

## Section VI

### *TECHNICAL DESCRIPTION / SPECIFICATIONS*

## TABLE OF CONTENT

<b>3.1</b>	<b>GENERAL REQUIREMENTS .....</b>	<b>3</b>
3.1.1	Introduction .....	3
3.1.2	General items .....	5
<b>3.2</b>	<b>TECHNICAL SPECIFICATIONS.....</b>	<b>8</b>
3.2.1	General requirements .....	8
3.2.2	Technical requirements .....	9
<b>3.3</b>	<b>ARCHITECTURE / CONSTRUCTION – CRAFT WORKS .....</b>	<b>29</b>
3.3.1	Technical description .....	30
3.3.2	Technical conditions for execution of works .....	52
3.3.3	Quality Control Program .....	75
3.3.4	B of Q Unit Prize Description .....	78

### **3.1 GENERAL REQUIREMENTS**

These General Requirements take precedence over the Technical Specifications, BoQ and apply to all types of work.

#### **3.1.1 INTRODUCTION**

The General Technical Conditions pertain to all types of works described in the special technical conditions, in the Bill of Quantity and Main Design, as well as the works which may occur during the execution of works and are necessary for completion of project.

The obligation of the Contractor is to study these Technical Conditions in detail, to examine in advance the Main Design and terrain at the construction site, in order to get a clear picture of the type and scope of works involved. In case that the technical documentation is not clear enough, the Contractor should ask for clarifications in written form. If the Contractor finds discrepancies in the technical documentation, he is obliged to inform the Supervisor.

All works included in the Bill of Quantity must be carried out in accordance with the technical description of positions, general technical conditions, requests of the main design, details of the project, as well as requirements of the Supervisor

The Contractor's scope of works shall include all required activities to ensure the correct and proper realization of construction / adaptation and reconstruction works.

The Contractor is responsible for complete and accurate performance of works in accordance with Main Design Notwithstanding the content of the item descriptions below the Contractor will be deemed to have included in his rates and prices the full inclusive cost of carrying out all the works described in the General Technical Conditions.

#### **Standards:**

The stated Technical Description / Specifications are an English translation of the descriptive part of the main project published in Montenegrin. Whenever this document refers to standards (national, European, etc.) and manufacturers, it should be read "or equivalent". Any standard that meets the same functionality and describes the same level of quality or better can be replaced by any of the listed standards.

Specified manufacturer's products Manufacturer's name or catalogue number, if shown in the Technical Description / Specification or indicated on the Drawings or Bill of Quantities, are given only for indicative purposes and for general reference only. It shall be understood that the actual material supplied shall meet the requirements of the Specifications, and if necessary, the material specified under such manufacturer's name or catalogue indicated for reference, shall be modified under the direction of the Supervisor.

#### **Alternative materials:**

If during the course of the Contract certain materials or items required for use in the Works should be unobtainable, despite the best effort of the Contractor, the Contractor may offer for the approval of the Supervisor alternative materials or items, provided that they possess the minimum requirements of the originally specified material. In the event of acceptance of any alternative materials or items a suitable price reduction shall be made in respect of any decrease in value but no price addition shall be made in respect of increase in value.

In the event of refusal of any alternative materials or items the Contractor shall not be relieved of any of his obligations under the Contract and shall be solely liable for any delay or loss occasioned by his failure to provide the material or items as specified.

### **Waste Management Plan (WMP)**

If indicated in the Environment Impact Assessment Decision, the Waste Management Plan shall be prepared and submit for approval to relevant institution. That Plan shall explain how to cater for the safe control and handling of waste, especially old wooden sleepers. WMP shall be submitted in Montenegrin with translation into English language (two copies).

### **Environmental Management Plan (EMP)**

If indicated in the Environment Impact Assessment Decision, the Environmental Management Plan has to describe all necessary measures and monitoring to be applied at the construction site to minimize the impact on the environment. EMP shall be submitted in Montenegrin with translation into English language (two copies).

### **Health and Safety Plan**

The Plan shall be in accordance with all relevant National and International Laws and Regulation. The Plan will be submitted in Montenegrin with translation into English language (two copies).

In the Safety Plan, the Contractor has to describe the actions of protection at work and the participants involved in the works. The plan has to include chapters on, at least: protection of working places, protection of workers, personal equipment, traffic signalization and regulation, procurement and storage of fuel, oil, fire protection during the works.

The Contractor should possess all required equipment described in the Safety Plan, in order to safely execute all works.

### **Testing and Quality control**

The Contractor will arrange all testing and quality control, which will be carried out according to relevant standards by authorized independent institutions. Copies of all the test results must be delivered by the Contractor to the Supervisor immediately after testing. The Supervisor will monitor and control all test results and test certificates according to the Technical Specifications. Unless otherwise specified in the Bill of Quantities the Contractor will bear all the costs of testing and quality control defined in these Technical Specifications.

### **Log Book (Building Log Book)**

The Log Book prepared in two copies shall be kept on the Site and the Contractor's Representative shall record site information on daily basis. The Log Book must be available to the Supervisor, the Employer or other authorised parties under the terms of the Montenegrin Regulation (Law on spatial planning and construction, Official Gaz. of Montenegro no. 064/17, 044/18, 063/18, 011/19). At the Supervisor's request, the Contractor has to provide all necessary information for the daily completion of the works dairy and attachments.

**Measurement Book (Works Register)**

The Measurement Book is where all measurements of the items are registered. The Contractor shall prepare two copies of the Measurement Book and the Book must be available to the Supervisor, the Employer or other authorised parties under the terms of the Montenegrin Regulation (Law on spatial planning and construction, Official Gaz. of Montenegro no. 064/17, 044/18, 063/18, 011/19).

**Inspection Book (Inspection Records)**

The Inspection Book has to be available, in two copies, on the site and where the State Inspectorate registers the visits, comments or orders. The Inspection Book must be available to the Supervisor, the Employer /Contacting Authority under the terms of the Montenegrin Regulation (Law on spatial planning and construction, Official Gaz. of Montenegro no. 064/17, 044/18, 063/18, 011/19).

Note: Construction Permit

The Construction Permit is not part of the Contractors obligation. The Contractor shall assume that the Employer will obtain the Construction Permit.

**3.1.1 GENERAL ITEMS****Contractor's Mobilization & Demobilization:**

The Contractor should organize preparatory works and safety measures on the site. The Contractor should install, maintain and later dismantle all necessary offices, storage for tools, space for materials, service roads, temporary works, information board, deliver required machinery.

The Contractor will secure the construction site, will place the signs, provide lights and guards, and will keep them in position throughout the performance of the works until the handover. During the works execution the Contractor should ensure the safety of all participants in the works as well as security and organization of the construction site.

The Contractor will secure the construction site, will place the signs, provide lights and guards, and will keep them in position throughout the performance of the works until the handover. During the works execution the Contractor should ensure the safety of all participants in the works as well as security and organization of the construction site.

The Construction site has to be generally cleaned after the works are completed and the Contractor has to remove all the machinery which was used on the site.

Unless specifically given in the BoQ items, Contractor's mobilization, demobilization on the site also implies all demolition, dismantling and surveying works on the site, included in unit prices and not paid separately.

**Accommodation for Supervisor**

The Contractor shall provide one working space (desk and a chair) in their own office space for the use of the Supervisor.

**Facility Maintenance Project (hereinafter referred to as As-Built Design) and Operation and maintenance manual**

Contractor shall prepare any required shop drawings and reflect the same on the as-built drawings.

The Contractor shall prepare and submit: As-Built Design in three printed copies and in electronic version all according to the Law on spatial planning and construction, Official Gaz. of Montenegro no. 064/17, 044/18, 063/18, 011/19 and BoQ.

The As-built design shall be accompanied by all relevant records compiled during the construction of the works. The As-built design shall be made available for inspection to Supervisor before official submitting. On completion of the works and not more than 30 days after, the Contractor shall furnish 2 set of As-built drawings to the Supervisor covering the complete construction of the works.

The Contractor shall submit to the Supervisor, all such documentation as well as all warranties and/or guarantees and operation manuals for the installed plant and equipment, all in three copies and in electronic format.

### **Training**

The Contractor shall be responsible for training the selected technical staff employed by the Beneficiary by means of on-site training for each type of equipment and technical appliance and make him/her aware of regular maintenance Specifications, all in accordance with the particular technical specifications.

The training shall cover as a minimum the following:

- The correct operation and understanding of the system, control system and the technology applied;
- Operation of systems and equipment;
- Maintenance procedures;
- Procurement of spare parts and other items that require replacement.

### **Reconstruction and building adaptation (where applicable for Lot)**

In cases of reconstruction and adaptation of a part of the building, it is necessary for the Contractor to take all measures to protect the existing part of the building where construction works are not performed. It is necessary that the Contractor, in the cases of possible damage to that part of the building, which he caused during the execution of works, to reimburse the same at his own expense. It is necessary for the Contractor to protect a construction site and enable uninterrupted work and technological process on the part of the building that is not being adapted. On his own expense.

### **Quality Assurance**

A comprehensive Quality Assurance System (QAS), covering all aspects of the Contract and the Works must be implemented, documented and maintained by the Contractor during the entire implementation period of the Contract.

The QAS shall as a minimum consist of:

- A Quality Assurance plan (QAP)
- A Control Plan (CP)

The Contractor shall make sure that the quality control complies with international standards. Guidance from the following international standards shall be taken from:

- ISO 9000 Standards for the quality control and assurance – Guideline for selection and utilization.
- ISO 9001 Quality system - Model for the quality assurance in conception development, production, installation, and after-sales support.

- ISO 9002 Quality system - Model for the quality assurance in production and installation. - ISO 9003 Quality system - Model for the quality assurance in controlling

and final tests. - ISO 9004 Quality control and element of the quality system – Guidelines.

-ISO 45001: Occupational health and safety (OH&S) management system.

### **Right of Access and Audit**

The Contracting Authority shall be guaranteed unlimited access at any time to all documents and quality assurance documentation associated with the Contract. This also includes the same unlimited access to all production and manufacturing facilities.

When the Contracting Authority wants access to suppliers, manufacturers or sub-Contractors, the Supervisor will give due notice to the Contractor, whereby the time and purpose of the visit will be specified with the agreement of all parties involved.

### **Other Requirements**

The Contractor is obliged to perform all necessary geodetic surveys and checks during construction, reconstruction and adaptation.

The Contractor has to take care of the existing objects, infrastructure installation: electrical, water supply, sewage ... During the execution of works, the Contractor will take all measures to protect the existing structure and infrastructure (cables, pipes, cabinets...). 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.

### 3.2. TECHNICAL SPECIFICATION

#### List of Abbreviation

Abbreviation	Full Reference
ACAD	Auto-CAD- computer aided design
AHD	Average Haul Distance
BoQ	Bill of Quantities
BS	Basement
CA	Contracting Authority
Cca	Circa (approximately)
CE	Conformity European
Const. Book.	Construction Book (presented exec. works)
ČPČ	Pure - Half pure
CSNU	Central Supervisory and Control System
Day	Calendar Day
DD	Detailed Design
DEA	Diesel electric generating set
DN	Diameter Nominal
DNP	Defects Notification Period
DVGW	Deutscher Verein des Gas und Wasserl- ache;(German Technical and Scientific Association for Gas and Water)
EMP	Environmental Management Plan
EN	European Norms
ENEC	European Norms Electrical Certification
EU	European Union
FP	Fire Protection
GC	General Conditions
GF	Ground floor
GRO	Main distribution cabinet
GSIP	Main Bus for Potential Equalization
H&S	Health and Safety
H&S&E	Health, Safety and Environment
HVAC	Heating, Ventilating, and Air Conditioning
ICT	Information and Communications Technolog.
IEC	International Electro technical Commission
ISO	International Organiz. for Standardization
JA	Judicial Academy
JUS	Yugoslavian Standard
KRK	Cable Connection
LAN	Local Area Network
LED	Light-emitting Diode
MCB	Main Circuit Board
Misc.	Miscellaneous
MS	Method Statement
MSDS	Material Safety Data Sheet
OSB	Oriented Strand Board
OSHA	Occupational Safety and Health Administr.
PAC	Provisional Acceptance Certificate
PCT	Perforated Cable Tray
PE	Poly Ethylene
PM	Project Manager
PP	Polypropylene
PRAG	Procedures and Practical Guide



PVC	Polyvinyl Chloride
QAP	Quality Assurance Plan
QAS	Quality Assurance System
RAL	Colouring system (Reichs-Ausschul3 für Lieferbedingungen und Gtitesicherung)
RC	Reinforced Concrete
MNE	Montenegro
TMP	Trafic Management Plan
TS	Technical Specifications
TUV	Technischer Überwachungsverein (Technical Inspection Association)

### **3.2.1 GENERAL**

#### **3.2.1.1 CONSTRUCTION SITE**

##### **3.2.1.2 Fencing of the Construction Site**

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

The Contractor shall fence the construction site, in the parts where external and internal works are planned.

The fence shall be installed in line with the regulations on occupational health and safety and a sketch of the construction site approved by the Supervisor.

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.

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.

The Contractor shall be aware of existing restrictions and shall be responsible for their observance during construction.

The Contractor shall be liable for all damages on the existing infrastructure caused by him - they shall be repaired at its expense.

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.

The Contractor shall identify and hold harmless the Contracting Authority against any accusations arising from its failure to comply with the above point, including legal fees and costs.

At finalization of works (Provisional Acceptance), all temporary fences, gates and signs erected by the Contractor must be removed.

The item shall be paid as a lump sum.

##### **3.2.1.3 Visibility**

A Signboard, prepared according to the "Visibility Guidelines of the European Union", shall be fixed on the temporary fence adjacent to the entrance gate to the site as well as Rulebook about shape and outlook of the construction building board (Official Gazette of Montenegro no.040/17, from 27.10.2017)

The Contractor shall obtain instructions from the Supervisor regarding information to be displayed on the signboard. The dimensions and text on the board shall be as per the requirements in the latest version of the EU "Visibility Guidelines" which can be found at <https://ee.europa.eu/europeaid/funding/communication-and-visibility-manual-eu-external-actions> en.

All supplied goods must comply with requirements laid down in the "Communication and Visibility in EO-financed external actions". For the purpose of visibility and clarity of labeling, all hardware shall have a solidly fixed metallic or solid plastic label. Self-adhesive paper or film is not allowed. The EU emblem must prominently feature and the phrase "provided with the financial support of the European Union" in English and Montenegrin. Events such as a "hand-over ceremony" should be envisaged and implemented according to visibility requirements.

The Contractor shall not undertake or allow bill posting or advertising of any kind upon the Works without the written consent of the Supervisor. The item shall be paid as a lump sum.

#### **3.2.1.4 Temporary Site Facilities**

The Contractor, prior to the start of construction works, shall submit a draft Design for the organization 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.

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.

The item shall be paid as a lump sum.

#### **3.2.1.5 Facilities and Equipment for the Contractor and the Supervisor**

The Contractor shall hand over the fully equipped office to the Supervisors within 2 weeks of being ordered to do so.

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.

The Contractor shall procure, at its own risk and expense, all additional facilities outside the site that may be necessary for its work.

#### **3.2.1.6 Offices for the Supervisor**

All offices for the Supervisor shall have at least two grounded electrical sockets, rooms exceeding 10 m<sup>2</sup> floor areas, having at least one additional socket per 5 m<sup>2</sup> 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 Supervisor.

The Contractor shall arrange internet connection. The item shall be paid as a lump sum.

#### **3.2.1.7 Protective Equipment for the Supervisor**

The Contractor shall initially provide the Supervisor with protective clothing and equipment, as follows, and, as the Supervisor considers necessary, provide replacement items under the provisions for maintenance of the Supervisor's facilities. Prior to making this provision, the Contractor shall obtain a list of appropriate sizes from the Supervisor. As and where the Contractor's methodology, activities or planned testing program may require additional protective equipment (such as gloves, earplugs, goggles, torches etc.) the Contractor shall make these available to the Supervisor when the need arises.

The item shall be paid as a lump sum.

#### **3.2.1.8 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.

The item shall be paid as a lump sum.

#### **3.2.1.9 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, the Contractor shall give strict instructions to all its employees to use the sanitary accommodation provided at the site.

The item shall be paid as a lump sum.

#### **3.2.1.10 Storage of Equipment and Materials in Public Space**

Construction materials and equipment shall not be stored outside the site borders. All documents and requests for approval have to be submitted to the Supervisor. Approvals and instructions are given exclusively by the Supervisors.

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.

The item shall be paid as a lump sum.

#### **3.2.1.11 Traffic Arrangements**

The Contractor shall, as far as be 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. The item shall be paid as a lump sum.

### **3.2.2 CONTRACTOR'S GENERAL RESPONSIBILITIES**

#### **3.2.2.1 Management of the Project by the Contractor**

The Contractor shall provide the Quality Assurance Plan(QAP) for the management and execution of construction works.

The QAP should reflect the management structure and clearly describe the duties, responsibilities and powers of each member of the Contractors' staff.

The representative of the Contractor and its staff must possess experience and qualifications according to the contract, MNE Law and type and scope of works.

The QAP will be updated and provided again whenever there is a change in personnel.

#### **3.2.2.2 Approval and Instruction by the Supervisor**

All requests for instruction, approval of documents and drawings should be submitted to the Supervisor. The Supervisor is the only actor who can give instruction, direction or approval to the Contractor.

The Supervisor will supervise the works and give instructions according to Law on Planning and Construction and PRAG requirements defined by these TS and Contract.

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

#### **3.2.2.3 Quality Assurance Plan**

The Contractor shall be responsible for assuring such quality of materials, works and processes that shall comply with the requirements of the Specifications.

In order to meet the specified requirements, the Contractor shall implement Quality Assurance System presented in Quality Assurance Plan (QAP) 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.

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 Organization chart containing names, CVs and duties of all key personnel whether or not they are related to quality assurance directly.

The item shall be paid per piece of completed documents.

#### **3.2.2.4 Work Program**

### **3.2.2.5 Form of submissions**

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

### **3.2.2.6 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 to the Supervisor for approval according to this Contract.

### **3.2.2.7 Work program**

Pursuant to the requirements, the Work Program to be submitted by the Contractor shall show the planned monthly rates of progress between the program 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 Program 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 Contract.

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 Program for each component.

The Contractor shall allow in its Program 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 Program sufficient time required for Provisional Acceptance and for the maintenance periods (Defects Notification Period) as stipulated in the Contract.

### **3.2.2.8 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:

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

When actual work progress differs from that shown in the Construction Program, 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" program in respect of work carried out. It shall be submitted within ten working days of the following month at the latest.

Processing of the Interim Payment Certificate (IPC) is conditioned with completed Progress Report. According to Special and General Conditions to the Contract

### **3.2.2.9 Progress Photographs**

Digital color 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 labeling each photography (location, date when taken and a brief description or title).

The item shall be paid as a lump sum.

### **3.2.2.10 Contractor's Design Documentation**

For the Design, works and supply use of metric units is compulsory.

All documents will be issued in English. The official documents, which are to be presented to authorities (such as for the purpose of the issuance of permits, of an inspection, etc.), will be issued in Montenegrin language too.

Works documentation (see Chapter 3.1.4.) will be in English and in Montenegrin, except Construction Log, which will be in Montenegrin.

Reports and correspondence documentation will be in English and in Montenegrin.

When submitted as electronic files, the documents shall be compatible with the following formats: texts in MS Word, tables in MS Excel, drawings in ACAD, time schedules in MS Project.

During the entire Project, the Contractor is obliged to act in line with the Contract with all applicable annexes, PRAG rules and regulations and all laws and standards valid at the time of execution of activities. Laws and regulations include, but are not limited to Law on Spatial Planning and Construction of Structures, Law on Occupational Health and Safety, Fire protection regulations, etc.

### **Design for execution**

The Contractor shall prepare, in accordance with MNE legislation, Main design drawings included in this Tender Dossier and taking into account the Contracting Authority's Requirements, written in the present Technical Specifications.

In course of development of the Design for execution, the Contractor is obliged to foresee all necessary provision for access of disabled persons to the premises.

### **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, all according to Rulebook on the manner of keeping and content of the construction log and construction book (Official Gazette of Montenegro, no.068/18, from 19.10.2018 :

- Inspection Book (forms laid down by the MNE Law)
- Construction Log (forms laid down by the MNE Law)
- Measurement Book (forms laid down by the MNE Law)

- All necessary certificates (for material, equipment and other) during the works execution.

The Contractor (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 Contractor (Site 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 The Supervisor will ensure that all documents are prepared in line with the Contractual requirements, PRAG guidelines and current local legislation.

### **Modification of main design**

Any Modification of the revised master plan due to deficiencies and unforeseen circumstances should be considered and regulated in accordance in accordance with Law on Spatial Planning Construction of Structures- "Official Gazette no. 064/17 od 06.10.2017, 044/18 od 06.07.2018, 063/18 od 28.09.2018, 011/19 od 19.02.2019, 082/20 od 06.08.2020), article 97.and 98.

### **Operation and maintenance manuals**

The Contractor shall provide comprehensive operation and maintenance manuals for the delivered equipment including a full technical description and operational characteristics thereof. The Contractor shall provide 2 copies in both English and Montenegrin of each of the manuals bound loose leaf in ring binder folders.

Manuals shall be prepared in accordance with the approved standard. Manuals shall also be subject to the approval of the Supervisor.

The item shall be paid as a lump sum.

## **3.2.3 HEALTH & SAFETY AND ENVIRONMENT PROTECTION**

### **3.2.3.1 Health & Safety**

#### **3.2.3.2 Health and Safety Plan and other 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, labor, and other persons authorized 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 Organizational plan for the management and execution of the works. The Contractor shall:

- Fully comply with the Law on Safety and Health at Work (Official Gazette of the Montenegro, no 34/2014 and 44/2018);
- Appoint a member of staff responsible for all matters related to health and safety for the duration of the Contract according to MNE regulations;
- Provide and maintain equipment in a safe working condition and adopt safe methods of work



- Adopt methods for the use, handling, storage, transport, and disposal of materials, and substances which are not injurious to health and safety;
- Provide and maintain adequate lighting, signing, and fencing of the Works;
- 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
- Provide and maintain access to all places on the Site in a condition that is safe and without risk of injury
  - Provide and maintain adequate water, waste water and waste collection, for all offices, workshops, and laboratories erected on the Site;
  - Provide and maintain adequate sanitary units at locations where works are in progress;
  - 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;
  - Report all accidents to the Supervisor and appropriate authorities at the time of occurrence or as soon as possible thereafter.

The item shall be paid per piece of completed documents.

### **3.2.3.3 Testing and certification of mechanization and equipment**

The Contractor shall provide and maintain equipment for lifting, embedding and transporting materials and must comply with all relevant requirements of the standards in Montenegro.

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.

The Contractor shall prepare and update construction sites according to MNE Law. 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.

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.

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.

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.

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.

The Contractor shall ensure access to sites at all times to any authorized external institutes or experts carrying out safety inspections.

#### **3.2.3.4 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.

#### **3.2.3.5 Environmental Protection**

##### **3.2.3.5.1 Environmental Management Plan and other general requirements**

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.

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.

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. 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.

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

An 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.

The item shall be paid per piece of completed documents.

##### **3.2.3.5.2 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 works in accordance with the Specifications, the Design and drawings.

#### **3.2.3.5.3 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, service and fuel ingress, 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.

#### **3.2.3.5.4 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 Montenegrin 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.

#### **3.2.3.5.5 Air quality**

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.

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.

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.

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.

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.

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.

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.

#### **3.2.3.5.6 Noise**

The Contractor shall consider noise as an environmental constraint in its planning and execution of the Works. 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.

### **3.2.3.5.7 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:

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

## **3.2.4 MATERIALS**

### **3.2.4.1 General**

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.

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.

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 attestations and suppliers' certificates, all according to TS and MNE regulations.

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.

### **3.2.4.2 Origin**

Certificates of origin have to accompany the products proving that supplies originate from an eligible country as stated in general Conditions (GC) of the Contract. List of eligible countries and territories may be found in the annex on "Rules on participation in procurement procedures and grants" to the Practical Guide on procurement and grants for European Union external actions (PRAG) on the following link:

<http://ec.europa.eu/europeaid/prag/annexes.do?annexName=A2a&lang=en>

### **3.2.4.3 Conformity of Materials**

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

- Requirements of the local legislation (Law on construction products ("Official Gazette of Montenegro", no. 018/14 from 11.04.2014, 051/17 from 03.08.2017), Rulebook on construction products (Official Gazette of Montenegro" no.082/16 from 29.12.2016, 041/18 from 28.06.2018, 039/20 from 28.04.2020);
- 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.

### **3.2.5 TECHNICAL REQUIREMENTS FOR EXECUTION OF WORKS**

#### **3.2.5.1 Technical Requirements**

#### **3.2.5.2 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 analyzed and measured items in the unit prices of the existing ones.

#### **3.2.5.3 General Terms**

##### **3.2.5.3.1 Notice of commencement**

In accordance with the provisions of the Law - Article 90 [Application of adaptation works], the owner or holder of another right on the existing facility or part of the facility is obliged to submit a report on adaptation works to the competent inspection body (Ministry of Sustainable Development and Tourism - Urban Development Inspectorate), which is given on Form 4 of the Rulebook on application forms, applications and statements in the procedure of construction of facilities ("Official Gazette of Montenegro", No. 070/17 of 27.10.2017, 060/18 of 07.08.2018).

The Contractor shall give a written notice to the Supervisor of its intention to commence works (Notice of Commencement). The works shall not be commenced until written approval has been received from the Supervisor.

##### **3.2.5.3.2 Technical specifications 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 (MEST), common practice of trade and circumstances for their execution. Nevertheless, it is understood that, whenever local regulations, local standards (MEST), 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 (MEST), 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 (and also the Designer), during the works will be carried out exclusively through the Supervisor. The Beneficiary is responsible for the design. Any communication with the Designer is through the Beneficiary because the Designer is not party to the contract signed.

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.

ICS number	Standard number	Year	TITLE
03.120.10	MEST EN ISO 9000:2016	2016	Quality management systems - Fundamentals and vocabulary
	MEST EN ISO 9001:2016	2016	Quality management systems-Requirements
	MEST EN ISO 9004:2018	2018	Quality management - Quality of an organization - Guidance to achieve sustained success
	MEST ISO/TS 9002:2019	2019	Quality management systems - Guidelines for the application of ISO 9001:2015
	MEST ISO 10002:2009	2009	Quality management - Customer satisfaction - Guidelines for complaints handling in organizations
	MEST ISO 10005:2009	2009	Quality management systems - Guidelines for quality plans

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 nearly 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 Law on Spatial Planning and Construction of Structures.  
For all works, applicable MNE regulations and standards shall prevail.

#### **3.2.5.3.3 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 MNE standards and codes of practice shall apply. In any case, if Montenegrin 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 Montenegrin 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.

#### **3.2.5.3.4 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.

#### **3.2.5.3.5 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;

#### **3.2.5.3.6 Mechanical and Electrical Installations**

The term "Mechanical and Electrical Installations" shall mean the obligations of the Contractor under the Contract to cover all manufacturing, delivery, assembling and installation, testing and commissioning of the required mechanical and electrical equipment and machinery for the proper completion of Works, which shall be performed by the Contractor.



The following shall be included, but not limited to, within the limits of the Works:

- Mechanical and electrical equipment and machinery, including motors and pumps and spare parts;
- Complete piping system, incl. armatures and fittings
- All other auxiliary materials of any description and all materials
- Spare parts for fixed and mobile mechanical equipment

#### **3.2.5.3.7 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.

#### **3.2.5.3.8 Subcontracted Work**

The Contractor shall appoint subcontractors for the work for which the Contractor is not experienced, recognized or approved. All documents and requests for approval have to be submitted to the Supervisor. Approvals and instructions are given exclusively by the Supervisors.

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.

#### **3.2.5.3.9 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 for approval. The Supervisor will review and provide its comments within 10 days. The Contractor shall make final corrections (if any) and submit it 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.

#### **3.2.5.3.10 Provisional Time Schedule**

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

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.

#### **3.2.5.3.11 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 Montenegrin 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.

#### **3.2.5.3.12 Technical specifications of the mobile fire extinguishing equipment**

The apparatuses shall have cylindrical shape. The apparatuses shall be operational at temperatures from- 20 to+ 40°C. The free play of the units for activation of the apparatuses (button, handle, lever ...) must be  $3 \pm 1$  mm, and the hand wheel on the valve of the propellant gas bottle shall have free play at the angle of 30°.

The apparatuses shall be delivered filled.

The apparatus should be delivered with attests and manuals in both English and Serbian language. Maintenance and handling have to be described in detail in manuals and training for the staff has to be obtained by the Contractor. The Contractor is obliged to prepare evacuation plan and also prepare graphical presentation of the evacuation plans and place them along the building.

Record on the fillings, tests, and other characteristics on the apparatus have to be presented on the technical service card.

##### **3.2.5.3.12.1 Hand- held portable apparatus type CO2**

The apparatuses with carbon dioxide are made with the activation handle or with the valve wheel. Each apparatus has an upward pressure tube, but the high-pressure valve design may differ and depends on the manufacturer of the apparatus.

The apparatuses with the activation handle have a spring, the resistance of which is overcome by manual force, whereby the valve closing device moves downwards, opening the path to carbon dioxide.

The apparatuses are used in the upright position, and the handle enables their easier carrying.

Apparatus	Quantity of filling[kg]	Temperature range[°C]	Gross weight [Kg]	Action time [s]	Jet range [m]	Operating pressure [bar]	Test pressure [bar]	Safety VALVE [bar]
C02-5	5	-20 / + 40	20	20	2-3	56	190	175

The item shall be paid per piece.

### 3.2.5.3.12.2 Hand- held portable apparatus type S-9A

These apparatus are used for extinguishing of fires of liquid substances (petrol, oil, benzene, alcohol, ether, paints, varnishes, greases, etc.), gaseous substances (methane, propane, acetylene, etc.), and for fires of solid substances, as well as for fires on electrical equipment and installations.

A range of the jet must be minimum 2 meters. The valve of the apparatus must enable interruption of the jet and apparatuses must be provided with a discharge nozzle, and the apparatus of 5 kg must also be provided with a hose 0.8 meters long. Such apparatuses operate at temperatures from- 20 to+ 35°C, winter filling, and from-20 to+ 40°C, summer filling.

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

Apparatus	Powder content [kg]	Gas content [°C]	Gross weight [Kg]	Action time [s]	Jet range [m]	Operating pressure [bar]	Test pressure [bar]	Safety VALVE [bar]
S-9	9	160-200	15.7	20-22	4-6	12-14	22-25	16-19

The item shall be paid per piece.

**CONTENT**

	<b>Technical Description / Specification</b>	<b>Corresponding Folder from Main Design</b>
<b>01</b>	<b>Architecture / Construction – craft works</b>	<b>1.1</b>

*VOLUME 3*

*TECHNICAL DESCRIPTION / SPECIFICATIONS*

*01 ARCHITECTURE / CONSTRUCTION – CRAFT WORKS*

*TECHNICAL DESCRIPTION*

Object:	P.I. Vocational High School in Bar
Location:	C.P. No 4669, C.M. Novi Bar, Bar
Investor:	
Total Gross area:	5136,68m <sup>2</sup> (before facade) / 5209,00m <sup>2</sup>
Total Nett area:	4536,02m <sup>2</sup>
Stories:	3 (GF+2)

## INTRODUCTION

Based on the projected task submitted by the Investor, the project documentation was prepared - the main project for the adaptation of the building of the Public Institution Secondary Vocational School in Bar.

## EXISTING SITUATION

The subject building of the school is located on the C.P. No. 4669, C.M. Novi Bar, Municipality of Bar, is a free-standing, divided base, floors GF + 2 (in the part GF + 1), frame dimensions 55x105m.



The structural system of the building is a reinforced concrete skeletal system with wall panels for horizontal stiffening. The mezzanine and roof constructions are reinforced - concrete monolithic profiled (cast on the spot forming profile ribs).

The roofs are flat, impassable, insulated with bituminous waterproofing and partially repaired by installing a PVC membrane of ballast type (above the gym) and sloping with a covering of flat copper sheet metal folded on the spot.

The current condition of the building in terms of the envelope is unsatisfactory in terms of several elements, as follows:

Existing roofs do not have adequate thermal insulation. The condition of bitumenized waterproofing is partially in poor condition and since the movement of atmospheric water that penetrates through the insulation into the building is not directly related to the places of insulation damage and the exact location of damage cannot be determined, the entire insulation is repaired.

Copper folded sheet metal as a covering of sloping roofs is in bad condition due to poor connection with the substrate, missing parts and the fact that due to the patination of the surface, partial repair is not visually acceptable.

The existing facade is in bad condition, with separate plaster surfaces, lack of thermal insulation layers, damaged paint and the appearance of mold due to long exposure to atmospheric precipitation;

The existing facade joinery (wooden and metal in part) is in bad condition in terms of functionality, and do not satisfy the minimum requirements for achieving energy efficiency parameters. Part of the facade joinery was replaced during the previous renovation works with new PVC joinery. Part of the facade positions are with protective window grilles made of box profiles of black locksmiths.

The primary analysis of the existing state of the building is related to the energy state of the building as a whole, ie. of its individual parts which form the envelope.

By detailed auscultation of the entire building, as well as analysis of the original project documentation according to which the building was constructed, we came to the following data - elements needed to analyze the energy performance of the facility and conclusions related to the decision to implement measures to increase energy efficiency in the function of sustainability and profitability of the investment itself.

### **ANALYSIS OF THE CONDITION OF THE EXISTING ENVELOPE OF THE BUILDING *(floors in contact with the ground, walls, roof and facade joinery)***

#### **a. CONSTRUCTIONS IN CONTACT WITH THE GROUND - FLOOR**

##### **CONSTRUCTIONS ON THE GROUND / PVC**

1. PVC,  $t = 0.2\text{cm}$
2. Perlite mortar,  $t = 3\text{cm}$
3. Cement screed,  $t = 1.5\text{ cm}$
4. RC slab,  $t = 7\text{cm}$
5. Bitumen insulation,  $t = 0.6\text{ cm}$
6. RC slab,  $t = 7\text{cm}$
7. Gravel,  $t = 15\text{cm}$

##### **CONSTRUCTIONS ON THE GROUND / Ceramics**

1. Ceramics,  $t = 1,0\text{cm}$
2. Glue,  $t=0,25\text{cm}$
3. Perlite mortar,  $t = 3\text{cm}$
4. Cement screed,  $t = 1.5\text{ cm}$
5. RC plate,  $t = 7\text{cm}$
6. Bitumen insulation,  $t = 0.6\text{ cm}$



7. RC slab,  $t = 7\text{cm}$
8. Gravel,  $t = 15\text{cm}$

#### **CONSTRUCTIONS ON THE GROUND / Parquet**

1. Parquet,  $d = 1,0\text{cm}$
2. Perlite mortar,  $t = 3\text{cm}$
3. Cement screed,  $t = 1.5\text{ cm}$
4. RC plate,  $t = 7\text{cm}$
5. Bitumen insulation,  $t = 0.6\text{ cm}$
6. RC slab,  $t = 7\text{cm}$
7. Gravel,  $t = 15\text{cm}$

#### **b. FACADE WALLS**

##### **CONSTRUCTION OF FACADE WALLS / RCzwall**

1. Smooth and paint
2. Lime mortar,  $t=1,5\text{cm}$
3. Reinforced concrete wall,  $t=20\text{cm}$
4. Extension mortar,  $t=1,5\text{cm}$

##### **CONSTRUCTION OF FACADE WALLS / concrete block**

1. Smooth and paint
2. Lime mortar,  $d=1,5\text{cm}$
3. Concrete block,  $d=20\text{cm}$
4. Extension mortar,  $t=1,5\text{cm}$

#### **c. ROOFS (flat)**

##### **ROOF CONSTRUCTION / flat roof**

1. Bituminous waterproofing,  $t=\text{cca } 2\text{cm}$
2. Fall layers - perlite concrete,  $t=3\text{cm}$
3. Bituminous steam dam,  $t=\text{cca } 1\text{cm}$
4. Reinforced concrete monolithic slab, slab thickness =  $12\text{cm}$
5. Extension mortar,  $t=1,5\text{cm}$

##### **ROOF CONSTRUCTION / flat roof (above gym)**

1. Ballast layer - gravel,  $t = 5\text{-}10\text{cm}$
2. Protective layer - Geotextile -  $300\text{gr} / \text{m}^2$
3. PVC waterproofing membrane,  $t = \text{min } 1.5\text{ mm}$
4. Separating layer - Geotextile -  $300\text{gr} / \text{m}^2$
5. Bitumen waterproofing,  $t = \text{approx. } 2\text{cm}$
6. Substrate layers - perlite concrete,  $t = 3\text{cm}$
7. Reinforced concrete monolithic slab  $st = 12\text{cm}$
8. Production mortar,  $t = 1.5\text{ cm}$

#### **d. ROOFS (sloping)**

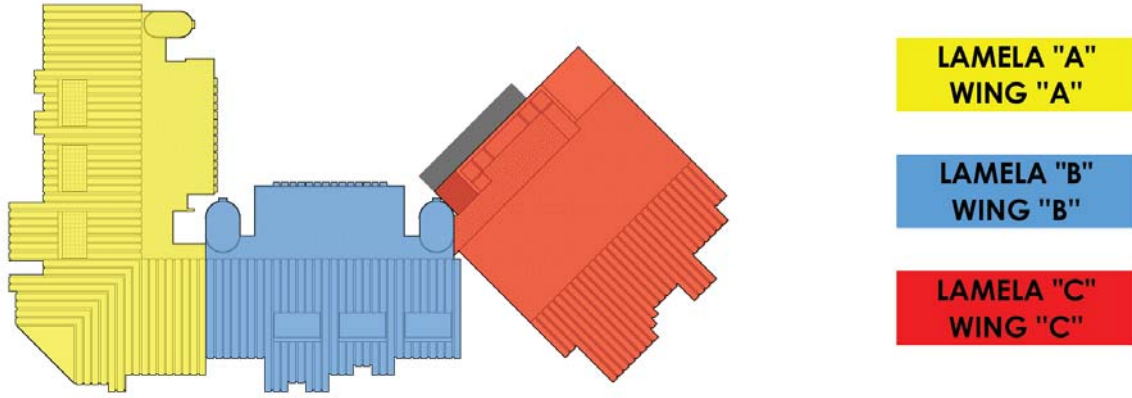
##### **ROOF STRUCTURE / sloping roof**

1. Copper flat sheet metal folded on site
2. Plywood,  $t = 1.8\text{cm}$
3. Thermal insulation - mineral soft wool,  $t = 3\text{cm}$
4. Reinforced concrete monolithic slab  $st = 12\text{cm}$
5. Extension mortar,  $t = 1.5\text{ cm}$

Considering the fragmentation of the building, as well as the fact that all planned works can be performed in phases, in the project documentation the building is divided into three wings - zones, as follows:

Wings „A and B“ – classrooms/ labs and administrative part and

Wing „C“ – gym with accompanying facilities.



## AREA OF EXISTING / DESIGNED SITUATION

BILANS POVRŠINA PRIZEMLJA AREA OF GROUND FLOOR						
Br. / No.	Naziv prostorije/ Name of the room	Finalna obrada podova / final floor treatment	Finalna obrada zidova / final wall treatment	Finalna obrada plafona/ final ceiling treatment	Neto površina/ Neto area	
lamela "B" / wing "B"	1 Vjetrobbran / Windshield	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	15,88m <sup>2</sup>	346,73m <sup>2</sup>
	2 Glavni hol / Main lobby	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	330,85m <sup>2</sup>	
lamela "A" / wing "A"	2' Hodnik 1 / Corridor 1	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	149,66m <sup>2</sup>	836,93m <sup>2</sup>
	3 Amfiteatar / Amphitheater	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	186,81m <sup>2</sup>	
	4 Kabinet 1 / Classroom 1 - Lab	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	77,15m <sup>2</sup>	
	5 Toalet 1 / Toilet 1	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,88m <sup>2</sup>	
	6 Kancelarija 1 / Office 1	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	24,32m <sup>2</sup>	
	7 Kancelarija 2 / Office 2	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	24,32m <sup>2</sup>	
	8 Zbornica / Assembly hall	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	58,95m <sup>2</sup>	
	9 Toalet 2 / Toilet 2	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,88m <sup>2</sup>	
	10 Hol 2 / Lobby 2	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	95,49m <sup>2</sup>	
	11 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	15,45m <sup>2</sup>	
	12 Kancelarija 3 / Office 3	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	22,86m <sup>2</sup>	
	13 Kancelarija 4 / Office 4	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	23,45m <sup>2</sup>	
	14 Kancelarija 5 / Office 5	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	23,36m <sup>2</sup>	
	15 Kancelarija 6 / Office 6	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	23,36m <sup>2</sup>	
	16 Kancelarija 7 / Office 7	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	23,45m <sup>2</sup>	
	17 Kancelarija 8 / Office 8	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	22,86m <sup>2</sup>	
	18 Kancelarija 9 / Office 9	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	47,68m <sup>2</sup>	
lamela "B" / wing "B"	19 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	12,19m <sup>2</sup>	321,55m <sup>2</sup>
	20 Toalet 3 / Toilet 3	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,51m <sup>2</sup>	
	21 Kabinet 2 / Classroom - Lab 2	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	56,56m <sup>2</sup>	
	22 Kabinet 3 / Classroom - Lab 3	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	55,15m <sup>2</sup>	
	23 Ostava 1 / Storage room 1	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	22,39m <sup>2</sup>	
	24 Ostava 2 / Storage room 2	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	7,12m <sup>2</sup>	
	25 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	14,55m <sup>2</sup>	
	26 Kabinet 4 / Classroom - Lab 4	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	70,81m <sup>2</sup>	
	27 Kabinet 5 / Classroom - Lab 5	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	60,52m <sup>2</sup>	
	28 Kancelarija 10 / Office 10	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	13,75m <sup>2</sup>	
lamela "C" / wing "C"	29 Hol 3 / Lobby 3	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	24,25m <sup>2</sup>	855,71m <sup>2</sup>
	29' Hodnik 2 / Corridor 2	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	29,56m <sup>2</sup>	
	30 Svlačionica 1 / Dressing room 1	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	12,46m <sup>2</sup>	
	31 Toalet 4 / Toilet 4	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	1,85m <sup>2</sup>	
	32 Toalet 5 / Toilet 5	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	1,85m <sup>2</sup>	
	33 Svlačionica 2 / Dressing room 2	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	18,11m <sup>2</sup>	
	34 Toalet 6 / Toilet 6	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	1,85m <sup>2</sup>	
	35 Toalet 7 / Toilet 7	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	1,85m <sup>2</sup>	
	36 Svlačionica 3 / Dressing room 3	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	7,78m <sup>2</sup>	
	37 Fiskulturna sala / Gym hall	Parket / Parquet	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	585,08m <sup>2</sup>	
	38 Pomoćna prostorija sale 3 / Utility room for gym hall	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	91,33m <sup>2</sup>	
	39 Pomoćna prostorija sale 2 / Utility room for gym hall	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	79,74m <sup>2</sup>	
Ukupna neto površina prizemlja / Total net area ground floor					2360,92m <sup>2</sup>	
Ukupna bruto površina prizemlja / Total gross area ground floor					2742,30m <sup>2</sup>	



BILANS POVRŠINA I SPRATA AREA OF 1ST FLOOR					
Br.	Naziv prostorije/ Name of the room	Finalna obrada podova / final floor treatment	Finalna obrada zidova / final wall treatment	Finalna obrada plafona / final ceiling treatment	Neto površina/ Neto area
lamela "A" / wing "A"	1 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	15,44m <sup>2</sup>
	2 Hodnik 1 / Corridor 1	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	19,49m <sup>2</sup>
	3 Hodnik 2 / Corridor 2	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	105,79m <sup>2</sup>
	4 Kabinet 6 / Classroom - Lab 6	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	77,79m <sup>2</sup>
	4' Pomoćna prostorija 1 / Auxiliary room 1	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	5,29m <sup>2</sup>
	5 Kabinet 7 / Classroom - Lab 7	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	49,71m <sup>2</sup>
	6 Terasa 1 / Terrace 1	Keramika / Ceramic	Deko, fas, malter / Deco, facade plaster	Deko, fas, malter / Deco, facade plaster	26,01m <sup>2</sup>
	7 Pomoćna prostorija 2 / Auxiliary room 2	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	19,84m <sup>2</sup>
	8 Kabinet 8 / Classroom - Lab 8	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	49,71m <sup>2</sup>
	9 Terasa 2 / Terrace 2	Keramika / Ceramic	Deko, fas, malter / Deco, facade plaster	Deko, fas, malter / Deco, facade plaster	26,01m <sup>2</sup>
	10 Pomoćna prostorija 3 / Auxiliary room 3	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	19,84m <sup>2</sup>
	11 Kabinet 9 / Classroom - Lab 9	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	49,71m <sup>2</sup>
	12 Terasa 3 / Terrace 3	Keramika / Ceramic	Deko, fas, malter / Deco, facade plaster	Deko, fas, malter / Deco, facade plaster	26,01m <sup>2</sup>
	13 Arhiva / Archive	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	36,35m <sup>2</sup>
	14 Toalet 1 / Toilet 1	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,17m <sup>2</sup>
	15 Kabinet 10 / Classroom - Lab 10	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	46,34m <sup>2</sup>
	16 Pomoćna prostorija 4 / Auxiliary room 4	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	9,89m <sup>2</sup>
	17 Kabinet 11 / Classroom - Lab 11	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	47,04m <sup>2</sup>
	18 Toalet 2 / Toilet 2	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,17m <sup>2</sup>
lamela "B" / wing "B"	19 Hol / Lobby	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	54,73m <sup>2</sup>
	20 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	22,74m <sup>2</sup>
	21 Toalet 3 / Toilet 3	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,19m <sup>2</sup>
	22 Kabinet 12 / Classroom - Lab 12	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	46,34m <sup>2</sup>
	23 Pomoćna prostorija 5 / Auxiliary room 5	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	9,88m <sup>2</sup>
	24 Kabinet 13 / Classroom - Lab 13	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	46,34m <sup>2</sup>
	25 Toalet 4 / Toilet 4	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,19m <sup>2</sup>
	26 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	22,74m <sup>2</sup>
	27 Hodnik 3 / Corridor 3	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	68,39m <sup>2</sup>
	28 Kabinet 14 / Classroom - Lab 14	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	48,84m <sup>2</sup>
	29 Terasa 4 / Terrace 4	Keramika / Ceramic	Deko, fas, malter / Deco, facade plaster	Deko, fas, malter / Deco, facade plaster	24,62m <sup>2</sup>
	30 Pomoćna prostorija 6 / Auxiliary room 6	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	20,76m <sup>2</sup>
	31 Kabinet 15 / Classroom - Lab 15	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	48,84m <sup>2</sup>
	32 Terasa 5 / Terrace 5	Keramika / Ceramic	Deko, fas, malter / Deco, facade plaster	Deko, fas, malter / Deco, facade plaster	24,62m <sup>2</sup>
	33 Pomoćna prostorija 7 / Auxiliary room 7	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	20,76m <sup>2</sup>
	34 Kabinet 16 / Classroom - Lab 16	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	48,84m <sup>2</sup>
	35 Terasa 6 / Terrace 6	Keramika / Ceramic	Deko, fas, malter / Deco, facade plaster	Deko, fas, malter / Deco, facade plaster	24,62m <sup>2</sup>
	36 Kabinet 17 / Classroom - Lab 17	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	22,70m <sup>2</sup>
lamela "C" / wing "C"	37 Hodnik 4 / Corridor 4	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	55,66m <sup>2</sup>
	38 Kabinet 18 / Classroom - Lab 18	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	68,18m <sup>2</sup>
	39 Ostava 2 / Storage room 2	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	9,78m <sup>2</sup>
	40 Ostava 3 / Storage room 3	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	7,58m <sup>2</sup>
	41 Toalet 5 / Toilet 5	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	7,58m <sup>2</sup>
	42 Tribine / Grandstand	Beton / Concrete	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	121,99m <sup>2</sup>
Ukupna neto površina I sprata / Total net area 1st floor					1489,51m <sup>2</sup>
Ukupna bruto površina I sprata / Total gross area 1st floor					1586,43m <sup>2</sup>

BILANS POVRŠINA II SPRATA AREA OF 2ND FLOOR					
Br.	Naziv prostorije/ Name of the room	Finalna obrada podova / final floor treatment	Finalna obrada zidova / final wall treatment	Finalna obrada platfona/ final ceiling treatment	Neto površina/ Neto area
lamela "A" / wing "A"	1 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	15,44m <sup>2</sup>
	2 Hodnik 1 / Corridor 1	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	19,49m <sup>2</sup>
	3 Pomoćna prostorija 1 / Auxiliary room 1	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	5,21m <sup>2</sup>
	4 Pomoćna prostorija 2 / Auxiliary room 2	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	5,21m <sup>2</sup>
	5 Pomoćna prostorija 3 / Auxiliary room 3	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	4,68m <sup>2</sup>
	6 Toalet 1 / Toilet 1	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,17m <sup>2</sup>
	7 Pomoćna prostorija 4 / Auxiliary room 4	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	9,05m <sup>2</sup>
	8 Kabinet 19 / Classroom - Lab 19	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	54,33m <sup>2</sup>
	9 Pomoćna prostorija 5 / Auxiliary room 5	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	19,12m <sup>2</sup>
	10 Kabinet 20 / Classroom - Lab 20	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	54,33m <sup>2</sup>
	11 Toalet 2 / Toilet 2	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,17m <sup>2</sup>
	12 Hodnik / Corridor	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	146,79m <sup>2</sup>
lamela "B" / wing "B"	13 Hodnik / Corridor	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	119,74m <sup>2</sup>
	14 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	24,00m <sup>2</sup>
	15 Toalet 3 / Toilet 3	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,19m <sup>2</sup>
	16 Kabinet 21 / Classroom - Lab 21	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	54,33m <sup>2</sup>
	17 Pomoćna prostorija 6 / Auxiliary room 6	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	9,05m <sup>2</sup>
	18 Pomoćna prostorija 7 / Auxiliary room 7	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	19,20m <sup>2</sup>
	19 Kabinet 22 / Classroom - Lab 22	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	54,33m <sup>2</sup>
	20 Pomoćna prostorija 8 / Auxiliary room 8	PVC	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	9,05m <sup>2</sup>
	21 Toalet 4 / Toilet 4	Keramika / Ceramic	Poludisperzivna boja-keramika / Semi-dispersive paint - ceramic	Poludisperzivna boja / Semi-dispersive paint	8,19m <sup>2</sup>
	22 Stepenište / Staircase	Keramika / Ceramic	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	22,74m <sup>2</sup>
	23 Pomoćna prostorija 9 / Auxiliary room 9	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	3,39m <sup>2</sup>
	23 Pomoćna prostorija 10 / Auxiliary room 10	Gumeni pod / Rubber floor	Poludisperzivna boja / Semi-dispersive paint	Poludisperzivna boja / Semi-dispersive paint	3,39m <sup>2</sup>
Ukupna neto površina II sprata / Total net area 2nd floor					685,59m <sup>2</sup>
Ukupna bruto površina II sprata / Total gross area 2nd floor					807,95m <sup>2</sup>
Ukupna neto površina objekta / Total net area of the building					4536,02m <sup>2</sup>
Ukupna bruto površina objekta / Total gross area of the building					5136,68m <sup>2</sup>

After the installation of the contact thermal insulation facade "demit", the total gross area of the building increases from **5136.68 m<sup>2</sup>** to **5209.00 m<sup>2</sup>**.

## DESIGNED SITUATION

### 1. PREPARATORY AND DEMOLITION AND DISASSEMBLY WORKS

Demolition and dismantling works include removal of part of the roof coverings - complete flat folded copper sheet from all sloping roofs, removal of existing facade joinery (excluding already replaced positions of PVC joinery), roof lanterns from all positions, as well as associated protective window grilles from all positions;



## 2. MASONRY WORKS

Masonry works include the treatment of all slats on the inside after the installation of the planned positions of the facade carpentry, as well as the repair of cement screeds after the removal of floor ceramics on the terraces on the first floor;

Spalettes are processed according to the following description - stages of processing depending on the condition of the spalette after removal of existing and installation of planned positions:

- Level 1 damage: Manual plastering with extension mortar 1: 3: 9 including all necessary pre-works, application of appropriate substrate (if it is an opening in a concrete wall), as well as protection of planned carpentry, floors and walls;

Level 2 damage: Installation of gypsum boards  $t = 1.25$  cm by direct gluing with a suitable adhesive, including the purchase and installation of corner metal strips to strengthen the corners.

The average width of the spalette on the inside is 20cm.

## 3. INSULATION WORKS

Insulation works include renovation of existing flat roofs by installing thermal insulation and making a new PVC membrane of ballast type according to the following description:

Installation of insulation (thermal insulation and waterproofing) of the flat roof part with direct overflow into the horizontal gutter. The waterproofing is a PVC membrane of ballast type (with a load of gravel layer) "Sikaplan-SGmA 1.5 (TrocAl® SGmA, 1.5 mm)" or equivalent. Waterproofing is performed with prior installation of thermal insulation - XPS  $d = 8$ cm with all the accompanying layers, and according to the following description (and details from the project "D1 and D2");

1. Cleaning the complete roof from the remains of leaves, various impurities as well as cutting the branches of the surrounding trees that lean on the building;
2. Installation of evaporators (charged separately);
3. Separating layer - geotextile 300gr / m<sup>2</sup> (between the existing bitumen waterproofing and the planned thermal insulation. Geotextile is placed with an overlap of at least 10 cm;
4. Thermal insulation, XPS min. 30gr,  $t = 8$ cm;
5. Separating layer - geotextile 300gr / m<sup>2</sup>;
6. PVC waterproofing elastic, multilayer, synthetic, waterproofing membrane  $d =$  min. 1.5mm based on modified polyvinyl chloride (PVC) with glass veil reinforcement intended for use with ballast - load (not fixed to the substrate except the rim - along the attic) "Sikaplan-SGmA 1.5 (TrocAl® SGmA, 1.5 mm)" or equivalent. It is installed by overlapping and welding the joints in accordance with the manufacturer's instructions;
7. Mechanical fixing of the membrane around the perimeter of the entire roof towards the gutter through a gravel stop ("S-Gravelstop Bracket Profile" or equivalent), as well as through a type drip made of laminated sheet metal, in all respects according to EN ISO 9001/14001;
8. Protective - drainage and separating layer - geotextile  $d = 6$ mm type "Sika / S protection sheet RS 6mm" or equivalent (between PVC membrane and ballast layer - gravel). Geotextile is laid with overlaps of min. 15cm;
9. Ballast layer of gravel, granulation 16-32mm, river, washed, without impurities. It is placed in a layer thickness of 5 cm (in the field), 8 cm (perimeter in a width of 1

m from the attic) and 10 cm in the corners - gravel, due to differences, the thickness of the layers is calculated separately;

All layers of waterproofing are raised along the vertical elements (contact zones with the walls) in everything according to the technical description of the works and details from the project. PVC membrane should meet EN 13956 quality standards, as follows:

- Welding resistance to tearing  $\geq 500\text{N} / 50\text{mm}$  (EN 12317-2);
- Shear weld resistance  $\geq 300\text{N} / 50\text{mm}$  (EN 12316-2);
- Fire resistance EN 13501-1 - Vapor permeability EN 1931;
- Tensile strength EN 12311-2;
- Impact resistance EN 12691;
- Resistance to static loads EN 12730;
- Resistance to root penetration - satisfactory (prEN 13948);
- Dimensional stability EN 1107-2.

Protection of waterproofing from the influence of wind force, ie. the exact amount of gravel ballast layer and possible number and arrangement of fixers, the direction of installation of the membrane and the width of the membrane - report according to the calculation (Eurocode EN-1991-1-4 (2005)), made by the supplier.

#### **Waterproofing on terraces floors (positions of previously removed ceramics)**

Production of waterproofing of floors and parts of walls within terraces on the first floor with a coating based on polymer cement ("SIKA elastic" 152 or equivalent). Treat all corners with waterproof tape ("SIKA stop seal" or equivalent). Insulate according to the following description:

1. Cleaning and dusting of the cement screed and the wall zone approx. 20 cm high;
2. Gluing of waterproof tape "SIKA stop seal" or equivalent at all corners - floor - wall crossings;
3. Gluing of the appropriate glass mesh reinforcement mesh on all sanitary elements of penetration through the floor (drains) in the dimensions prescribed by the manufacturer of the sanitary element and
4. Coating the floor and wall to a height of approx. 10 cm with polymer - cement waterproofing "SIKA elastic" 152 or equivalent. The insulation is coated in two layers, with cross strokes of the appropriate brush at the interval prescribed by the manufacturer, but not less than 1.5 hours.

#### **4. SHEET METAL - ROOFING WORKS**

Sheet metal works includes the production of the roof covering of all sloping roofs at the positions of the existing copper sheet, as well as its accompanying sheet metal edging at the positions of sloping and flat roofs.

For all sheet metal - covering works, galvanized plasticized flat sheet metal  $d_{min} = 0.55\text{ mm}$  in green color is provided, which is the closest to the existing green - copper patina (RAL 6021 - 6028). The planned sheet metal for hemming is according to the same qualitative description. When delivering sheet metal to the construction site, it is necessary to enclose complete attest documentation.

Fasteners for roofing sheet are suitable self-tapping screws anti-corrosion protected with galvanizing (as well as wood screws), head M8mm, with steel plastic washer  $\varnothing 14\text{mm}$  with EPDM membrane made of synthetic rubber resistant to aging at high

temperatures (from min. -50 to + 1200C) as well as dilatation movements of the sheet metal roof covering by min. 1cm by 10m.

All used sheet metal must meet the standards ISO 9001: 2008 and ISO 14001: 2004 as well as the criteria set by the EU standard EN14782 for sheet metal products.

Covering sloping roofs with flat steel galvanized plasticized sheet metal hand-folded on site according to the principle and geometry in everything according to the existing sheet metal (copper) covering. Covering is done according to the following description by procurement and installation:

1. Steam dams - PVC construction foils  $t = 0.15\text{mm}$ ;
2. Longitudinal slats (beams) for ventilation dim. 5x12cm at an axial distance of approx. 50cm (between two 100 cm wide gutters). Fixing directly to the AB roof structure with concrete screws;
3. Thermal insulation (between longitudinal battens - beams) - mineral soft wool  $d = 10\text{cm}$  (not placed in the vertical parts of the roof overhangs, as well as in positions over 50cm from the facade wall - cold zone of the roof eaves);
4. Installation of protective PVC construction foil  $t = 0.15\text{mm}$
5. OSB boards over longitudinal slats / beams. The boards are  $t = 18\text{mm}$  and are fixed by screwing for longitudinal slats / beams with wood screws;
6. Separating layer - vapor-permeable waterproof foil;
7. Longitudinal batten in the middle of the distance between the gutters (approx. 50 cm from the gutters), dim. 4x5cm. The batten is used to join the sheets by folding on the spot. It is fixed to the central longitudinal batten / beam through the OSB board with wood screws;
8. Cover sheet from the general description. The sheet metal is laid as flat by folding on site on a similar principle as the existing copper sheet. Horizontal joints are provided by folding the dropped seam while applying a sealant to the folding surface of the seam. Longitudinal folding is done over the central slat with the insertion of a cover sheet metal strip above the slat itself.

The position includes all the necessary material from the description, all the accompanying unspecified edgings (eaves, edging, lantern edgings, etc.), as well as the assembly and disassembly of the required scaffolding. Calculation per  $\text{m}^2$  of the developed area of the sloping roof, including sloping gutters within the roof, as well as all edge drips on the eaves.

Sheet metal edgings contain elements of: roof attics - eaves and roof drop beams, lantern attics and superstructures above the stair verticals, and after the installation of the PVC roof membrane. The edging is made of galvanized steel plasticized sheet metal  $d = 0.6\text{ mm}$ , in all respects according to the technical description and details from the project (Details "D1 - D10")

Note:

To harmonize the phasing and dynamics of roofing works with the works on the installation of FeZn strips of lightning distribution and their anchors and fixers that are connected to the sheet metal.

## 5. CERAMIC WORKS

Floor ceramics within the terraces on the floor (positions from which the existing ceramics are removed) are placed in the ceresit CM 11 ceramic adhesive or equivalent with open joints  $d = 1\text{mm}$ . Tiles are in mild tones, dimensions 40x40 - 60x60cm. The position includes the installation of plinth ceramics cut from the floor, height  $h = 7\text{-}10\text{cm}$ , grouting, siliconizing the joint of plinth ceramics and the wall, as well as cleaning and washing the surface with water. After laying the ceramics and



grouting, the surfaces are cleaned and washed with water, which is included in the price.

Ceramics must have slip (floor) and acid-resistant properties (also applies to grout), which is proven by the manufacturer's documentation, as well as the appropriate attestation documentation for specifically selected ceramics.

Floor porcelain tile in color / decor of natur concrete of lighter tone ("Pamesa Belgio Perla" or visual equivalent), in the range of dimensions 30x30 - 60x60cm, d = min. 10mm.

## **6. JOINERY - LOCKSMITH WORKS - facade aluminum joinery**

Facade joinery is made of aluminum profiles type "Alumil M11500 Alutherm Plus" or technical equivalent - with interrupted thermal bridge over the polyamide insert. The final treatment of the facade joinery profile is plastic coating in white (RAL 9003 or visual equivalent). Glazing of all doors and headlights up to a height of approx. 2.4 m is done with thermal insulation glass package "pamplex" multilayer safety glass 3.3.1 t = 6mm / package 6 + 16 + 6mm (in both packages it is mandatory to use one low-emission glass / coating / Low E). The overhead lights are glazed with thermopane glass 4 + 16 + 4mm (inside Float glass, and outside low-emission with solar factor (g) less than 45%).

The characteristics of aluminum hardware that must be met are the following (specified values and classes are the minimum that must be satisfied):

1. Thermal insulation (profile) in accordance with EN ISO 10077-2,  $U_f \leq 2.3 \text{ W} / \text{m}^2\text{K}$ ;
2. Thermal insulation of packages / products in accordance with EN 1077Uw  $\leq 1.8\text{W} / \text{m}^2\text{K}$ ;
3. Air. permeability in accordance with EN 12207 - Class 4; EN 12208 - CLASS E750; EN 12210 - CLASS C4;
4. Watertightness in accordance with EN 12208 - Class 9A;
5. Wind pressure resistance (blow test) in accordance with EN 12210 - Class C5;
6. Mechanical requirements EN 12400 - Class 2;
7. Load capacity of the wing mechanism min. 130kg;
8. Certificate for glass EN 673;

Pay special attention to the highly mounted ventus wings, which must be equipped with high-quality fittings and provide a quality opening system in the lower zone of the opening. The command of these openings should be with a rope - a tug lowered at an elevation of max 1.50m from the floor. Openings and channels in the condensate drainage profiles must be with mandatory covers on the outside of the drainage opening. The cover must also be protected from falling due to atmospheric influences.

All entrance door positions are equipped with hydraulic door closers with the possibility of locking in the open position;

Positions include the purchase and installation of aluminum profiles for additional reinforcement of facade hardware, all according to graphic attachments.

The position of the window includes the purchase of all the necessary fittings, mechanisms for opening the tilt -turn window - rope - pull and installation of aluminum. seam and inside PVC sill benches (windows) depending on the position.

The position marks are from the graphic part "Designed situation".

The obligation of the Bidder / Contractor is to submit the required attest documentation which proves the satisfaction of the required characteristics of the facade locksmith from the position description.

## 7. LOCKSMITH WORKS - facade PVC joinery

Facade joinery is made of PVC profiles. The system of windows and entrance doors should be made of multi-chamber (at least five-chamber) PVC profiles, minimum profile width 70 mm, in accordance with the RAL quality standard (which includes resistance to UV radiation, twisting, etc.)

The maximum value of thermal conductivity of the profile should be  $U_f \leq 1.3 \text{ W / m}^2\text{K}$ .

The reinforcement of the profile should be in accordance with the specification of the supplier of the profile (from galvanized steel profiles of appropriate thickness as stiffening and reinforcement, and reinforcement of all corners and connections for permanent preservation of the given window geometry).

Glazing of all doors, headlights and skylights is done with thermopane glass 4 + 16 + 4mm (inside Float glass, and outside low-emission with a solar factor (g) less than 45%). The positions indicated in the items below are glazed with a thermal insulation glass package "pamplex" multilayer safety glass 3.3.1 d = 6mm / package 6 + 16 + 6mm (both packages require the use of one low emission glass / coating / Low E).

Provide a minimum of two sealing rubber bands around the circumference of the frames and sash. The minimum performances that the finished product must provide and which must be proven through an official certificate are:

EN 12207 - CLASS 4;

EN 12208 - CLASS 8A;

EN 12210 - CLASS C4;

All windows are equipped with inside PVC sill benches and aluminum outside sill board.

Supply carpentry with high-quality nickel-based and AL-alloy fittings ("Winkhaus Activ Pilot" or technical equivalent), handles, locks and keys.

Pay special attention to highly mounted ventus wings that must be equipped with high quality fittings. The command of these openings should be a rope - a tug lowered at an elevation of max 1.50m from the floor. The openings and channels in the condensate drainage profiles must be fitted with lids on the outside of the opening. The cover must also be protected from falling due to atmospheric influences.

All entrance doors are equipped with a hydraulic mechanism for automatic door closing (for double-leaf entrance doors, the mechanism is installed on the primary wing).

All window positions are equipped with aluminum outside sill board and inside PVC sill benches.

### GENERAL NOTE FOR JOINERY - LOCKSMITH WORKS:

Take all measures on the spot. Before making and submitting the final workshop drawings and cutting lists by the Contractor, adjust them to the specific positions and requirements of users (in terms of direction and relationship of opening / wing / ventus, and similar minor corrections that do not affect the final price of the finished product).

## 8. LOCKSMITH WORKS – protective window grilles

Protective grilles are provided at all positions from which they were previously removed and include the production and installation of protective window grilles at all positions of the facade joinery F10, as well as the rehabilitation of existing, temporarily removed in advance. The new grilles are made of box profiles of black hardware, dimensions 20x20x1.5-2mm, from which both the frame and the filling are

made. All joints are made by welding, and fixing to the walls via existing anchors (from existing pre-removed gratings).

The position includes all the necessary work and supporting material, sanding all welds with an abrasive fan to level the surfaces, anti-corrosion protection in two coats and final coating with white polyurethane varnish (RAL9003) in two layers with protection of all surrounding surfaces, as well as assembly and disassembly of the required scaffolding. The existing, pre-removed window grilles are ground to metal, then protected and finally processed in accordance with the above description and installed in the same positions. Calculation per piece of installed gratings.

## 9. PAINTING WORKS

The position of the painting works includes the painting repair of all the spalettes from the inside after the installation of the facade PVC joinery. Position includes:

- Smoothing in two hands with grinding to the required flatness and smoothness. The price includes all the necessary pre-work (scraping as needed) as well as the cost of protecting the finished final surfaces (windows, doors, etc.) and the installation of corner aluminum moldings and
- Painting of spalettes and contact zones with walls with water-based acrylic matte latex paint. All surfaces intended for painting must be previously cleaned, dusted and applied with a suitable substrate / primer with additives against the appearance of mold, in one layer, and white.

## 10. FACADE WORKS

The position of facade works includes three main items:

- Production of thermal insulation contact "demit" facade;
- Construction of the facade in the part where thermal insulation is not provided and
- Processing of spalettes after installation of new positions of facade PVC and aluminum joinery.

Production of contact thermal insulation "demit" facade at all positions defined by the project. Thermal insulation of facade walls is provided with expanded polystyrene EPS with a thermal conductivity coefficient  $\lambda_{\max} = 0.037 \text{ W / mK}$  and a thickness of 8 cm (on 3-5 cm joists), which is produced according to the appropriate EN standards. The composite exterior thermal insulation system (ETICS) should be ETAG 014 certified.

The lower part of the façade walls, at the height of the ground floor (all sills and plinths in ground floor, pillars and parts of solid walls), treated with harder insulation material, extruded polystyrene XPS thickness  $d = 8\text{cm}$  (min 5cm in socle part) which is more resistant to mechanical damage, nominal heat conductivity in the range  $\lambda = 0.035\text{--}0.04 \text{ W / mK}$ .

Thermo plates are "folding" - seamed, flammability class B1 (DIN 4102 B1 heavy flammability, incombustibility and self-extinguishing), with vertical width breaks 50cm, placed along the entire facade at a maximum distance of 20m, as well as horizontal breaks of 50 cm above the opening on the part of the mezzanine structures made of TP mineral wool flammability class A1.

Before starting the installation of thermal panels, the following works must be completed:

- All works on the flat roof, including sheet metal work;
- Replacement of facade joinery;
- Installation of all planned installations on the facade;

- Cover and protect all surfaces that remain untreated - glass surfaces, stone.

Provjera postojeće podloge na objektu:

Checking the existing substrate on the building:

For the purpose of plucking, prepare a glass mesh in the size of about 50x50 cm. Apply adhesive and reinforcement mortar to the substrate (which is also intended for use in installation), and tweak it in one direction with a trowel.

Press the glass mesh for reinforcement into the mass and level it with the smooth side of the trowel so that part of the mesh remains free (10 cm).

Depending on the weather conditions, dry for 5-7 days.

After hardening, the glass mesh should be removed from the test surface on the wall. If only the glass mesh is torn from the reinforcing layer of mortar, it means that the substrate is sufficiently load-bearing and the test is positive by pulling, and if both the glass mesh and the reinforcing layer (even old plasters or coatings) are separated from the wall, the substrate is not load-bearing and is not suitable for direct treatment with mortar or coating. Ultimately, a load-bearing base should be created by mechanical reinforcement.

In order to determine the load-bearing capacity of the substrate and the suitability of the intended mortar for gluing and reinforcement, the substrate must be wiped.

If the substrate is dusty, it must be dusted. Mechanically remove coatings from the substrate in cases where the coatings are lime-based.

Contact thermal insulation facade is performed in the following steps:

1. 1. Cleaning and degreasing of the surface (with a preliminary test of the load-bearing capacity of the substrate) according to the above description with repair - filling large cracks with repair mass "Röfix 510" or equivalent;
2. 2. Installation of a perimeter plinth zone with a height of min. 40cm from the elevation of the terrain / sidewalk with XPS thermal insulation board,  $\gamma_{min} = 35\text{kg} / \text{m}^3$ ,  $d = 8\text{cm}$ . The board is glued with a suitable adhesive of the "Röfix Unistar" type or technical equivalent, covering with a notched trowel 1 / 1cm in the entire surface - contact with the substrate 100% of the surface. XPS panels should be additionally fixed to the base in the upper zone 5 cm below the edge with 2 dowels /  $\text{m}^2$ ;
3. Installation of EPS thermal insulation boards  $\gamma_{min} = 20\text{kg} / \text{m}^3$ ,  $d = 8\text{cm}$ . The board is glued with a suitable adhesive type "Röfix Unistar" or technical equivalent, edge - point - contact with the substrate min. 40% of the surface. EPS panels additionally fixed to the substrate with min. 6 dowels /  $\text{m}^2$  (obligation of the contractor is the submission of the budget by the supplier regarding the required number of dowels for a specifically selected system of thermal insulation boards, for a specific facility);
4. Installation of fire barriers / insulation lamellas above all positions of facade openings. The lamella is made of mineral hard pressed wool type "Röfix Firestop 034" or equivalent,  $d = 6\text{cm}$ , fire resistance class min. A2-s1-d0. Position includes placement of EPS leveling strip  $\gamma_{min} = 20\text{kg} / \text{m}^3$ ,  $d = 2\text{cm}$ ;
5. Application of reinforcement mortar in two layers with placement of reinforcing mesh between layers. The mortar is pasty type "Röfix R12 - R16" or equivalent and is applied in a total layer thickness of 3-5mm. The reinforcing mesh is glass type "Röfix P50" or equivalent. After applying the second layer, the mesh must be covered with a layer of mortar for min. 1mm. When reinforcing the surface, pay attention to additional reinforcements and overlaps of the mesh, as follows:
  - Diagonal reinforcement around all corners of windows and doors by placing mesh in strips of minimum dimensions 20x40cm at an angle of about 45 °;
  - Reinforcement of edges and corners is performed with an overlap of at least 10 cm;

- Connection and end profiles are made with an overlap of at least 10 cm and
  - TI-additional mounting parts (eg corner profile with mesh, drip profile with mesh) are performed with an overlap of at least 10 cm;
  - The end profile for sheet metal edging of the "Röfix Bap" type or equivalent is installed on the plinth profile - for inserting sheet metal edging;
- Profile joints are connected on drips with pre-assembled couplings. Surface reinforcement is performed to the extreme edge of the profile;
- The drip profile is placed on the outer corner of the drip tray for retractors facade parts. It is installed before surface reinforcement.

6. Application of "Röfix Premium" type substrate or white equivalent (according to the choice of the final decorative silicone mortar). Apply min. 3-5 days after application of surface reinforcement mortar;
7. Application of pasty silicone decorative finishing mortar type "Röfix SHP Premium" in white color. The application is in full structure (do not rub the grooved surface structure), granulation 1.5-2mm. The final mortar contains substances against the appearance of algae and fungi, increased resistance to temperature influences, UV radiation as well as alkalinity - permanent protection against microbiological organisms with a mandatory degree of environmental acceptability.

ETA certificate (European Technical Approval) is a certificate issued by the European Organization for Technical Approval, which confirms that the thermal insulation system complies with the parameters prescribed by this organization - mechanical resistance and stability, fire safety, hygiene, health and environmental sustainability, safety. in use, noise protection, energy efficiency and heat retention.

Processing of all spalette according to the general description of works on the production of thermal insulation facades (item 1 of facade works), including the following items:

1. Cleaning of the spalette zone;
  2. Installation by gluing thermal insulation panel made of EPS  $\gamma_{min} = 20 \text{ kg} / \text{m}^3$ , d3-5cm depending on the ratio of production and masonry dimensions of the planned facade PVC joinery
  3. Application of reinforcement mortar in two layers with the installation of a fiberglass reinforcement mesh, with prior installation of the corner profile with the mesh. All reinforcement meshes are installed using the "fresh in fresh" method for a better connection;
  4. Application of the final pasty silicone decorative finishing mortar type "Röfix SHP Premium" in white color (in accordance with the rest of the facade) and
  5. After finishing all the works on the treatment of the spatula (after at least 3 days), clean the joint of the decorative plaster and PVC window profile and apply / fill with glue - sealant ("KD" or equivalent) with prior protection of all surrounding surfaces.
- The price includes the purchase, installation of a set of materials, preparatory work, preparation of the substrate, production of thermal facade in the described layers, all the accompanying small unspecified material and means, as well as assembly and disassembly of the necessary scaffolding.

## 11. OTHER WORKS

Installation of a new distribution of the roof lightning protection installation - Fe / Zn strips dim. 20x3mm laid on suitable "T" girders poured into standard concrete cakes in all positions of the flat roof. Galvanically connect the strips to all metal parts of the

roof - roof covering and sheet metal cladding made of galvanized plastic steel sheet, as well as to all existing risers within the vertical elements of the building structure. Lightning distribution strips should be reported in everything according to the project (roof base - planned condition) - harmonized with the project of the existing facility.

## **PLANNED CONDITION of assemblies / layers after adaptation interventions**

### **CONSTRUCTIONS IN CONTACT WITH THE GROUND - FLOOR**

#### **CONSTRUCTIONS ON THE GROUND / PVC**

1. PVC,  $t = 0.2\text{cm}$
2. Perlite mortar,  $t = 3\text{cm}$
3. Cement screed,  $t = 1.5\text{ cm}$
4. RC slab,  $t = 7\text{cm}$
5. Bitumen insulation,  $t = 0.6\text{ cm}$
6. RC slab,  $t = 7\text{cm}$
7. Gravel,  $t = 15\text{cm}$

#### **CONSTRUCTIONS ON THE GROUND / Ceramics**

1. Ceramics,  $t = 1,0\text{cm}$
2. Glue,  $t=0,25\text{cm}$
3. Perlite mortar,  $t = 3\text{cm}$
4. Cement screed,  $t = 1.5\text{ cm}$
5. RC plate,  $t = 7\text{cm}$
6. Bitumen insulation,  $t = 0.6\text{ cm}$
7. RC slab,  $t = 7\text{cm}$
8. Gravel,  $t = 15\text{cm}$

#### **CONSTRUCTIONS ON THE GROUND / Parquet**

1. Parquet,  $d = 1,0\text{cm}$
2. Perlite mortar,  $t = 3\text{cm}$
3. Cement screed,  $t = 1.5\text{ cm}$
4. RC plate,  $t = 7\text{cm}$
5. Bitumen insulation,  $t = 0.6\text{ cm}$
6. RC slab,  $t = 7\text{cm}$
7. Gravel,  $t = 15\text{cm}$

### **a. FACADE WALLS**

#### **CONSTRUCTION OF FACADE WALLS / AB wall**

1. Smooth and paint
2. Extension mortar  $t = 1.5\text{ cm}$
3. Reinforced concrete wall,  $t = 20\text{cm}$
4. Thermal insulation contact "demit" facade,  $d = 8\text{cm}$

#### **CONSTRUCTION OF FACADE WALLS / concrete block**

1. Smooth and paint
2. Extension mortar  $t = 1.5\text{ cm}$
3. Concrete block  $t = 20\text{cm}$
4. Thermal insulation contact "demit" facade  $d = 8\text{cm}$

**b. ROOF CONSTRUCTION (flat roof)****ROOF STRUCTURE / flat roof**

1. Ballast / gravel granulation 16-32mm
2. Protective drainage and distributing layer - geotextile  $t = 6\text{mm}$
3. PVC waterproofing membrane  $t = \text{min } 1.5\text{ mm}$
4. Separating layer - geotextile 300gr /  $\text{m}^2$
5. Thermal insulation,  $t = 8\text{cm}$
6. Separating layer - geotextile 300gr /  $\text{m}^2$
7. Existing bituminous waterproofing,  $t = \text{approx. } 2\text{ cm}$
8. Existing layers for fall - perlite concrete  $t = 3\text{cm}$
9. Existing bituminous steam dam,  $t = \text{approx. } 1\text{ cm}$
10. Existing AB monolithic slab  $st = 12\text{cm}$
11. Extension mortar,  $t = 1.5\text{ cm}$

**ROOF STRUCTURE / flat roof (above the hall)**

1. Ballast layer of gravel granulation 16-32mm,  $t = 5/8 / 10\text{cm}$
2. Protective drainage and distributing layer - geotextile  $t = 6\text{mm}$
3. PVC waterproofing membrane,  $t = \text{min } 1.5\text{mm}$
4. Separating layer - geotextile 300gr /  $\text{m}^2$
5. Thermal insulation - XPS 30kg /  $\text{m}^2$ ,  $t = 8\text{cm}$
6. Separating layer - geotextile 300gr /  $\text{m}^2$
7. Existing bituminous waterproofing,  $t = \text{approx. } 2\text{ cm}$
8. Existing layers for fall - perlite concrete,  $t = 3\text{cm}$
9. Existing AB monolithic slab  $st = 12\text{cm}$
10. Extension mortar,  $t = 1.5\text{ cm}$

**c. ROOF STRUCTURES (sloping roof)****ROOF STRUCTURE / sloping roof**

1. Flat galvanized steel plasticized sheet,  $t = 0.55\text{cm}$
2. Separating layer - vapor-permeable foil
3. OSB board  $t = 18\text{mm}$
4. Longitudinal wooden beams dim. 5x12cm
5. Protective layer - PVC construction foil  $t = 0.15\text{mm}$
6. Thermal insulation - soft mineral wool  $t = 10\text{cm}$
7. Steam dam - PVC construction foil  $t = 0.15\text{mm}$
8. Existing AB construction
9. Extension mortar,  $t = 1.5\text{ cm}$

**NOTE:**

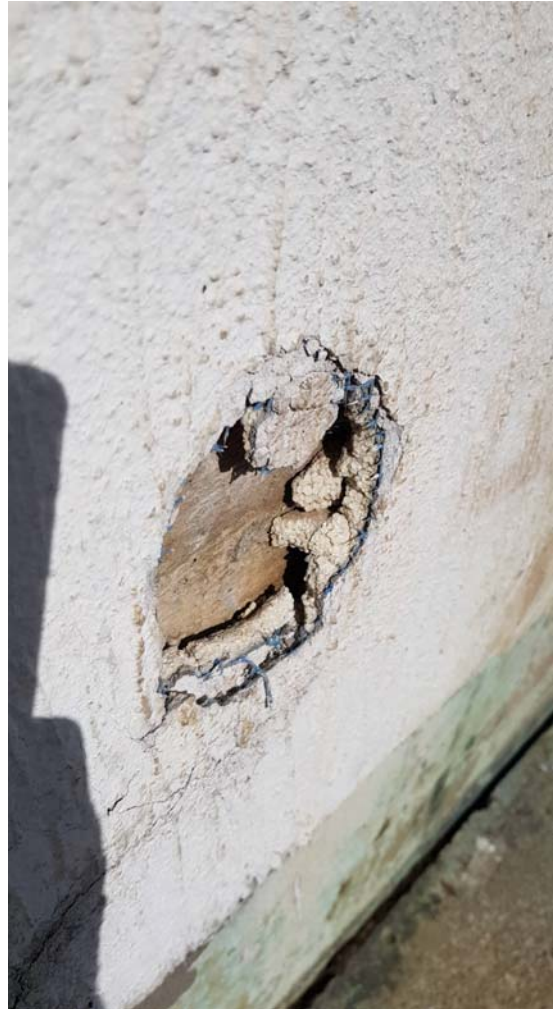
The designed layers / assemblies are presented in green while the existing layers / assemblies that are retained are represented in black.

*PHOTO DOCUMENTATION*





















*TECHNICAL CONDITIONS FOR EXECUTION OF WORKS*

## **GENERAL TECHNICAL CONDITIONS for construction and construction - craft works**

All items of the bill of quantities and estimates include the execution of each position unconditionally professional, precise and high quality, and all according to the approved drawings, technical description and descriptions in this estimate, technical conditions and details from the study of building physics, static calculation, details and subsequent details of the designer, applicable technical regulations, standards and instructions of the supervisory body and the designer, unless otherwise stipulated in the respective position.

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

All works and materials listed in the descriptions of individual items of this estimate must be included in the offered prices of the contractor. Contracted prices are the selling prices of the contractor and they include all labor costs, material with the usual size, external and internal transport, scaffolding and payment for the works (if those for individual items of work are not provided in this estimate), water, lighting, plant materials and energy for machines, digging and backfilling of limestone, warehouses for storage of materials, temporary construction premises, offices, working premises, directing contractors, social contributions, all state and municipal taxes, earnings of contractors and all other expenses conditioned by existing regulations for forming the selling price of construction products, including all expenditures arising from special working conditions provided by the norms in construction, as well as the conditions specified in the previous two paragraphs.

The Contractor shall not be entitled to demand any surcharges on the prices offered and contracted, unless it is expressly stated in one position that certain of the said work is to be done separately and not provided for in another position. Also, no fee or supplement to the agreed prices will be recognized in the name of increasing the standard values from the Average Standards in Construction.

The calculation and classification of the performed works will be performed according to the average norms in construction, which is obligatory for both the investor and the contractor, unless otherwise indicated in the descriptions of individual items of the estimate of works.

In the same way, all descriptions of works from the mentioned norms are obligatory for the contractor, unless otherwise provided in the description of the respective position of work or in the general description.

The general description given for one type of work and material obliges the contractor to perform all such works in individual positions according to that description, regardless of whether the general position refers to the general description, unless the job description is stated otherwise in that position.

In all construction and construction - craft works, the use of appropriate labor force and quality material is conditioned, which must correspond to the existing technical regulations, Yugoslav standards and descriptions of appropriate positions in the estimate of works. For each material that is installed, the contractor must first submit a certificate to the supervisory authority. In disputed cases regarding the quality of materials, samples will be submitted to the Institute for Material Testing, whose findings are relevant for both the investor and the contractor. If the contractor, despite the negative findings of the Institute for Material Testing, continues to install poor quality material, the investor / supervisory body will order demolition, and all material damage from the next demolition will be borne by the contractor - without complaints and objections to demolition brought by the investor or inspection.

All material that the investor's representative concludes does not correspond to the contractual estimate and prescribed quality, the contractor is obliged to

immediately remove from the construction site, and the Investor and the supervisory body will suspend work if the contractor tries to use it.

In all construction and construction - craft works, the use of appropriate is conditioned professional, qualified workforce, as provided for individual job positions in average standards in construction.

The contractor is obliged to remove an unscrupulous and unprofessional worker from the construction site at the request of the investor.

Before the start of each work, the construction site manager is obliged to timely request from the investor's representative the necessary explanation of the plans and notifications for all works that are not sufficiently defined in the project study.

If the contractor, without consulting the investor / supervisory body, performs certain works incorrectly, or performs them contrary to the instructions received through the construction log, ie contrary to the intended description, plans and given details, no justification will be considered. In this case, the contractor is obliged to, regardless of the amount of work performed, demolish and remove everything at his own expense, and again at his own expense to perform as provided by plans, descriptions and details, unless such changes are through the construction log by representatives investor / supervisory authority approved.

If the contractor performs a job better and more expensive than the anticipated quality, he has no right to request additional payment, if he did it on his own, without prior approval or order of the investor's representative / supervisory body through the construction log.

The contractor must keep the facility and the entire construction site tidy and completely clean, and at the end of the works, before handing over the facility, all contractors, toilet pits, scaffolding holes and fences, the contractor is obliged to bury, fill, level, level the entire surface and all well solid that no subsidence occurs later.

For technical inspection and handover, the contractor must clean the entire facility and the construction site from debris, excess materials, all means of work and ancillary facilities.

All accesses to the building, plateaus, stairs and paths, as well as the floors in all rooms must be completely clean, as well as all carpentry, locksmithing, glass surfaces and all roof surfaces.

Roads and sidewalks damaged by works or transport must also be brought in proper condition for technical inspection and handover of the facility.

All these finishing works are not paid separately, because they must be included in the agreed prices. Any damage that the contractor would do during the execution of works in the area of the construction site or in neighboring buildings, he is obliged to eliminate and restore to its original condition at his own expense.

Special attention is drawn to the contractor that he alone is responsible for all damage that he would cause by his careless and irresponsible work to the neighboring existing facilities. If there is a need to insure (concreting, etc.) the foundations of existing neighboring facilities, such work will be paid separately by the investor, but only the contractor will be liable for all damages if he does not take all necessary measures to insure neighboring facilities.

In case of constructive changes, as well as in case of increase, decrease or cancellation of individual works from the estimate - surpluses or deficits, the contractor is obliged to accept without objections and restrictions, as well as without the right to compensation, provided that any surplus or deficit calculated at contractual prices. In case there is a need for works that do not have a contract price in the estimate, the contractor is obliged to obtain the approval of the investor's representative, determine the price for them and enter it all in the construction log, and according to the price list of all materials and labor. attach to the offer.



The investor has the right to request a written guarantee from the contractor for special works (roof insulation, new materials, etc.) that the performed works will be permanent and of high quality.

The contractor is obliged to coordinate the work of subcontractors who independently perform certain types of work, so as not to harm each other, and if that happens, he is obliged to immediately regulate the elimination and compensation of damage at the expense of the culprit. Otherwise, the costs for eliminating such damages will be borne by the contractor. This also applies to all disturbances and damages that would occur due to non-compliance with the agreed order and time plan for the execution of certain works. The supervisory body has the right to request that the contractor for new materials submit for inspection samples on the basis of which he (the supervisory body) in agreement with the investor will make a selection. Procurement of these samples is not required separately.

In addition to all temporary facilities needed by the contractor to perform the works, the contractor is obliged to provide a room for the office of the supervisory body and to maintain it properly during the construction of the facility with the necessary provision of light, heating, cleaning, as well as necessary office inventory.

If the contractor needs to take over the organization of the construction site and storage of materials, in addition to the plot and neighboring land and sidewalks, the contractor will obtain approval for this use from the competent authorities or owners, provided that the necessary costs for this use can not be charged to the investor. .

The contractor is obliged to prepare a study on occupational safety on the construction site, and according to the "Law on Occupational Safety" Official Gazette of the Republic of Montenegro, No. 79/2004.

During the technical inspection, the contractor is obliged to submit to the investor all certificates that are provided by law and regulations (on the installation of the facility on the regulation line, connections to energy sources, water supply and sewerage network, etc.). All expenses related to obtaining this documentation shall be borne by the contractor.

The contractor is obliged to submit to the investor a certificate of payment for the consumed water, electricity and other fees charged to the contractor during the execution of works.

The construction book and construction log will be kept by the contractor on the basis of existing legal regulations, entering the necessary data on a daily basis, which will be reviewed and verified daily by the investor's representative / supervisory body with his signature on each page. In the case of a turnkey contract, the contractor is obliged to perform a preliminary control of the quantities of works given in the pro forma invoice.

In addition to these general conditions, the special conditions of the investor, the existing technical and legal regulations as well as the complete elaboration of the technical documentation are an integral part of the contract.

All works must be performed with all the necessary structural parts completely flawlessly and  
ro designer details.

Until the facility is handed over to the investor, the contractor is responsible for absolutely everything on it and in any case  
damage or malfunction is obliged to bring everything into proper condition at his own expense.

The contractor is obliged to appoint a highly qualified and experienced expert to the construction site for the entire construction period, who will be responsible for the professional control and accurate execution of all obligations of the contractor.

For all works in the estimate where formwork and scaffolding are required, the contractor is obliged to supply them and make them solidly, which is not paid separately but is calculated in the offered price of the appropriate work.

The contractor is obliged to make all the necessary openings and grooves in the walls and ceilings for the implementation of installations and various devices exactly according to the details and disposition plans, and after laying the pipes and grooves to be walled up and plastered. This is not done separately, but is included in the price of the respective constructions, masonry and plastering.

All obligations in these general conditions and general descriptions are accepted by the contractor as an integral part of the contract concluded with the investor and he undertakes to accept them without any restrictions and perform them without any objections or complaints.

## **1. MASONRY WORKS (GN 200)**

### **GENERAL DESCRIPTION**

The works must be reported professionally and with quality, and in all respects according to the valid regulations, standards, approved drawings, technical description, technical conditions from the study for building physics and building norms.

The material for the masonry work must be of high quality, and the production must be professional and conscientious. Bricks and brick products must be provided brands, well baked, without lime and saltpetre, river sand and without organic impurities and sludge. Lime well baked, properly quenched and aged.

The work process of these works includes three work operations: making mortar, masonry or plastering and transfer of masonry materials (bricks, blocks, mortar, etc.). In addition to each of these operations, there are ancillary masonry services that include bringing water, occasionally mixing mortar in the masonry trough, wetting the bricks, moving the trough, moving the scaffolding to 2.00 m, cleaning the workplace after the job is done. All these works go into the price of the final job position and will not be charged subsequently.

Bricks and all other brick products and materials used in the execution of masonry work must in all respects meet Yugoslav standards, as follows:

- JUS U.N1.308. for aerated concrete wall screeds
- JUS B.D1.011. for solid clay bricks
- JUS B.D1.015. for hollow bricks and clay blocks
- JUS V.V8.039. for sand for construction purposes
- JUS V.S1.035 and DIN 18180 and JUS V.S1.045 and DIN 4103-E for lightweight prefabricated partition walls lined with plasterboard
- JUS B.C1.010. for cement
- JUS V.S1.020, for lime
- JUS V48>-8.S1.030. for gypsum

The water used for the works must be clean without any impurities and organic ingredients that could adversely affect the quality.

Brick and beam samples should also be submitted to the inspection body for inspection before being delivered to the construction site. The contractor shall submit, at the request of the inspection body, appropriate laboratory samples of all materials required for testing.

Samples of all materials will be tested from time to time. All unusable ones will be removed from the construction site at the expense of the contractor.

### **MASONRY**

Masonry with bricks, clay blocks and aerated concrete plants should be done according to plans and static calculation. Masonry clean with regular connections in completely horizontal rows without small pieces smaller than 1/4 of the brick,

provided that broken bricks and pieces must not be placed next to each other in the wall.

Joints - vertical and horizontal - must be completely filled, ie. no cavities.

The mortar in the joints must not be thicker than 1 cm. Leave the external joints empty by 1.5 - 2 cm, for a better connection of the mortar when plastering the walls, and paint the leaked mortar from the joints with a trowel while it is still fresh.

The price of masonry includes the construction of all openings, gutters for the passage of vertical sewer lines, central heating, electricity, gutter pipes, etc. with subsequent bricklaying or grooving, plastering or post-installation plastering and for all these

no special fee will be paid for the works.

In the height above the door, for walls with a thickness of  $d = 7$  cm, and walls  $d = 9$  cm, make a reinforced concrete circle with a height of  $h = 20$  cm, made of concrete class MV25, reinforced with 02/08 and stirrups U06 / 120 mm.

The connection of the partition walls with the reinforced concrete walls and pillars is informed by means of a wire with a diameter of 3 mm placed in every other row, ie. at 25 cm with a connection for vertical reinforcement with a diameter of 6 mm placed at the joint with the concrete wall or pillar from which the mustache was dropped, and in all respects according to Article 4.2.5. PTP - GuSP.

For the connection of 1/2 brick partition walls, drop 1/2 brick from the solid walls in every fourth row, and for the connection of the partition walls to the edge, leave grooves of 1/2 brick dimension in the solid walls at the height of every second row of bricks.

Masonry should be done with completely regular joints over a template prepared for that purpose, in harmony according to the designer's decision. Masonry using 9 cm thick concrete blocks, as well as 20 and 25 cm thick aerated concrete blocks should be done with the correct connections and in everything according to the project and the manufacturer's instructions.

Pay special attention to the connection of the sides and to the plastering during masonry, because the full surfaces of the sides must be well filled with plaster. In order to form a correct connection in the masonry, use blocks of different formats, so that the blocks do not have to be trimmed as in brick masonry. For work, use only factory-processed bolsters, completely correct formats, required dimensions and tested quality (by the Institute for Material Testing).

At the corners, use corner beams and, if necessary, reinforce them and fill them with concrete.

When masonry with aerated concrete slabs, they must be treated exclusively according to the manufacturer's instructions.

When masonry in cement mortar, be sure to wet the bricks. Masonry of structural walls in cement mortar in seismic areas is prohibited by seismic regulations.

Openings for windows and doors are rejected so that the window teeth enter the cubature of the wall along its entire length.

All partition walls include concreting (together with the formwork and reinforcement) of the circle and will not be paid separately.

Double partition walls are calculated for each wall separately. The openings are bounded according to the masonry measures listed in the plan. If the thickness of the walls in the window sills is narrowed, the full thickness of the wall on those parapets will be calculated, as compensation for the hard work around making the edges.

All masonry work should be done vertically on a pendulum and leveled with all right angles in the line and joints.

The bricks must be laid roughly on an equal layer of mortar, and the vertical faces of all bricks must be in line and well covered with mortar in each layer.

Layers of brick must not exceed more than four layers in one part during masonry, a

masonry work must not go more than 1.50 m above other works.

When building in high heat, soak the bricks by dipping them in water.

In the event that the masonry is interrupted due to the cold, all walls must be protected from wetting and freezing at the place of work interruption by covering the entire thickness of the wall with board formwork and the like. If the walls are damaged by wetting and frost due to poor protection, then when continuing the work, the damaged walls must be demolished and rebuilt at the expense of the contractor.

The price for 1.00 m<sup>3</sup> or 1.00 m<sup>2</sup> of the wall includes all work, material with normal size, tools, transport, mobile scaffolding, plastering of chimneys inside, construction of packages for installation of doors and windows and tinsmiths, earnings, all contributions and duties. Circlages for partition walls will not be paid separately, because they are included in the unit price of the walls.

The method of calculation and payment will be done in accordance with the general conditions for construction and construction - craft works, this general description, valid average standards in construction, the corresponding positions of the estimate of works ro 1.00 m<sup>3</sup> or per m<sup>2</sup> of the wall, if in the positions of the estimate be otherwise indicated. Openings for doors, windows and partitions shall be deducted from the cubature of the masonry together with the beam above them, provided that the window teeth enter the cubature of the masonry along the entire thickness of the wall, according to the measures entered in the plan. Reducing the wall thickness in window sills is not refused.

Partition walls up to 12 cm thick are calculated per m<sup>2</sup> of masonry wall, with the openings being bounced off the square together with the ragast wall.

## **PLASTERING**

The mortar will be prepared only as much as can be used on the same day. Hardened mortar must not be used. The mortar should be prepared exactly according to the regulations and to the extent required in the respective position of the estimate. Regular mixing is mandatory both during preparation and during use, in order to avoid the separation of lime milk.

The sand used to make the mortar must be sharp and clean river sand, and the lime well aged and necessarily strained through a thick sieve.

The cement to be used is normal Portland cement.

The walls are plastered only when they completely settle and dry at a favorable temperature, because at high temperatures the plaster dries too quickly and gets cracks, and at low temperatures it freezes and falls off.

Plastering should start from the top floor and then go down with the work.

Before painting, all surfaces on which the plaster comes should be thoroughly cleaned of dust and dirt with a brush, and in the summer months, watered with water (especially walls that are plastered with cement mortar). Clean the joints of excess mortar at a depth of 1.5 - 2 cm for better

adhesion of mortar.

If saltpetre appears, the walls should be thoroughly cleaned with wire brushes and washed with water with the addition of 10% hydrochloric acid (salzgais), and when it dries, brush with bitumen emulsion to prevent moisture and salt from penetrating the surface again. This work is not done separately, but falls on the contractor. Applying mortar to the wall must be done in layers of the prescribed strength and treatment.

Plastering should be done in two layers with a total thickness of 2 to 7 cm, as follows: the first layer of mortar with coarse, sharp sifted sand, and the second, fine layer with fine sand. The mortar for the second layer must be sifted through a thick sieve and applied over a well-dried first layer. The flat surface of the sublayer is obtained by using a leveling bar. Wet mortar with the appropriate density is first applied to the wall, and then leveled with a leveling lath. When the first layer of mortar dries well,

the wall is moistened and mortar is applied, which is leveled with a large trowel - iron, with wetting until the surface becomes flat.

All concrete surfaces to be plastered (cast or masonry made of screeds), regardless of whether this is emphasized in the respective position of the estimate, must be previously roughened if necessary and must be sprayed with rare cement mortar, which is included in the unit price and is not paid separately. .

Surfaces must be wetted according to use to achieve the necessary moisture before applying the first coat of mortar. Attention should be paid to high-grade concrete, which should be especially moist, before the bonding material is applied. In places where a leveling layer is necessary, it will be made in mortar of the same proportions as the next layers and will not exceed a thickness of 1.00 cm in one coat.

Where necessary, the rabic net shall be secured with galvanized steel staples, with 40 mm lids and secured with galvanized steel wire.

The surface of the net should be at right angles to the holders. Everything must be placed so that it enables uninterrupted plastering.

After plastering, the surfaces must be flat and smooth without waves, dents and bulges. the moldings must be slightly rounded - bent and straight, and the corners at the junction of the walls of the walls and the ceiling sharp and straight.

Cement and lime should be stored dry and used alternately according to deliveries. Sand should be stored separately, in accordance with the type, on a solid and dry surface and protected from any contamination.

Masonry work must not be carried out at temperatures below 3 ° C, unless there is an approval of the supervisory authority to continue the work with certain protection measures, to ensure a minimum temperature of 4 ° C until the mortar hardens.

For other methods of production, calculation of performed works and payment, the general conditions for performing construction and construction - craft works, the general description for masonry works and the valid average norms in construction are valid.

The calculation is made of really plastered surfaces after the opening, and in accordance with the average norms in construction, the price includes the installation and removal of the necessary scaffolding, then patching the installation slots, cleaning windows, doors, partitions, etc. since these works will not be paid separately.

Openings up to 3.00 m<sup>2</sup> are not rejected and their spalettes are not counted.

Openings of 3.00m<sup>2</sup> to 5.00m<sup>2</sup> are rejected, and their spalettes are not charged separately. If the slats are larger than 20 cm, the excess over 20 cm is calculated per m<sup>2</sup>, and the openings are rejected as stated.

## **2. CARPENTRY WORKS (GN 601)**

### **GENERAL DESCRIPTION**

All carpentry work should be performed by qualified and professional workers, because even minor mistakes in the construction of scaffolding, formwork and roof construction can lead to unwanted consequences.

The sawn timber used must comply with Yugoslav standards, and according to JUS D.S1.040. JUS D.B7.020 is required for hewn coniferous material.

The quality of the material may be subjected to testing as prescribed by the standards JUS D.A1.048 and JUS D.A1.052. The costs of testing and rehearsal shall be paid by the contractor if the results are negative, provided that this is not specified otherwise in the description of the works.

Material on the construction site should be provided from moisture. The material must be cut in all respects according to the dimensions from the project.

All carpentry work must be performed professionally and with quality, in all respects according to the static calculation and detailed drawings.

The roof structure must be made exactly according to the projected slope, the surfaces of which must be completely flat in all directions so as to ensure the correct fit of the roof covering.

### **3. ASSEMBLY PLASTERING WORKS**

Works on the production of suspended ceilings and light partitions must be reported professionally and with quality.

#### **MATERIJAL**

Materijali koji se upotrebljavaju za ove radove moraju odgovarati zahtjevima jugoslovenskih standarda. Materijali koji nisu obuhvaćeni jugoslovenskim standardima moraju posjedovati ateste o kvalitetu.

#### **PERFORMANCE**

The works must be reported in accordance with the standards and technical conditions, and in everything according to the project, the designer's instructions and the descriptions from the estimate of works.

### **CALCULATION AND MEASUREMENT OF QUANTITIES**

The calculation is performed according to the units of measures from the estimate of works with the measurement of actually performed works.

### **4. ROOFING WORKS (GN 361)**

#### **GENERAL DESCRIPTION**

When performing work, strictly adhere to the existing regulations for this type of work, as well as the instructions of the material manufacturer.

All roofing material must be of first-class quality and must meet the requirements prescribed by Yugoslav standards for this type of work.

The covering base must be properly and well made, so that the roof covering rests over its entire surface without movement.

Pay special attention to various penetrations through the roof covering (chimneys, ventilation and laying of the cover next to bays, humps, passages and other places where there could be a wrong installation of the cover).

Roofing works must be unconditionally reported professionally and with quality.

The price per unit of measure of covering works includes all materials, work, tools, external and internal transport, scaffolding, salaries, duties and all other costs. The calculation is performed per m<sup>2</sup> of actually covered area.

### **5. FACADE WORKS (GN 421)**

Facade works must be reported professionally and with quality, and in everything according to the technical description, bill of quantities and estimate of works and agreement with the designer and in accordance with the general description for masonry works and technical conditions for facade works (JUS U.F2.010).

Facade finishing materials must comply with the provisions of the relevant Yugoslav standards and technical conditions. Materials for which there are no Yugoslav standards must have a quality certificate for the purpose for which they are used.

Materials can be installed and applied only on those surfaces for which they are intended according to their physical - chemical and mechanical properties.

### **6. CERAMIC WORKS (GN 501)**

Ceramic works must be reported professionally, with quality and precision, and in all respects according to the technical conditions for performing ceramic works (JUS U.F2.011).

**MATERIAL**

Ceramic tiles that are delivered and installed on the building must be new (unused), and must meet the existing Yugoslav standards, if in the description works is not otherwise provided.

If there is no Yugoslav standard for certain tiles, they must meet the following conditions:

- the edges must be sharp, parallel, straight and undamaged,
- the tiles must not contain soluble salts and other harmful ingredients,
- the surface must be free of notches and bubbles,
- the lower surface must be treated in such a way that it is suitable for installation,
- the color must be uniform,
- the tiles must not exceed the limit of water absorption on the surface provided by the Yugoslav standard for the respective type,
- when choosing tiles, it is necessary to take into account, in addition to aesthetic requirements, that the tiles with their physical, chemical and mechanical properties correspond to the intended surfaces (so that for purely aesthetic reasons wall tiles are not installed on the floor, interior or exterior or ordinary floor tiles on the floor with high traffic frequency, etc.)

**1. Floor tiles**

1.1. Unglazed floor tiles - must meet the requirements prescribed in the standards: JUS B.D1.310, JUSB.D1.320, JUS B.D1.335, JUS B.D1.332.

1.2. Glazed floor tiles must meet the requirements of the following standards: JUS B.D1.305 ,, JUS.

B.D1.306, JUS B.D1.405, JUS W. D8.052.

**2. Tiles for wall cladding**

They can be glazed and unglazed and must meet the requirements of the following standards:

JUS B.D1.300, JUS B.D1.301, JUSB.D8.450, JUS B.D8.052 as well as JUS B.D1.335, JUS B.D1.334, JUS B.D8.332, JUS B.D8.050.

3. Ceramic tiles - for outdoor use must have certificates of resistance to atmospheric influences and resistance to temperature changes. Both unglazed and glazed relief mosaics are used for cladding facades.

**4. Binding material****4.1. Cement mortar**

Cement mortar must be made of a mixture of cement, sand and water, and, if necessary, with the addition of a bonding agent or plasticizer.

The volume ratio of cement and sand depends on the purpose and ranges from 1: 3 for interiors and exteriors to 1: 2 for mosaic.

4.1.1. The cement must comply with the provisions of standards JUS.B.C1.010 to 015.

4.1.2. Means for accelerating the setting of mortar or concrete, plasticizers, etc. they must not cause any harmful consequences.

4.1.3. The sand must be washed, granulometric composition according to purpose.

4.1.4. The water must not contain ingredients that would be harmful to the substrate, ceramic tiles and sealant.

**4.2. Adhesives**

Only those adhesives that have been declared by the manufacturer for a certain type of work can be used for gluing ceramic tiles.

**5. Sealing material**

Sealing materials are materials used to close joints between ceramic tiles, to close expansion joints between limited paving sizes, as well as wall or ceiling paving joints.

Only sealing materials that meet the required installation conditions according to the manufacturer's instructions may be used.

**6. performance**

Before applying the ceramic tiles, the correctness and quality of the substrates over which the coating is performed must be checked.

When circling the interior of the building, ceramic works are performed only after the premises have been plastered, carpentry frames have been installed and the installation has been carried out and tested, unless otherwise provided in the description of the works. Wall cladding should be reported completely flat and vertical, without waves, bulges and depressions, with uniform and sufficiently wide joints. Finishing works, as well as fractures, protrusions and protruding corners are covered with rounded (single-edged, double-edged) tiles or tiles with "bent" edges. Flooring is performed horizontally, without waves, protrusions, with flat surfaces or the required slope, with uniform and sufficiently wide joints.

After finishing, the joints should be treated with a suitable sealing material. At the points of penetration of the installation pipes and the bottom of the gratings, the tiles must be precisely cut and placed.

In order to protect the performed works, it is necessary to prevent any traffic and movement of people within 3 days after the end of the treatment. Until the moment of use, in order to protect the surfaces, the floor should be sprinkled with sawdust.

#### 7. Measurement and calculation of quantities

The calculation is performed in  $m^2$  or  $m^3$  of the performed coating with measurement according to the actually performed works.

### GENERAL DESCRIPTION

These general conditions are an integral part of the description for individual positions of works and refer to the coating of walls and floors with all types of ceramic tiles inside and outside the building. Ceramic works must be performed with quality, with an appropriate qualified workforce, and in accordance with applicable standards and technical regulations for performing this type of work. All material installed in the facility must be new - unused, unless otherwise specified in the individual description of works, and must comply with existing PI standards for quality and dimensions. If certain tiles are not according to the standard, a certificate of the competent institution must be obtained for them, which must confirm the following characteristics:

- that the edges are sharp, straight, parallel and undamaged
- that the tiles do not contain any soluble salts or other harmful ingredients
- that their visible surface is free of notches and bubbles
- that their color is uniform
- that their water absorption is within the limits provided by the standard for the appropriate type of tiles.

### BINDING MATERIALS

Bonding material - cement mortars and adhesives must meet the prescribed standards in terms of quality and have certificates. Cement mortar and glue must be applied in the norms prescribed in the prospectus so as to ensure complete and permanent adhesion of ceramics to the substrate, and must not change or damage the substrate. The adhesive for gluing ceramic tiles must be declared for a certain type of work and certified by an authorized institution. Shear strength for walls must be min. 3 kPa /  $cm^2$ . The manufacturer must give detailed instructions for the application of the adhesive, as well as for the necessary pre-treatments which the contractor must strictly adhere to. The water must be clean, it must not contain any ingredients that would have a harmful effect on the substrate, ceramic tiles or sealing compound. To determine the width of the joints between the ceramic tiles, use PVC crosses, which must be removed before grouting.



**QUANTITY CALCULATION AND MEASUREMENT**

The calculation of quantities is performed according to the units of measures indicated in the estimate of works with the measurement of actually performed works.

**GENERAL DESCRIPTION**

This general description includes works on the production of flooring from classic parquet. Floor coverings must be of high quality and professionally performed in all respects according to technical regulations, norms and standards in the premises where the project envisages it. These are performed by ro m<sup>2</sup>, and the calculation is performed according to the actually performed quantities, according to the measures from the project. Before starting the works, the contractor is obliged to examine the quality of the substrate and its suitability for parquet flooring. The substrate must be solid, completely horizontal, without cracks and damage, dry, with max. 3% moisture at the time of installation of parquet, and clean, free of mechanical impurities and grease. Flooring is done by gluing the cover to the prepared substrate with a suitable adhesive. Apply a layer of glue to the substrate over the entire surface with a notched trowel and press the parquet boards or lamella boards well into the glue and place them next to each other. The feathers must enter the grooves along their entire length and tie well.

Fasten the cover strips every 300 mm, and cut them at an angle of 45 degrees at the joints and at the corners.

Planing of parquet can be performed after complete bonding of the adhesive, and for lamella parquet only after 24 hours. Use sanding paper no.120 -150 for hobbing.

Varnish the parquet immediately after hobbing, with previously meticulous removal of dust from the floor. Varnish in such a way that a completely smooth and even surface is obtained without traces of brushes and pulling. Varnishing should be done in three layers by brush application or spraying, with drying for at least 12 hours between two varnishes. Parquet can be used after 48 hours from the application of the third - final layer of varnish.

The percentage of humidity of the parquet during delivery must be within the limits allowed by the JU standards. Parquet varnish must protect the upper surface of the parquet from dirt, moisture penetration and other harmful influences. After varnishing, the appearance of the surface and structure of the parquet must not be changed. Between the parquet and the wall when installing the parquet, leave a joint width of 18 - 20 mm. Around the penetration of the central heating pipe, the contractor is obliged to cut the parquet cleanly and meticulously so that the penetration is completely covered by the covering rosette. The contractor is obliged to protect the performed works of other contractors from damage during the performance of his works. Otherwise, he will be obliged to bring all the damage in good condition at his own expense. The contractor is obliged to keep his performed works from damage until delivery to the client.

**7. PAINTING WORKS (GN 531)**

Painting and painting works must be reported professionally and with quality, and in all respects according to the technical conditions for performing painting works (JUS U.F2.013) and technical conditions for performing painting works (JUS U.F2.012).

**MATERIAL**

The materials used to perform painting and painting works must meet the requirements of Yugoslav standards, which determine their quality.

Materials not covered by Yugoslav standards must have a quality certificate. For these materials, the contractor is obliged to submit a quality certificate to the client.

Materials may be used and applied only on those surfaces for which they are intended according to their physico - chemical and mechanical properties.

If any changes in the works occur during the warranty period due to poor quality, the contractor eliminates the defects at his own expense, if it turns out that they are the result of improper installation of materials, and if it is proven that the material used is poor, then the manufacturer is responsible.

### **IMPLEMENTATION**

The works must be performed professionally and technically correctly, with all planned preliminary works and final works.

The works must be performed as standard, unless otherwise specified or subsequently agreed in the technical description.

Finished, factory-made materials must be used according to the manufacturer's instructions.

Coatings must adhere firmly, give off a uniform surface, without traces of a brush or roller. The color must be of uniform intensity (no stains). Topcoats must completely cover the substrate. Everything else related to the performance must be done in accordance with the standards and technical conditions.

### **CALCULATION AND MEASUREMENT OF QUANTITIES**

The calculation is performed in 1 m<sup>2</sup> area or per piece, with the measurement of actually performed works.

### **GENERAL DESCRIPTION**

All positions of painting and painting works must be performed professionally and with quality, with materials that in all respects correspond to technical regulations, norms and valid standards, in those premises where it is provided by the construction project. Materials may be installed and applied only on those surfaces for which, according to their physical -

chemical and mechanical properties and intended. Materials not covered by the standards must be of the best quality and for these materials the contractor is obliged to submit certificates of

performed examination. The contractor is obliged to submit to the client a certificate for all materials that he installs before the start of work. Certificates must be issued by organizations authorized for this type of work and must not be older than 1 year, counting from the date of issuance of the certificate to the date of commencement of works on the facility. Finished, factory-made materials must be used in everything according to the manufacturer's instructions. Painted surfaces must be clean, without traces of brushes and rollers. The color and tone must be of completely uniform intensity, without stains. The paint must completely cover the substrate, all finishes of painted surfaces must be flat and regular, as well as compositions with doors, windows, etc. The contractor is obliged to thoroughly clean the substrate from mechanical ones before starting the works

dirt, dust and grease. Fasting and emulsion, ie facade, semi-dispersive, as well as varnishes, paints and wood protection, must not be peeled and must be resistant to abrasion if, according to the manufacturer's instructions, they can be wiped with a light rubbing cloth after the setting time.

Dispersive paints, oil and oil-free varnishes, oil paints and matt oil paints must be washable if, according to the manufacturer's instructions, they can be washed with a soft sponge and water after the setting time, with a small addition (about 1%) of neutral detergent. that the water is not colored. Painted surfaces must be resistant to light, temperature, various chemical and mechanical influences, as well as to the weather. Oil paints must not wrinkle or crack. For all types of coatings, use paints with light-resistant pigments.

The choice of colors is made by the designer, the client, or the responsible representative of the client, by agreement. The contractor is obliged to submit the tone of the map for the appropriate materials, the contractor is obliged to make test samples of 1.00 m<sup>2</sup> for each type of staining and can proceed to the final staining only after obtaining the written consent of the person designated to choose colors. During the execution of works, the contractor must not, through the negligence of his workers, contaminate other types of work already performed by other contractors. Otherwise, the contractor is obliged to acknowledge to the client the value of the repairs performed on these works. The calculation of the performed works will be performed in accordance with the norms for performing the final works in construction.

## **8. INSULATION WORKS (GN 561)**

### **GENERAL DESCRIPTION**

All insulation works must be reported professionally and with quality in everything according to the project, technical conditions from the study for construction physics, details and other technical documentation related to them, applicable technical regulations and Yugoslav standards and regulations, and especially according to:

- "Ordinance on technical measures and conditions for slopes of roof planes"
- "Technical conditions for performing insulation works on flat roofs" JUS. U.F2.024 / 1980. year - "Rulebook on technical measures and conditions for sound protection of buildings" - S1. list SFRJ br. 14/82
- "Rulebook on Yugoslav standards for thermal engineering in construction" - S1.list SFRJ no. 69/87

Insulation work must be carried out with a qualified workforce and appropriate tools, as well as with materials that comply with technical regulations, norms and standards. The contractor is obliged to submit to the client the attestation as well as additional explanations and instructions on the method of installation, for all materials that he will use in performing his works. Certificates must be issued by institutions authorized for this type of work. Certificates must not be older than one year from the day the certificate is issued until the day when the contractor started performing these works on the facility.

If there are no JUS standards for certain intended materials, certificates must be obtained for them with the opinion of the appropriate authorized professional institution that they can be applied in the provided insulation.

All contracted positions of insulation works will be performed according to the design details, thermal calculation and individual descriptions of works for each position. Some positions can be done according to the details of the contractor if the designer or the client accepts them in writing as a better solution. In any case, the contractor is obliged to warn the designer and the client of any deficiencies in the details and construction plans that may affect the quality of work and safety of the facility, and in agreement with them to make the necessary changes before starting insulation work.

All works whose parallel or later execution would create the possibility of damage to the insulation must be performed before the insulation is installed. Prior to the commencement of insulation works, the correctness of already performed, construction, craft and other works that could affect the quality, durability and safety of insulation must be checked. If an irregularity is found, it must be corrected before performing insulation work. Before applying the insulation, the surfaces to be insulated must be carefully leveled, cleaned and completely dry. Layers of insulation must not be laid on a concrete base if the setting process has not been completed in the concrete. Before starting any of the contracted positions of the insulation

works, the substrate must be dusted and thoroughly and carefully cleaned of all impurities. As a base coat for waterproofing, use cold bituminous coatings based on organic solvents, or based on emulsion. When performing insulation layers, proceed as follows:

- lay the first layer of full non-perforated, impregnated, bituminized, bitumen coated or other insulating tapes with overlaps of min. 10 cm and glue them with hot bituminous mass along the entire length;
- lay the second layer at 50 cm in relation to the first layer, and lay the third layer so that its overlaps move by 10 cm from the overlap of the first layer
- Laying the tape can also be reported so that each subsequent layer moves by 1/3 in relation to the previous layer. The deviation from the dimensions of the folds can be 4-10 cm, and only in the case of strips of synthetic materials in which the folds are processed by a special procedure, ie. by inserting closing strips, whereby the overlaps are completely welded, vulcanized, etc. so that they are secured against detachment.

The contractor is obliged to apply the procedure of rolling the strips by unwinding them into poured hot bitumen. Unwinding the strips pushes the constantly thicker poured bitumen layer into which the strip is firmly pressed with a roller of a certain weight, starting from the middle to the ends over the entire surface, so that not even the smallest part remains unglued. The length of the strip during laying must not exceed 5.00 m. The strips are laid with overlaps of min. 10 cm, and are also glued with hot bitumen.

Perforated and similar strips will not have to be laid with folds, but can be laid for facing. These strips can be laid on either side, and in any direction.

Solid non-perforated and impregnated, bituminized, bitumen-coated and other insulating strips, when laid on sloping surfaces, begin to be laid on the downstream side, with the direction of laying the strips perpendicular to the direction of roof slope and water drainage, and each subsequent strip has to fold the previously laid downstream strip.

Bituminous perforated glass veil, other perforated strips and other coarse-grained strips intended for making pressure equalization layers from diffuse steam, or for separating layer from layer, are not previously cleaned of sand, but only the upper side is cleaned after laying for better adhesion. bituminous spread, if it is intended to be applied over a perforated strip.

No changes may be made on their own during the execution of works. For any possible change, there must be a previously obtained consent. When making waterproofing, all penetrations through walls, floors, roofs and terraces must be effectively insulated and watertight connections must be established with other materials and other constructed building elements with which the waterproofing comes into contact. When performing sound and thermal insulation, special attention should be paid to thermal or sound bridges and not allow them to form. Strictly make sure that when casting concrete, screed, etc. there is no penetration of water into the thermal insulation (it is obligatory to perform appropriate protection). During the execution of insulation works or after their completion, while the insulations are still unprotected, they must not be walked over, transported and stored material.

Immediately after the insulation is performed, only those construction works that are related to the insulation protection can be performed.

The temperature at which spreads may be applied, applied with hot bitumen and bituminous masses, must not be lower than 5 ° C. For cold spreads and coatings, the minimum temperature is 10 ° C. In addition to walls and other vertical surfaces, raise the waterproofing min. 20cm ro wall height measured from the base. The contractor is obliged to provide the necessary measures and means for hygienic and technical protection at work, to acquaint all workers with these measures and to apply them.

The calculation is performed according to the units of measure indicated in the items of bill of quantities and estimate of works (m<sup>2</sup> or m<sup>1</sup>). Unit prices include all main and auxiliary materials, work, tools, scaffolding, all transport and storage, cleaning the workplace, removal of rubble and waste, compensation for damage to their own and other people's work, if caused by the negligence of the contractor insulation.

Unit prices also include taking measures for the execution and calculation of works, CNTB measures, insurance of works from daily water and protection of performed works until handover.

## **9. LOCKSMITH WORKS (GN 701)**

### **GENERAL DESCRIPTION**

Locksmith works include aluminum and steel constructions that contain windows, doors, partitions, blinds, fences, steel constructions and other locksmiths. Locksmith works must be reported professionally and with quality, and in all respects according to the Technical conditions for performing locksmith works, steel and aluminum constructions, technical description, detailed drawings and instructions of the designer. All positions of locksmith works must be performed and installed with a qualified workforce, appropriate tools and materials that meet all technical regulations, norms and standards for this type of work.

Windows, doors and partitions are parts of the building that are installed in the openings of buildings in order to provide hygienic and technical conditions.

Built-in windows, doors and partitions in the following text "building elements" must meet the minimum hygiene requirements in terms of: blowing, waterproofing, lighting and shading, ventilation, heat and sound protection. In terms of blowing and impermeability in all adhere to the values that are given in Table 1.2 within the document "Technical conditions for the execution of finishing works in buildings 11 part - locksmith works". Building elements must be tested and provided with certificates by authorized organizations. In the installed and ready for operation condition, the construction elements must meet the following operating conditions, safety and security conditions:

- operating conditions: usability and durability:
- safety conditions: safety against wind and mechanical influences during glazing
- safety conditions: in operation in case of fire during handling and fastening

The gaps between the frame of the building elements and the infill must be such as to prevent it from splashing due to temperature changes, or so as to enable the use and filling of such thicknesses and elastic properties as to provide the resistance and safety prescribed for each category of building elements.

In terms of safety in operation, the building elements must be designed in such a way that their parts cannot be unintentionally separated, due to the action of wind or removed when handling the hardware. When handling the opening mechanism and other fittings, pressures, shocks and stresses must not cause deformations and damage that would reduce the quality of the building elements in terms of strength in the opening, tightness and functioning.

In case of fire, building elements must not generate toxic gases higher than prescribed during combustion (S1. List SFRJ 35G10).

The material and elements that the contractor delivers and installs on the facility must be new (unused). They must be in accordance with the regulations of JUS, and those for whom JUS does not exist must have certificates confirming that they correspond to the intended purpose. Doors can have openings only around the vertical axis, and windows around the vertical and horizontal axes.

Locksmith positions can be reported from standard iron profiles, sheets, drawn Kumanovo boxes of various cross-sections, hollow pipes, steel griffin wire fillings and other materials provided by the position description or materials that were not

provided by the position description, but need to be installed. The aluminum for the openings on the facade walls is anodized, and then processed, mined and varnished in the tone chosen by the designer. Dimensions, processing and equipment in everything according to the project, details, specifications and instructions of the designer.

Connections and joints of elements should be made in everything according to detailed drawings, and according to the provisions of JU standards and manufacturer's technology, with the consent of the designer and the supervisory body. All joints must be made flawlessly with correct and precise cutting. Before starting work, the contractor must check that all connections between the building elements and the intended locksmithing are in accordance. The contractor is obliged to submit to the client for approval the details with the description on the basis of which the hardware will be installed.

All locksmith elements that require special construction (fire resistance, sealing, etc.) must be entrusted to specialized organizations for this type of elements.

All positions of locksmith works must be anticorrosively protected and finally painted. In the case of locksmith surfaces that are unavailable after installation, a durable and high-quality anti-corrosion coating must be applied before installation. The method of cleaning the substrate and the type of protective agents are determined on the basis of special technical conditions for corrosion protection.

Anticorrosive protection provides:

- cleaning of metal profiles from rust and degreasing with detergent, and
- coating with primer (anticorrosive agent - mini, radiolin or similar) in two layers.

The installation of all elements on the construction site should be performed professionally, while the installation of elements of special construction is performed according to the manufacturer's instructions.

When fixing hardware for stone, brick wall or concrete, materials that can adversely affect the metal must not be used. Window sash must be fastened to seal well and to open and close easily even before glazing.

Window frames must be tied with a sufficient number of anchors for building elements.

In the case of windows without movable sash, the frames must be anchored. In the case of windows with movable wings, the frames must be anchored at the places where the load is transmitted.

Doors and gates must be easy to open and close and this must be taken into account during further surface treatment. Closed door leaves must fit snugly. The wings must not get caught in any place.

Manufacturing and welding must be performed with quality. Notches or transverse folds must not appear during bending and shaping. The joints must be transversely machined, fit the shape and allow a good connection. Welded joints must be made according to recognized rules of welding technique, must be strong and unbreakable and must not have defects. Parts of the welding strip must be removed from the surfaces that remain visible after installation, if they are not statically necessary, and it is not otherwise prescribed in the description of works.

In addition to the basic conditions for the construction and installation of hardware, the contractor is obliged to do the following, which is included in the offered price:

- taking measures for the execution and calculation of works, including the use of measuring instruments
- making detailed drawings according to the given schemes and making plans for anchoring doors, gates, windows, etc.
- providing data to the client regarding glass cutting works
- construction of necessary scaffolding and platforms for uninterrupted performance of work

- production of smaller test pieces, if these can be changed later in the execution of the contracted works
- implementation of all protection measures under the CNTB and other regulations
- supply of water, gas and electricity from the connections provided by the customer to the place of performance of works
- delivery of fasteners
- removal of all impurities and debris originating from the contractor

Before starting the production of locksmith elements, the locksmith contractor must agree on each work position individually with the supervisory authority and the designer, in order to accurately determine the dimensions, construction, fabrication and processing, types and dimensions of materials used and installation. All this must be stated in the minutes, as well as possible changes that entail changes in the quantities and types of materials, which will later be used to calculate the quantities. The price of locksmith works includes production, corrosion protection, installation, final processing, fitting with fittings, equipment and curtains, glazing and installation, as well as all necessary scaffolding, unless otherwise indicated in the bill of quantities. The unit price of the appropriate position includes the delivery and installation of anchors and anchor plates, brackets, brackets, etc. which the contractor installs when concreting walls and mezzanine structures, roof rosettes, skirting boards, sealing material and more, and it will not be paid separately. All locksmith positions, except those procured from other suppliers, are made in the locksmith contractor's workshop, including anti-corrosion protection and painting. In all other respects, the RTD is valid for the execution of finishing works in construction. The calculation of the locksmith will be done according to the kilogram, m<sup>2</sup>, m<sup>1</sup> or piece, but as ordered in certain positions of works. If the determination of quantities is done on the basis of theoretical weights from the tables, then 7% is added to the prepared theoretical weights for connecting elements, welds and protective layer.

#### **10. TIMBER WORKS (GN 771)**

The base for covering with sheet metal must be properly and well made, so that the roof covering rests on its entire surface without movement. All roofing material must be of good quality and must meet the requirements prescribed by the JU standards for this type of work.

Roofing works must be unconditionally performed professionally and with quality.

All auxiliary works and the transfer of all necessary materials to the place of installation will not be paid separately because they are included in the price per unit of the roof covering measure. The calculation is done to cover the actual covered area.

All sheet metal works must be performed precisely and professionally, in all respects according to the technical conditions for performing sheet metal works and according to the technical description.

All parts of the bodywork must be cut in the workshop and partially assembled into larger parts, which are then mounted on the construction site and interconnected into one whole.

Make all the ingredients professionally and solidly with a double seam and riveting. Connect the individual parts so that the sheet gives the possibility of dilatation.

All iron parts that are in direct contact with the sheet metal must be galvanized.

For concrete or mortar substrates, place a layer of ter-paper under the sheet metal.

All profiles, drips and other must be in everything according to detailed drawings and descriptions of individual positions.

#### **GENERAL DESCRIPTION**

These general conditions include all works related to all types of sheet metal covering and edging, as well as the manufacture and installation of horizontal and

vertical gutters, ventilation pipes, treatment of openings and the like. Sheet metal works covered by these conditions must be performed with quality, in accordance with all applicable regulations and in accordance with the provisions of these conditions. All works that precede tinsmithing must be completely completed, and the required material delivered by types and quantities at a distance of up to 50 m. The materials installed by the contractor must be new - unused, unless otherwise provided by the project.

Auxiliary - binding materials - tin, rivets, screws, etc., must also comply with the relevant provisions of JUS. Before starting the works, the contractor is obliged to harmonize the details with the project, to check all construction elements to which, or to which the sheet metal is attached, as well as to prepare sheet metal from the required material that will meet the intended method of binding and all other requirements. Parts of different metals must not come into contact to prevent corrosion or other harmful effects. All fasteners must match the type of sheet metal. Sheet metal and fastening compositions must be designed in such a way that the elements can dilate without hindrance during thermal changes, while remaining impermeable. Make drips on all wreaths and solbans, unless otherwise provided by details. The gutters must be laid in a uniform slope, so that the edge of the gutter next to the roof is at least 10 mm higher than the outer edge. The drop in the gutter is at least 0.5%.

Calculate quantities as follows:

- oršivanje wreaths, overhangs, and attics ro m??, measured ro outer longest edge
- solbanci po m<sup>1</sup>

The unit price includes the purchase of materials, production of elements with the usual size, all auxiliary and connecting materials, tools, external and internal transport, installation and scaffolding. As well as the protection of the performed works until the handover to the investor, salaries and all other duties.

## **11. JOINERY WORKS (GN 550)**

### **GENERAL DESCRIPTION**

This general description covers all conditions for the manufacture and installation of interior and facade joinery. Facade joinery is subject to the provisions of JUS from the main group D.E. and that:

- for making details and dimensions of facade joinery JUS D, E.1.100-192
- for making details and dimensions of interior joinery JUS D, E, 1.020-192
- to determine the quality category of facade and interior joinery made by JUS D.E, 1.011 and JUS

D.E.1.012

- for the quality of sealing the joint between the wing and the stem for watertightness and blowing, classification 202 C from JUS D.E8.193 and D, E8.235, Official Gazette of SFRY no. 69/82

All carpentry works must be reported professionally and with quality, and in all respects according to the technical conditions for the production of construction carpentry and JUS.

All carpentry must be performed according to the technical description, specifications, schemes and details certified by the designer.

The manufactured carpentry must be of high quality and must fully meet its purpose, both in terms of functionality and aesthetics. All facade and interior carpentry must be made of first-class dry sawn healthy material, hardwood without wormholes, cracks and knots, with max. humidity of 12% and must meet the following quality requirements:

- impermeability to air and water,
- thermal protection according to valid regulations and



- sound protection according to the valid regulations, and in all according to the technical conditions from the study for construction physics.

The interior carpentry is installed according to the dry mounting system, over a blind rod in the width of the wall. The parapet board with a thickness of  $d = 30$  mm should be made of hardwood, with a profiled inner edge according to the detail, which exceeds the finished parapet by 20 mm or according to the detail of the designer. The material for making the stocks is made of hardwood profiles of standard dimensions according to JUS, in everything according to detail. The rods are installed by dry process, over blind frames, by screwing with appropriate holc - screws through two - stage openings on the door jamb. Interior door wings in everything according to the carpentry specification, details of the architectural project and the requirements of the designer.

All doors and partitions in solid wood will be painted and varnished, veneered and the like, according to the details of the interior, which is included in the price of a piece of individual carpentry element, and according to the requirements of the interior designer together with all preparatory works for these types of works. The surface treatment - carpentry painting - must be in accordance with the requirements of the project, and depending on the purpose of the room in which it is installed.

It is necessary to prove the quality of colors with a certificate.

All glazing should be done with thermo-insulated glass  $4 + 12 + 4$  mm, or some other type of glass of the designer's choice and detail. Glazing is included in the price of carpentry so that it is not specifically processed through the positions, as well as special requirements of the designer regarding glazing such as stained glass and the like. All roofing strips will be installed after the completion of painting and ceramic works.

The contractor is obliged to make workshop documentation on the basis of the project documentation, which he will submit to the ordering party for approval.

The contractor is obliged to bring a prototype with a certificate to the construction site, which will be approved by the designer. Non-certified carpentry must not be installed.

Testing the validity of the material must be carried out under the following conditions: JUS D.A1.060-068, JUS D.A1.080-087, JUS D.B0.021 and JUS D.A1.040-049, which must be proven when handing over the carpentry and confirm with a valid document.

Examination of the validity of interior doors is performed according to the conditions: JUS D.B8.821-1, which must be proven and confirmed by a valid document during the handover.

All materials must be placed under canopies, separated from the ground to allow free air flow and protection from moisture. All elements of carpentry work must be protected from the weather during transmission and stored in a dry, clean, ventilated and covered area, before and after the protective coating.

The door should be stored horizontally.

Regardless of whether it is especially emphasized, the carpentry contractor is obliged to install rubber bumpers in the floor or wall, without special payment.

### **BASIC MATERIAL**

According to JUS DE1.012. the following errors are not allowed for exterior carpentry:

- torsion above 3 mm and a length of 1 m (Z%)
- heart cracks due to dehydration and frost
- medium muscularity and boreholes
- no rot in the material
- rotten bumps
- great bruising

- congestion in the letter
- white at the oak

According to JUS DE1.011 for interior joinery the following errors are allowed:

- healthy fused and unfused nodules
- healthy small fused bumps up to 20 mm, except on bars
- the beds are allowed to extend up to 2/3 of the width of the frame, one per square meter
- healthy medium fused bumps in the door jambs ro jedna na m??
- small or medium unfused bumps entangled in pairs per m<sup>2</sup>, with a distance of more than 15 cm
- patched medium resins one by one
- longitudinal cracks which must not be longer than 50 mm and must not run obliquely or through a part of the wood element
- bruising up to 4% of the surface

**Note:**

Of the permitted errors, it is allowed to have on one element:

- up to 4 pieces on the starting meter up to 10 cm wide on the door jambs, middle, frames and door leaf frames
- up to 5 pcs per m<sup>2</sup> on fillings

**Wooden plates**

Individual parts of panels that are installed in parts of construction joinery should consist of one piece or lamellae of veneer.

Plywood or plywood, plywood or two veneer sheets glued to each other crosswise in relation to the direction of the fibers are used. The quality of plywood (I, II and mercantile class) must comply with the provisions of JUS DC5.020. The quality of chipboard (Class I) must comply with the provisions of JUS DC5.030. The quality of fiber boards (hard and semi-hard I and II class) must comply with the provisions of JUS DC5.022.

**Hardware for commanding carpentry**

Provide all doors with the necessary hardware, lock with keys and close the joints with other materials - sealing. The fittings must in all respects correspond to the drawings or description of the catalog sheet or the position of the pro forma invoice, ie Technical provisions for a particular type of carpentry, provided that everything is first class and complies with JU standards, and if these standards do not cover a particular type of fittings, then according to DIN standard. They must allow easy opening and closing of the carpentry from the room. They must prevent opening from the outside, ie. they must withstand a pressure of 100kp / m<sup>2</sup>. Functional and visual parts must be protected against corrosion. The visual parts must have a satisfactory aesthetic appearance.

**Protection material**

Kits for filling major damage:

- they must be quick-setting (they must harden in 5-8 minutes after application)
- must not change volume after drying
- sanding with sandpaper M01 and M02 must be possible after 1/2 hour of drying

Impregnating agents:

- they must penetrate well into the woods and dry quickly
- after applying the impregnation layer, the wood must not swell
- should allow the wood to regulate moisture
- must have a fungicidal effect

- the thickness of the layer is 25-30 microns and can be sanded with sandpaper No.100

Means for forming a leveling layer (for sealing):

- should have the ability to be easily applied or large thixotropy
- must have the ability of long processing and easy leveling - ironing
- must have the ability to fill pores well
- the thickness of the layer is 40-50 microns which can be sanded with sandpaper No.150-180

**Note:**

Exterior sash windows and balcony doors, as well as carpentry that is finalized by a colorless process must not be puttied.

**Installation material**

For direct dry wall mounting:

- wood screws made according to JUS MV1.024, and plain according to JUS M61.510

- plastic dowels

For dry installation via anchors:

- steel anchors for concrete
- shooting bullets

For dry installation over a blind frame:

- steel nails
- shooting bullets
- blind frames
- wood screws

The number of pieces, dimensions and quality are determined separately according to the conditions that are

determined by the height of the building and the exposure of the building to wind, provided that for the calculation of the sea take a pressure force of 100kp / m<sup>2</sup>.

**Sealing material**

Sealing material must be resistant to:

- oxidation
- sunlight
- water
- atmospheric influences
- must not change shape and elasticity with temperature changes
- must not contain toxic ingredients

**Required properties of built-in joinery**

Joinery must be resiliently and firmly installed. The joint must be permanently sealed against wind and moisture. The connection must provide protection against sound and heat and drain rainwater. There must be the possibility of tolerance between the untreated wall and the joinery element, as well as the appropriate equalization of opposite movements of the wall and the joinery element. It must be possible to change the carpentry without breaking the walls.

Before the start of carpentry work, the contractor will determine all the measures in the minutes with the designer and supervision, as well as the dynamics of the production of individual elements and the terms of receipt.

The calculation is performed per piece of installed carpentry element (window, door), finally processed and glazed with all the necessary fittings, connecting and insulating material.

The unit price includes the production of workshop drawings, production of elements, packaging, transport, storage, vertical and horizontal transport on the construction site, installation - assembly with all the necessary substructure, with auxiliary and basic materials, fittings and finishing.

## **12. MISCELLANEOUS WORKS**

All various works must be reported professionally, with quality and precision, and in everything according to standards and technical conditions for this type of work.

### **MATERIAL**

The materials used for these works must meet the requirements of the JU standard. Materials not covered by Yugoslav standards must have quality certificates.

### **IMPLEMENTATION**

The works must be reported in accordance with the standards and technical conditions, and in all respects according to the project and the instructions of the designer and the descriptions from the estimate of works.

### **CALCULATION AND MEASUREMENT OF QUANTITIES**

The calculation is performed according to the units of measures from the estimate of works with the measurement of actually performed works.

*QUALITY CONTROL PROGRAM WITH CONDITIONS FOR MEETING  
THE BASIC REQUIREMENTS FOR THE FACILITY DURING  
CONSTRUCTION AND MAINTENANCE OF THE FACILITY (QUALITY  
ASSURANCE PROCEDURE AND TEST PROGRAM)*

**QUALITY CONTROL PROGRAM WITH CONDITIONS FOR MEETING THE BASIC REQUIREMENTS FOR THE FACILITY DURING CONSTRUCTION AND MAINTENANCE OF THE FACILITY (QUALITY ASSURANCE PROCEDURE AND TEST PROGRAM)**

GENERAL

ICS number	Standard number	Year	TITLE
91.200	MEST ISO 4463-1:2017	2017	Measurement methods for building - Setting-out and measurement - Part 1: Planning and organization, measuring procedures, acceptance criteria
	MEST ISO 7976-1:2017	2017	Tolerances for building - Methods of measurement of buildings and building products - Part 1: Methods and instruments
	MEST ISO 7976-2:2017	2017	Tolerances for building - Methods of measurement of buildings and building products - Part 2: Position of measuring points
	MEST EN ISO 9000:2016	2016	Quality management systems - Fundamentals and vocabulary
03.120.10	MEST EN ISO 9001:2016	2016	Quality management systems-Requirements
	MEST EN ISO 9004:2018	2018	Quality management - Quality of an organization - Guidance to achieve sustained success
	MEST ISO/TS 9002:2019	2019	Quality management systems - Guidelines for the application of ISO 9001:2015
	MEST ISO 10002:2009	2009	Quality management - Customer satisfaction - Guidelines for complaints handling in organizations
	MEST ISO 10005:2009	2009	Quality management systems - Guidelines for quality plans

FACADE ALUMINIUM JOINERY

ICS Number	Standard Number	Year	TITLE
91.060.50	MEST EN 1026:2017	2017	Windows and doors - Air permeability
	MEST EN 1027:2017	2017	Windows and doors - Water tightness - Test method
	MEST EN 1121:2009	2009	Doors - Behavior between two different climates - Test method
91.190	MEST EN 1935:2010	2010	Building hardware - Single-axis hinges - Requirements and test methods

## PLASTERING / GYPSUM PLASTERBOARDS

ICS Number	Standard Number	Year	TITLE
91.100.10, 01.040.91	MEST EN 520:2017	2017	Gypsum plasterboards - Definitions, requirements and test methods
91.100.10, 91.100.60	MEST EN 13950:2016	2016	Gypsum board thermal/acoustic insulation composite panels - Definitions, requirements and test methods
91.060.30	MEST EN 13964:2016	2016	Suspended ceilings - Requirements and test methods
91.100.10	MEST EN 13963:2016	2016	Jointing materials for gypsum boards - Definitions, requirements and test methods

## FACADE WORKS

ICS Number	Standard Number	Year	TITLE
83.100, 93.010	MEST EN 14933:2010	2010	Thermal insulation and light weight fill products for civil engineering applications - Factory made products of expanded polystyrene foam (EPS) – Specification
91.100.60	MEST EN 14309:2016	2016	Thermal insulation products for building equipment and industrial installations - Factory made expanded polystyrene foam (EPS) products – Specification
91.100.60	MEST EN 13163:2017	2017	Thermal insulation products for buildings - Factory made expanded polystyrene foam (EPS) products – Specification

*BoQ UNIT PRICE DESCRIPTIONS*



## ***BoQ UNIT PRICE DESCRIPTIONS***

### **PREFACE**

This Technical Specification for works execution will be an integral part of the Tender Documentation, which being an Annex to the Contract on Works Execution, therefore will be considered as the integral part of the said Contract on Works Execution.

The Contractor is fully familiar with all details of the submitted Design, as well as with all local regulations, local standards (MEST), common practice of trade and circumstances for their execution, nevertheless, it is understood that, whenever local regulations, local standards (MEST), 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 (MEST), including, but not limited to:

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.

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, the final product, and ready for use.

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

The Contracting Authority will provide to the Contractor the access to building site. All other matters in this regard will be the competence of the Contractor.

Supply of water, electricity and all other raw materials to the building site, all the time during the execution of the works, will be the sole liability of the Contractor, including all costs and necessary administrative procedures.

Prior to the commencement of the works, and also in the course of the execution of every work item, the Contractor will ask 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 Design.

The Contractor will be responsible to keep records on the progress of works all according to Rulebook on the manner of keeping and content of the construction log and construction book (Official Gazette of Montenegro, no.068/18, from 19.10.2018:


- Inspection Book (forms laid down by the MNE Law)
- Construction Log (forms laid down by the MNE Law)
- Measurement Book (forms laid down by the MNE Law)
- All necessary certificates (for material, equipment and other) during the works execution


It is also considered that the Contractor's will be responsible for safeguarding of the building site and maintenance of existing structure and/or building all the time during the progress of the works until completion and acceptance of the building by the Contracting Authority.


Upon the completion of the works, the Contractor will remove from the building site and other used areas all his 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.


Coding of each specific technical specification for any type of works given in this Technical Specification and subsequently in the BoQ, is based on the International Classification for Standards - ICS, providing comprehensive correlation between the international and local standards. "The Institute for Standardization of the Montenegro" ("Institut za Standardizaciju Crne Gore") <https://www.isme.me/catalog> within its Catalogue provides numerous updated tables enabling connection between international and local standards, as well as, updated review of old MNE standards which have been either withdrawn or replaced or simply renamed.

## I PREPARATORY AND DEMOLITION WORKS

BoQ Item	3.3.4.1.1.	Unit	Pcs.
Unit price definition	Removal of all polyester roof lanterns, dim. 980x170cm		
Description			
<p>Lanterns are removed completely with the accompanying sheet metal and other edgings and anchors. Prior to removal, secure all areas below against accidental falling debris and removed material. The position includes lowering the removed lanterns from the roof into the yard, loading them into a suitable means of transport and transporting them to the city landfill, which is charged separately. Calculation of which lanterns were removed depending on the dimension.</p>			
			

BoQ Item	3.3.4.1.2.	Unit	Pcs.
Unit price definition	Removal of all polyester roof lanterns, dim. 960x110cm		
Description			
Lanterns are removed completely with the accompanying sheet metal and other edgings and anchors. Prior to removal, secure all areas below against accidental falling debris and removed material. The position includes lowering the removed lanterns from the roof into the yard, loading them into a suitable means of transport and transporting them to the city landfill, which is charged separately. Calculation of which lanterns were removed depending on the dimension.			
			

BoQ Item	3.3.4.1.3.	Unit	Pcs.
Unit price definition	Removing roof centrifugal fans with gyms and locker rooms.		
Description	<p>The fan is removed with all associated parts with prior disconnection from the mains and protection of all power cables from accidental contact. The position includes lowering the fan into the school yard, as well as proper storage for later reassembly, as well as proper securing of the openings in the roof from intrusions and atmospheric precipitation.</p> 		

BoQ Item	3.3.4.1.4.	Unit	m'
Unit price definition	Temporary dismantling of existing FeZn strips of lightning distribution from all roof surfaces.		
Description	<p>Remove the earthing strips, including the corresponding anchors, concrete cakes and dispose of them in a suitable place in the school yard for later loading into a suitable means of transport and taking them to the city landfill (charged separately). Calculation per m' of removed lightning strip.</p> 		


BoQ Item	<b>3.3.4.1.5.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Dismantling of the complete existing sheet metal edging made of galvanized steel and copper sheet - vertical gutters, ventilation duct edging, roof attics, beams dropped above the roof plane(wing "C"), as well as all expansion joints between the lamellae of the building. -Flashing of roof attics w=25cm</b>		
Description	<p>Dispose of the sheet metal in a suitable place in the school yard for later transport to the landfill, which is charged separately. Calculation per m<sup>1</sup> and pcs. removed flashing.</p>		

BoQ Item	<b>3.3.4.1.6.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Flashing of roof beams w=35cm</b>		

BoQ Item	<b>3.3.4.1.7.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Flashing of gutter (trough) above the terrace d.w.=116cm</b>		

BoQ Item	<b>3.3.4.1.8.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Flashing of chimney</b>		

BoQ Item	3.3.4.1.9.	Unit	m <sup>2</sup>
Unit price definition	<b>Dismantling of the complete existing copper roof covering from all positions of sloping roofs.</b>		
Description	<p>The position includes the removal of sheet metal with a substructure - wooden slats smoke. 4x5cm, plywood and remnants of thermal insulation - stone wool, all associated edging transitions to the flat part of the roof, as well as drip on the eaves, to the AB roof sloping structure. Dispose of the sheet metal in a suitable place in the school yard for later transport to the landfill, which is charged separately.</p>		



BoQ Item	<b>3.3.4.1.10.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Removal of all layers of flat roof above the gym - the position where the roof insulation is PVC membrane.</b>		
Description	<p>The position includes the removal of the ballast layer of gravel d = 5-10 cm, 3geotextiles and PVC membranes themselves, including all associated fittings (sheet metal drips, corners, penetrations, etc.). Carefully lower the completely removed material from the roof and dispose of it in a suitable place in the school yard for later loading into a suitable means of transport and taking it to the city landfill (it is charged separately).</p>		

BoQ Item	<b>3.3.4.1.11.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Removal of existing floor ceramics from upstairs terraces including plinth ceramics.</b>		
Description	<p>When removing, take care not to cause major damage to the surrounding walls and the existing cement screed for later easier repair and installation of the planned ceramics. Dispose of all rubble in a suitable place on the construction site for later loading and transport to the city landfill, which is charged separately.</p>		



BoQ Item	<b>3.3.4.1.12.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Removal of existing PVC sewer pipes Ø100 – drainage of terraces.</b>		
Description	<p>The pipes are removed with the corresponding anchors, taking care not to damage the connections to the drain part, as well as penetrations and contacts with the facade. Dispose of the removed pipes in a suitable place in the school yard for later loading into a suitable means of transport and taking them to the city landfill. (calculated separately).</p>		

BoQ Item	<b>3.3.4.1.13.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Temporary removal of air conditioners from all positions on the building (outdoor units).</b>		
Description	<p>The position includes disconnection from the network, careful and controlled discharge of coolant, as well as domination of the devices themselves and the bracket brackets. They are disposed of in a convenient place near the building, in a place determined by the Investor, for later reassembly (special position).</p>		

BoQ Item	<b>3.3.4.1.14.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Removal of all existing protective grilles on doors and windows, from box and bar profiles of black hardware, dim. 210x310cm (F3)</b>		
Description	<p>The grilles are removed completely including the associated anchors. Removed grates should be temporarily stored in a suitable place in the yard for later loading and transport to the city landfill, which is charged separately. Calculation according to which the grilles were removed depending on the dimension (position markings are related to the positions of the facade joinery on which they are installed).</p>		

BoQ Item	3.3.4.1.15.	Unit	Pcs.
Unit price definition	Window grill dim. 695x235cm (F8)		
BoQ Item	3.3.4.1.16.	Unit	Pcs.
Unit price definition	Window grill dim. 695x210cm (F9)		
BoQ Item	3.3.4.1.17.	Unit	Pcs.
Unit price definition	Window grill dim. 350x306cm (trapezoidal position) (F18)		
BoQ Item	3.3.4.1.18.	Unit	Pcs.
Unit price definition	Window grill dim. 210x310cm (F24)		
BoQ Item	3.3.4.1.19.	Unit	Pcs.
Unit price definition	Window grill dim. 215x595cm (F26)		
BoQ Item	3.3.4.1.20.	Unit	Pcs.
Unit price definition	Window grill dim. 100x120cm (F36)		
BoQ Item	3.3.4.1.21.	Unit	Pcs.
Unit price definition	Window grill dim. 45x60cm (F38)		
BoQ Item	3.3.4.1.22	Unit	Pcs.
Unit price definition	Dismantling of all positions of facade wooden and metal doors and windows (black hardware) with all associated outside sill board and inside sill benches, in all according to the project - demolition and dismantling plan (position excludes already replaced positions - PVC)- Glazed facade wall with entrance doors on terraces dim. 695x215cm (F1)		
Description When dismantling, take care not to damage the facade and internal slats for easier repair later. Removed material / rubble must be temporarily disposed of in a suitable place for later loading and transport to the city landfill, which is charged separately. Calculation according to which positions were removed.			
BoQ Item	3.3.4.1.23.	Unit	Pcs.
Unit price definition	Entrance double door with transom and ventilation shutters, dim. 215x370cm (F2)		
BoQ Item	3.3.4.1.24.	Unit	Pcs.
Unit price definition	Entrance double door with transom and ventilation shutters – entrance "E", dim. 210x310cm (F3)		
BoQ Item	3.3.4.1.25.	Unit	Pcs.
Unit price definition	Entrance double door - entrance "H", dim. 175x235cm (F4)		
BoQ Item	3.3.4.1.26.	Unit	Pcs.
Unit price definition	Entrance double door - entrance "F", dim. 160x200cm (F5)		
BoQ Item	3.3.4.1.27.	Unit	Pcs.
Unit price definition	Entrance single door - entrance "G", dim. 90x210cm (F6)		
BoQ Item	3.3.4.1.28.	Unit	Pcs.
Unit price definition	Glazed facade wall, dim. 720x160cm (F7)		

BoQ Item	<b>3.3.4.1.29.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 695x235cm (F8)</b>		
BoQ Item	<b>3.3.4.1.30.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 695x210cm (F9)</b>		
BoQ Item	<b>3.3.4.1.31.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 695x190cm (F10)</b>		
BoQ Item	<b>3.3.4.1.32.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 695x100cm (F11)</b>		
BoQ Item	<b>3.3.4.1.33.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. (480+220)x160cm (F12)</b>		
BoQ Item	<b>3.3.4.1.34.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 480x190cm (F13)</b>		
BoQ Item	<b>3.3.4.1.35.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. (465+180)x160cm (F14)</b>		
BoQ Item	<b>3.3.4.1.36.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 395x334cm (F15)</b>		
BoQ Item	<b>3.3.4.1.37.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 395x210cm (F16)</b>		
BoQ Item	<b>3.3.4.1.38.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 395x190cm (F17)</b>		
BoQ Item	<b>3.3.4.1.39.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 350x305cm (F18)</b>		
BoQ Item	<b>3.3.4.1.40.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 335x260cm (F19)</b>		
BoQ Item	<b>3.3.4.1.41.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 335x190cm (F20)</b>		
BoQ Item	<b>3.3.4.1.42.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 240x210cm (F21)</b>		
BoQ Item	<b>3.3.4.1.43.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 240x190cm (F22)</b>		
BoQ Item	<b>3.3.4.1.44.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 215x425cm (F23)</b>		
BoQ Item	<b>3.3.4.1.45.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall, dim. 215x595cm (F24)</b>		



BoQ Item	3.3.4.1.46.	Unit	Pcs.
Unit price definition	Glazed facade wall, dim. 225x355cm (F25)		
BoQ Item	3.3.4.1.47.	Unit	Pcs.
Unit price definition	Glazed facade wall, dim. 215x285cm (F26)		
BoQ Item	3.3.4.1.48.	Unit	Pcs.
Unit price definition	Double-sash window with transoms , dim. 215x260cm (F27)		
BoQ Item	3.3.4.1.49.	Unit	Pcs.
Unit price definition	Double-sash window, dim. 215x190cm (F28)		
BoQ Item	3.3.4.1.50.	Unit	Pcs.
Unit price definition	Double-sash window, dim. 215x125cm (F29)		
BoQ Item	3.3.4.1.51.	Unit	Pcs.
Unit price definition	Double-sash window, dim. 215x100cm (F30)		
BoQ Item	3.3.4.1.52.	Unit	Pcs.
Unit price definition	Glazed façade wall, dim. 400x160cm (F31)		
BoQ Item	3.3.4.1.53.	Unit	Pcs.
Unit price definition	Double-sash window, dim. 180x190cm (F32)		
BoQ Item	3.3.4.1.54.	Unit	Pcs.
Unit price definition	Single window with transom, dim. 180x100cm (F33)		
BoQ Item	3.3.4.1.55.	Unit	Pcs.
Unit price definition	Glazed facade wall, dim. 135x455cm (F34)		
BoQ Item	3.3.4.1.56.	Unit	Pcs.
Unit price definition	Glazed facade wall dim. 135x220cm (F35)		
BoQ Item	3.3.4.1.57.	Unit	Pcs.
Unit price definition	Double-sash window, dim. 100x120cm (F36)		
BoQ Item	3.3.4.1.58.	Unit	Pcs.
Unit price definition	Glazed façade wall, dim. 60x200cm (F37)		
BoQ Item	3.3.4.1.59.	Unit	Pcs.
Unit price definition	Single window, dim. 45x60cm (F38)		
BoQ Item	3.3.4.1.60.	Unit	m³
Unit price definition	Loading into a suitable means of transport, removal and unloading of debris generated during removal and dismantling to a suitable city landfill up to 10 km away.		
Description The total calculated amount of debris increased 2 times due to looseness is taken for calculation.			



## II MASONRY WORKS

BoQ Item	<b>3.3.4.2.1.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Procurement of materials and repair of cement screed after removal of floor ceramics on terraces.</b>		
Description	It is being repaired to the level of making a new screed, t = 3.5-4 cm with all the necessary preliminary work and material.		

BoQ Item	<b>3.3.4.2.2.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Procurement of materials and processing of jambs from the inside after the installation of the planned facade PVC and aluminum joinery.</b>		
Description	<p>Jambs are processed according to the following description - stages of processing depending on the condition of the jambs after removal of existing and installation of planned positions:</p> <p><u>Level 1 damage:</u> Manual plastering with extension mortar 1: 3: 9 including all necessary pre-works, application of appropriate substrate (if it is an opening in a concrete wall), as well as protection of planned carpentry, floors and walls;</p> <p><u>Level 2 damage:</u> Installation of gypsum boards w=1.25 cm by direct gluing with a suitable adhesive, including the purchase and installation of corner metal strips to strengthen the corners. The position includes all the necessary work, material as well as the assembly and disassembly of the required scaffolding. The average width of the jambs is 20cm.</p>		

### III INSULATION - ROOFING WORKS

BoQ Item	3.3.4.3.1.	Unit	m <sup>2</sup>
Unit price definition	<b>Procurement of materials and installation of insulation (thermal insulation and waterproofing) of the flat roof after removal of the existing protective layers (gravel / sand t = 5-10cm - all special item of preparatory works) and the existing PVC membrane on the part. Calculation per m2 of developed area of performed insulation, including treatment of all penetrations through insulation and vertical drains (procurement of drains and evaporators is a separate item). -Flat roof on win , 'A'</b>		
Description	<p>The waterproofing is a PVC membrane of ballast type (with a load of gravel layer) "Sikaplan-SGmA 1.5 (Tocal® SGmA, 1.5 mm)" or equivalent. Waterproofing is performed with prior installation of thermal insulation - XPS d = 8cm with all the accompanying layers, and according to the following description (and details from the project "D1 - D10"):</p> <ol style="list-style-type: none"> <li>1. <u>Cleaning of the complete roof after removal of the existing layers</u> (up to bituminous insulation) on the lamella, as well as the existing bituminized insulation on the lamellas of the protective layers of waterproofing (and sand) from all larger and smaller remnants of the mentioned layers;</li> <li>2. <u>Installation of the evaporator (charged separately)</u></li> <li>3. <u>Seperating layer - geotextile 300gr/m2</u> (between)existing bitumen hydro insulation and planned thermal insulation. Geotextile is laid with a fold of min. 10cm</li> <li>4. <u>Thermal insulation</u>, XPS min. 30gr, w=8cm;</li> <li>5. <u>Seperating layer - geotextile 300gr/m2</u>;</li> <li>6. <u>PVC hydro insulation elastic</u>, multilayer,synthetic, hydro insulation membrane w = min. 1.5mm based on modified polyvinyl chloride (PVC) with glass veil reinforcement intended for use with ballast - load (not fixed to the substrate except the rim - along the attic) "Sikaplan-SGmA 1.5 (Tocal® SGmA, 1.5 mm)" or eq. It is installed by overlapping and welding the joints in accordance with the manufacturer's instructions;</li> <li>7. <u>Mechanical fixation of the membrane</u> around the perimeter of the entire roof, ie. immediately adjacent to the roof attic with standard railings made of galvanized steel profiles "Sika Sarnabar type 6" or equivalent. The PVC bar "Sika / S-Welding cord" or equivalent is welded on the outside of the rail (according to the attic), in order to ensure the extraction of the membrane under the rail, in all respects according to EN ISO 9001/14001. If during the execution of works it is determined that the base is not good enough for palpation of the rail, it can be fixed for the roof attic itself vertically;</li> <li>8. <u>Protective - drainage and separating layer - geotextile</u> d = 6mm type "Sika / S protection sheet RS 6mm" or equivalent (between PVC membrane and ballast layer - gravel). Geotextile is laid with overlaps of min. 15cm;</li> <li>9. <u>Ballast layer of gravel</u>, granulation 16-32mm, river, washed, without impurities. It is placed in a layer thickness of 5 cm (in the field), 8 cm (perimeter in a width of 1 m from the attic) and 10 cm in the corners - gravel, due to the difference, the thickness of the layers is calculated separately.</li> </ol> <p>All layers of waterproofing are raised along the vertical elements (attics) and under the metal edgings - drip attics, and in everything according to the tech. description of works and details from the project.PVC membrane should meet EN 13956 quality standards, as follows:</p> <ul style="list-style-type: none"> <li>- Welding resistance to tearing ≥500N / 50mm (EN 12317-2);- Shear weld resistance ≥300N / 50mm (EN 12316-2);</li> </ul>		

- Fire resistance EN 13501-1;
- Vapor permeability EN 1931;
- Tensile strength EN 12311-2;
- Impact resistance EN 12691;
- Resistance to static loads EN 12730;
- Resistance to root penetration satisfies(prEN 13948);
- Dimensional stability EN 1107-2.

Calculation per m<sup>2</sup> of developed area of performed insulation, including treatment of all penetrations through insulation and vertical drains (procurement of drains and evaporators is a separate item). Insulation and all separating layers of geotextiles are made to the bottom of the sheet metal of the attic in order to remove water vapor. Protection of waterproofing from the influence of wind force, ie. the exact amount of gravel ballast layer and the possible number and arrangement of fixers, the direction of installation of the membrane and the width of the membrane - report according to the calculation (Eurocode EN-1991-1-4 (2005)), made by the supplier of waterproofing. Calculation per m<sup>2</sup> of developed roof area(excluding remediation of existing falls and gravel ballast layer - special items).

BoQ Item	<b>3.3.4.3.2.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Flat roof on win , 'B''</b>		

BoQ Item	<b>3.3.4.3.3.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Flat roof on win , 'C''</b>		

BoQ Item	<b>3.3.4.3.4.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Procurement of materials and rehabilitation - correction of existing flat roof falls at all positions of the planned PVC roofing membrane. -Repairing the roof on wing "A" / 30% from 316,8m<sup>2</sup></b>		
Description	All existing falls are retained with the necessary correction in order to solve the problem of possible "puddles", counter-falls and the like. The falls are corrected with a cement screed - a semi-dry method of installation in a layer thickness of approx. 4-6 cm, in positions where it is necessary. Considering the general good condition of the roof waters as well as the fact that they are partially corrected by installing thermal insulation - XPS, remediation / correction is planned for 30% of the roof surface. The position includes all the necessary work and materials.		

BoQ Item	<b>3.3.4.3.5.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Repairing the roof on wing "B" / 30% from 337,3m<sup>2</sup></b>		

BoQ Item	<b>3.3.4.3.6.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Repairing the roof on wing "C" / 30% from 540,3m<sup>2</sup></b>		

BoQ Item	<b>3.3.4.3.7.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Procurement of materials and installation of standard point vert. drains at the positions of the existing ones(detail "D8").</b>		
Description	Drains are of the "Sikaplan Sarnafil Gully PVC vertical" type or equivalent, a complete set for penetration through the mezzanine structure and are installed in everything according to the manufacturer's instructions. The position includes all accompanying and preparatory work as well as the procurement and installation of a protective grid (gravel protection), type "Sika S-Gravelstop frame with S grid" or equivalent.		

BoQ Item	3.3.4.3.8.	Unit	Pcs.
Unit price definition	Procurement of materials and installation of evaporators at all positions defined by the project (detail"D9").		
Description			
The evaporators are typically PVC and are installed over pre-prepared openings in the existing waterproofing (bitumen) as well as the existing fall layer, to the existing roof reinforced concrete structure. The opening in the layers is of circular cross-section min. Ø120mm - max 150mm (not larger than evaporator hat). The position includes all accompanying work and material, procurement and installation of a standard waterproofing lining of pipes of the "Sika S-pipe flashing" type or equivalent. <u>Note: Spot evaporators are performed due to the large roof area and the distance between the attics - over 20m, as well as the fact that the previous waterproofing was not removed, so it is a steam dam.</u>			

BoQ Item	3.3.4.3.9	Unit	Pcs.
Unit price definition	Procurement of materials and installation of cladding for the penetration of all sewage, ventilation and chimney vert. through the flat roof.- Sewer vertical covering (wings "A, B i C")		
Description Penetration treatments are of typical PVC and are installed over pre-prepared openings in the existing waterproofing (bitumen) as well as the existing fall layer. The position includes all accompanying work and materials. Calculation according to which coatings were made.			

BoQ Item	<b>3.3.4.3.10.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Ventilation covering (wing "C")</b>		

BoQ Item	<b>3.3.4.3.11.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Chimney covering (wing "B")</b>		

BoQ Item	3.3.4.3.12.	Unit	m <sup>3</sup>
Unit price definition	<b>Procurement of materials and installation of ballast layer of gravel on flat roof positions. - ,‘WING A’</b> <b>Gravel d=5cm / A=131,2m<sup>2</sup> / V=6,56m<sup>3</sup></b> <b>Gravel d=8cm / A=59,5m<sup>2</sup> / V=4,76m<sup>3</sup></b> <b>Gravel d=10cm / A=118,4m<sup>2</sup> / V=11,84m<sup>3</sup></b>		
Granulation of gravel is 16-32mm, river, washed, without impurities. It is placed in a layer thickness of 5cm (in the field), 8cm (perimeter in the width of 1m from the attic) and 10cm in the corners, and in everything according to the project (Roof base and details "D1 - D10"). Calculation per m <sup>3</sup> of placed gravel.			

BoQ Item	<b>3.3.4.3.13.</b>	Unit	<b>m<sup>3</sup></b>
Unit price definition	<b>, 'WING B'</b> <b>Gravel d=5cm / A=182,9m<sup>2</sup> / V=9,15m<sup>3</sup></b> <b>Gravel d=8cm / A=57,5m<sup>2</sup> / V=4,60m<sup>3</sup></b> <b>Gravel d=10cm / A=83,5m<sup>2</sup> / V=8,35m<sup>3</sup></b>		

BoQ Item	<b>3.3.4.3.14.</b>	Unit	<b>m<sup>3</sup></b>
Unit price definition	<b>, 'WING C'</b> <b>Gravel d=5cm / A=231,2m<sup>2</sup> / V=11,56m<sup>3</sup></b> <b>Gravel d=8cm / A=129,1m<sup>2</sup> / V=10,33m<sup>3</sup></b> <b>Gravel d=10cm / A=159,4m<sup>2</sup> / V=15,94m<sup>3</sup></b>		

BoQ Item	3.3.4.3.15.	Unit	m <sup>2</sup>
Unit price definition	<b>Procurement of materials and production of waterproofing of floors and parts of terrace walls on the first floor (positions from which the floor ceramics are removed) with a coating based on polymer cement ("SIKA elastic" 152 or equivalent).</b>		
Description			
Treat all corners with waterproof tape ("SIKA stop seal" or equivalent). Insulate according to the following description:			
1. <u>Cleaning and dusting</u> of the cem. screed and the wall zone approx. 20 cm high;			
2. <u>Gluings of waterproof tape "SIKA stop seal"</u> or equivalent at all corners ;			
3. <u>Gluings of the appropriate glass mesh reinforcement</u> on all sanitary elements of penetration through the floor (drains) in the dimensions prescribed by the manufacturer of the sanitary element and			
4. <u>Coating the floor and wall to a height of approx. 10 cm</u> with polymer-cem. waterproofing "SIKA elastic" 152 or equivalent. The insulation is coated in two layers, with cross strokes of the appropriate brush at the interval prescribed by the manufacturer, but not less than 1.5 hours. The position includes all necessary materials and accompanying means.			

#### IV SHEET METAL - ROOFING WORKS

##### GENERAL DESCRIPTION FOR SHEET METAL WORKS

Galvanized plasticized flat sheet steel is provided for all sheet metal - covering works  $d_{min} = 0.55\text{mm}$  in green color closest to the existing green - copper patina (RAL 6021 - 6028). The planned sheet metal for hemming is according to the same qualitative description. When delivering sheet metal to the construction site, it is necessary to enclose complete attest documentation. Fasteners for the roofing sheet are suitable self-tapping screws anti-corrosion protected with galvanizing (as well as wood screws), head M8mm, with steel plastic washer  $\varnothing 14\text{mm}$  with EPDM membrane made of synthetic rubber resistant to aging at high temperatures (from min. - 50 to + 1200C) as well as dilatation movements of the sheet metal roof covering by min. 1cm by 10m. All used sheet metal must meet the standards ISO 9001: 2008 and ISO 14001: 2004 as well as the criteria set by the EU standard EN14782 for sheet metal products.

BoQ Item	3.3.4.4.1.	Unit	m <sup>2</sup>
Unit price definition	<b>Procurement of materials and covering of all sloping roofs with flat steel galvanized plasticized sheet metal hand-folded on the spot according to the principle and geometry in everything according to the existing (copper) covering. -Covering of hip roof on wing "A" (developed surface)</b>		
Description	<p>Covering is done according to the following description by procurement and installation:</p> <ol style="list-style-type: none"> <li>1. <u>Steam dams</u> - PVC construction foils, <math>w = 15\text{mm}^2</math>. Longitudinal laths (beams) for ventilation, dimensions 5x12cm at an axial distance of approx. 50cm (between two gutters 100 cm wide). Fixing directly to the AB roof structure with concrete screws;</li> <li>2. <u>Thermal insulation</u> (between longitudinal battens - beams) - mineral soft wool <math>d = 10\text{cm}</math> (not placed in the vertical parts of the roof overhangs, as well as in positions over 50cm from the facade wall - cold zone of the roof eaves);</li> <li>3. <u>Installation of protective PVC</u> construction foil <math>w = 0.15\text{mm}</math></li> <li>4. <u>OSB boards</u> over longitudinal slats / beams. The boards are <math>d = 18\text{mm}</math> and are fixed by screwing for longitudinal slats / beams with wood screws;</li> <li>6. Separating layer - vapor-permeable waterproof foil.</li> <li>5. <u>Longitudinal batten</u> in the middle of the distance between the gutters (approx. 50 cm from the gutters), dim. 4x5cm. The batten is used to join the sheets by folding on the spot. It is fixed to the central longitudinal batten / beam through the OSB board with wood screws;</li> <li>6. <u>Cover sheet from the general description</u>. The sheet metal is laid as flat by folding on site on a similar principle as the existing copper sheet. Horizontal joints are provided by folding the dropped seam while applying a sealant to the folding surface of the seam. Longitudinal folding is done over the central slat with the insertion of a cover sheet metal strip above the slat itself. The position includes all the necessary material from the description, all the accompanying unspecified edgings (eaves, edging, lantern edgings, etc.), as well as the assembly and disassembly of the required scaffolding. Calculation per m<sup>2</sup> of the developed area of the sloping roof, including sloping gutters within the roof, as well as all edge drips on the eaves.</li> </ol>		

BoQ Item	3.3.4.4.2.	Unit	m <sup>2</sup>
Unit price definition	<b>Covering of hip roof on wing "B" (developed surface)</b>		

BoQ Item	3.3.4.4.3.	Unit	m <sup>2</sup>
Unit price definition	<b>Covering of hip roof on wing "B" (developed surface)</b>		

BoQ Item	<b>3.3.4.4.4.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Procurement of materials, production and installation of sheet metal edgings of roof attics - drip and roof drop beam lantern attics and superstructures above the stair verticals and after the installation of PVC roofing membrane.-Drip edge around the roof lanterns on the wing "C" - gym, d.w. = 30cm / Detail "D10"</b>		
Description	<p>The edging is made of galvanized steel plasticized sheet metal d = 0.6 mm, and in everything according to the technical description and details from the project (Details "D1 - D10"). The position previously includes:</p> <p>1. Installation of anchors made of galvanized sheet dim. min. 40x6mm which are placed at a distance of max 60cm. They are fixed with screws with dowels in two places closer to the edges of the attic (remove all labile elements of mortar and layers), then:</p> <p>2. Installation of the attic cover itself by folding around the sheet metal anchor d.a. = 30 cm, as well as all the accompanying work, material and connecting means.</p>		
BoQ Item	<b>3.3.4.4.5.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Drips edge on overhangs of stair verticals and gutters (concrete trough) above the terraces on the first floor, width = 32cm / Detail "D2"</b>		
BoQ Item	<b>3.3.4.4.6.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Drip edge of roof attics, d.w.=46-48cm / Detail "D1i D5"</b>		
BoQ Item	<b>3.3.4.4.7.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Drip edge dropped roof beams - wing "C" - dressing room, d.w.=60cm / Detail "D7"</b>		
BoQ Item	<b>3.3.4.4.8.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Drip edges on the transition of sloping to flat roofs and roofs to the walls of fences on the terraces on the first floor, d.w.=70cm / Details "D2 i D3"</b>		
BoQ Item	<b>3.3.4.4.9.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Driped edge on upper zones of the membrane around the window on the wings "A" and "B", d.w.=45cm, L=100cm</b>		
BoQ Item	<b>3.3.4.4.10.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Procurement of materials, production and installation of drip edges on horizontal gutters - troughs above the terraces on the first floor.</b>		

<p>Description</p> <p>The gutter is lined with sheet metal from the general description and in everything according to the detail "D2". The gutter is 110 cm wide. The position includes pre-leveling - repairing the layer for falling (semi-dry), laying layers of thermal insulation (min. Hard pressed wool d = 5cm along the vertical part of the gutter), separating layer - vapor-permeable waterproof foil under the entire developed width, nets / combs against birds and insects , as well as all accompanying small unspecified edgings (drip is a special item of bill of quantities).</p> <p><u>GENERAL NOTE: Since the entire roof covering of sloping roofs is made of sheet metal, harmonize the phase and dynamics of the works with the works on the installation of FeZn strips of the lightning distribution and their anchors and fixers that are connected to the sheet metal.</u></p>
---

## V CERAMIC WORKS

BoQ Item	3.3.4.5.1.	Unit	m <sup>2</sup>
Unit price definition	<b>Procurement of materials and installation of floor ceramics on all terraces on the floor from which the ceramics were previously removed.</b>		
<p>Description</p> <p>Place the tiles in the "ceresit CM16" ceramic adhesive or equivalent with open joints d = 2mm. The tiles are in light beige tones, dimensions 40x40 - 60x60cm.</p> <p>The position includes the installation of plinth ceramics cut from the floor, height h = 7-10 cm, grouting, siliconizing the joint of plinth ceramics and the wall, as well as cleaning and washing the surface with water. Ceramics must have slippery and acid-resistant properties (also applies to grout), which is proven by the manufacturer's documentation, as well as the appropriate attestation documentation for specifically selected ceramics.</p> <p><u>NOTE: Form a price based on the unit price of ceramics up to 15 € / m<sup>2</sup>. Calculation per m<sup>2</sup> of developed surface of installed ceramics.</u></p>			



## VI JOINERY - LOCSMITH WORKS – facade PVC joinery

### GENERAL DESCRIPTION FOR JOINERY - LOCSMITH WORKS – facade PVC joinery

The system of windows and entrance doors should be made of multi-chamber (at least five-chamber) PVC profiles, minimum profile width 70 mm, in accordance with the RAL quality standard (which means resistance to UV radiation, twisting, etc.) The maximum value of thermal conductivity of the profile should be  $U_f \leq 1.3 \text{ W / m}^2\text{K}$ . The reinforcement of the profile should be in accordance with the specification of the supplier of the profile (from galvanized steel profiles of appropriate thickness as stiffening and reinforcement, and reinforcement of all corners and connections for permanent preservation of the given window geometry.

Glazing is done with a thermal insulation package of glass, 4 + 16 + 4mm (Float glass inside, and low-emission outside with a solar factor (g) less than 45%). The glazing of the lower zones of the entrance door and similar positions of more frequent use are glazed with the same type of package using safety tempered glass d = 4mm (specified in the carpentry schemes as well as in the description of the item in the bill of quantities). Provide a minimum of two sealing rubber bands around the circumference of the frames and sash. The minimum performances that the finished product must provide and which must be proven through an official certificate are: EN 12207 - CLASS 4; EN 12208 - CLASS 8A; EN 12210 - CLASS C4;

All windows are equipped with inside PVC sill benches and aluminum sills. Supply carpentry with high-quality nickel-based and AL-alloy fittings ("Winkhaus Activ Pilot" or technical equivalent), handles, locks and keys. Pay special attention to highly mounted ventus wings that must be equipped with high quality fittings. The command of these openings should be a rope - a tug lowered at an elevation of max 1.50m from the floor. The openings and channels in the condensate drainage profiles must be fitted with lids on the outside of the opening. The cover must also be protected from falling due to atmospheric influences.

All entrance doors are equipped with a hydraulic mechanism for automatic door closing (in the case of double-leaf entrance doors, the mechanism is installed on the primary wing). All window positions are equipped with aluminum outside sill board and inside PVC sill benches.

BoQ Item	3.3.4.6.1.	Unit	Pcs.
Unit price definition	<b>Procurement of materials, production and installation of facade joinery from PVC profiles. -Glazed facade wall on terraces with entrance door – terraces on the 1st Floor , dim. 695x215cm</b>		
Description	In accordance with, 'GENERAL DESCRIPTION FOR JOINERY - LOCSMITH WORKS – facade PVC joinery'";		

BoQ Item	3.3.4.6.2.	Unit	Pcs.
Unit price definition	<b>Entrance double door with transom and ventilation shutters dim. 215x370cm</b>		

BoQ Item	3.3.4.6.3.	Unit	Pcs.
Unit price definition	<b>Entrance double door with transom and ventilation shutters – entrance "E", dim. 210x310cm</b>		

BoQ Item	3.3.4.6.4.	Unit	Pcs.
Unit price definition	<b>Entrance double door - entrance "H", dim. 175x235cm</b>		

BoQ Item	<b>3.3.4.6.5.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Entrance double door - entrance "F" dim. 160x200cm</b>		
BoQ Item	<b>3.3.4.6.6.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Entrance single door - entrance "G", dim. 90x210cm</b>		
BoQ Item	<b>3.3.4.6.7.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with three double sash windows, dim. 720x160cm</b>		
BoQ Item	<b>3.3.4.6.8.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with two tilt and turn windows opening, dim. 695x235cm</b>		
BoQ Item	<b>3.3.4.6.9.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with three double sash windows with transom dim. 695x210cm</b>		
BoQ Item	<b>3.3.4.6.10.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with three double sash windows, dim. 695x190cm</b>		
BoQ Item	<b>3.3.4.6.11.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with two single windows and two double sash windows, dim. 695x100cm</b>		
BoQ Item	<b>3.3.4.6.12.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with three double sash windows dim. (480+220)x160cm</b>		
BoQ Item	<b>3.3.4.6.13.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with three double sash windows and transoms, dim. 480x190cm</b>		
BoQ Item	<b>3.3.4.6.14.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with three double sash windows, dim. (465+180)x160cm</b>		
BoQ Item	<b>3.3.4.6.15.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with two double sash windows and PVC panel filling, dim. 395x334cm</b>		
BoQ Item	<b>3.3.4.6.16.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with three double sash windows and transoms, dim. 395x210cm</b>		
BoQ Item	<b>3.3.4.6.17.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with three double sash windows, dim. 395x190cm</b>		
BoQ Item	<b>3.3.4.6.18.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with one single window dim. 350x305cm</b>		

BoQ Item	<b>3.3.4.6.19.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with one single window and PVC panel filling transoms, dim. 335x260cm</b>		
BoQ Item	<b>3.3.4.6.20.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with one single window, dim. 335x190cm</b>		
BoQ Item	<b>3.3.4.6.21.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with two doublesash windows and transoms dim. 240x210cm</b>		
BoQ Item	<b>3.3.4.6.22.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with two double sash window dim. 240x190cm</b>		
BoQ Item	<b>3.3.4.6.23.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with double sashwindow and transoms with tilt and turnopening dim. 215x425cm</b>		
BoQ Item	<b>3.3.4.6.24.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade with tilt and turn transoms opening and PVC panel filling dim. 215x595cm</b>		
BoQ Item	<b>3.3.4.6.25.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with double sash window, transom and PVC panel filling, dim. 225x355cm</b>		
BoQ Item	<b>3.3.4.6.26.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Procurement of materials, production and installation of facade joinery from PVC profiles. - Glazed facade wall with tilt and turn transoms opening dim. 215x285cm</b>		
BoQ Item	<b>3.3.4.6.27.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Double-sash window with full panel filling transoms, dim. 215x260cm</b>		
BoQ Item	<b>3.3.4.6.28.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Double-sash window dim. 215x190cm</b>		
BoQ Item	<b>3.3.4.6.29.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Double-sash window dim. 215x125cm</b>		
BoQ Item	<b>3.3.4.6.30.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Double-sash windowdim. 215x100cm</b>		
BoQ Item	<b>3.3.4.6.31.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with two double sash windows dim. 400x160cm</b>		
BoQ Item	<b>3.3.4.6.32.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Double - sash window, dim. 180x190cm</b>		

BoQ Item	<b>3.3.4.6.33.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Single window with sidelights, dim. 180x100cm</b>		

BoQ Item	<b>3.3.4.6.34.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with transom with tilt and turn opening and PVC panel filling dim. 135x455cm</b>		

BoQ Item	<b>3.3.4.6.35.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with tilt and turntransom opening dim. 135x220cm</b>		

BoQ Item	<b>3.3.4.6.36.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Double sash window, dim. 100x120cm</b>		

BoQ Item	<b>3.3.4.6.37.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Glazed facade wall with singlewindow and transom, dim. 60x200cm</b>		

BoQ Item	<b>3.3.4.6.38.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Single window, dim. 45x60cm</b>		

BoQ Item	<b>3.3.4.6.39.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Procurement and installation of planned roof windows dim. 114x160cm in the positions of removed polyester lanterns (wing "B"-zone above the amphitheater) made of thermodified wooden core coated with a protective polyurethane layer (maintenance-free finishing system).</b>		

**Description**

The window is of the "Velux - GGL Integra" type or equivalent with remote control (the windows are set high and out of reach for classic operation. The window is with a middle hanging, glazed with a triple thermopane package 4 + 14 + 3 + 14 + 3mm where the upper (outer) glass is ground (milky) and tempered, and the space between the panes filled with argon gas / EE glass Uw = 1,1.

The window is equipped with:

- Electric motor drive with remote control - window opening;
- Internal blinds for complete blackout with electric motor drive and remote control;
- Rain sensor - automatic closing;
- Ventilation and in the closed position;
- Dust and insect filter;
- Drainage channel within the tin aluminum. a strip to collect any atmospheric water that penetrates through the roof covering, or condensate;
- Double belt gasket (additional safety against leaks).

## VII JOINERY - LOCKSMITH WORKS – facade aluminium joinery

### GENERAL DESCRIPTION FOR FACADE ALUMINIUM JOINERY

Facade joinery is made of aluminum profiles type "Alumil M11500 Alutherm Plus" or technical equivalent - with interrupted thermal bridge over the polyamide insert. The final treatment of the facade hardware profile is plastic coating in white (RAL 9003 or visual equivalent). Glazing is done with a thermal insulation glass package "pamplex" multilayer safety glass 3.3.1 d = 6mm / package 6 + 16 + 6mm (in both packages it is mandatory to use one low-emission glass / coating / Low E). The overhead lights are glazed with thermopane glass 4 + 16 + 4mm (inside Float glass, and outside low-emission with solar factor (g) less than 45%). The characteristics of aluminum hardware that must be met are the following (specified values and classes are the minimum that must be met):

1. Thermal insulation (profile) in accordance with EN ISO 10077-2,  $U_f \leq 2.3 \text{ W / m}^2\text{K}$ ;
2. Thermal insulation of packages in accordance with EN 1077  $U_w \leq 1.8 \text{ W / m}^2\text{K}$ ;
3. Air permeability in accordance with EN 12207 - Class 4; EN 12208 - CLASS E750; EN 12210 - CLASS C4;
4. Watertightness in accordance with EN 12208 - Class 9A;
5. Wind pressure resistance (blow test) in accordance with EN 12210 - Class C5;
6. Mechanical requirements EN 12400 - Class 2;
7. Load capacity of the wing mechanism min. 130kg;
8. Certificate for glass EN 673;

Pay special attention to the highly mounted ventus wings which must be equipped with high quality fittings and provide a quality opening system in the lower zone of the opening. The command of these openings should be with a rope - a tug lowered at an elevation of max 1.50m from the floor. Openings and channels in the condensate drainage profiles must be with mandatory covers on the outside of the drainage opening. The cover must also be protected from falling due to atmospheric influences. All entrance door positions are equipped with hydraulic door closers with the possibility of locking in the open position;

Positions include the purchase and installation of aluminum profiles for additional reinforcement of facade hardware, all according to graphic attachments. The position of the window includes the purchase of all the necessary fittings, mechanisms for opening the window "on the ventus" - rope - pull and installation of aluminum outside sill benches and inside PVC sill benches (windows) depending on the position. Position labels are from the "Planned Status" graphic part. The obligation of the Bidder / Contractor is to submit the required attest documentation which proves the satisfaction of the required characteristics of the facade locksmith from the position description.

BoQ Item	3.3.4.7.1.	Unit	Pcs.
Unit price definition	<b>Procurement of materials, production and installation of lanterns on wing "C" - gym. Roof lanterns dim. 980x170cm.</b>		
Description	The lanterns are made of aluminum profiles with an interrupted thermal bridge of the "Alumil Smartia 10800" type or the technical equivalent for use on flat roofs. The profile and glass should meet the characteristics from the general description for aluminum facade joinery, primarily in the part of energy efficiency of the profile, glass package and complete product - lantern, which is proven by attestation documentation and statement of the manufacturer on meeting the characteristics in accordance with the Ordinance. The position includes all supporting materials and fasteners. The edging is calculated separately. Calculation per piece of installed lanterns.		

BoQ Item	<b>3.3.4.7.2.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Procurement of materials and installation of strip curtains on all facade positions defined by the project (office - positions of the new facade carpentry and administration).</b>		
Description	The position includes all the necessary supporting material and fasteners. Color and texture / decor of strip curtains in all according to the wishes of the Investor, provided that it does not affect the unit price provided by the offer.		

BoQ Item	<b>3.3.4.7.3.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Procurement of materials and installation of venetian blinds on all facade positions defined by the project (classrooms and cabinets).</b>		
Description	The position includes all the necessary supporting material and fasteners. The color of the venetian blind in everything according to the wishes of the Investor, provided that it does not affect the unit price provided by the offer.		

### VIII LOCSMITH WORKS – protective window grills

BoQ Item	<b>3.3.4.8.1.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Procurement of materials, production and installation of protective window grilles at all positions of the F10 facade joinery, as well as repair of the existing ones, temporarily removed in advance.). - Window grill dim. 204x304cm (F3)</b>		
Description	The new grilles are made of box profiles of black hardware, dim. 20x20x1,5- 2mm from which both the frame and the filling are made. All joints are made by welding, and fixing to the walls via existing anchors (from existing pre-removed window grilles). The position includes all the necessary work and supporting material, sanding all welds with a sanding fan to even out surfaces, anti-corrosion protection in two coats and final coating with white polyurethane varnish (RAL9003) in two layers with protection of all surrounding surfaces, as well as assembly and disassembly of the necessary scaffolding . The existing, pre-removed gratings are ground to metal, then protected and finally processed in accordance with the above description and installed in the same positions. Calculation according to which grilles are installed.		

BoQ Item	<b>3.3.4.8.2.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Window grill dim. 689x229cm (F8)</b>		

BoQ Item	<b>3.3.4.8.3.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Window grill dim. 689x204cm (F9)</b>		

BoQ Item	<b>3.3.4.8.4.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Window grill dim. 344x300cm (trapezoidal position) (F18)</b>		

BoQ Item	<b>3.3.4.8.5.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Window grill dim. 204x304cm (F24)</b>		

BoQ Item	<b>3.3.4.8.6.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Window grill dim. 209x589cm (F26)</b>		

BoQ Item	<b>3.3.4.8.7.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Window grill dim. 94x114cm (F36)</b>		

BoQ Item	<b>3.3.4.8.8.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Window grill dim. 39x54cm (F38)</b>		

## IX PLASTER – PAINTING WORKS

BoQ Item	3.3.4.9.1.	Unit	m'
Unit price definition	Procurement of materials and painting repair of all slats on the inside after the installation of facade PVC joinery.		
Description			
Position includes:- Smoothing in two hands with grinding to the required flatness and smoothness. The price includes all the necessary pre-work (scraping as needed) as well as the cost of protecting the finished final surfaces (windows, doors, etc.) and installation of corner aluminum moldings and- Painting of spalettes and contact zones with walls with acrylic matte water-based latex paint. All surfaces intended for painting must be previously cleaned, dusted and applied with a suitable substrate / primer with additives against the appearance of mold, in one layer, and white colour.			

## X FACADE WORKS

BoQ Item	3.3.4.10.1.	Unit	m <sup>2</sup>
Unit price definition	<b>Procurement of materials and production of contact thermal insulation "demiit" facade at all positions defined by the project.</b> <b>- Facade with EPS thermal insulation boards,</b> <b>γmin = 20kg / m³, w= 8cm</b>		
Description			
<p>Thermal insulation of facade walls is provided with expanded polystyrene EPS with a thermal conductivity coefficient λmax = 0.037 W / mK and a thickness of 8 cm (on 3-5 cm joists), which is produced according to the appropriate EN standards. The composite exterior thermal insulation system (ETICS) should be ETAG 014 certified. The lower part of the facade walls, at the height of the ground floor (all sills and plinths on the ground floor, pillars and parts of solid walls), treated with harder insulating material, extruded polystyrene XPS thickness d = 8cm (min 5cm in the basement) which is more resistant to mechanical damage , nominal thermal conductivity in the range λ = 0.035-0.04W / mK. Thermal panels are "folding" - folded, flammability class B1 (DIN 4102 B1 heavy flammability, incombustibility and self-extinguishing), with vertical breaks 50 cm wide, placed along the entire facade at a maximum distance of 20 m, as well as horizontal breaks 50 cm above the opening on part of the mezzanine structure made of TP mineral wool flammability class A1. Before starting the installation of thermal panels, the following works must be completed:- All works on the flat roof, including tinsmith works;- Replacement of facade joinery;- Installation of all planned installations on the facade; - Cover and protect all surfaces that remain untreated - glass surfaces, stone... Checking the existing substrate on the building:</p> <p>For the purpose of plucking, prepare a glass mesh in the dimensions of about 50x50 cm. Apply adhesive and reinforcement mortar to the substrate (which is also</p>			

intended for installation), and trowel it in one direction with a trowel. Press the glass mesh into the mass for reinforcement and level with the smooth side of the trowel so that part of the mesh remains free (10 cm). Depending on the weather conditions, dry for 5-7 days. After hardening, the glass mesh should be removed from the test surface on the wall. If only the glass mesh is torn from the reinforcing layer of mortar, it means that the substrate is sufficiently load-bearing and the test is positive by pulling, and if both the glass mesh and the reinforcing layer (even old plasters or coatings) are separated from the wall, the substrate is not load-bearing and is not suitable for direct treatment with mortar or coating. As a last resort, a load-bearing base should be created by mechanical reinforcement. To determine the load-bearing capacity of the substrate and suitability to the intended mortar for gluing and reinforcement, the substrate must be wiped. If the substrate is dusty, it must be dusted. Mechanically remove coatings from the substrate in cases where the coatings are lime-based.

Contact thermal insulation facade is performed in the following steps:

1. Cleaning and degreasing of the surface (with a preliminary test of the load-bearing capacity of the substrate) according to the above description with repair - filling large cracks with repair mass "Röfix 510" or equivalent;
2. Installation of a perimeter plinth zone with a height of min. 40cm from the elevation of the terrain / sidewalk with XPS thermal insulation board,  $\gamma_{min} = 35 \text{ kg} / \text{m}^3$ ,  $d = 8 \text{ cm}$ . The board is glued with a suitable adhesive of the "Röfix Unistar" type or technical equivalent, covering with a notched trowel 1 / 1 cm in the entire surface - contact with the substrate 100% of the surface. XPS boards should be additionally fixed to the base in the upper zone 5 cm below the edge with 2 dowels / m;
3. Installation of EPS thermal insulation boards  $\gamma_{min} = 20 \text{ kg} / \text{m}^3$ ,  $d = 8 \text{ cm}$ . The board is glued with a suitable adhesive type "Röfix Unistar" or technical equivalent, edge - point - contact with the substrate min. 40% of the surface. EPS panels additionally fixed to the substrate with min. 6 dowels /  $\text{m}^2$  (obligation of the contractor is to submit the budget by the supplier regarding the required number of dowels for the specifically selected system);
4. Installation of fire barriers / insulation wings above all positions of facade openings. The lamella is made of mineral hard pressed wool type "Röfix Firestop 034" or equivalent,  $d = 6 \text{ cm}$ , fire resistance class min. A2-s1-d0. The position includes placing the leveling strip EPS  $\gamma_{min} = 20 \text{ kg} / \text{m}^3$ ,  $w = 2 \text{ cm}$ ;
5. Applying reinforcement mortar in two layers with the installation of reinforcing mesh between the layers. The mortar is pasty type "Röfix R12 - R16" or equivalent and is applied in a total layer thickness of 3-5 mm. The reinforcing mesh is glass type "Röfix P50" or equivalent. After applying the second layer, the mesh must be covered with a layer of mortar for min. 1mm. When reinforcing the surface, pay attention to additional reinforcements and overlaps of the mesh, as follows:
  - Diagonal reinforcement around all corners of windows and doors by placing mesh in strips of minimum dimensions 20x40cm at an angle of about 45 °. Reinforcement of edges and corners is performed with an overlap of at least 10 cm;
  - Connection and end profiles are made with an overlap of at least 10 cm and TI-additional mounting parts (eg corner profile with mesh, drip profile with mesh) are made with an overlap of at least 10 cm;
  - Finishing profile for sheet metal edging type "Röfix Bap" or equivalent is placed on the plinth profile - for inserting tin edging; The profile joints are connected on drips with pre-assembled joints. Surface reinforcement is performed to the extreme edge of the profile;
  - The drip profile is placed on the outer corner of the drip with the recessed facade parts. It is installed before surface reinforcement;



- Apply a "Röfix Premium" type substrate or white equivalent (according to the choice of the final decorative silicone mortar). Apply min. 3-5 days after application of surface reinforcement mortar;
6. Apply a "Röfix Premium" type substrate or white equivalent (according to the choice of the final decorative silicone mortar). Apply min. 3-5 days after application of surface reinforcement mortar;
  7. Application of pasty silicone decorative finishing mortar type "Röfix SHP Premium" in white color. The application is in full structure (do not rub the grooved surface structure), granulation 1.5-2mm. The final mortar contains substances against the appearance of algae and fungi, increased resistance to temperature influences, UV radiation as well as alkalinity - permanent protection against microbiological organisms with a mandatory degree of environmental acceptability.

ETA certificate (European Technical Approval) is a certificate issued by the European Organization for Technical Approval, which confirms that the thermal insulation system complies with the parameters prescribed by this organization - mechanical resistance and stability, fire safety, hygiene, health and environmental sustainability, safety in use, noise protection, energy efficiency and heat retention.

The price includes the purchase, installation of a set of materials, preparatory work, preparation of the substrate, production of thermal facade in the described layers, all the accompanying small unspecified material and means, as well as assembly and disassembly of the necessary scaffolding.

Calculation per m<sup>2</sup> of the developed surface of the façade, regardless of the number of edges to be treated, with rejected façade openings in their entirety (joists are calculated separately).

BoQ Item	<b>3.3.4.10.2.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Facade with thermal insulation boards XPS, <math>\gamma_{min} = 35\text{kg} / \text{m}^3</math>, w = 8cm (plinth part h = 40cm)</b>		

BoQ Item	<b>3.3.4.10.3.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Facade (frames) with TI panels d = 3-5cm</b>		

BoQ Item	<b>3.3.4.10.4.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Procurement of materials and processing of all jambs according to the gen. description of works on the production of thermal insulation facade (it. 1 of facade works)</b>		

Description

Including the following items:

1. Cleaning of the spalette zone;
2. Installation by gluing of thermal insulation panel made of EPS  $\gamma_{min} = 20\text{kg} / \text{m}^3$ , d = 3-5cm depending on the ratio of production and masonry dimensions of the planned facade PVC joinery;
3. Application of reinforcement mortar in two layers with the installation of a reinforcing mesh made of fiberglass, with prior installation of the corner profile with the mesh. All reinforcement meshes are installed using the "fresh in fresh" method for a better connection;
4. Application of the final pasty silicone decorative finishing mortar type "Röfix SHP Premium" in white color (in accordance with the rest of the facade) and
5. After the completion of all works on the treatment of the spatula (after at least 3 days), clean the joint of the decorative plaster and PVC window profile and apply / fill with glue - sealant ("KD" or equivalent) with prior protection of all surrounding surfaces.

BoQ Item	<b>3.3.4.10.5.</b>	Unit	<b>m<sup>2</sup></b>
Unit price definition	<b>Procurement of materials and processing of all parts of the facade that are not intended for the production of thermal insulation "demit" of the façade (parts of the attic, roof overhangs on the underside, etc.)</b>		
Description	According to the description of the façade works (item 1 of the façade works) with the exception of the installation of thermal insulation EPS, XPS and mineral wool panels.		

## XI OTHER WORKS

BoQ Item	<b>3.3.4.11.1.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Procurement of materials and installation of a new distribution of the roof lightning protection installation - Fe / Zn stripes dim. 20x3mm laid on suitable "T" girders poured into standard concrete cakes in all positions of the flat roof. - Lightning stripes distribution - Wing "A"</b>		
Description	Galvanically connect the strips to all metal parts of the roof - roof covering and sheet metal cladding made of galvanized plastic steel sheet, as well as to all existing risers within the vertical elements of the building structure. Lightning distribution strips to be reported in everything according to the project (roof base - planned condition) - harmonized with the project of the existing building, no. 685/80 of 1980 made by "Institute for Urbanism and Housing and Communal Technology of SRM Skopje".		

BoQ Item	<b>3.3.4.11.2.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Lightning stripes distribution - Wing "B"</b>		

BoQ Item	<b>3.3.4.11.3.</b>	Unit	<b>m<sup>1</sup></b>
Unit price definition	<b>Lightning stripes distribution - Wing "C"</b>		

BoQ Item	<b>3.3.4.11.4.</b>	Unit	<b>Pcs.</b>
Unit price definition	<b>Final rough and fine cleaning of the facility with driving away of fine debris to a suitable city landfill up to 10km away.</b>		
Description			