# VOLUME 3

# TECHNICAL SPECIFICATIONS

**GENERAL REQUIREMENTS**

The Technical Specification is an integral part of the Tender Documentation together with the provisions of the Contract, the detailed design drawings, Building permissions and the other contract documents. The Specification specifies and further develops the requirements for the implementation of the construction works under the Contract.

Implementation of construction 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).

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

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

**2. CONTROL OF WORKS**

The Contracting Authority will provide a supervisor who will supervise construction with investment functions, according to Macedonian legislation and other legal acts in construction works in accordance with Macedonian Law of construction and the PRAG rules, the Contracting Authority will appoint Supervisor with separate contract. The Contracting Authority and / or Investor control 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 found serious defects, errors and low-quality performance, the Contracting Authority shall notify the Contractor that breached the contract and should stop to work. The Contractor shall always provide access to the construction site of the authorized representatives of the Contracting Authority, the investor control and the Supervisor.

**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 within the time stipulated in the Tender. 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 to such order.

**2.2 Protection of existing structures and utilities**

The Contractor shall assume 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.

The Contractor has to pay special attention to avoid any damages on any protected areas.

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

**2.3 Safety and security on site**

Safety and security arrangement should be performed in accordance with Macedonian Construction Law

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

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

Materials incorporated must originate in any eligible source country as defined in Regulation (EU) No 231/2014 of the European Parliament and of the Council of 11 March 2014 establishing an Instrument for Pre-Accession Assistance. However, the goods to be purchased may originate from any country, whenever the total price of the estimated quantity of those goods, as reflected in a separate item of the Breakdown of the Unit Price is below 100.000 €. A category of similar goods to be purchased shall not be broken down over more than 1 item of the Breakdown of the Unit Price.

For these purposes, ‘origin’ means the place where the goods are mined, grown, produced or manufactured and/or from which services are provided. The origin of the goods must be determined according to the EU Customs Code or the applicable international agreement.

When importing goods, any change in the specified origin must be pointed out to the project Supervisor and approved by him.

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 Works.

**2.6 Requirements regarding environmental protection**

In the execution of construction works contractor must confine its action within the construction site. After completion of construction works the Contractor shall reimburse the construction site by the project for development and park arrangement - to withdraw all their machinery and unused materials and leave the site clean of debris and completely finished.

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

**2.8 Responsibility of the Contractor**

Approvals from the Investor Control do not relieve the Contractor from his obligations or responsibilities under the Contract.

**3. ADMINISTRATIVE SPECIFICATIONS**

**3.1 Work Plan and Programme**

Work Plan and Programme for construction should be prepared consistent with the duration of the investment implementation. They should be part of offer and concluded contract.

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.

**3.2 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.

**4. IMPLEMENTATION OF THE WORKS**

**4.1 Materials**

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

All Materials and Plant supplied to perform the Permanent Works under the contract shall be new products. Second-hand Materials and Plant will not be accepted.

The Tender drawings constitute the drawings issued for construction/ installation/ execution.

Any changes of the approved design must be communicated, coordinated and approved by contracting authority.

**4.2 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.

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

**4.3 Inspection and measurement of 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 paid by the Contractor.

**5. PREPARATORY WORKS**

Before starting the works the Contractor has to perform some preparatory works at the site.

**5.1 Boards and signs**

The Contractor shall mount and maintain in good condition a board with the name of the project and the financing institution. The visibility measures must comply with rules laid down in the Communication and Visibility Manual for EU External Actions published by the European Commission

**5.2 Setting out the site**

The Contractor shall in co-operation with the Contracting Authority set out the total site to be used for construction.

**5.3 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.

**5.4 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 his use. The water supply shall be used for construction purposes and for consumption in the temporary facilities.

Power supply

All electrical power required by the Contractor shall be provided by him at his own expense. The Contractor prior to taking-over of the Works shall remove all temporary installations if it is not agreed upon that the Contracting Authority takes over the installations.

**6. ADDITIONAL SPECIFICATIONS**

All provisions and clauses from the Macedonian Construction Law and other codes that are valid obligate the Contractor.

**SPECIFIC REQUIREMENTS**

Construction and adaptation of 10.193m of walking trail – separated on three sections.

* **Section 1** – from church St. Petar and Pavle to St. Petka in v.Podmochani (1801, 42m),
* **Section 2**- from the Church St.Ilija in Grnchary village to St. Georgi in v.Kurbinovo (4782m) and
* **Section 3**- from the church St. Georgi – v.Kurbinovo to St. Holy Mother of God in v. Slivnica (2544 m) and
* second part in Section 3 – with length of 1063 metres.

Beside path sections there are works for

* **Paternal arrangement of the yard of St. Elijah church in Grnchari village**.

These paths are of a great importance for the development of the tourism and for the cultural and historical significance of selected monasteries and the whole Prespa and Pelagonija Region. There are existing paths in certain parts of the route which are with variable dimensions on particular sections but not wide more than 1.0m , with large bumps, without pavements, with large longitudinal and cross slopes on particular sections and with drainage problem of the surface water in some places.

The works will include construction works for paternal arrangement yard of St. Elijah church in v. Grnchari.

All works should be implemented according to national legislation and in line with prepared technical documentation for the path Holy Water.

There are existing paths in certain parts of the route which are with variable dimensions on particular sections but not wide more than 1.0m , with large bumps, without pavements, with large longitudinal and cross slopes on particular sections and with drainage problem of the surface water in some places.

The constructor should perform all the planned activities according to the predicted technical conditions.

The investor is obliged to solve all the legal property issues before the start of the construction works in the construction area as well as to finish all the preparation works such as the organization of the construction site, accommodation for the staff, installation of toilets, sheds for accommodation, sheds for the tools and materials and other necessary contents for placing the HTZ conditions according to the regulations.

The contractor is obliged to hand the Dynamic plan to the supervisory engineer about the construction works which includes: the quantity and type of the works, material and workforce, the available mechanization.

The contractor starts with the construction works after the approval of the working plan.

The supervisor is authorized to stop the construction if there are other works not predicted in the approved working plan which prevent the effective performing of the works.

The excavation type is selected by the constructor according to the available mechanization, terrain conditions and other circumstances.

All the variations from the basic project must be included in the project and the construction paper.

The constructor is also obliged to be concerned with the constructed works until the final realization, technical inspection and the reception and delivery of the work to the investor. Furthermore, the investor is obliged to implement all of the HTZ measures during the construction works.

On the other hand, the supervisor is authorized to control the construction works and can stop the construction due to unprofessional working.

If the material is inserted unprofessionally and contrary to the regulations, the constructor must correct it, to break or undo it on proper account.

The constructor is obliged to accomplish the order given by the supervisor, but if the constructor proves that the order was not properly given by the supervisor then the constructor will have the right of compensation.

After the completed construction works, the constructor is obliged on proper account to clean and to organize the surfaces within the facility and construction site.

All these works the constructor will calculate in single prices and these costs will not be separately charged.

**Section 1 – starting at church St. Petar and Pavle to church St Petka in Podmochani village**

| **Item** | **Description** | **Unit** | **Firm quantities** |
| --- | --- | --- | --- |
| 1 | **PREPARATORY WORKS** |  |  |
| 1 | Marking and securing the route | M1 | 1.804 |
| **2.** | **GROUND WORKS** |  |  |
| 1 | Mechanical excavation of humus and transport to landfill up to 10 km | M3 | 1.257 |
| 2 | Mechanical excavation of rock of IV and V category with a procedure selected by the contractor with loading of material and transport to the landfill provided and insured by the contractor up to 10km. | M3 | 13 |
| 3 | Machine excavation (wide) of material with loading and transport to landfill provided and insured by a contractor | M3 | 113 |
| 4 | Narrow machine excavation of earth material with loading and transport to the landfill up to 10km. | M3 | 193 |
| 5 | Rolling and compacting the bedding | M2 | 927 |
| **6** | Construction of an embankment to the required density with supply and transport from the borrowed. | M3 | 867 |
| 7 | Making the subsoil to the required compaction | M2 | 3.767 |
| 8 | Making slopes | M2 | 2.992 |
| 3. | **DRAINAGE** |  |  |
| 1 | Formation of a land canal in accordance with the details with supply and transport. | M1 | 800 |
| 2 | Supply, transport and installation of MCP Ф1000 complete with input-output head according to the detail shown in the project. | M1 | 9 |
| 4.. | **UPPER LAYER** |  |  |
| 1. | Supply, transport and installation of a buffer layer of crushed stone material with a fraction of 63mm and a final layer of 5cm of white gravel with a fraction of 16mm for the path to the required density of 95 Mp according to the technical conditions. | M3 | 1.031 |
| 5. | **URBAN EQUIPMENT** |  |  |
| 1 | Supply, transport and installation of prefabricated urban equipment from natural materials suitable for the location of the tracks or combined - wood and metal (benches). placed on parts of the tracks, at the choice of the investor | Piece | 10 |
| 2 | Supply, transport and installation of prefabricated urban equipment from natural materials suitable for the location of the tracks or combined - wood and metal (waste bins). placed on parts of the tracks, at the choice of the investor | Piece | 5 |
| 3 | Supply, transport and installation of mounting signs - signposts of natural materials suitable for the position of the paths or combined - wood and metal (signs, signposts) of the investor's choice, as well as marking of trees, stones or rocks, placed on appropriate parts along the paths. | Piece | 3 |
| 4 | Supply, transport and installation of info boards made of natural materials suitable for the position of the paths or combined - wood and metal, at the choice of the investor, placed in appropriate parts along the paths, at the beginning and / or end of the paths | Piece | 2 |
| 5 | Supply, transport and installation of solar lamps of the investor's choice, placed on appropriate parts along the paths, ie at the beginning and / or end of the paths. | Piece | 3 |
| IV | **OTHER WORKS** |  |  |
| 1 | Construction laboratory | Piece | 1 |
| 2 | Performance Project | Piece | 1 |

**Section 2 – starting at church St. Elijah on village Grnchari to church St Gjorgi in Kurbinovo village**

| **Item** | **Description** | **Unit** | **Firm quantities** |
| --- | --- | --- | --- |
| 1 | **GROUND WORKS** |  |  |
| 1 | Levelling of earth masses with machine excavation of earth material and preparation of the embankment to the required compaction. | M3 | 100 |
| 2 | Mechanical excavation of rock of IV and V category with a procedure selected by the contractor with loading of material and transport to the landfill provided and insured by the contractor up to 10km. | M3 | 10 |
| **2.** | **DRAINAGE** |  |  |
| 1 | Supply, transport and installation of MCP Ф1000 complete with input-output head according to the detail shown in the project. | M1 | 41 |
| 3. | **OTHER WORKS** |  |  |
| 1 | Performance Project | Piece | 1 |
| 4. | **URBAN EQUIPMENT** |  |  |
| 1 | Supply, transport and installation of prefabricated urban equipment from natural materials suitable for the location of the tracks or combined - wood and metal (benches). placed on parts of the tracks, at the choice of the investor | Piece | 5 |
| 2 | Supply, transport and installation of prefabricated urban equipment from natural materials suitable for the location of the tracks or combined - wood and metal (waste bins). placed on parts of the tracks, at the choice of the investor | Piece | 2 |
| 3 | Supply, transport and installation of mounting signs - signposts of natural materials suitable for the position of the paths or combined - wood and metal (signs, signposts) of the investor's choice, as well as marking of trees, stones or rocks, placed on appropriate parts along the paths. | Piece | 8 |
| 4 | Supply, transport and installation of info boards made of natural materials suitable for the position of the paths or combined - wood and metal, at the choice of the investor, placed in appropriate parts along the paths, at the beginning and / or end of the paths | Piece | 2 |
| 5 | Supply, transport and installation of solar lamps of the investor's choice, placed on appropriate parts along the paths, ie at the beginning and / or end of the paths. | Piece | 2 |

**Section 3 – starting at church St. Gjorgi in Kurbinovo village to church St Holy Mother of the God in Slivnica village**

| **Item** | **Description** | **Unit** | **Firm quantities** |
| --- | --- | --- | --- |
| 1 | **GROUND WORKS** |  |  |
| 1 | Marking and securing the route | M1 | 2.544 |
| 2 |  |  |  |
| **2.** | **GROUND WORKS** |  |  |
| 1 | Mechanical excavation of humus and transport to landfill up to 10 km | M3 | 1.839 |
| 2 | Mechanical excavation of rock of IV and V category with a procedure selected by the Contractor with loading of material and transport to the landfill provided and insured by the Contractor up to 10km. | M3 | 179 |
| 3 | Machine excavation (wide) of material with loading and transport to landfill provided and insured by a Contractor | M3 | 1.608 |
| 4 | Narrow machine excavation of earth material with loading and transport to the landfill up to 10km. | M3 | 361 |
| 5 | Rolling and compacting the bedding. | M2 | 3.456 |
| 6 | Construction of an embankment to the required density with procurement and transport from a loan | M3 | 491 |
| 7 | Making the subsoil to the required compaction. | M2 | 2.156 |
| 8 | Making slopes | M2 | 5.179 |
| 3. | **DRAINAGE** |  |  |
| 1 | Formation of a land canal in accordance with the details of procurement and transport | M1 | 1.715 |
|  | Supply, transport and installation of MCP Ф1000 complete with input-output head according to the detail shown in the project. | M1 | 40 |
| 4. | **UPPER LAYER** |  |  |
| 1 | Supply, transport and installation of a buffer layer of crushed stone material with a fraction of 63mm and a final layer of 5cm of white gravel with a fraction of 16mm for the path to the required density of 95 Mp according to the technical conditions | M3 | 900 |
|  | **URBAN EQUIPMENT** |  |  |
| 4 | Supply, transport and installation of prefabricated urban equipment from natural materials suitable for the location of the tracks or combined - wood and metal (benches). placed on parts of the tracks, at the choice of the investor | Piece | 5 |
|  | Supply, transport and installation of prefabricated urban equipment from natural materials suitable for the location of the tracks or combined - wood and metal (waste bins). placed on parts of the tracks, at the choice of the investor | Piece | 3 |
|  | Supply, transport and installation of mounting signs - signposts of natural materials suitable for the position of the paths or combined - wood and metal (signs, signposts) of the investor's choice, as well as marking of trees, stones or rocks, placed on appropriate parts along the paths | Piece | 7 |
|  | Supply, transport and installation of info boards made of natural materials suitable for the position of the paths or combined - wood and metal, at the choice of the investor, placed in appropriate parts along the paths, at the beginning and / or end of the paths | Piece | 1 |
|  | Supply, transport and installation of solar lamps of the investor's choice, placed on appropriate parts along the paths, ie at the beginning and / or end of the paths. | Piece | 1 |
|  | **OTHER WORKS** |  |  |
|  | Construction laboratory | Piece | 1 |
|  | Performance Project | Piece | 1 |

**Section 3 – Sub-section of frame of Section 3**

**Starting at St. Gjorgi in Kurbinovo village to church St Holy Mother of the God in Slivnica village**

| **Item** | **Description** | **Unit** | **Firm quantities** |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | **PREPARATORY WORKS** |  |  |  |  |
| 1 | Marking and securing the route | M1 | 1.063 |  |  |
|  | | | | |  |
| **2.** | **GROUND WORKS** |  |  |  |  |
| 1 | Mechanical excavation of humus and transport to landfill up to 10 km | M3 | 927 |  |  |
| 2 | Machine excavation (wide) of material with loading and transport to landfill provided and insured by a contractor | M3 | 603 |  |  |
| 3 | Narrow machine excavation of earth material with loading and transport to the landfill up to 10km. | M3 | 180 |  |  |
| 4 | Rolling and compacting the bedding. | M2 | 897 |  |  |
| 5 | Construction of an embankment to the required density with procurement and transport from a loan. | M3 | 746 |  |  |
| 6 | Making the subsoil to the required compaction. | M2 | 1.127 |  |  |
| 7 | Making slopes | M2 | 2.992 |  |  |
|  | | | | |  |
| 3. | **DRAINAGE** |  |  |  |  |
| 1 | Formation of a land canal in accordance with the detail with supply and transport. | M1 | 828 |  |  |
| 2 | Supply, transport and installation of MCP Ф1000 complete with input-output head according to the detail shown in the project. | M1 | 8 |  |  |
|  | | | | |  |
| 4. | **UPPER LAYER** |  |  |  |  |
| 1 | Supply, transport and installation of a buffer layer of crushed stone material with a fraction of 63mm and a final layer of 5cm of white gravel with a fraction of 16mm for the path to the required density of 95 Mp according to the technical conditions. | M3 | 174 |  |  |
|  | | | | |  |
| 5 | **OTHER WORKS** |  |  |  |  |
| 1 | Construction laboratory | Piece | 1 |  |  |
| 2 | Performance Project | Piece | 1 |  |  |

**4. Paternal arrangement of St Elijah church’s yard in Grnchari village**

**Construction and craft works**

| **Item** | **Description** | **Unit** | **Firm quantities** |
| --- | --- | --- | --- |
| I | **PREVIOUS WORKS** |  |  |
| 1 | Demolition of a wall plinth that reaches the south wall of the church, with lateral delay of the stone. | M3 | 2.30 |
| 2 | Demolition of part of an existing plateau beside south wall, by removing the stones floor tiles and their lateral storage storing, with a possibility of reuse. | M2 | 5.80 |
| **II** | **GROUND WORKS** |  |  |
| 1 | Excision, rough and fine planning of the route of the surrounding sidewalks around the church | M2 | 77.00 |
| 2 | Manual excavation of land surfaces, which are located laterally from the walls of the church, to the elevation of a new layer of gravel, with lateral land delay. | M3 | 10.00 |
|  | Manual excavation of land along the north wall next to elevation – 0.75 below ground, for the purpose of detecting the previously ascertained wall on that side, with depositing the ground laterally from the trench. | M3 | 6.00 |
|  | Manual up to the ground around the west,  the north and east walls of the church and the move from the church to the retaining wall to the west, for drainage performance | M3 | 30.00 |
|  | Planning the bottom of the trench, with formation of the necessary falls for subsequent arrangement of drainage pipes. | M2 | 18.40 |
|  | Perform external drainage around church, with perforated pipes Ф160, class SN4 kN/m2 EN1401, for drainage water.Pipes should be placed on a clay plug. The collecting pipe to be implemented through the existing one | M1 | 29.00 |
|  | Supply and installation of geotextiles, as a filter  on drainage gravel | M2 | 29.00 |
|  | Supply, transport and installation of stones  fractions, 4-8mm, 8-16mm, 16-32mm, | M3 | 26.50 |
|  | Embankment and soil compaction of the part of  geotextile up to the level of exposed gravel for voluminous sidewalks, with simultaneous formation of slopes from the surrounding terrain to the concrete trench and pavements, with  mitigating their decline towards the church | M3 | 3.70 |
|  | Manual loading of the remaining ground into a tractor and transport to landfill up to 30 km distance | M3 | 42.00 |
|  | Procurement and spreading of gravel by compaction, in  layer of 10 cm, under floor layers of pavements | M3 | 1.80 |
|  | supply of quality humus soil, transportation and  its dispersal and leveling of the places where greenery will be planted in the yard | M2 | 52.00 |
|  | Supply and sifting of quality seeds for  English grass | M2 | 52.00 |
| III | **STONE-MAKING WORKS** |  |  |
|  | Supply, transport and installation of ready  concrete ditches on the outer wall of sidewalks, with dimensions 35/15/50 cm, stabilized in a concrete plug. | M1 | 21.00 |
|  | Supply, transport and harassment of the traced  sidewalks around the church with stones,  raw boards with d = 4cm, with irregular form and allowed min. area of 0.2m2, with max. fugue of 3 cm, placed on a buffer of  compacted sand (or gravel) with d = 4-6cm, with  leveled fall from the building to the outside with 2-3%. | M2 | 18.40 |
|  | Preparation of stone stairs, with utilization of the stone from before destroyed retrofits and wall-plinth, built in hydraulic lime mortar, for overcoming  of the height difference at the crossing from the south and north wall to east wall |  |  |
|  | cross section of a ladder - 25x20 cm, with w = 80 cm | M1 | 6.40 |
| IV | **OTHER WORKS** |  |  |
|  | Manufacture, transport and installation of metal  mounting stairs at the corner of the north with  east wall, with four steps in height, with cross section 25 / 20cm and width 80cm,  laid out as one piece. Stairs to be made of side load-bearing pipes with cross section 80/80 / 4mm, with the formation of stairs  with 40/40 / 4mm pipe and corrugated sheet metal tread with d = 5mm. In the calculation taken into account cleaning, scraping the metal, painting with a primer and two coats of metal paint finish of the type "Antico" - in gray tone. | Kg | 95.00 |
|  | Procurement, transport and installation of ready-made, floor PVC-based siphon, with galvanized upper lattice, with dimensions  85/ 10cm, placed in  concrete base, at the lowest part of sidewalk on the north side and connected to  drainage pipe running parallel to the object. | Piece | 1.00 |