials applied shall be accompanied with quality certificates to prove their concordance with the requirements set out in the design, the Specification and the Code for Civil Construction Works.

The Contractor shall make diligent efforts to procure the specified materials. Where, due to different reasons, the materials required by the Contract are not available, substitute materials may be used but with the prior approval by the Supervisor and the Designer.

# TECHNICAL REQUIREMENTS FOR EXECUTION OF WORKS

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## TECHNICAL REQUIREMENTS

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### PURPOSE OF THE TECHNICAL REQUIREMENTS

The purpose of the technical requirements is to provide quality performance of works to comply with technical regulations and standards. Therefore, the Contractor is obliged to adhere strictly to them and to perform all the works that are the subject of this project, in accordance with technical requirements, design documentation, accompanying drawings and Bill of Quantities.

In addition, technical requirements define the method of measurement. Therefore, bidders are required to include all costs for not separately analysed and measured items in the unit prices of the existing ones.

## GENERAL TERMS

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### NOTICE OF COMMENCEMENT

The Contractor shall give a written notice to the Supervisor of its intention to commence works (Notice of Commencement).

Also, according RS law, Notice of Commencement must be submitted to competent Local and National Authority.

The works shall not be commenced until written approval has been received from the Supervisor.

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### TECHNICAL SPECIFICATION FOR WORKS

Technical Specifications are an integral part of the Tender Documentation, and are annexed to the Works Contract.

The Contractor is fully familiar with all details of the provided design documentation, as well as with all local regulations, local standards (SRPS), common practice of trade and circumstances for their execution. Nevertheless, it is understood that, whenever local regulations, local standards (SRPS), or any common practice of trade, are subject to any interpretation, clarification, ambiguity, or dispute, a ruling by the Supervisor will prevail, always provided that such ruling will be fully in compliance with and will be based on the subject local regulations, local standards (SRPS), as well as in accordance with common practice of trade, and any such ruling by the Supervisors and subsequent instruction in that respect, will not constitute any ground for variation order and/or any additional payment.

Communication between the Contractor and the Beneficiary (also Designer), during the works will be carried out exclusively through the Supervisor.

All works must be carried out precisely and professionally. Prior to application, the Supervisor must examine all material and all his comments referring to material and quality of work will be obligatory for the Contractor. The agreed prices include all fully completed works and final products ready for use.

The Contractor will be responsible for any and all damages caused by the Contractor during any works, to any third party, structure, main building or adjacent buildings, and any and all repair works and compensations of any kind will be at the Contractor’s expense.

Prior to the commencement of the works, and also in the course of the execution of every work item, the Contractor will ask the Supervisor for any explanations and clarifications required, therefore, the Contractor will solely bear full material responsibility for all works not completed in accordance with the concept and details of this specifications.

The Contractor will be responsible to keep records on the progress of works in the measurement book and have it controlled and verified by the Supervisor.

Upon the completion of the works the Contractor will remove from the building site and other used areas all its tools, machinery, surplus material, etc. so as to have the site neatly arranged as defined in the investment-technical documentation, and all other areas restored in same condition as before the construction.

All construction works must be carried out under the conditions and in the manner prescribed by RS Law on Construction and Planning.

For all works, applicable Serbian regulations and standards shall prevail.

## TECHNICAL STANDARDS AND REGULATIONS

In accordance to these Technical Requirements the Contractor shall ensure that its performance incorporates the following key principles

* For all required works and services specified in this Tender Dossier, the relevant Serbian standards and codes of practice shall apply. In any case, if Serbian standards are more strict or dominant, they shall apply to replace other standards given or not in other parts of this document.
* For works and services where no relevant Serbian standards or codes of practice exist the latest European Standards and code of practice shall be applied.
* The proposed application of other standards and code of practice for certain works and/or services shall be such as to ensure equal or higher than specified quality and safety of works, and to facilitate operation, inspection, maintenance, repairs, lubrication and similar operations.
* In any case, National standards and code of practice have to be used for each service and work, accompanied with explanations, to demonstrate to the agreement of the Supervisor that application of these standards and code of practice shall give required quality, safety, functionality and durability of the completed works.
* The applicable version of any standard shall be that valid 28 days prior to the latest date for submission of tenders.

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## MATTERS NOT COVERED BY THE STANDARDS

Any materials and workmanship not fully specified herein or covered by the Standards, Codes or Manuals shall be of such type and quality so as to produce a required quality of work. In such circumstance the Supervisor shall determine whether all or any of the materials offered or delivered to the site are suitable for use in the Works and the Supervisor’s decision in this respect shall be final and conclusive.

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## CIVIL WORKS

The term "Civil Works" means the obligations of the Contractor to perform all manufacturing, excavation, building, structures and other construction Works.

All other works from the Contractor’s Offer whether specified or not in the BoQ or any other Contract Document (including the Contractor's proposal), as necessary for the completion of the Works and the operation thereof, and as required under the terms of the Contract;

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## CONTRACTOR'S EQUIPMENT

Details of all Contractors’ Equipment to be used in the execution of the Works shall be submitted to the Supervisor prior to its use.

The Supervisor's consent to use such Equipment will not be unreasonably withheld, but if, in the Supervisor's opinion, circumstances arise which make it desirable that the use of the said Equipment should be suspended either temporarily or permanently, the Contractor shall change the method of performing the work affected and it shall be deemed to have no cause for claims against the Supervisor on account of having to carry out the work by another method, nor it shall be deemed to have cause for claim if any order issued by the Supervisor results in the Contractor's Equipment having to stand idle for a period of any duration whatsoever or having to be removed.

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## SUBCONTRACTED WORKS

The Contractor shall appoint subcontractors for the work for which the Contractor is not experienced, recognized or approved.

The Contractor shall submit for consent, the names of all proposed subcontractors and suppliers of special manufactured items with full details of the company, reference list and all other documentation needed for approval of the subcontractors and shall indicate the precise sections of the work for which each will be responsible.

The Contractor shall be solely responsible for the overall co-ordination of the Contract. Direct formal communication between its sub-contractors and the Supervisor will not be allowed.

## 

## METHOD STATEMENTS

The Contractor shall provide, in writing, a description of the arrangements and methods it intends to apply for the execution of the Works.

Method Statements (MS) shall show in detail the methods proposed by the Contractor for carrying out the principal activities of construction in full safety. In particular, the Contractor shall indicate the resources (plant, personnel, materials) to be allocated, timing and sequencing, emergency/contingency measures, and any other information required to clearly detail the proposed methods. All necessary health and safety and environmental measures required shall be clearly indicated.

This will be supported by calculations for temporary works for supporting excavated faces and shuttering of concrete. Flowcharts, sketches and drawings shall be included if necessary.

Proposed MS will be submitted to the Supervisor (also to the Beneficiary) for approval. The Supervisor (in cooperation with the Beneficiary's representative) will review and provide its comments within 10 days. The Contractor shall make final corrections (if any) and submit them to the Supervisor for final approval, 15 days before the commencement of relevant work. Written agreement shall be obtained before any work is commenced.

## PROVISIONAL TIME SCHEDULE

The Defects Notification Period (DNP) shall be twelve (12) months under the Contract and shall commence after completion of the Works.

The duration and sequence of the various activities constituting the Works may be varied by the Contractor to suit its own proposals for carrying out the works, subject to the approval of the Supervisor, but no consideration will be given to any request by the Contractor to extend the Contract completion dates.

## STANDARDS ON THE SITE

The Contractor shall purchase and keep on Site at least one copy of each of the relevant Standards, Codes and Manuals or approved National Standards which are referred to in the Specification. In addition, the Contractor shall keep on Site a copy of any other Standard, Code, Manual, or National Standard, which applies to materials supplied.

Copies of the standards shall be made available for reference at all times at the office of the Supervisor.

Should the Supervisor require an English or Serbian translation of any of the Standards or Manuals, the Contractor shall provide a translation within 7 days of receiving a written request from the Supervisor.

# 

# TECHNICAL SPECIFICATIONS OF THE MOBILE FIRE EXTINGUISHING EQUIPMENT

## Hand-held portable fire extinguishing apparatuses using powder - Technical requirements

The apparatuses shall have cylindrical shape. The range of the jet must be minimum 3 m, and the quantity and pressure of the propellant gas must ensure equal powder ejection. The remaining powder in the tank must not exceed 10% of the original quantity. The apparatuses shall be operational at temperatures from – 20 to + 45oC. The free play of the units for activation of the apparatuses (button, handle, lever ...) must be 3 ± 1 mm, and the hand wheel on the valve of the propellant gas bottle shall have free play at the angle of 30o. The direction of opening of the hand wheel shall be counter-clockwise. The apparatuses shall always be used in the upright position.

The apparatuses having filings over 3 kg (S-6, S-9, S-12) must have the discharge nozzle (with a mechanism for release and interruption of the powder jet) connected to the tank, by means of a flexible hose 800 mm long, and the discharge nozzle and the hose must be of materials that do not conduct electricity. The apparatuses type S shall be delivered filled (the powder and the propellant gas under pressure).

The apparatuses shall be filled with the powder up to 3/4. In smaller apparatuses, carbon dioxide shall be used as the propellant gas and, for bigger apparatuses, nitrogen. The allowable deviation in the filling of apparatuses with powder shall be:

* For apparatuses up to 3 kg: ± up to 3% ;
* For apparatuses over 3 kg: ± 0.2 kg.

The allowable deviation in the quantity of gas under pressure in a steel bottle shall be ± 2%, and the allowable deviation in the pressure of gas in the tank, which is to be under constant pressure, shall be ± 10% of the indicated operating pressure at the temperature of 20oC.

Technical data for hand-held portable fire extinguishing apparatuses using powder:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Apparatus | Powder content [kg] | Gas content  [g] | Gross weight  [kg] | Action time  [s] | Jet range  [m] | Operating pressure  [bar] | Test pressure  [bar] | Safety valve [bar] |
| S-0,5 | 0.5 | 10 | 1.6 | 4-5 | 3–4 | 10–12 | 20-25 | 16 |
| S-1 | 1 | 20 | 2.5-3.2 | 7-8 | 4-5 | 12 | 20-25 | 16 |
| S-2 | 2 | 36-40 | 4.2-5.3 | 8-12 | 4-5 | 12 | 20-25 | 16 |
| S-3 | 3 | 50-60 | 5.5-7 | 12-17 | 4-5 | 12-15 | 20-25 | 16 |
| S-6 | 6 | 120-130 | 11-12 | 12-15 | 4-6 | 12-14 | 22-25 | 16-19 |
| S-9 | 9 | 160-200 | 15.7 | 20-22 | 4-6 | 12-14 | 22-25 | 16-19 |
| S-12 | 12 | 200-250 | 18-19 | 25-28 | 4-6 | 12-15 | 22-25 | 16-19 |

There are various workmanships (versions) of the apparatus type S, but all of them function in the same way in principle.

# VOLUME 3.1

# TECHNICAL SPECIFICATIONS

**FOR THE NATURE-BASED REVITALISATION OF THE CITY PARK IN BAČKA TOPOLA**

The nature-based revitalization of the city park in Bačka Topola consists of the construction of pedestrian and jogging paths as well as a children’s playground. The park in Bačka Topola is located on the cadastral plots 7666 and 5310, while a part of it falls under plot 7300 belonging to the river Krivaja. The total area of ​​the park is 57,945 m2.

The revitalization of the park includes:

* the demolition of the existing walking paths, the preparation of the ground for laying the base and the laying of teraway covering material in an area of ​​1500 m2, as well as establishing chopped bark walking paths in a thickness of 5 cm in an area of ​​620 m2.
* the installation of, 50 LED street lamps of modern design, with a height of 4m along the paths for walking and running, which will be powered from the transformer station on plot 5337/2. The new associated cables will be laid underground, except at the intersections with the Krivaja River at the bridges, where it is planned to place the cables on the bridge structure. The existing fences on the two bridges will be replaced with new fences in accordance with the design of the park’s furniture.
* the clearing and felling of dry, hollow trees along with the removal of the invasive species that have spontaneously developed in the park.
* the plantation of decorative plant species while respecting the selection criteria that favors species that are known to have been present in the park and autochthonous species that tolerate the conditions of the given environment (climatic, pedological and high level of groundwater) and the restoration of the flower beds by planting floral elements in the eastern and southeastern part of the park.
* the establishment of a children's playground, including the procurement, delivery and assembly of multifunctional items for the playground.

# VOLUME 3.2

**TECHNICAL SPECIFICATIONS - The technical description of works**

For the needs of the investor, a conceptual project has been prepared for the revitalization of the park, including the creation of pedestrian and fitness trails on cadastral plots 7666, 7300, 5310, located in the cadastral municipality of Bačka Topola – City, Maršala Tita Street, Bačka Topola. The revitalization does not include works or the use of the water flow of the Krivaja River.

The park revitalization includes landscaping works on the existing flora, detailed in Volume 9 of the landscape project, the arrangement of pedestrian and running trails, detailed in Volume 2.2 of the traffic project, as well as lighting works, described in Volume 4. The architectural design of the park encompasses all previously mentioned components in terms of design, typological shaping, and aesthetics.

The revitalization also involves the reconstruction of the fences of two small bridges over the Jegrička River. At the location of the existing rusty fences, new wrought iron fences will be installed, anchored into the existing concrete bridge structures.

**Multifunctional Children's Playground**

Castle Outer Gate: Overall dimensions of the equipment: minimum 958x1156x440 cm, critical fall height: maximum 173 cm. The equipment is installed on concrete footings with a foundation depth of 90 cm. The structure is made of a steel frame, hot-dip galvanized inside and out – lead-free, providing additional corrosion resistance in outdoor environments and requiring minimal maintenance. Curved structural elements/panels must be made from UV-stabilized recycled PE, at least 19 mm thick, using "ECO Care™" PE, which is durable, environmentally friendly, and recyclable. The safety zone for the equipment is irregular in shape, with dimensions 1254x1362 cm.

**Prefabricated spring rider**

Overall dimensions of the equipment: 36x75x89 cm, critical fall height: 45 cm. The structure is made of a steel frame, hot-dip galvanized inside and out – lead-free, providing additional corrosion resistance in outdoor environments and requiring minimal maintenance. Curved structural elements/panels must be made from UV-stabilized recycled PE, at least 19 mm thick, using "ECO Care™" PE, which is durable, environmentally friendly, and recyclable. The spring rider must be made of high-quality steel springs certified to EN10270 standards. After cleaning with phosphate, the springs are coated with an epoxy primer and finished with a polyester powder coating. They must be anti-pinch for maximum safety and ensure the long lifespan of the equipment. The safety zone for the equipment is irregular in shape, with dimensions 350x236 cm.

The works can be carried out in phases.

**GENERAL TECHNICAL CONDITIONS FOR EXECUTION OF WORKS**

**For the CONSTRUCTION PERMIT PROJECT for the execution of construction works**

All items in the bill of quantities and cost estimates require the execution of each work position unconditionally, professionally, precisely, and with high quality, in accordance with the following: approved drawings, technical description and descriptions in this estimate, details from the building physics report, structural calculations, provided details and subsequent details from the designer, applicable technical regulations, standards, and instructions from the supervisory authority and the designer, unless otherwise specified in the respective position.

All provisions of these general conditions, as well as the mentioned general descriptions, are integral parts of the contract concluded between the investor and the contractor.

All works and materials specified in the descriptions of individual positions in this estimate must be included in the prices offered by the contractor. The agreed prices are the contractor's unit prices, and they include all expenses for labor, materials with standard waste, external and internal transportation, scaffolding and formwork for the execution of works (unless such items are not foreseen in this estimate), water, lighting, operational materials, and machinery energy, warehouses for material storage, temporary construction site facilities, offices, worker premises, temporary fences around the construction site, protective canopies, protective sheets on scaffolding, warning signs, and others, as well as the contractor's overhead, social contributions, all state and municipal fees, contractor's profit, and all other expenses regulated by current laws and regulations for the formation of the sales price of a construction product, including all expenses arising from specific working conditions anticipated in construction standards, as well as the conditions outlined in the previous two paragraphs.

The contractor does not have the right to demand any surcharges on the offered and agreed prices, except where a specific task is explicitly stated to be paid separately and not included in another position. Additionally, no compensation or surcharge on agreed prices will be recognized for increased normal values from average standards in construction.

The calculation and qualification of completed works will be carried out in accordance with current average standards in construction and technical conditions for finishing works in construction, which is binding for both the investor and the contractor unless otherwise specified in the descriptions of individual positions in the estimate. Also, no compensation, i.e. additional payment to the contracted prices in the name of increasing the normal values from the average standards in construction, will be recognized.

The contractor is obligated to use appropriate labor and quality materials for all construction and craft works, as well as the necessary working scaffolding. All materials to be installed must comply with applicable technical regulations, standards, and descriptions of the respective positions in the bill of quantities. The contractor must provide a certificate for each material to the supervisory authority for review before installation. In case of disputes regarding material quality, samples will be submitted to the Materials Testing Institute, whose findings will be binding for both the investor and the contractor. If the contractor continues to use substandard materials despite a negative finding, the investor will order demolition, and all material damages caused by the demolition will be borne by the contractor without any right to complaint or objection to the demolition ordered by the investor or construction inspection.

All material that the representative of the investor states does not correspond to the contractual estimate and the prescribed quality, the contractor is obliged to immediately remove from the construction site, and the investor will stop work if the contractor tries to use it. With all construction and construction craft works, the use of appropriate professional qualified labor is conditioned, as it is stipulated for certain positions of works in the average norms in construction. The contractor is obliged to remove negligent and unprofessional workers from the construction site at the request of the investor. Before the start of each work, the construction site manager is obliged to promptly request from the investor's representative the necessary explanation of plans and notices for all works that are not sufficiently defined by the project report.

Any contractor who, without consulting the investor, performs certain works incorrectly, or performs them contrary to the instructions received through the construction diary, that is, contrary to the provided description, plans and given details, will not be granted any justification. In such a case, the contractor is obliged, regardless of the amount of work performed, to demolish and remove everything at his own expense, and to perform it again at his own expense as provided for in the plans, descriptions and details, unless such changes are made through the construction diary by the investor's representative approved. If the contractor, some work, performs better and more expensively than the expected quality, he has no right to demand additional payment, if he did it on his own, without the prior approval or order of the investor's representative, through the construction diary.

The contractor must keep the buildings and the entire construction site neat and completely clean, and upon completion of the works, before handing over the building, the contractor is obliged to backfill, compact, align, and level the entire surface, all holes, toilet pits, holes from scaffolding and fences so that subsidence does not occur later.

For the technical inspection and handover, the contractor must clean the entire building and construction site of debris, excess materials, all tools, and auxiliary structures.   
All access routes to the building, platforms, stairs, paths, as well as floors in all rooms, must be completely clean, along with all joinery, metalwork, glass surfaces, and roof areas.  
Roadways and sidewalks damaged during construction or transportation must also be restored to proper condition for the technical inspection and handover of the building.

The specified final works are not paid separately, as they are included in the agreed prices. Any damage caused by the contractor during the execution of works within the construction site or to neighboring buildings must be repaired and restored to its original state at the contractor's expense.

Particular attention is drawn to the contractor’s sole responsibility for any damage caused to adjacent existing buildings due to careless or negligent work. If there is a need to secure foundations of neighboring buildings (e.g., underpinning), such work will be paid for by the investor, but the contractor remains solely responsible for any damage resulting from failing to take timely measures to protect neighboring structures.

In the case of structural changes, as well as increases, decreases, or cancellations of certain works from the cost estimate, the contractor is obliged to comply without objections or limitations and without the right to compensation. Any excess or shortage will be calculated at the agreed-upon prices.

If works not covered by the agreed prices in the cost estimate become necessary, the contractor must obtain approval from the investor's representative, determine a price for these works, and record it in the construction logbook, adhering to the material and labor price list, which must be attached with the offer (price analysis).

The investor has the right to require the contractor to provide a written guarantee for specific works (e.g., roof insulation, new materials) ensuring that the performed works are durable and of high quality.

The contractor must coordinate the work of subcontractors who independently carry out certain types of work to avoid mutual interference. If damage occurs due to such interference, the contractor must immediately resolve it at the expense of the responsible party. Otherwise, the contractor will bear the cost of repairing such damages. This also applies to all delays or damages caused by non-compliance with the agreed sequence and schedule of works. The supervising authority may require the contractor to submit samples of new materials for approval, and the acquisition of these samples will not be paid separately.

In addition to any temporary structures necessary for the execution of works, the contractor must provide an office space for the supervising authority, maintaining it in an orderly condition during construction, ensuring lighting, heating, cleaning, and necessary office equipment.

If the contractor requires adjacent land or sidewalks for organizing the construction site or storing materials, they must obtain approval from the relevant authorities or owners and bear the costs themselves, without charging the investor.

The contractor is obligated to prepare a work safety report for the construction site in accordance with the valid "Regulations on Occupational Safety in Construction."

At the technical inspection, the contractor must hand over all legally and regulatory required certificates to the investor (e.g., compliance with regulatory lines, utility connections). The costs for obtaining these documents fall on the contractor.

The contractor must provide proof to the investor that water, electricity, and other charges during the execution of the works have been paid.

The construction logbook and diary must be maintained daily in accordance with legal regulations, with required entries reviewed and signed daily by the investor's representative.

In a "turnkey" contract, the contractor is obliged to conduct a preliminary check of the quantities of works listed in the cost estimate.

The general conditions, along with specific conditions of the investor, existing technical and legal regulations, and the full technical documentation, are integral parts of the contract.

All works must be executed with all necessary structural components flawlessly and according to the designer's details.

Until the handover of the building to the investor, the contractor is fully responsible for all aspects and must rectify any damages or defects at their own expense.

The contractor must assign a highly qualified and experienced professional to the construction site throughout the project, ensuring professional supervision and precise execution of all obligations.

The contractor accepts all obligations outlined in these general descriptions as an integral part of the contract with the investor and agrees to fulfill them without limitations, complaints, or objections.

**EARTHWORKS**

Before commencing earthworks, the contractor is required to:

Clear the land where the structure will be located of weeds, trees, and shrubs.

Mark the building accurately with stakes on-site in the presence of the supervising authority.

Survey the elevation of the entire area affected by the construction at 5.0 m intervals in both cross-sectional and longitudinal directions, recording all data in the construction logbook. This data will later be used for earthwork calculations.

Excavation and backfilling must be carried out precisely according to the plan. Excavation for foundations (footings, foundation slabs, strip foundations) must be perfectly horizontal, adhering to the dimensions and levels specified in the project, with a permissible deviation of ±3.0 cm.

Excavation for wide trenches must follow the perimeter of the foundation footings and boundary walls. Undermining foundation pits to widen them for footings is strictly prohibited, regardless of the soil category.

Excavation to the specified depth for foundation footings must occur immediately before concreting to prevent the foundation base from becoming waterlogged or excessively dry.

The soil category will be determined on-site jointly by representatives of the investor and the contractor, following average standards in construction and temporary technical regulations for earthworks.

Sidewall bracing and protection of neighboring buildings will depend on the soil category and the location of adjacent structures. These activities must be included in the unit price for the corresponding excavation items in the agreed cost estimate, as they will not be paid separately.

If additional excavation protection is required, the contractor must prepare a protection plan in full compliance with applicable legal regulations.

Any damage caused by the contractor due to negligence, unprofessional work, or failure to provide adequate protection must be rectified at the contractor's expense, restoring all to proper condition.

Over-excavation is not permitted. If the contractor excavates deeper than planned or levels the excavation base imprecisely, they are obligated to fill the over-excavated area with compacted concrete (ratio: 100 kg of cement per 1.0 m³ of gravel) at their own cost, to match the planned elevation.

Excavated soil should primarily be used for backfilling around and above foundations, walls, and floors, and for yard leveling if necessary. Any surplus must be removed from the site to a disposal area designated by the relevant authorities. The deposited soil should be spread and roughly leveled.

Pumping of groundwater and work under water will be paid under a separate cost item. Pumping of rainwater and occasional water inflow into foundations will not be paid separately.

Small water inflows are usually removed manually; larger inflows require motor pumps. In cases of significant water inflow necessitating the use of powerful pumps and incurring higher costs, such work will be invoiced separately based on actual costs and legal regulations. Before starting groundwater pumping, the contractor must prepare a project fully compliant with current legal regulations.

Concrete work for foundations must not begin until the excavation has been inspected and approved by the investor’s representative in the presence of the contractor, and the measurement data for completed excavations has been recorded in the construction logbook.

If excavation uncovers remnants of demolished or buried structures not included in the demolition item, such works will be paid separately as unforeseen work, with prices based on actual cost analysis.

If archaeological artifacts are discovered during excavation, the contractor must promptly notify the relevant authorities through the investor's representative, and work in that area must cease until the authorities decide on the continuation of works.

**EMBANKMENTS AND BASE LAYERS**

Embankments and base layers must be constructed immediately after the completion of preceding works to enable uninterrupted progress of other tasks, clear the site of excavated soil, and achieve the most complete and uniform compaction of the embankments. However, before starting the embankments, all necessary measurements of completed works must be taken if this cannot be done after the embankments are built.

All embankments should use clean, healthy soil from the excavations, free from organic matter. Humus and waste materials containing decomposable organic components must not be used for embankments. Depending on the height of the embankment, soil moisture, and other conditions, filling and compaction should be done in layers of 20–30 cm thickness, with occasional wetting of the soil to achieve optimal consistency.

Embankments must be compacted and consolidated mechanically. In all cases, the embankments must be completely stable—similar to natural ground—so that no deformations or damage occur later to structures built on these embankments.

Base layers specified in the project and agreed cost estimate must be made from a natural mixture of clean gravel in the designated layers, measured in a compacted state. Compaction of the base layers should also be performed mechanically; where this is not permitted or possible, compaction must be done manually with great care according to standard methods.

The compaction level of the base layers is determined by the structural designer.

Work performed will be calculated per square meter (m²) or cubic meter (m³), as defined in the descriptions provided in the cost estimate.

**MASONRY WORKS**

Materials used for masonry must be of high quality, and the work must be performed professionally, in compliance with current technical regulations and JUS standards.

Bricks and all other ceramic products used in masonry works must comply fully with JUS standards B. D1. 011 to B. D1. 015/79, B. 01. 016, B. D1. 017/84, B. D1. 022, and B. D1. 030/79.

* **Lime**: Must comply with JUS standard B. C1. 020/81.
* **Cement**: Must comply with JUS standards B. C1. 009/82 and B. C1. 011/82.
* **Sand**: Must comply with JUS standards B. B8. 040/82 and B. B8. 042/84.
* **Gypsum**: Must comply with JUS standard B. C1. 030.
* **Water**: Used for mortar preparation must be clean, free from organic substances that could negatively impact the quality of the mortar, and must comply with JUS standard U. M1. 058.

**Plastering**

The plaster for plastering must conform to the JUS standards U.M2.002 and U.M2.012/68.

Begin plastering walls only after the structure has settled (approximately 2–3 months) and the walls are completely dry at an appropriate ambient temperature. Before starting, clean and gouge wall joints to a depth of at least 15 mm to ensure better adhesion. Walls must be clean and dry or adequately moistened if using cement plaster.

If efflorescence appears on wall surfaces, the contractor is required to clean and wash these areas with a solution of hydrochloric acid in water (1:10 ratio) at their own expense before plastering.

All concrete surfaces, whether cast or constructed with blocks, must be pre-sprayed with a thin cement mortar (1:1 ratio). This process is included in the cost of the project. Plastering is performed in two layers, with a total thickness of 20–25 mm:

The first layer uses coarse, sharp, sieved sand.

The second, finishing layer uses fine sand and is applied after the first layer has dried. The finishing plaster must be sieved through a fine mesh.

Finished surfaces must be smooth and flat, free of waves, dents, or protrusions. Edges can be straight and sharp or slightly rounded, as required by the designer, with clean and precise corners at wall and ceiling junctions.

**Concrete and Reinforced Concrete Works**

All concrete and reinforced concrete works must comply with the "Regulations on Technical Measures and Conditions for Concrete and Reinforced Concrete," Official Gazette of the SFRY, No. 11/87.

For each type of work listed in the project budget, the approximate cross-sectional dimensions and required concrete grade are specified. The contractor must achieve this by determining appropriate proportions of aggregate, binder, and water, testing all samples for strength and other specified characteristics in an authorized laboratory.

Trial cubes must be made in accordance with regulations, and this process must start well in advance of construction to ensure all testing and adjustments are completed before work begins. The results of material testing are binding for both the contractor and the investor, with costs borne by the contractor and included in unit prices.

Structures requiring waterproof concrete are specifically indicated in the budget. If load tests are necessary due to inadequate strength or other deficiencies, the contractor bears all associated costs. For control tests requested by the investor or supervisor, costs are borne by the contractor only if the results are unsatisfactory.

All work must comply with the structural calculations, designs, and approved detailed drawings. Construction must be performed expertly, with qualified personnel under supervision, and using appropriate equipment. Concrete is generally mixed and placed mechanically; manual placement is allowed only for small, non-load-bearing structures with supervisory approval.

**STEEL CONSTRUCTIONS**

The steel structures (roofing, as well as other structural, static, or decorative systems) is constructed from rolled, box-shaped, or tubular profiles, with specified cross-sections and dimensions, in full accordance with the project, static calculations, workshop details, and other instructions and explicit requirements of the designer.

The quality of materials designated for the production of the steel structure must comply with the applicable standards in force (JUS, GOST, ASTM, BS, DIN, etc.).

All assembly connections are executed with bolts of class 5.8 or their equivalents, while welds are made using electrodes E42, GOST 9467-75, or their equivalents specified by other regulations and standards.

For all auxiliary materials, the contractor must provide certification documentation, as well as all necessary images and verification from an authorized organization.

The contractor responsible for assembly work is required to take all necessary measures to ensure the stability and safe further execution of each element at any stage of assembly.

**Welding Technology**

During welding, attention must be paid to minimizing deformation effects resulting from this operation.

Welds must meet the specified quality requirements. If not explicitly indicated, the thickness of the weld must be at least 70% of the smallest thickness of the element.

Before executing individual welds, the precise formation of the project's prescribed geometry must be achieved by "tack welding."

After tack welding, perform an inspection to verify that the geometry prescribed by the project is correctly established, inspect the quality of the tack welds, and, if necessary, reinforce weaker points of previously completed subassemblies.

All temporary welds (tacks) should be performed on the external side, leaving the side designated for final weld preparation clean.

Welding must be carried out manually—arc welding or semi-automatically in a protective argon atmosphere. The surfaces of individual elements in the weld zone must be clean and free of corrosion.

Welding operations should be performed under suitable climatic and atmospheric conditions appropriate for this type of work.

**Protection**  
Anti-corrosion protection of the steel structure must be carried out in accordance with the provisions of regulations on technical measures and conditions for the protection of steel structures from corrosion (Official Gazette of the SFRY No. 32/70). The structure should be painted with two base coats and two final coats of chlorinated rubber-based paint with a layer thickness of 160 microns, fully in accordance with the manufacturer’s prescribed technology and in a tone selected by the designer.

Fire protection of the steel structure must be carried out in accordance with JUS U.J1.070 and JUS U.J1.090 for a duration of 60 minutes or longer, as required by the project.

**Calculation**  
The calculation of performed work is based on the kilogram of the installed structure, protected from corrosion and fire, and finished with final painting. Unit prices include material procurement, production of elements with typical waste, all auxiliary and binding materials, tools, external and internal transportation, installation, scaffolding, protection of completed works until handover to the investor, wages, and all other expenses.

**LOCKSMITHING WORKS**

All locksmithing tasks must be executed and installed professionally and to a high standard, utilizing qualified labor, appropriate tools, and materials that fully comply with technical regulations, norms, and JU standards for this type of work.

The contractor must provide certificates from an authorized institution (e.g., Institute for Materials Testing of RS or similar) for all materials used, confirming that they meet the specified and required purpose. These certificates must not be older than one year from the date of issuance to the date of installation of the locksmithing tasks.

All locksmithing elements must be executed in accordance with the locksmithing scheme from the main project and workshop drawings for each position and installed in locations designated by the project.

The contractor is responsible for producing locksmithing details and execution drawings.  
Upon contract signing and before commencing production, the contractor must submit execution drawings and details to the designer and coordinate them with other construction and installation works in collaboration with the investor's representative.  
All execution drawings and details are subject to the designer's review and approval.

For mass-produced locksmithing items, the contractor must create or secure suitable prototypes. Upon written approval of the prototypes, the contractor gains the right to commence serial production or procurement of corresponding assemblies or complete elements. Other locksmithing tasks may only begin after the approval of execution drawings and details.

Locksmithing elements must be made from standard iron profiles, sheets, drawn box profiles of various cross-sections, pipes, infill made of shaped steel wire, and other materials specified in the description of the position or those not initially included but are necessary, all installed according to the prescribed technological process.

Details of joints, connections, anchoring, etc., must comply fully with JU standards and manufacturer technology, executed with prior consent from the designer and supervisory authority.

All locksmithing items must be properly protected against corrosion and finished with paint.

**Anti-Corrosion Protection**  
Anti-corrosion protection includes the following operations but is not limited to these:

* Degreasing metal profiles and sheets using appropriate agents.
* Cleaning rust through sandblasting with dry, clean quartz sand granules (0.2–3.0 mm) followed by final dust removal with compressed air.
* Priming with an anti-corrosion coating (e.g., red lead, radidolin, or similar) applied in two layers.
* Painting all visible surfaces with two base coats and two final coats of chlorinated rubber-based paint with a thickness of 260 microns, per the manufacturer’s technology and instructions, in a tone selected by the designer.

The required warranty period for paint durability on all locksmithing elements, particularly on façade elements exposed to atmospheric and temperature effects, is ten years.

All locksmithing items, except those procured from other suppliers, are manufactured in the contractor's workshop, including anti-corrosion protection and painting.

The locksmithing elements must be protected and preserved from damage until they are handed over to the investor. If damage occurs to paint, materials, or glass before the technical acceptance, the contractor must replace severely damaged items promptly at their own expense.

Damage to paint or materials is defined as any damage noticeable from a distance of 50 cm.

The unit price for each locksmithing task includes the supply and installation of anchors, anchor plates, brackets, supports, etc., which the contractor installs during the concreting of walls and floor structures, as well as covering rosettes, edge trims, sealing materials, and other necessary components. These will not be separately charged.

The unit price also covers glazing of locksmithing elements. Each task description will specify the type and thickness of glass required for glazing the locksmithing element.

**ALUMINUM WORKS**

This description encompasses all tasks related to the fabrication, delivery, and installation of façade elements, windows, and doors. It includes all required materials, glazing, sealing, preparation of workshop details, sample submission, production and delivery of prototypes, certificates, and attestations, protection of completed works until handover to the investor, cleaning, and other necessary tasks.

Architectural drawings and these descriptions will serve as the basis for preparing workshop details. All façade elements, doors, and windows will fully comply with these general requirements and be executed according to the dimensions and shapes specified in the relevant detailed drawings. Before beginning the preparation of detailed workshop drawings and production of elements, the contractor must verify all measurements.

**Material and Its Characteristics**

The primary material for producing façade elements, windows, and doors will consist of solid or hollow drawn aluminum profiles, anodized in a color chosen by the designer.  
Anchors, screws, bolts, rivets, and other fastening materials will be made of high-quality steel, anti-corrosion sealed, and cadmium-coated. In visible areas, they will have the same finish as the drawn aluminum profiles. Substructures, anchors, spacers, and joints will be made of aluminum, stainless steel, or galvanized steel.

**Fabrication of Elements**

All aluminum elements will be fabricated according to approved workshop drawings and details, using skilled labor and under rigorous factory control.

Connections in frames and corners will be mechanically joined or welded to ensure strong and secure joints. Welded connections must be permanently waterproof and free from damage to the surface coating.

During fabrication, allowances must be made for the permissible expansion and contraction of elements exposed to atmospheric conditions, as well as deformation due to wind pressure. The contractor assumes full responsibility for accurate calculations, quality, and dimensions. Any deformation in aluminum elements, cracks, or breakage of glass due to insufficient or unaccounted-for tolerances will be repaired by the contractor at their own expense.

Aluminum must have a corrosion-resistant coating and protection against chemical reactions between two metals applied before installation.  
Joints and contact points between aluminum profiles and reinforced concrete structures or walls must be sealed with two-component, permanently elastic sealants in a color chosen by the designer.

**Finishing**

All exposed and visible surfaces will be machine-polished to achieve a uniform clean finish, free of defects, paint stains, scratches, and similar imperfections.  
Aluminum profiles will be given a final finish through electrostatic powder coating (dry method) using colors from the RAL color chart in a tone chosen by the designer. This will comply with the recommendations of the European QUALICOAT association and the quality requirements of ISO 9001. Alternatively, they can be anodized with an oxidation layer thickness of 22 microns.

**Seals**

The seals in the couplings should be made of EPDM (ethylene-propylene-dienomonomer) profile.

The suitability and sequence of installation of seals must be carefully studied to ensure optimal performance and required safety. Seals must be of such quality that exposure to temperature and other atmospheric influences cannot affect them. Air and water tightness must correspond to class 2D2. Sealing tapes and sealants are required in all exposed areas.

Sealing joints should be thoroughly cleaned beforehand, and then protected with tape and suitable sealants and other means, in all respects according to the manufacturer's requirements.

The contractor will be responsible for the adequate selection of seals, tapes and gaskets.

**Obligations of the Contractor**

The contractor is required to prepare workshop drawings for all façade elements, doors, and windows, including all joints and details that need to be executed. These drawings must be harmonized with the project and submitted to the designer for approval and certification.

The contractor must provide the designer with samples of aluminum profiles, seals, putties, glass, and other materials, along with certifications for all materials used in the installation.

The preparation of workshop drawings, project harmonization, and submission of samples and certifications will not be separately compensated but are considered a contractual obligation of the contractor.

After the workshop drawings are approved, the contractor is obliged to produce, at their own expense, a characteristic detail measuring 500x500mm. This prototype, along with certifications obtained from the relevant authority, must be submitted to the designer for approval.

Before commencing production, the contractor must verify all opening dimensions on the construction site and create a report signed jointly by the contractor and the investor.

Regular daily cleaning of the construction site during the works and final cleaning of the site after the completion of works are contractual obligations of the contractor. If the contractor fails to adhere to this, a third party will be engaged at the contractor's expense.

**Warranty**

The contractor must provide a manufacturer's warranty for aluminum, auxiliary materials, connection materials, and glass, ensuring that the completed work will remain defect-free for a period of ten years from the date of handover to the investor.

If any defects in materials occur during the work or within the warranty period, the contractor is obligated to rectify them at their own expense.

**Work Accounting**

Work is calculated per square meter or per piece of delivered and installed elements for curtain walls or per piece for doors and windows. This includes:

* Supporting structure
* Filling
* Connection and sealing materials
* Glazing (ordinary or special glass)
* Aluminum powder coating
* Transportation
* Protection
* Other fees and duties.

**FLOORING WORKS**

This general description covers the conditions for the delivery and installation of all floor coverings glued to a previously prepared substrate. These coverings include:

* Textile fibers
* Rubber and PVC materials
* Other materials with specific characteristics (e.g., antistatic floors glued directly to the substrate or raised).

The installation of these coverings is performed by gluing them with appropriate adhesives to a prepared substrate of cement screed or concrete screed (grade 20). Before laying the floor covering, the surface may need to be leveled using a leveling compound (e.g., "Olma" or similar), which is included in the unit price of the floor and is not charged separately.

Before installing floor coverings, the floor surfaces must be inspected, cleaned, dusted, and washed. The coverings are glued to an absolutely clean and dry substrate using certified adhesives that ensure a firm and durable bond between the substrate and the floor covering.

All installed materials must meet relevant RF standards, as evidenced by certification.

At the joints of different types of floors (e.g., carpet to ceramic tile, carpet to parquet, carpet to marble), an oak threshold or brass dividing strip must be installed along the joint, which is charged separately.

**Floor Coverings Made of Textile Fibers**

The installation of machine-made carpets, wall-to-wall carpets, and similar materials of Class I quality with sponge, jute backing, or without backing is planned. The type, quality, color, and pattern of the carpet are determined by the designer based on submitted samples.

In addition to adhesives, carpets can be fixed to the substrate using double-sided PVC adhesive tapes placed along the room's perimeter and at carpet joints.

All carpet seams must be executed perfectly straight, without visible deviations in color, pattern, weave, or fiber alignment. Extensions in rooms requiring them due to width or length must not be narrower than 500 mm.

Along all perimeter walls, unless otherwise specified by the design, the installation of profiled oak skirting boards with a cross-section of 100x20 mm, stained to match the approved sample, and varnished with parquet lacquer is planned. Skirting boards are charged separately per linear meter (m¹).

Carpet flooring is calculated per square meter (m²) based on the type and quality, grouped into separate positions, and includes leveling compound.

**Floor Coverings Made of Rubber and PVC Materials**

The installation of all types of rubber flooring (nodular, ribbed, and flat) and PVC materials in tiles or strips of Class I quality is planned.

The type of rubber or PVC material, color, and thickness are determined by the designer based on submitted samples provided by the contractor and approved by the designer and supervision.

All seams of strips or tiles must be executed perfectly straight, with no visible deviations in color, pattern, or seams. Strips or tiles with improperly cut or damaged edges during trimming must not be used.

Along all perimeter walls, unless otherwise specified by the design, the installation of angular plastic skirting in the color of the floor covering is planned, which is included in the unit price of the floor and is not charged separately.

Flooring is calculated per square meter (m²) based on the type and quality, grouped into separate positions, and includes leveling compound and angular PVC skirting.

**Floors Made of Other Materials with Specific Characteristics**

These floors are installed exclusively according to the manufacturer’s technology by skilled labor.