

Section VI

TECHNICAL DESCRIPTION / SPECIFICATIONS

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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

VOLUME 3	Refurbishment of P.I. Vocational School "Danilo Kiš" Budva
TMP	Traffic 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 indentify 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-acticms> 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 m² floor areas, having at least one additional socket per 5 m² of floor area or part thereof.

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

The Contractor shall supply, install and maintain furniture such as desks, cupboards, drawing tables and plan chests, chairs and shelves, etc. in the numbers, trademarks and quality as approved by the 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 ± 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]
CO2-5	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

	Technical Description / Specification	Corresponding Folder from Main Design
01	Architecture / Construction – craft works	1.1
02	Electric instalation – high voltage	1.2
03	Elactric instalations – low voltage	1.3
04	Water supply & Sewerage	1.4

VOLUME 3.1

TECHNICAL DESCRIPTION / SPECIFICATIONS

01 ARCHITECTURE / CONSTRUCTION – CRAFT WORKS

TECHNICAL DESCRIPTION

Object:	P.I. Vocational High School „Danilo Kiš“ Budva
Location:	C.P. No 1617/1, C.M. Budva, Budva
Investor:	P.I. Vocational High School „Danilo Kiš“ Budva
Total Gross area:	5487,51m ²
Total Nett area:	4426,62m ²
Stories:	2 (GF+1)

INTRODUCTION

Based on the terms of reference submitted by the Investor, the project documentation was prepared - the main project for the adaptation of the facility of the Public Institution vocational high school "Danilo Kiš" in Budva.

EXISTING SITUATION

The subject building of the school is located in the center of Budva, stands independently, divided, floors Su (basement) + P(groundfloor) + 1, dimensions cca. 110x43m.

The construction system of the building is a skeletal-concrete skeletal system with wall plates for horizontal fastening and a monolithic reinforced concrete burial ground and roof structure.

All roofs are flat, impassable and slightly sloping.

The current condition of the building is quite bad, starting from the condition of facade cladding, part of the facade carpentry (which has not been replaced) through the condition of the interior - floors, walls, ceilings to lighting installations and part of plumbing and sewerage installations within toilets that were not repaired in previous adaptations.



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

By detailed auscultation of the entire facility, as well as the analysis of the original project documentation according to which the facility 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 implemented in the function of sustainability and profitability of the investment itself.

ANALYSIS OF THE CONDITION OF THE EXISTING ENVELOPE ENVELOPE (floors in contact with the ground, walls, roof and facade carpentry)

GROUND STRUCTURES / vinyl flooring

1. Floor covering - vinyl boards (marmoleum) + glue, d = 1cm;
2. Reinforced cement screed, d = 3cm;
3. Waterproofing / thermal insulation protection - soda paper;
4. Hard pressed mineral wool - tervol, d = 5cm;
5. Bitumen waterproofing, d = 0.5cm &
6. Lightly reinforced concrete slab on the ground, d = 10cm

GROUND STRUCTURES / ceramic floor covering

1. Floor covering - ceramics on the underlying mortar, d = 1.2 cm;
2. Reinforced cement screed, d = 3cm;
3. Waterproofing / thermal insulation protection - soda paper;
4. Hard pressed mineral wool - tervol, d = 5cm;
5. Bitumen waterproofing, d = 0.5cm &
6. Lightly reinforced concrete slab on the ground, d = 10cm

STRUCTURES ABOVE OPEN SPACE / vinyl floor covering

1. Floor covering - vinyl boards (marmoleum) + glue, d = 1cm;
2. Reinforced cement screed, d = 3cm;
3. Waterproofing / thermal insulation protection - soda paper;
4. Hard pressed mineral wool - tervol, d = 2cm;
5. RC monolithic slab, d = 18cm
6. Hard pressed mineral wool - tervol, d = 5cm &
7. Suspended ceiling - windy space.

CONSTRUCTION OF FACADE WALLS

1. Smooth and paint;
2. Lime mortar, d = 1.5 cm;
3. RC wall, d = 16-25cm (depending on the position);
4. Tervol, d=3cm;
5. Light reinforced concrete, d = 5cm;
6. Cement mortar, d = 2cm &

7. Silicate facade brick, d = 6.5 (7) cm

CONSTRUCTION OF FLAT IMPROPER ROOFS / with and without ballast layer

1. Ballast layer of gravel, d = 5-10cm;
2. Geotextil 300gr / m² - waterproofing protection;
3. Waterproofing PVC membrane, d = 1.5mm;
4. Thermal insulation XPS, d = 5cm;
5. Geotextil 300gr / m² - waterproofing protection;
6. Bituminous four-layer waterproofing, d = 1.5 cm;
7. Hard pressed mineral wool, d = 8cm (6.5 in compacted state);
8. Perlite concrete - sloping layer, d = 5cm;
9. Steam dam - PVC foil;
10. RC monolithic slab, d = 18cm
11. Lime mortar, d = 1.5 cm &
12. Smooth and paint, d = 0.3cm.

SLOPE ROOF CONSTRUCTION

1. Self-aligning metal sheet, d = 0.55mm;
2. OSB, d=2,2cm;
3. Wooden slats - ventilation, dim. 5x5cm;
4. Vapor-permeable waterproof foil;
5. Thermal insulation - mineral hard pressed wool, d = 8cm;
6. Wooden slats, dim. 5x8cm;
7. Steam dam;
8. RC monolithic inclined plate, d = 18cm;
9. Lime mortar, d = 1.5 cm &
10. Smooth and paint.

FACADE JOINERY / GLAZED POSITIONS - The existing façade joinery has for the most part already (in previous adaptations) been replaced by new PVC positions in a share of 82% of the total area of facade positions / glazed areas (excluding positions intended for removal or walling).

Given all the above descriptions and the condition of the building envelope, and with the fact that the facade cladding is silicate brick, the removal of which to create new layers of thermal insulation that would enhance the energy image of the building, would exceed the financial possibilities for the project and would not give tangible results, no additional measures are envisaged to improve the energy parameters of the building, because the existing ones (including all previous adaptations and energy efficiency measures - roof repairs and replacement of facade joinery), meet.

The possibility of coating the existing facade silicate cladding with a contact thermal insulation facade of the "demit" type or similar, is eliminated as a solution due to the complete loss of the visual identity of the school building and copyright infringement.

As for the visual aspect of the facade surfaces, it is in a rather bad condition due to the influence of atmospheric precipitation and the appearance of algae and lichens, as well as due to graphite which is difficult to remove from

the facade silicate brick due to the relief and porosity of the silicate brick surface.



Photo 1 – Northwest facade



Photo 2 – Southeast facade

Also, the general condition of the façade plastered surfaces, finally treated with façade coatings, is poor and also requires masonry and painting repairs. The position also includes the annex of the building - a pergola with a colonnade in front of the main entrance to the school.



*Photo 3 – Segment of the southwest facade
(condition of the part of the facade that is not covered with silicate brick)*

ANALYSIS OF THE EXISTING CONDITION OF THE INTERIOR

(floors, walls, ceilings, interior carpentry and installations - the topic of projects of electrical installations of strong and weak electricity and installation of water supply and sewerage).

The existing floors in the building are ceramics and vinyl tiles. In the administrative part of the building (the director's office and the rest of the administration), the floor covering is rug and laminate (over vinyl panels). All floors are in poor condition and unacceptable for this type of building in terms of appearance and difficult regular maintenance of hygiene.

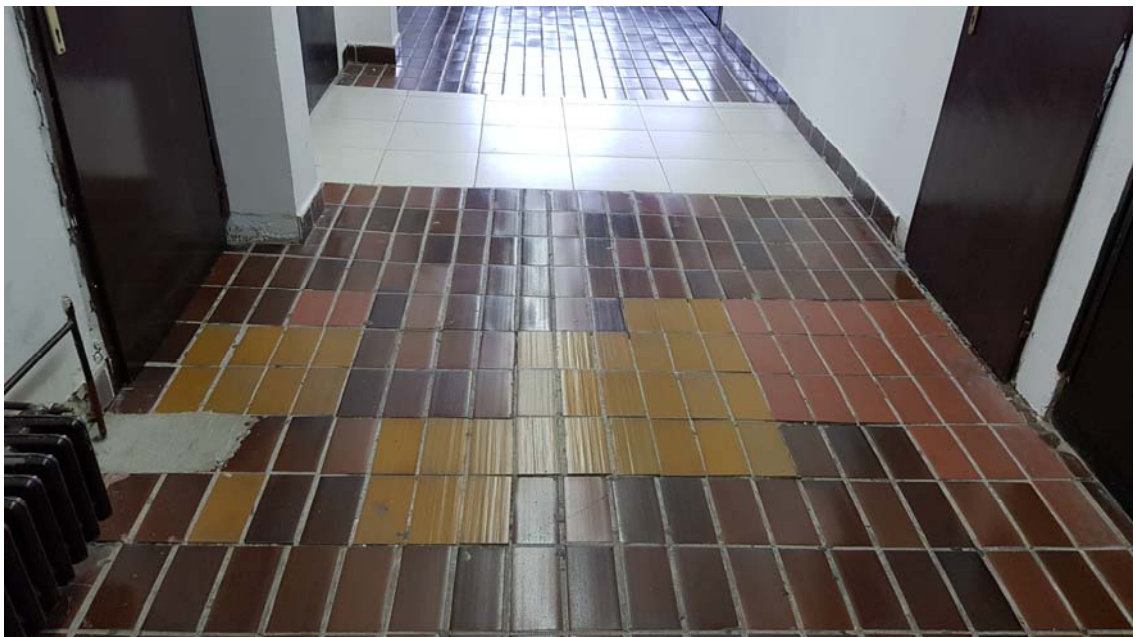


Photo 4 – Detail of the condition of floor ceramics



Photo 5 – Detail of the condition of floor ceramics



Photo 6 i 7 – Detail of the condition of the interior walls



Photo 8 – Renovated toilets

Part of the toilet was renovated in the previous onesprojects and is not the subject of the subject project.

Photo 9 – Renovated toilets



BALANCE SHEET OF EXISTING SITUATION

GROUND FLOOR AREA					
No.	Name of the room	Final floor tretment	Final wall treatment	Final ceiling treatment	Net area
Public institution Vocational school "Danilo Kiš"					
1a	Porch	Ceramic / Concrete	Silicate brick	Dec. fac. plaster	134,74m ²
1	Windshield 1	Ceramic	Silicate brick	Semi-dispersive paint	10,97m ²
2	Windshield 2	Ceramic	Silicate brick	Semi-dispersive paint	9,35m ²
3	Lobby / corridor	Ceramic	Silicate brick / semi-dispersive paint	Wooden suspended ceiling / semi-dispersive paint	838,14m ²
4	Main vertical communications	Marble	Silicate brick / semi-dispersive paint	Semi-dispersive paint	26,18m ²
5	F.P. vertical communications	Marble	Silicate brick / semi-dispersive paint	Semi-dispersive paint	8,85m ²
6	Classroom / Lab 1	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	59,37m ²
7	Auxiliary room 1	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	17,35m ²
8	Classroom / Lab 2	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	59,41m ²
9	Storage room 1	/	Semi-dispersive paint	Wooden suspended ceiling	21,93m ²
10	Man toilet 1	Ceramic	Ceramic	Wooden suspended ceiling	18,62m ²
11	Woman toilet 1	Ceramic	Ceramic	Wooden suspended ceiling	24,24m ²
12	Storage room 2	/	Semi-dispersive paint	Wooden suspended ceiling	8,65m ²
13	Janitor	/	Semi-dispersive paint	Wooden suspended ceiling	7,32m ²
14	Classroom / Lab 3	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	61,38m ²
15	Auxiliary room 2	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	18,01m ²
16	Classroom / Lab 4	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	61,38m ²
17	Amphitheater	Textile floor covering	Semi-dispersive paint	Wooden suspended ceiling	322,41m ²
18	Projection cabin	Textile floor covering	Semi-dispersive paint	Semi-dispersive paint	7,22m ²
19	Shop	Ceramic	Silicate brick	Semi-dispersive paint	14,16m ²
20	Classroom / Lab 5	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	59,34m ²
21	Auxiliary room 3	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	17,28m ²
22	Classroom / Lab 6	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	58,85m ²
23	Man toilet 2	Ceramic	Ceramic	Semi-dispersive paint	8,76m ²
24	Woman toilet 2	Ceramic	Ceramic	Semi-dispersive paint	9,08m ²
25	Office 1	Laminate	Semi-dispersive paint	Semi-dispersive paint	19,49m ²
26	Storage room 3	Ceramic	Semi-dispersive paint	Semi-dispersive paint	2,50m ²
27	Office 2	Laminate	Semi-dispersive paint	Semi-dispersive paint	19,47m ²
28	Office 3	Laminate	Semi-dispersive paint	Semi-dispersive paint	19,47m ²
29	Kitchenette	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	14,35m ²
30	Classroom / Lab 7	Laminate	Semi-dispersive paint	Wooden suspended ceiling / semi-dispersive paint	59,30m ²
31	Assembly hall	Laminate	Semi-dispersive paint	Semi-dispersive paint	57,28m ²
32	Director	Textile floor covering	Semi-dispersive paint	Semi-dispersive paint	32,06m ²
33	Director's assistant	Laminate	Semi-dispersive paint	Semi-dispersive paint	17,77m ²

Restaurant	34	Windshield	Ceramic	Semi-dispersive paint	Semi-dispersive paint	4,34m ²
	35	Entrance hall	Ceramic	Semi-dispersive paint	Metal suspended ceiling	27,88m ²
	36	Restaurant space	Ceramic	Semi-dispersive paint	Metal suspended ceiling / semi-dispersive paint	103,27m ²
	37	Teaching space 1	Ceramic	Semi-dispersive paint	Metal suspended ceiling / semi-dispersive paint	71,49m ²
	38	Teaching space 2	Ceramic	Semi-dispersive paint	Metal suspended ceiling / semi-dispersive paint	72,92m ²
	39	Toilets 1	Ceramic	Ceramic	Semi-dispersive paint	14,74m ²
Kitchen	40	Pick up line 1	Ceramic	Semi-dispersive paint	Semi-dispersive paint	5,31m ²
	41	Pick up line 2	Ceramic	Ceramic	Semi-dispersive paint	23,76m ²
	42	Toilets 2	Ceramic	Ceramic	Semi-dispersive paint	5,67m ²
	43	Toilets 3	Ceramic	Ceramic	Semi-dispersive paint	5,95m ²
	44	Kitchen space	Ceramic	Ceramic	Semi-dispersive paint	72,78m ²
	45	Storage room 4	Ceramic	Semi-dispersive paint	Semi-dispersive paint	3,30m ²
	46	Auxiliary room 4	Ceramic	Ceramic	Semi-dispersive paint	20,97m ²
	47	Auxiliary room 5	Ceramic	Ceramic	Semi-dispersive paint	16,46m ²
	48	Auxiliary room 6	Ceramic	Ceramic	Semi-dispersive paint	8,53m ²
	49	Auxiliary room 7	Ceramic	Semi-dispersive paint	Wooden suspended ceiling	12,74m ²
	50	Ambulance	Ceramic	Semi-dispersive paint	Semi-dispersive paint	32,39m ²
Total net area of ground floor						2627,18m ²
Total gross area of ground floor						2982,92m ²
Ukupna bruto površina prizemlja						2982,92m ²

Note:

The amphitheater, kitchen and restaurant are not the theme of the project.

FIRST FLOOR AREA

No.	Name of the room	Final floor treatment	Final wall treatment	Final ceiling treatment	Net area
Public institution Vocational school "Danilo Kiš"					
1	Main vertical communication	Marble	Silicate brick / Semi-dispersive paint	Semi-dispersive paint	25,52m ²
2	F.P. vertical communication	Marble	Silicate brick / Semi-dispersive paint	Semi-dispersive paint	11,71m ²
3	Lobby / corridors	Ceramic	Silicate brick / Semi-dispersive paint	Wooden suspended ceiling / Acrylic latex paint	532,98m ²
4	Classroom / Lab 1	Parquet	Semi-dispersive paint	Semi-dispersive paint	56,12m ²
5	Man toilet 1	Ceramic	Ceramic	Semi-dispersive paint	10,47m ²
6	Classroom / Lab 2	Parquet	Semi-dispersive paint	Semi-dispersive paint	56,12m ²
7	Classroom / Lab 3	Parquet	Semi-dispersive paint	Semi-dispersive paint	60,28m ²
8	Classroom / Lab 4	Parquet	Semi-dispersive paint	Semi-dispersive paint	56,11m ²
9	Classroom / Lab 5	Parquet	Semi-dispersive paint	Semi-dispersive paint	62,78m ²
10	Woman toilet 1	Ceramic	Ceramic	Semi-dispersive paint	10,36m ²
11	Classroom / Lab 6	Vinyl asbestos tiles	Semi-dispersive paint	Wooden suspended ceiling	41,90m ²
12	Classroom / Lab 7	Vinyl asbestos tiles	Silicate brick / Semi-dispersive paint	Wooden suspended ceiling	40,95m ²
13	Auxiliary room 1	Parquet	Semi-dispersive paint	Semi-dispersive paint	16,47m ²
14	Classroom / Lab 8	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	59,70m ²
15	Auxiliary room 1	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	17,55m ²
16	Classroom / Lab 9	Ceramic	Semi-dispersive paint	Semi-dispersive paint	59,70m ²
17	Storage room 1	/	Semi-dispersive paint	Wooden suspended ceiling	22,05m ²
18	Man toilet 2	Ceramic	Ceramic	Wooden suspended ceiling	17,86m ²
19	Woman toilet 2	Ceramic	Ceramic	Wooden suspended ceiling	22,88m ²

20	Storage room 2	/	Semi-dispersive paint	Wooden suspended ceiling	8,77m ²
21	Storage room 3	/	Semi-dispersive paint	Wooden suspended ceiling	7,55m ²
22	Classroom / Lab 10	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	62,12m ²
23	Auxiliary room 2	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	18,27m ²
24	Classroom / Lab 11	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	62,12m ²
25	Classroom / Lab 12	Laminate	Semi-dispersive paint	Semi-dispersive paint	59,80m ²
26	Auxiliary room 3	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	17,55m ²
27	Classroom / Lab 13	Laminate	Semi-dispersive paint	Semi-dispersive paint	59,80m ²
28	Library	Parquet	Silicate brick / Semi-dispersive paint	Semi-dispersive paint	53,35m ²
29	Classroom / Lab 14	Vinyl asbestos tiles	Semi-dispersive paint	Semi-dispersive paint	62,74m ²
30	Auxiliary room 4	Ceramic	Silicate brick / Semi-dispersive paint	Semi-dispersive paint	11,49m ²
31	Classroom / Lab 15	Ceramic	Semi-dispersive paint	Semi-dispersive paint	35,94m ²
32	Auxiliary room 5	Textile floor covering	Semi-dispersive paint	Semi-dispersive paint	10,70m ²
33	Classroom / Lab 16	Laminate	Semi-dispersive paint	Semi-dispersive paint	35,94m ²
34	Classroom / Lab 17	Ceramic	Semi-dispersive paint / Wood	Semi-dispersive paint	40,97m ²
35	Classroom / Lab 18	Ceramic	Semi-dispersive paint / Wood	Semi-dispersive paint	29,85m ²
36	Classroom / Lab 19	Vinyl asbestos tiles	Semi-dispersive paint / Wood	Semi-dispersive paint	40,97m ²
Total net area of first floor					1799,44m²
Total gross area of first floor					2504,59m²
Total net area of building					4426,62m²
Total gross area of building					5487,51m²

TOTAL NET AREA OF THE PART OF THE FACILITY 3,529.12m²

PLANNED SITUATION

A CONSTRUCTION - CRAFT WORKS

A.1 PREPARATORY AND DEMOLITION AND DISASSEMBLY WORKS

Demolition and dismantling works include removal of existing built-in furniture (benches - wardrobes in hallways), all floor coverings (ceramics, vinyl, rug and laminate), removal of all suspended ceilings (wooden and metal), punching / widening of existing openings for installation of new position of internal carpentry, removal of complete internal carpentry (excluding positions within already repaired toilets), removal of part of facade wooden and metal carpentry (including protective grilles) from all positions not covered by previous adaptation works;

A.2 MASONRY WORKS

Masonry works include masonry of all planned partition walls, walling of part of the skylight at the level of the flat roof, repair of cement screeds after removal of floor coverings, repair of walls after removal of wall ceramics, masonry of silicate brick walls, repair of existing silicate brick wall coverings and production of new coverings;

The planned internal partition walls, including the walling of a part of the existing openings, are performed in accordance with the project, with a brick

hollow partition block d = 12 cm and 15 cm in extension mortar. The position also includes the production of reinforced concrete lintels (dim. 12x20cm) together with reinforcement (RA Ø12mm x L x 4pcs and RUØ8 / 20) and the necessary formwork. The position involves cutting / removing all layers of the floor - to the slab on the ground at the positions of the planned walls.

Silicate brick walls d = 12cm (between part of the classroom and the hallway) are built according to the following description and details "D1" - "D10". The position includes the following phases of works:

1. Cutting of all layers of the existing floor to the mezzanine structure in the dimensions of the planned walls, d = 12cm + 1cm on both sides;
2. Masonry of silicate brick wall d = 12cm in extension mortar 1: 3: 6. A set of debtors with 1/2 brick is built. When masonry, pay attention to the regularity and uniformity of the thickness d = 1cm and the indentation of the joint d = 1cm due to the fact that the wall is not plastered;
3. Pouring a horizontal circle of smoke. 12x20cm above the door level, h = 210cm from the floor level. The position includes reinforcement (RA Ø12mm x L x 4pcs and RUØ8 / 20) with anchoring of the cerclage in the side walls / pillars - four anchors that are welded to the reinforcement in the cerclage. When pouring, take care not to pour concrete and cement laitance over the face of the silicate brick wall.

Cladding the walls with silicate brick d = 7cm is performed in accordance with the project and includes the following phases of work:

1. Cleaning of the existing wall that is protected from unevenness and existing paint and coating with a primer;
2. Installation - laying with silicate brick d = 7 (6,5) cm in extension mortar 1: 3: 6 with installation of anchors - stainless steel anchors - 5 pcs / m². The debtor's style is built without a bandage in everything according to the existing linings in the school. When masonry, pay attention to the regularity and uniformity of the thickness d = 1cm and the indentation of the joint d = 1cm due to the fact that the wall is not plastered;
3. Coating of treated bricks with water-repellent impregnation based on silicone type "TKK Silofob V" or equivalent.
Impregnation must provide the following characteristics of the treated surface of silicate brick:
 - 3.1 Prevented surface excretion of water-soluble salts (flowering);
 - 3.2 The structure and color of the material remain unchanged, the resistance to the action of paint (graffiti) is improved and it is easier to clean them and
 - 3.3 The development of microorganisms: algae, molds and fungi is significantly reduced.

Renovation of existing silicate brick wall coverings in the interior. The bricks are sanded dry, without the use of water for cooling and dusting (with the necessary protection of all surfaces exposed to dust) until a flat and clean surface of uniform color of the new silicate brick is obtained. The position includes repairing all damaged joints (graphite paint residues, missing mortar, water and moisture damage, etc.) by re-applying the mortar in a uniform joint thickness.

All positions where joint repair is planned will protect the face of the brick from the effects of mortar.

A.3 INSULATION WORKS

Production of waterproofing of floors and parts of walls within toilets that are the subject of adaptation 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 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.

A.4 SHEET METAL WORKS

Production of sheet metal edgings of parts of roof attics that were not covered by previous adaptations.

For all sheet metal works, galvanized plasticized plastic sheet $d_{min} = 0.55$ mm is provided, in red color - in accordance with the existing one (RAL 3009 or visual equivalent). When delivering the sheet metal to the construction site, it is necessary to enclose complete attest documentation as well as instructions and recommendations of the manufacturer regarding the installation.

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.

The edging is made of galvanized steel plasticized sheet metal in everything according to the general description of sheet metal work. The position previously includes:

1. Installation of anchors made of galvanized bottles of smoke. min. 40x5mm which are placed at a distance of max 60cm. Fix with screws with doweling in two places closer to the edges of the attic (remove all labile elements of plaster and layers), and then:
2. Installation of the attic cover itself by folding around the sheet metal anchor $r_{sh} = 30-60$ cm, as well as all the accompanying work, material and connecting means.

Note: Edging - drips must not be drilled in order to fix to the substrate, but only using the anchor system from the description.

A.5 CERAMIC AND STONE CUTTING WORKS

Floor and wall ceramics are placed in the ceramic adhesive "ceresit CM 11" or equivalent with open joints $d = 1$ mm. The tiles are in soft tones, dimensions 30x30 - 90x90cm floor and 20x30 - 40x40cm wall. After laying the ceramics and grouting, the surfaces are cleaned and washed with water, which is included in the price.

The surface of doors and windows is not deducted from the surface at the expense of processing the joists and installation of corner moldings of brushed stainless steel. Wall ceramics in toilets are placed up to a height of 230 cm - the height of the wall between the cabins.

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 the specifically selected ceramics.

Porcelain floor tile in hallways, halls and in front of the entrance, in color / decor of natural concrete of lighter tone ("Pamesa Belgio Perla" or visual equivalent), in the range of dimensions 60x60 - 120x120cm, d = min. 10mm.

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

Wall ceramics in classrooms in the washbasin zones are in matt white, h = 2.1m

Wall porcelain tile in toilets in color / decor of natur concrete of lighter tone ("Pamesa Chelsea Gray" or visual equivalent), in the range of dimensions 20x40 - 30x60cm, d = min. 8mm. It is installed up to the ceiling h = 2.6 - 2.9 m

Renovation of the existing floor in the halls, as well as the stairs, made of Danilovgrad marble in the following steps:

1. Washing the surface Ph with a neutral absorbent chemical using water for rinsing;
2. Grinding / calibration of the surface, ie. removing the surface layer of stone that has been exposed to dirt, dirt and bacteria during use;
3. Application of polyurethane penetrating component for structural bonding of aggregates within terrazzo (surface layer conservation) and
4. Polishing the surface with a combination of appropriate abrasive stone plates (from the coarsest to the finest - polishing) and
5. Impregnation of the final - polished surface for protection against absorption of impurities, grease, etc. Impregnation is performed by coating with silicone penetrating oils or equivalent for the same purpose.

A.6 FLOORING WORKS

Procurement of materials and installation by gluing a floor covering of heterogeneous polyvinyl chloride on foam (ISO11638) / PVC floor covering of the type "Tarkett Tapiflex Excelence" in the range 65 - 80, "Facet Yellow" or visual - qualitative equivalent. The floor covering is placed over a pre-prepared and leveled base (self-leveling mass over a cement screed - included in the price).

The position includes coating with a primer (primer) "Thomsit R777" or equivalent in accordance with the manufacturer's instructions, and then gluing the PVC floor in rolls, d = min. 3mm glue "Thomsit K188" or equivalent. The floor is glued to the substrate, and the joints are welded according to the

manufacturer's recommendation using the same material in order to homogenize the color and texture. The position includes the purchase and installation of plinth moldings of the same material over the appropriate former PVC elements, as well as finishing elements and transitions to interior aluminum joinery.

The characteristics that heterogeneous vinyl floor must meet are the following:

- Product standard EN 10582;
- Commercial designation of surface resistance (ISO 10874) - 34 - intended high-traffic areas;
- Min. final layer thickness 0.8mm (ISO 24340);
- Resistance to damage from furniture legs (EN 424) - without damage;
- Dimensional stability 0.10%;
- Min. thickness 2-3mm;
- Impact on indoor air quality (EN 16516) after 28 days $\leq 10 \mu\text{g} / \text{m}^3$;
- Slip resistance (EN 13893) DS class ($\mu \geq 0.30$);
- Reaction to fire (EN 13501-1) Bfl-s1;
- Resistance to chemicals (ISO 26987) High resistance;
- Color fastness - light (ISO 105-B02) 6;
- Possibility of recycling - Yes, 100%.

The existing beech parquet is being rehabilitated (rearrangement, planing and varnishing, as well as planing and varnishing itself) in all rooms envisaged by the project. The position includes the following phases of works:

1. Careful removal and sorting of parquet lamellas and associated plinth strips;
2. Cleaning the substrate from adhesive residues, dirt and any unevenness. The position also includes the final dedusting of the surface;
3. Gluing parquet - previously removed beech lamellas in natur class with two-component parquet glue. The position includes additional purchase of damaged lamellas in the amount of up to 30%;
4. Application of joint mass in accordance with the state of joints of overlaid lamellas;
5. Planing;
6. Application of substrate - primer;
7. Replaying;
8. Application of substrate - primer;
9. Fine grinding;
10. Applying the first layer of varnish with max 60% gloss;
11. Vacuuming and applying the second layer of varnish, taking care to close / protect the room from the effects of drafts, dust and insects until the varnish hardens, and
12. Procurement and installation of new corner beech moldings.

In the positions of the administration premises, and in everything according to the project, a laminate of 1st class is placed, treated edges with waterproof treatment in order to achieve high resistance to moisture (type "Tarkett Navigator 1233" in Gibraltar texture or similar) in all rooms except bathrooms. The laminate is laid over a suitable thermosilent substrate and pre-prepared and smoothed cement screed. The position includes the purchase and

installation of appropriate PVC moldings in the color and texture of the laminate itself.

A.7 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 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 / products in accordance with EN 1077Uw $\leq 1.8 \text{ W / m}^2\text{K}$;
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 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 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;

A.8 JOINERY - LOCKSMITH WORKS - facade PVC joinery

The window and entrance door system should be made of multi-chamber (at least five-chamber) PVC profiles, minimum profile width 70 mm, in accordance with 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%). Glazing of the lower zones of the entrance door and similar positions of more frequent use are glazed with the same type of package with the use of safety tempered glass $d = 4\text{mm}$ (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 PVC parapet benches and aluminum solbancima.

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

Pay special attention to high-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.

The entrance door is equipped with a hydraulic mechanism for automatic door closing.

All window positions are equipped with aluminum solbans and PVC parapet benches.

A.9 JOINERY - LOCKSMITH WORKS - interior aluminum joinery

The interior joinery is made of aluminum profiles without interrupted thermal bridge (cold profiles) ("Alumil M9400" or equivalent), in the color of natural aluminum (RAL 9006 or visual equivalent) and white (RAL 9003 or visual equivalent), depending on the position and scheme carpentry and locksmithing.

The wings are filled with pressed plywood - univer in the decor of a bright sonoma oak or visual equivalent and in yellow - " Falco 242 FS15 or visual equivalent and with PVC sandwich panels depending on the position and scheme of carpentry.

Glazing of all positions intended for glazing, excluding overhead lights, shall be done with single safety multilayer "pamplex" glass 3.3.1. $d = 6\text{mm}$, while the glazing of the transom is done with single float glass $d = 4\text{mm}$.

Supply carpentry with high-quality nickel-based fittings and AL-alloys ("Winkhaus Activ Pilot" or technical equivalent), handles, locks and keys. In terms of sealing, the minimum performance that the finished product must provide and which must be proven through an official certificate are:

EN 12207 - CLASS 4; EN 12208 - CLASS E750; EN 12210 - CLASS C4.

Positions V1 and V2 (windshield positions), include a hydraulic shutter on the main wing with the possibility of locking in position - open as well as the purchase and installation of aluminum profiles for additional reinforcement, all according to the graphic attachments.

Position P1 (position of the inner window - skylight on the library) includes gluing crystal foil (the effect of ground glass) as well as the installation of a PVC parapet bench on both sides.

A.10 LOCKSMITH WORKS - cantilever platform / exit from the lifting platform

Upstairs cantilever platforms for exit from vertically - lifting platforms for faces

with disabilities. The platform is made in all respects according to the details from the project from box and tubular profiles of black hardware, as follows:

- Boxes of smoke. 40x40x2-3mm i
- Tubular profiles Ø50x2-3mm (dimensioned in accordance with the existing handrail on the masonry fence), as well as
- Floor platforms made of aluminum tread, in standard: EN 573-3; EN 485-2; EN 485-4; EN 10204 3.1, ENAW 5754. Sheet thickness is $d = 4-5\text{mm}$. The sheet metal is folded at all corners in accordance with the project. A rubber floor covering $d = 3\text{mm}$ with pins (embossed circles) $d = 1\text{mm}$, in black, is glued over the sheet metal;
- The fence is made of tubular profiles with a filling of alubond $d = 4\text{mm}$ in everything according to the details from the project. The position of the fence also includes a gate for controlled access to the platform, equipped with a handle, lock and keys.

The platform is performed as a cantilever by fixing over the anchor plates to the existing AB beam and part of the monolithic AB plate. The dimensions of the platform are 150x150x50cm. The position includes all necessary work, material, assembly and disassembly of the necessary scaffolding, anti-corrosion protection in two layers and final treatment with polyurethane varnish in two layers in workshop conditions (on the construction site allowed corrections after installation and possible welding, etc.). The cladding of the platform is made of alubond $d = 4\text{mm}$ in the color of natural aluminum (RAL 9006 or visual equivalent - in accordance with the final treatment of the lifting shaft of the lifting platform, and in everything according to the project.

Note: During the final positioning, leveling and processing of the details of the platform connections, coordinate the work with the work on the installation of the vertical lifting platform.

A. 11 PLASTER - PAINTING WORKS

The position includes setting:

Modular suspended ceiling 60x60cm over a metal suspended substructure in all positions defined by the project. The boards are mineral "Fine stratos" or technical - visual equivalent, and in everything according to the graphic attachments of the project and the technical specification of the manufacturer.

Light plasterboard one-sided partitions in the parts above the transom between the classrooms and the hallway (gypsum board is placed on one

side - towards the classroom). Partitions should be made with classic gypsum plasterboards $d = 1.25$ cm of KNAUF system or equivalent, on BOHOR metal substructure or equivalent. The price includes smoothing the joints over the bandage tape and preparation for the final smoothing and painting.

Gypsum-cardboard monolithic complex buildings in the part of the ceiling within the central - entrance hall. The bodies are in the form of cubes of different heights and surfaces, in modular dimensions 60x60, 60x120, 120x120cm, and in all according to the project - the base of the ceiling. Enclosures are made of plasterboard over a metal substructure in everything according to the specification and instructions

manufacturer. The price includes smoothing of joints and transitions to the coffered part of the ceiling over the bandage tape and preparation for the final smoothing and painting, as well as harmonization of position processing with the planned built-in LED lighting (calculated separately).

Metal linear suspended ceiling with visible substructure ("Knauf metal linear" or equivalent). The disposition of the linear metal suspended ceiling is in everything according to the project. Calculation per m^2 of the performed ceiling.

Rehabilitation of all existing walls, beams and ceilings by smoothing, as well as smoothing of new masonry walls and plasterboard partitions. Smooth all surfaces in both hands with sanding to the required flatness and smoothness. The price includes all the necessary pre-work (scraping as needed) as well as the costs for the protection of the finished final surfaces (windows, doors, etc.) and the installation of corner aluminum moldings.

Painting walls and ceilings with water-based acrylic matte latex paint ("Tikkurila Harmony" or equivalent) resistant to cleaning with chemicals and weak solvents. All surfaces intended for painting should be previously cleaned, dusted and applied with a suitable substrate / primer ("Tikkurila Luja" primer with additives against the appearance of mold, or equivalent) in one layer, and the color depending on the manufacturer's instructions and the condition of the surface. is treated. The selected color should meet the parameters:

Heat resistance min. $85^{\circ}C$, ISO 4211-2 and ISO 4211-3;

Wet cleaning, class II, ISO 11998.

(which is proven by the manufacturer's documentation, as well as the appropriate attestation documentation) for the specifically selected product.

A. 12 FACADE WORKS

Procurement of materials and renovation of the complete facade cladding of silicate brick. The bricks are repaired according to the following description:

1. Protection of all surrounding - contact surfaces (facade carpentry and plastered walls);

2. Machine grinding of brick faces with the possibility of using water to cool the grinding wheels to obtain a flat and clean surface of uniform color equivalent to a new brick of the same type;
3. Repair of all damaged joints (graphite paint residues, missing mortar, damage from water and moisture, etc.) by re-applying the mortar in a uniform thickness of the joint. All positions where joint repair is planned to protect the face of the brick from the effects of mortar and
4. Coating the treated brick with a water-repellent impregnation based on silicone type "TKK Silofob V" or equivalent. Impregnation must provide the following characteristics of the treated surface of silicate brick:
 - 4.1 Prevented surface excretion of water-soluble salts (flowering);
 - 4.2 Vapor permeability (diffuse resistance) of the material to the outside remains unchanged - the wall normally "breathes";
 - 4.3 The structure and color of the material remain unchanged, the resistance to the action of paint (graffiti) is improved and it is easier to clean them and
 - 4.4 Development of microorganisms: algae, molds and fungi is significantly reduced.

Note: When performing works on the floor - at flat roof levels, previously provide passability to all positions not specified in the project by setting temporary paths from OSB boards over the ballast layer of gravel in the manipulative width required to perform all works from the description.

Treatment of all façade plastered surfaces (surfaces not coated with silicate brick) including pergola elements along the entrance façade (columns and reinforced concrete beam) by painting with a high-quality façade coating with silicone binder, according to the following description:

1. Removal by scraping of damaged parts of existing facade coatings and unstable (separate) parts of mortar by washing the surface with water under pressure without the use of abrasives and chemicals;
2. Substrate coating - bonding primer type "Baumit Multi Primer" or equivalent, which is diluted with water in a ratio of 1: 1 - 1: 5 depending on the porosity and absorbency of the substrate. If there is a need for application in two or more layers, the time interval between layers / coatings must not be less than 12 hours;
3. Application of repair mass - repair mortar type "Baumit MultiWhite" or equivalent on dry mortar using a notched trowel made of stainless steel with the insertion of a fiberglass mesh. After gently drying the first layer, a second thin layer is applied. After drying, the surface should be rubbed with a sponge trowel. The layer of repair mass is 3-5 mm thick;
4. Applying two coats of high quality facade paint with silicone binder. The first layer is applied diluted with 10-15% water. After a break of at least 12 hours, one to two coats of facade paint are applied, if necessary. Wait at least four hours between coats. The color is dark red / burgundy (RAL 3009) or visual equivalent - in accordance with the existing, as well as the color of the roofing sheet used in the previous renovation.

Covering part of the facade walls with silicate brick $d = 7\text{cm}$ in everything according to the project. The position includes the following phases of works:

1. Cleaning of the existing wall that is protected from unevenness and existing paint and coating with a primer;

2. Installation - laying with silicate brick $d = 7$ (6,5) cm in extension mortar 1: 3: 6 with installation of anchors - stainless steel anchors - 5 pcs / m^2 . The debtor's style is built without a bandage in everything according to the existing linings in the school. When masonry, pay attention to the regularity and uniformity of the thickness $d = 1$ cm and the indentation of the joint $d = 1$ cm due to the fact that the wall is not plastered;

A. 13 OTHER WORKS - vertical lifting platform

Installation of a vertical lifting platform with a protective shaft (lifting height > 4m), for persons with disabilities in the main entrance hall in everything according to the project. The platform is of the "Barduva SB200" type or equivalent.

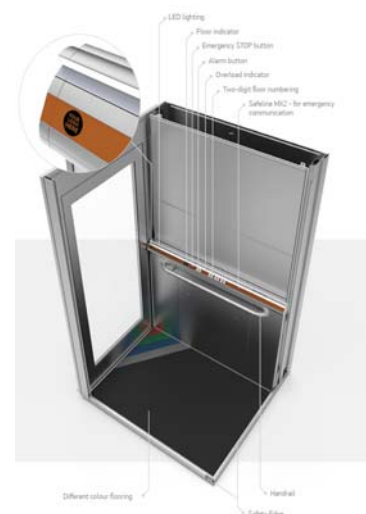
Platform features:

- Lifting height: 430cm
- Load capacity: 400 kg
- Stations: 2 (ground floor - I floor)
- Lifting speed min. 0.15 m / sec (9m / min)
- Lifting height: 4300 mm
- Approaches: 2, 1 + 1 at 90 °
- Pit: not needed
- Drive shaft: aluminum construction lined with steel panels
- Internal dimensions of the drive shaft: min. 1540 x 1500 mm

Internal dimensions of the platform plateau: 1100 x 1400 mm (minimum defined by the Ordinance)

- Access doors: manual, single-leaf, revolving
- Finishing of entrance doors: aluminum profiles with multilayer glass
- Dimensions of the entrance door opening: min. 900 x 2000 mm (1 pc.) And min. 940 x 2000 mm (1 pc.)
- Intended for indoor installation
- Power supply three-phase 3 x 380 V / 50Hz
- Drive: electric motor with threaded spindle
- Motor power: up to 2.2 kW
- Platform color: RAL 9006 (natural aluminum).

When assembling the platform, harmonize the access levels with the planned cantilever plateau - platform on the floor.



The position includes all supporting work, materials, fasteners, restoration of contact zones of walls and floors to their original condition, training of users for handling and basic / current maintenance, certification and development of maintenance project.

Note: The platform and all its elements must comply with EN 81-41: 2010, as well as the Ordinance on detailed conditions and methods of adapting facilities for access and movement for persons with reduced mobility and persons with disabilities.

BALANCE SHEET OF THE PLANNED SITUATION

GROUND FLOOR AREA					
No.	Name of the room	Final floor treatment	Final wall treatment	Final ceiling treatment	Net area
J U S M Š " D a n i l o K i š "					
1a	Covered entrance	Ceramic	Silicate brick	Linear metal ceiling	134,74m ²
1	Windshield 1	Ceramic	Silicate brick	Mod. sus. ceiling	10,97m ²
2	Windshield 2	Ceramic	Silicate brick	Acrylic latex paint	9,35m ²
3	Lobby / corridor	Ceramic	Silicate brick / Acrylic latex paint	Mod. sus. ceiling	759,61m ²
4	Main vertical communications	Marble	Silicate brick / Acrylic latex paint	Acrylic latex paint	26,18m ²
5	F.P. vertical communications	Marble	Silicate brick / Acrylic latex paint	Acrylic latex paint	8,85m ²
6	Assembly hall	Laminate	Acrylic latex paint	Acrylic latex paint	81,63m ²
7	Auxiliary room 1	Ceramic	Acrylic latex paint	Acrylic latex paint	8,46m ²
7'	Tec. / Server room	Ceramic	Acrylic latex paint	Acrylic latex paint	8,60m ²
8	Director's assistant	Laminate	Acrylic latex paint	Acrylic latex paint	23,47m ²
9	Director	Laminate	Acrylic latex paint	Acrylic latex paint	35,42m ²
10	Storage room 1	PVC floor	Acrylic latex paint	Linear metal ceiling	21,93m ²
11	Men's toilet 1	Ceramic	Ceramic	Linear metal ceiling	18,62m ²
12	Women's toilet 1	Ceramic	Ceramic	Linear metal ceiling	24,24m ²
13	Storage room 2	PVC floor	Acrylic latex paint	Linear metal ceiling	8,65m ²
14	Toilet for disabled pers.	Ceramic	Ceramic	Acrylic latex paint	7,32m ²
15	Classroom / Lab 1	PVC floor	Acrylic latex paint	Acrylic latex paint	61,38m ²
16	Auxiliary room 2	PVC floor	Acrylic latex paint	Acrylic latex paint	18,01m ²
17	Classroom / Lab 2	PVC floor	Acrylic latex paint	Acrylic latex paint	61,38m ²
18	Classroom / Lab 3	PVC floor	Acrylic latex paint	Acrylic latex paint	59,34m ²
19	Auxiliary room 3	PVC floor	Acrylic latex paint	Acrylic latex paint	17,28m ²
20	Classroom / Lab 4	PVC floor	Acrylic latex paint	Acrylic latex paint	58,85m ²
21	Men's toilet 2	Ceramic	Ceramic	Linear metal ceiling	8,76m ²
22	Women's toilet 2	Ceramic	Ceramic	Linear metal ceiling	9,08m ²
23	Office 1	Laminate	Acrylic latex paint	Acrylic latex paint	19,49m ²
24	Storage room 3	PVC floor	Acrylic latex paint	Acrylic latex paint	2,50m ²
25	Office 2	Ceramic	Acrylic latex paint	Acrylic latex paint	17,77m ²
26	Office 3	Ceramic	Acrylic latex paint	Acrylic latex paint	17,40m ²
27	Kitchenette	Ceramic	Acrylic latex paint	Acrylic latex paint	14,20m ²
28	Classroom / Lab 5	PVC floor	Acrylic latex paint	Acrylic latex paint	63,19m ²
29	Classroom / Lab 6	PVC floor	Acrylic latex paint	Acrylic latex paint	57,56m ²
30	Auxiliary room 4	PVC floor	Acrylic latex paint	Acrylic latex paint	14,35m ²
31	Classroom / Lab 7	PVC floor	Acrylic latex paint	Acrylic latex paint	63,81m ²

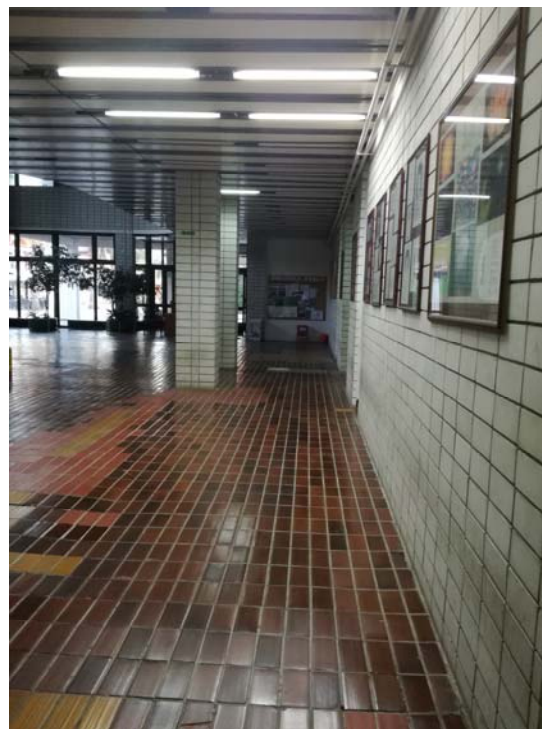
Gym	32	Men's locker room	Ceramic	Ceramic	Mod. sus. ceiling	15,18m ²	377,73 m ²
	33	Toilet	Ceramic	Ceramic	Mod. sus. ceiling	2,82m ²	
	34	Showers	Ceramic	Ceramic	Mod. sus. ceiling	3,69m ²	
	35	Women's locker room	Ceramic	Ceramic	Mod. sus. ceiling	18,70m ²	
	36	Toilet	Ceramic	Ceramic	Mod. sus. ceiling	2,61m ²	
	37	Showers	Ceramic	Ceramic	Mod. sus. ceiling	5,10m ²	
	38	Court	Oak parquet	Acoustic panels / Acrylic latex paint	Sus. acoustic.ceil.	233,40m ²	
	39	Seating	Rubber floor	Acoustic panels / Acrylic latex paint	Sus. acoustic.ceil.	89,01m ²	
	40	Teacher's room	Rubber floor	Acrylic latex paint	Acrylic latex paint	7,22m ²	
	41	Windshield	Ceramic	Acrylic latex paint	Acrylic latex paint	4,34m ²	
Restaurant	42	Entrance hall	Ceramic	Acrylic latex paint	Metal suspended ceiling	27,88m ²	294,64 m ²
	43	Restaurant space	Ceramic	Acrylic latex paint	Metal suspended ceiling / Acrylic latex paint	103,27m ²	
	44	Teaching space 1	Ceramic	Acrylic latex paint	Metal suspended ceiling / Acrylic latex paint	71,49m ²	
	45	Teaching space 2	Ceramic	Acrylic latex paint	Metal suspended ceiling / Acrylic latex paint	72,92m ²	
	46	Toilets 1	Ceramic	Ceramic	Acrylic latex paint	14,74m ²	
	47	Pick up line 1	Ceramic	Acrylic latex paint	Acrylic latex paint	5,31m ²	
Kitchen	48	Pick up line 2	Ceramic	Ceramic	Acrylic latex paint	23,76m ²	162,73m ²
	49	Toilets 2	Ceramic	Ceramic	Acrylic latex paint	5,67m ²	
	50	Toilets 3	Ceramic	Ceramic	Acrylic latex paint	5,95m ²	
	51	Kitchen space	Ceramic	Ceramic	Acrylic latex paint	72,78m ²	
	52	Storage room 4	Ceramic	Acrylic latex paint	Acrylic latex paint	3,30m ²	
	53	Auxiliary room 4	Ceramic	Ceramic	Acrylic latex paint	20,97m ²	
	54	Auxiliary room 5	Ceramic	Ceramic	Acrylic latex paint	16,46m ²	
	55	Auxiliary room 6	Ceramic	Ceramic	Acrylic latex paint	8,53m ²	
	56	Ambulance	Ceramic	Acrylic latex paint	Acrylic latex paint	32,39m ²	
Total net ground floor surface area						2619,88m ²	
Total gross ground floor surface area						2982,92m ²	

FIRST FLOOR AREA					
No.	Name of the room	Final floor treatment	Final wall treatment	Final ceiling treatment	Net area
J U S M Š " D a n i l o K i š "					
1	Main vertical communications	Marble	Silicate brick / Acrylic latex paint	Acrylic latex paint	25,52m ²
2	F.P. vertical communications	Marble	Silicate brick / Acrylic latex paint	Acrylic latex paint	11,71m ²
3	Lobby / corridor	Ceramic	Silicate brick / Acrylic latex paint	Modular sus. ceiling / Acrylic latex paint	532,98m ²
4	Classroom / Lab 1	Parquet	Acrylic latex paint	Acrylic latex paint	56,12m ²
5	Men's toilet 1	Ceramic	Ceramic	Acrylic latex paint	10,47m ²
6	Classroom / Lab 2	Parquet	Acrylic latex paint	Acrylic latex paint	56,12m ²
7	Classroom / Lab 3	Parquet	Acrylic latex paint	Acrylic latex paint	60,28m ²
8	Classroom / Lab 4	Parquet	Acrylic latex paint	Acrylic latex paint	56,11m ²
9	Classroom / Lab 5	Parquet	Acrylic latex paint	Acrylic latex paint	62,78m ²
10	Women's toilet 1	Ceramic	Ceramic	Acrylic latex paint	10,36m ²
11	Classroom / Lab 6	PVC floor	Acrylic latex paint	Mod. sus. ceiling	41,90m ²
12	Classroom / Lab 7	PVC floor	Acrylic latex paint	Mod. sus. ceiling	40,95m ²
13	Auxiliary room 1	PVC floor	Acrylic latex paint	Acrylic latex paint	16,47m ²
14	Classroom / Lab 8	PVC floor	Acrylic latex paint	Acrylic latex paint	59,70m ²
15	Auxiliary room 2	PVC floor	Acrylic latex paint	Acrylic latex paint	17,55m ²
16	Classroom / Lab 9	Ceramic	Acrylic latex paint	Acrylic latex paint	59,70m ²
17	Storage room 1	PVC floor	Acrylic latex paint	Linear metal ceiling	22,05m ²
18	Men's toilet 2	Ceramic	Ceramic	Linear metal ceiling	17,86m ²
19	Women's toilet 2	Ceramic	Ceramic	Linear metal ceiling	22,88m ²
20	Storage room 2	PVC floor	Acrylic latex paint	Linear metal ceiling	8,77m ²
21	Toilet for disabled pers.	Ceramic	Ceramic	Linear metal ceiling	7,55m ²
22	Classroom / Lab 10	PVC floor	Acrylic latex paint	Acrylic latex paint	62,12m ²
23	Auxiliary room 3	PVC floor	Acrylic latex paint	Acrylic latex paint	18,27m ²
24	Classroom / Lab 11	PVC floor	Acrylic latex paint	Acrylic latex paint	62,12m ²
25	Classroom / Lab 12	PVC floor	Acrylic latex paint	Acrylic latex paint	59,80m ²
26	Auxiliary room 4	PVC floor	Acrylic latex paint	Acrylic latex paint	17,55m ²
27	Classroom / Lab 13	PVC floor	Acrylic latex paint	Acrylic latex paint	59,80m ²
28	library	Parquet	Silicate brick / Acrylic latex paint	Acrylic latex paint	53,35m ²
29	Classroom / Lab 14	PVC floor	Acrylic latex paint	Acrylic latex paint	62,74m ²
30	Auxiliary room 5	PVC floor	Silicate brick / Acrylic latex paint	Acrylic latex paint	11,49m ²
31	Classroom / Lab 15	Ceramics	Acrylic latex paint	Acrylic latex paint	35,94m ²
32	Auxiliary room 6	PVC floor	Acrylic latex paint	Acrylic latex paint	10,70m ²
33	Classroom / Lab 16	Laminate	Acrylic latex paint	Acrylic latex paint	35,94m ²
34	Classroom / Lab 17	PVC floor	Acrylic latex paint	Acrylic latex paint	40,97m ²
35	Classroom / Lab 18	Ceramics	Acrylic latex paint	Acrylic latex paint	29,85m ²
36	Classroom / Lab 19	PVC floor	Acrylic latex paint	Acrylic latex paint	40,97m ²
Total net first floor surface area					1799,44m ²
Total gross first floor surface area					2504,59m ²
Total net surface area					4419,32m ²
Total gross surface area					5487,51m ²

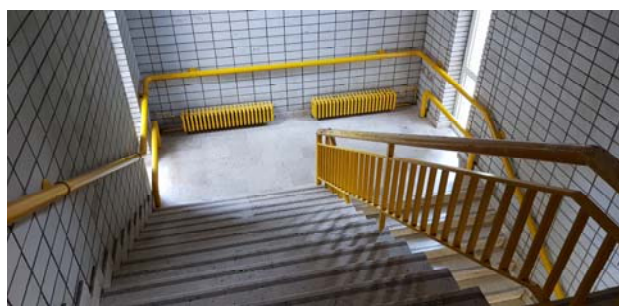
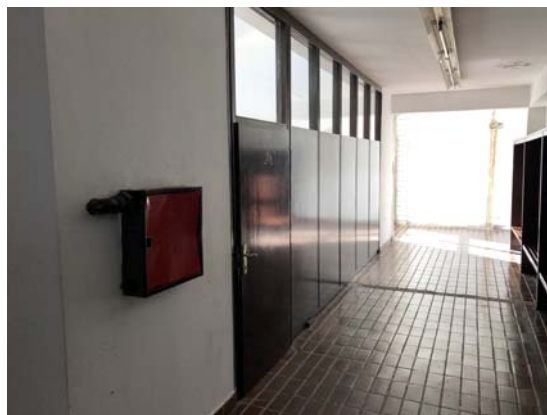
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TECHNICAL CONDITIONS FOR EXECUTION OF WORKS

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 in accordance with 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 m³ or 1.00 m² 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 m³ or per m² 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 m² 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 fabric 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 m² are not rejected and their spallettes are not counted.

Openings of 3.00m² to 5.00m² are rejected, and their spallettes are not charged separately. If the slats are larger than 20 cm, the excess over 20 cm is calculated per m², 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 m² 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. $3 \text{ kp} / \text{cm}^2$. 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 m², 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 m² 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 m² 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 (m² or m¹). 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, m², m¹ 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 m¹

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.E.8.193 and D, E.8.235, 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 m², 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 m² 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 / m². 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 / m².

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 existing wooden benches, dim.550x40x210		
Description	Removal of existing wooden benches - wardrobes from the hallway from all positions defined by the project. Benches - wardrobes are approx. 550x40x210cm, are fixed to the floor and perimeter walls / pillars. When removing, take care not to cause major damage to the floor and walls / pillars for later repair. Dispose of the removed benches in a suitable place for later loading and transport to the city landfill (charged separately). Calculation per piece of removed benches - wardrobes.		

BoQ Item	3.3.4.1.2.	Unit	Pcs.
Unit price definition	Light wooden partition in classrooms with single doors and transom, dim. 550x400cm (205 + 80 + 115cm) (S1)		
Description	Dismantling of the existing interior single-leaf and double-leaf wooden doors, light wooden partitions, fixed sidelights and transoms, from all positions defined by the project. The door is removed with the corresponding stocks. Dispose of the door in a suitable place for later loading into a suitable means of transport and transport to the city landfill (charged separately). Calculation per piece of removed doors and transoms.		

BoQ Item	3.3.4.1.3.	Unit	Pcs.
Unit price definition	Light wooden partition in classrooms with single doors and transom, dim. 550x300cm (205 + 95cm) (S2)		

BoQ Item	3.3.4.1.4.	Unit	Pcs.
Unit price definition	Light wooden partition in classrooms with single doors and transom, dim. 470x290cm (205 + 85cm) (S3)		

BoQ Item	3.3.4.1.5.	Unit	Pcs.
Unit price definition	Light wooden glazed partition on the store on the ground floor with a single door and transom, dim. 460x370cm (250 + 120cm) (S4)		

BoQ Item	3.3.4.1.6.	Unit	Pcs.
Unit price definition	Single-leaf door with transom (asymmetrically placed), dim. 370 (100 + 270) x285cm (205 + 80cm) (S5)		

BoQ Item	3.3.4.1.7.	Unit	Pcs.
Unit price definition	Light wooden partition on offices, with single-leaf doors and transom, dim. 270x400cm (205 + 80 + 115) (S6)		

BoQ Item	3.3.4.1.8.	Unit	Pcs.
Unit price definition	Light wooden partition on the computer room, with a single door and transom, dim. 270x345cm (205 + 20 + 120cm) (S7)		

BoQ Item	3.3.4.1.9.	Unit	Pcs.
Unit price definition	Light wooden partition on offices with single-leaf doors and transom, dim. 250x400cm (205 + 80 + 115cm) (S8)		

BoQ Item	3.3.4.1.10.	Unit	Pcs.
Unit price definition	Light wooden partition with single door and transom, dim. 240x300cm (205 + 95cm) (\$9)		

BoQ Item	3.3.4.1.11.	Unit	Pcs.
Unit price definition	Light wooden partition in the class. upstairs (towards the hall) with a single door and transom, dim. 240x290cm (205 + 85cm) (\$10)		

BoQ Item	3.3.4.1.12.	Unit	Pcs.
Unit price definition	Light wooden partially glazed partition on the ground floor with a single door with transom, dim. 220x370cm (250 + 120cm) (\$11)		

BoQ Item	3.3.4.1.13.	Unit	Pcs.
Unit price definition	Light wooden partially glazed partition on the upstairs library, single-leaf doors with transom, dim.220x370cm (250 + 120cm)(\$12)		

BoQ Item	3.3.4.1.14.	Unit	Pcs.
Unit price definition	Glazed windshield with two double doors, with sidelights and transom, dim. 524x400cm (V1)		

BoQ Item	3.3.4.1.15.	Unit	Pcs.
Unit price definition	Double doors with sidelights and transom, dim. 245x365cm (V2)		

BoQ Item	3.3.4.1.16.	Unit	Pcs.
Unit price definition	Double doors with sidelights and transom, dim. 245x345cm (V3)		

BoQ Item	3.3.4.1.17.	Unit	Pcs.
Unit price definition	Double doors with sidelights and transom, dim. 226x345cm (V6)		

BoQ Item	3.3.4.1.18.	Unit	Pcs.
Unit price definition	Glazed windshield with two double doors, with sidelights and transoms, dim. 440x285cm (V7)		

BoQ Item	3.3.4.1.19.	Unit	Pcs.
Unit price definition	Single-leaf door with transom, dim. 92x300cm (V14)		

BoQ Item	3.3.4.1.20.	Unit	Pcs.
Unit price definition	Single-leaf door with transom, dim. 92x385cm (V15)		

BoQ Item	3.3.4.1.21.	Unit	Pcs.
Unit price definition	Single-leaf door with transom, dim. 92x355cm (V16)		

BoQ Item	3.3.4.1.22.	Unit	Pcs.
Unit price definition	Single door, dim. 92x205cm (V17)		

BoQ Item	3.3.4.1.23.	Unit	Pcs.
Unit price definition	Single-leaf door with transom, dim. 82x305cm (V19)		

BoQ Item	3.3.4.1.24.	Unit	Pcs.
Unit price definition	Single door, dim. 72x205cm (V20)		

BoQ Item	3.3.4.1.25.	Unit	Pcs.
Unit price definition	Single door, dim. 62x205cm (V21)		

BoQ Item	3.3.4.1.26.	Unit	Pcs.
Unit price definition	Window - skylight, dim. 378x200cm (S = 100cm) (P22)		

BoQ Item	3.3.4.1.27.	Unit	Pcs.
Unit price definition	Window - skylight, dim. 335x180cm (S = 100cm) (P23)		

BoQ Item	3.3.4.1.28.	Unit	Pcs.
Unit price definition	Transom, dim. 160x75cm (P = 225cm) (P24)		

BoQ Item	3.3.4.1.29.	Unit	m ²
Unit price definition	Removal of the existing textile floor - rugs		
Description			
Removal of the existing textile floor - rug from the director's office. Rug is not glued to the substrate (vinaz tiles). Take the shot out of the building and dispose of it in a suitable place for later loading into a suitable means of transport and transport to the city landfill, which is charged separately.			

BoQ Item	3.3.4.1.30.	Unit	m ²
Unit price definition	Removal of the existing laminate floor from all rooms (existing offices - school administration).		
Description Removal of the existing laminate floor from all rooms (existing offices - school administration). The laminate is completely removed with the corresponding corner moldings and felt base. When removing, take care not to cause major damage to the cement screed for easier repair and installation of the planned parquet. 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.			

BoQ Item	3.3.4.1.31.	Unit	m ²
Unit price definition	Removing the existing floor covering made from vinaz tiles dim. 60x60cm.		
Description Removing the existing floor covering from vinaz tiles dim. 60x60cm from all rooms marked in the demolition and dismantling scheme. When removing, take care not to damage the existing screed, for easier repair later. The position includes the removal of the associated vinaigrette h = 8-12cm from all walls. Take the shot out of the building and dispose of it in a suitable place for later loading into a suitable means of transport and transport to the city landfill, which is charged separately.			

BoQ Item	3.3.4.1.32.	Unit	m ²
Unit price definition	Removal of existing floor and wall ceramics - Floor ceramics in hallways and auxiliary rooms		
Description			
Removal of existing floor and wall ceramics from all positions defined by the project (all rooms where a new ceramic floor covering is planned), including plinth ceramics.			
When removing, take care not to cause major damage to the screed for later easier repair and installation of the planned ceramics. The existing ceramics are partly placed on the glue over the pressed plywood d = cca 2cm (the exact proportion of this type of floor cannot be determined before the interventions to replace the floor covering). 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. Calculation per m2 of developed area of removed ceramics. Calculation per m2 of removed ceramics (door openings are rejected) including removal of associated plinth ceramics.			

BoQ Item	3.3.4.1.33.	Unit	m²
Unit price definition	Ceramic floor in front of the covered entrance		

BoQ Item	3.3.4.1.34.	Unit	m²
Unit price definition	Floor ceramics in toilets		

BoQ Item	3.3.4.1.35.	Unit	m²
Unit price definition	Wall ceramics in toilets		

BoQ Item	3.3.4.1.36.	Unit	m²
Unit price definition	Wall ceramics in the classroom washbasin zone		

BoQ Item	3.3.4.1.37.	Unit	m ²
Unit price definition	Dismantling of the complete existing wooden elements and pressed plywood suspended ceiling		
Description			
Dismantling of the complete existing suspended ceiling from wooden elements and elements of pressed plywood. The position includes the removal of the complete ceiling with the associated wooden and metal substructure (hangers and fasteners), as well as the assembly and disassembly of the required scaffolding.			
Dispose of the removed material in a suitable place in the school yard for later transport to the landfill, which is charged separately.			
Note: Before removing the ceiling, switch off all lighting and insulate all connection points to prevent accidental contact. Removal of existing lamps is a position within the works on electrical installations.			

BoQ Item	3.3.4.1.38.	Unit	m ²
Unit price definition	Dismantling of the existing metal linear suspended ceiling - Interior suspended ceiling		
Description Dismantling of the existing metal linear suspended ceiling from all positions defined by the project. The position includes the removal of the ceiling with the associated metal substructure (pendants and fasteners), as well as the assembly and disassembly of the required scaffolding. Dispose of the removed material in a suitable place in the school yard for later transport to the landfill, which is charged separately.			

BoQ Item	3.3.4.1.39.	Unit	m²
Unit price definition	Dismantling of the existing metal linear suspended ceiling - External suspended ceiling		

BoQ Item	3.3.4.1.40.	Unit	Pcs.
Unit price definition	Expansion of the existing and penetration of new door openings in the classrooms - Hole in the wall made of siporex block t = 15cm (plastered t = 19cm), hole size 102x205cm		
Description	<p>Expansion of the existing and penetration of new door openings in the classrooms listed in the project from the existing 92cm to 102cm (masonry measure for the installation of planned doors dim. 100x205-300cm), as well as breaking the existing fence to access the platform for people with disabilities.</p> <p>Expansion / punching, is done on one side (and on both sides where it is not possible on one side) in AB sheets, sandwich walls and walls of siporex blocks, with prior careful double-sided cutting of mortar and part of the wall (hand sander with concrete / stone cutting plate, at a depth of 3-5cm) in order to minimize the disturbance of the stability of the wall itself. Each labile element must be fixed with extension mortar. 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. Calculation per piece of widened openings depending on the type of wall and the dimensions of the opening.</p>		

BoQ Item	3.3.4.1.41.	Unit	Pcs.
Unit price definition	Hole in the wall with reinforced concrete canvas t = 16cm (plastered t = 20cm), opening dimensions 102x205cm		

BoQ Item	3.3.4.1.42.	Unit	Pcs.
Unit price definition	An opening in the sandwich wall (originally façade) which consists of: AB canvas t = 16cm + min. Wool t = 3cm + lightly reinforced concrete t = 5cm + cem. Mortar t = 2cm + silicate brick t = 7cm / 38cm total plastered on both sides, opening dimensions 102x300 (205 + 95) cm		

BoQ Item	3.3.4.1.43.	Unit	Pcs.
Unit price definition	Making an opening measuring 102x207cm in a wall of siporex blocks t = 15cm (plastered t = 19cm)		

BoQ Item	3.3.4.1.44.	Unit	Pcs.
Unit price definition	Demolition of part of the fence on the floor, made of siporex blocks t = 15cm lined with silicate brick d = 7cm / total t = 24cm. The opening is 150 cm wide (h existing = 100cm)		

BoQ Item	3.3.4.1.45.	Unit	m²
Unit price definition	Demolition of existing partition walls - Walls between existing rooms		
Description	<p>Demolition of existing partition walls in everything according to the scheme of demolition and masonry. The walls are made of siporex blocks d = 15cm (plastered d = 19cm). The walls are 400 cm high. 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. Calculation per m2 of demolished walls.</p>		

BoQ Item	3.3.4.1.46.	Unit	m²
Unit price definition	Parts of the walls in the rooms		

BoQ Item	3.3.4.1.47	Unit	m²
Unit price definition	Removal of the existing light "wooden" partition walls made from plywood – Partition t=16cm		
Description	<p>Removal of the existing light "wooden" partition walls from plywood placed on both sides over the wooden substructure in everything according to the demolition and masonry plan (part of the classrooms with a floor). The position includes the removal of partitions, taking care not to damage the surrounding surfaces of floors, walls and ceilings.</p> <p>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. Calculation per m² of collapsed partition walls.</p>		

BoQ Item	3.3.4.1.48.	Unit	m²
Unit price definition	Partition t=19cm		

BoQ Item	3.3.4.1.49.	Unit	m¹
Unit price definition	Removal of the existing inactive gutter casted iron verticals within the planned positions of showers, toilets as well as the amphitheater		
Description	<p>Removal of the existing inactive gutter caterpillar verticals within the planned positions of showers, toilets as well as the amphitheater (replacement of the position in the amphitheater with new - external ones, are treated by this project). The position includes the demolition of the anchor block in the bottom - knee of the vertical as well as the careful removal of the vertical from the zone of the suspended ceiling within the ceiling of the first floor. 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	3.3.4.1.50.	Unit	Pcs.
Unit price definition	Removal of all positions of the facade wooden joinery – Glazed facade wall with two entrance double doors, with sidelights and transoms, dim. 524x400cm - Main entrance - F1		
Description	<p>Removal of all positions of the facade wooden joinery in everything according to the project - demolition and dismantling plan. 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.</p>		

BoQ Item	3.3.4.1.51.	Unit	Pcs.
Unit price definition	Glazed facade wall with two entrance double doors, with sidelights, dim. 440x285cm - Side entrance - F2		

BoQ Item	3.3.4.1.52.	Unit	Pcs.
Unit price definition	Glazed facade wall with two sl. doors with sidelights and tr., dim. 520x355cm-Side entrance to the restaurant - F3		

BoQ Item	3.3.4.1.53.	Unit	Pcs.
Unit price definition	Glazed facade wall with single-leaf doors, with sidelights and transoms, dim. 255x320cm - F4		
BoQ Item	3.3.4.1.54.	Unit	Pcs.
Unit price definition	Entrance double doors with sidelights and transoms, dim. 230x355cm - Entrance to the restaurant - F5		
BoQ Item	3.3.4.1.55.	Unit	Pcs.
Unit price definition	Entrance double doors with sidelights and transoms, dim. 220x285cm - Entrance to the kitchen - F6		
BoQ Item	3.3.4.1.56.	Unit	Pcs.
Unit price definition	Entrance double doors with sidelights, dim. 216x225cm - Entrance to the restaurant - F7		
BoQ Item	3.3.4.1.57.	Unit	Pcs.
Unit price definition	Entrance double door with transom, dim. 210x355cm - F8		
BoQ Item	3.3.4.1.58.	Unit	Pcs.
Unit price definition	Entrance double door with transom, dim. 140x355cm - Entrance to the restaurant - F10		
BoQ Item	3.3.4.1.59.	Unit	Pcs.
Unit price definition	Glazed facade wall with sliding doors, with sidelights and transoms, dim. 470x370cm - F15		
BoQ Item	3.3.4.1.60.	Unit	Pcs.
Unit price definition	Glazed facade wall, dim. 289x370cm - F18		
BoQ Item	3.3.4.1.61.	Unit	Pcs.
Unit price definition	Glazed facade wall with double sash window, sidelight and transom, dim. 236x325cm - F20		
BoQ Item	3.3.4.1.62.	Unit	Pcs.
Unit price definition	Window - skylight in the amphitheater, dim. 80x635cm - F41		
BoQ Item	3.3.4.1.63.	Unit	Pcs.
Unit price definition	Window - skylight in the amphitheater, dim. 80x430cm - F42		
BoQ Item	3.3.4.1.64.	Unit	Pcs.
Unit price definition	Roof lantern above the stairs (administrative part), dim. 100x100cm - F44		
BoQ Item	3.3.4.1.65.	Unit	m²
Unit price definition	Removal of the existing facade cladding of silicate brick t = 7cm, in the area of the skylight above the flat roofs.		
Description			
Removal of the existing facade cladding of silicate brick t = 7cm, in the area of the skylight above the flat roofs. The brick is removed including the part within the joists, due to the later better fit of the planned silicate lining after the opening was walled up. 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.			

BoQ Item	3.3.4.1.66.	Unit	m¹
Unit price definition	Temporary removal of all existing vertical gutters in order to free the facade for uninterrupted execution of facade works. -Gutters, h=3m.		
Description	Removal of existing linings of part of the roof attics from clinker end (corner "L") tiles. When removing the layers, take care not to damage the existing waterproofing, as well as the attic for later easier masonry and sheet metal processing. 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.		

BoQ Item	3.3.4.1.67.	Unit	Pcs.
Unit price definition	Temporary removal of all existing vertical gutters in order to free the facade for uninterrupted execution of facade works. -Gutters, h=3m.		
Description	Temporary removal of all existing vertical gutters in order to free the facade for uninterrupted execution of facade works. The gutters are removed with the corresponding anchors and placed in a suitable place on the construction site for later reassembly in the same positions (mark the gutters). Calculation per m ¹ of temporarily removed vertical gutters.		

BoQ Item	3.3.4.1.68.	Unit	Pcs.
Unit price definition	Gutters, h=7,5m		

BoQ Item	3.3.4.1.69.	Unit	m²
Unit price definition	Temporary removal of all existing protective window grilles and gates behind the dental office, made from box profiles of black hardware.		
Description	Temporary removal of all existing protective window grilles and gates behind the dental office, from box profiles of black hardware. The grilles should be carefully removed by cutting the anchors and placed in a suitable place in the school yard for later return to the same position (with previous sanding and painting - a separate item). Calculation according to which the grilles were removed. The grilles are in the range of dimensions 0.9-2.2 x 1.3-2.6 m (1.5 - 4.5 m ²).		

BoQ Item	3.3.4.1.70.	Unit	Pcs.
Unit price definition	Temporary removal of air conditioners from all positions on the building (outdoor and indoor units).		
Description	Temporary removal of air conditioners from all positions on the building (outdoor and indoor units). The position includes disconnection from the network, careful and controlled discharge of coolant, as well as the doming of the devices themselves and the bracket brackets. They are disposed of in a convenient place near the facility, in a place determined by the Investor.		

BoQ Item	3.3.4.1.71.	Unit	m³
Unit price definition	Removal and transport of rubble.		
Description	Loading into a suitable means of transport, removal and unloading of rubble generated during removal and dismantling to a suitable city landfill up to 10 km away. The total calculated amount of shot increased 2x due to looseness is taken for calculation.		

II MASONRY WORKS

BoQ Item	3.3.4.2.1.	Unit	m²
Unit price definition	Procurement of materials and masonry of the planned internal partition walls, including walling of part of the existing openings - Partition walls t = 12cm		
Description	Procurement of materials and masonry of the planned internal partition walls, including walling of part of the existing openings, in all according to the project, with brick hollow partition block d = 12 cm and 15 cm in extension mortar. The position also includes the production of reinforced concrete lintels (dim. 12x20cm) together with reinforcement (RA Ø12mm x L x 4pcs and RUØ8 / 20) and the necessary formwork. Calculation per m2 of constructed walls together with lintels, circles and necessary reinforcement, with rejected openings. Note: The position includes cutting / removing all layers of the floor - to the slab on the ground at the positions of the planned walls.		

BoQ Item	3.3.4.2.2.	Unit	m²
Unit price definition	Walling of existing openings t = 12cm		

BoQ Item	3.3.4.2.3.	Unit	m²
Unit price definition	Walling of existing openings t = 15cm		

BoQ Item	3.3.4.2.4.	Unit	m²
Unit price definition	Procurement of materials and masonry of the planned internal partition walls between the part of the classrooms and the hall made of silicate bricks.		
Description	<p>Procurement of materials and masonry of the planned internal partition walls between the part of the classrooms and the hall made of silicate bricks, and in everything according to the details "D1" - "D10". The position includes the following phases of works:</p> <ol style="list-style-type: none"> 1. Cutting of all layers of the existing floor to the mezzanine structure in the dimensions of the planned walls, d = 12cm + 1cm on both sides; 2. Masonry of silicate brick wall d = 12cm in extension mortar 1: 3: 6. A set of debtors with 1/2 brick is built. When masonry, pay attention to the regularity and uniformity of the thickness d = 1cm and the indentation of the joint d = 1cm due to the fact that the wall is not plastered; 3. Procurement of materials and pouring of horizontal circulating smoke. 12x20cm above the door level, h = 210cm from the floor level. The position includes reinforcement (RA Ø12mm x L x 4pcs and RUØ8 / 20) with anchoring of the cerclage in the side walls / pillars - four anchors that are welded to the reinforcement in the cerclage. When pouring, take care not to pour concrete and cement laitance over the face of the silicate brick wall. Calculation per m2 of constructed walls together with circulations, necessary reinforcement, formwork and assembly and disassembly of the necessary scaffolding. 		

BoQ Item	3.3.4.2.5.	Unit	m²
Unit price definition	Cladding of walls with silicate bricks t = 7cm.		
Description	<p>The position includes the following phases of works:</p> <ol style="list-style-type: none"> 1. Cleaning of the existing wall that is protected from unevenness and existing paint and coating with a primer; 2. Installation - laying with silicate brick t = 7 (6,5) cm in extension mortar 1: 3: 6 with 		

installation of anchors - stainless steel anchors - 5 pcs / m². The debtor's style is built without a bandage in everything according to the existing linings in the school. When masonry, pay attention to the regularity and uniformity of the thickness $d = 1\text{cm}$ and the indentation of the joint $t = 1\text{cm}$ due to the fact that the wall is not plastered;

3. Coating of treated bricks with water-repellent impregnation based on silicone type "TKK Silofob V" or equivalent. Impregnation must provide the following characteristics of the treated surface of silicate brick:

3.1 Prevented surface excretion of water-soluble salts (flowering);

3.2 The structure and color of the material remain unchanged, the resistance to the action of paint (graffiti) is improved and it is easier to clean them and

3.3 The development of microorganisms: algae, molds and fungi is significantly reduced.

The position includes all accompanying work, material, as well as assembly and disassembly of the required scaffolding.

BoQ Item	3.3.4.2.6.	Unit	m ²
Unit price definition	Procurement of materials and manual plastering of all planned walls, including masonry and unplastered zones above the existing suspended ceiling, with cement - limestone mortar - Plastering of planned walls		
Description	Procurement of materials and manual plastering of all planned walls, including masonry and unplastered zones above the existing suspended ceiling, with cement - lime mortar. The price includes all the necessary pre-works - application of the substrate (contact concrete) and assembly and disassembly of the required scaffolding.		

BoQ Item	3.3.4.2.7.	Unit	m ²
Unit price definition	Plastering of wall zones above the existing suspended ceiling		

BoQ Item	3.3.4.2.8.	Unit	m ²
Unit price definition	Plastering the ceiling above the existing suspended ceiling		

BoQ Item	3.3.4.2.9.	Unit	m ²
Unit price definition	Procurement of materials and rehabilitation of part of the walls after the removal of wall ceramics.		
Description	Procurement of materials and rehabilitation of part of the walls after the removal of wall ceramics. The walls are repaired by hand plastering to a fine hand with all the necessary preliminary work and a description for the plastering works.		

BoQ Item	3.3.4.2.10.	Unit	m ²
Unit price definition	Procurement of materials and masonry repair of existing walls and ceilings damaged by moisture and water from the roof, etc. - Renovation of walls (10% of the total A walls)		
Description	Procurement of materials and masonry repair of existing walls and ceilings damaged by moisture and water from the roof, etc. The walls are repaired by hand plastering to a fine hand with all the necessary preliminary work and a description for the plastering works. Note: Mandatory tour of the building in order to ascertain the actual condition of the existing walls and ceilings that are the subject of renovation.		

BoQ Item	3.3.4.2.11.	Unit	m²
Unit price definition	Rehabilitation of the ceiling (10% of the total A ceiling)		

BoQ Item	3.3.4.2.12.	Unit	m²
Unit price definition	Procurement of materials and production of cem. scr. after removal of floor coverings - ceramics and vin. tiles. - Rehabilitation of the screed on the surfaces planned for the installation of ceramic tiles (halls, corridors, toilets and outdoor covered plateau).		
Description	Procurement of materials and production of cement screed after removal of floor coverings - ceramics and vinaigrette tiles (and production of waterproofing of floors on the ground), at all positions defined by the project. It is performed to the level of the required flatness for the planned floor coverings in accordance with the project, d = 3.5-4 cm with all the necessary pre-works and materials.		

BoQ Item	3.3.4.2.13.	Unit	m²
Unit price definition	Rehabilitation of the screed on the surfaces planned for the installation of PVC flooring (classrooms and cabinets).		

BoQ Item	3.3.4.2.14.	Unit	m¹
Unit price definition	Procurement of materials and processing of jambs from the inside after the installation of the planned facade PVC and aluminum joinery.		
Description	Procurement of materials and processing of jambs from the inside after the installation of the planned facade PVC and aluminum joinery - manual plastering with extension plaster 1: 3: 9. The position includes all the necessary preliminary work, as well as the protection of the planned carpentry, floors and walls. The average width of the spalette is 15-20cm.		

BoQ Item	3.3.4.2.15.	Unit	m¹
Unit price definition	Procurement of materials and processing of jambs after installation of planned positions of internal aluminum joinery. -Jamb widths approx. 20cm		
Description	Procurement of materials and processing of joists after installation of planned positions of internal aluminum joinery in the existing openings in the brick walls d = 19-20cm (siporex block and reinforced concrete canvas) and 34.5cm (original sandwich facade wall) - manual plastering with extension plaster 1: 3: 9. The position includes all the necessary preliminary work, as well as the protection of the planned hardware, floors and walls. Calculation per m ¹ of treated spalette on both sides.		

BoQ Item	3.3.4.2.16.	Unit	m¹
Unit price definition	Jamb widths approx. 30cm		

BoQ Item	3.3.4.2.17.	Unit	m ²
Unit price definition	Procurement of materials and sanding of existing silicate brick wall coverings in the interior. - Ground floor brick wall		
Description			
Procurement of materials and sanding of existing silicate brick wall coverings in the interior. The bricks are sanded dry, without the use of water for cooling and dusting (with the necessary protection of all surfaces exposed to dust) until a flat and clean surface of uniform color of the new silicate brick is obtained. The position includes repairing all damaged joints (graphite paint residues, missing mortar, water and moisture damage, etc.) by re-applying the mortar in a uniform joint thickness. All positions where joint repair is planned will protect the face of the brick from the effects of mortar. The price includes all pre-works, protection of adjacent surfaces, as well as assembly and disassembly of the necessary scaffolding.			

BoQ Item	3.3.4.2.18.	Unit	m²
Unit price definition	First floor brick wall		

III INSULATION WORKS

BoQ Item	3.3.4.3.1.	Unit	m ²
Unit price definition	Waterproofing of floors and parts of walls.		
Description			
Production of waterproofing of floors and parts of walls of wetlands 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 cement screed and wall zone approx. 20 cm high;			
2. Gluing 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 a suitable brush at the time 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 worksmin = 0.55mm 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 Ø14mm 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	m¹
Unit price definition	Procurement of materials, production and installation of sheet metal edging of roof attics - drips. -Roof attics drop, developed widths = 45 cm		
Description	<p>Procurement of materials, production and installation of sheet metal edging of roof attics - drips in all positions defined by the project. The edging is made of galvanized steel plasticized sheet metal in everything according to the general description of sheet metal work. The position previously includes:</p> <p>1. Installation of anchors made of galvanized bottles of dim. min. 40x5mm which are placed at a distance of max 60cm. Fix with screws with doweling in two places closer to the edges of the attic (remove all labile elements of plaster and layers), and then:</p> <p>2. Installation of the attic cover itself by folding around the sheet metal anchor rsh = 30-60 cm, as well as all the accompanying work, material and connecting means.</p>		
BoQ Item	3.3.4.4.2.	Unit	m¹
Unit price definition	Roof attics drop, developed widths = 60 cm		
BoQ Item	3.3.4.4.3.	Unit	m¹
Unit price definition	Roof attics drop, developed widths = 70 cm		
BoQ Item	3.3.4.4.4.	Unit	m¹
Unit price definition	Roof attics drop, developed widths = 90 cm		

V CERAMIC AND STONE CUTTING WORKS

BoQ Item	3.3.4.5.1.	Unit	m²
Unit price definition	Procurement of materials and installation of floor and wall ceramics. - Porcelain floor tile in hallways, halls and in front of the entrance.		
Description	<p>Procurement of materials and installation of floor and wall ceramics in all positions defined by the project. Place the tiles in the "ceresit CM 11" ceramic adhesive or equivalent with open joints d = 1mm. Tiles are in mild tones, dimensions 30x30 - 90x90cm floor and 20x30 - 40x40cm wall. After laying the ceramics and grouting, the surfaces are cleaned and washed with water, which is included in the price.</p> <p>The surface of doors and windows is not deducted from the surface at the expense of processing the joists and installation of corner moldings made of brushed INOX. Wall ceramics in toilets are placed up to a height of 230 cm - the height of the wall between the cabins. 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.</p> <p>NOTE: Form a price based on the unit price of ceramics up to 15 € / m2.</p>		

BoQ Item	3.3.4.5.2.	Unit	m²
Unit price definition	Floor porcelain tile in toilets and auxiliary rooms		

BoQ Item	3.3.4.5.3.	Unit	m²
Unit price definition	Wall ceramics in classrooms in washbasin zones		

BoQ Item	3.3.4.5.4.	Unit	m²
Unit price definition	Wall porcelain tile in toilets		

BoQ Item	3.3.4.5.5.	Unit	m ²
Unit price definition	Procurement of materials and rehabilitation of the existing stair cladding made of Danilovgrad stone		
Description			
Procurement of materials and rehabilitation of the existing stair cladding made of Danilovgrad stone within the stair vertical. The stone is repaired in the following steps:			
1. Washing the surface Ph with a neutral absorbent chemical using water for rinsing;			
2. Grinding / calibration of the surface, ie. removing the surface layer of stone that has been exposed to dirt, dirt and bacteria during use;			
3. Application of polyurethane penetrating component for structural bonding of aggregates within terrazzo (surface layer conservation)			
4. Polishing the surface with a combination of appropriate abrasive stone plates (from the coarsest to the finest - polishing)			
5. Impregnation of the final - polished surface for protection against absorption of impurities, grease, etc. Impregnation is performed by coating with silicone penetrating oils or equivalent for the same purpose.			

VI FLOORING WORKS

BoQ Item	3.3.4.6.1.	Unit	m ²
Unit price definition	Procurement of materials and installation by gluing a floor covering of heterogeneous polyvinyl chloride on foam (ISO11638) / PVC floor covering of the "Tarkett Tapiflex Excellence" type.		
Description			
<p>Procurement of materials and installation by gluing a floor covering of heterogeneous polyvinyl chloride on foam (ISO11638) / PVC floor covering of the "Tarkett Tapiflex Excellence" type, in the range 65 - 80, "FACET Yellow" or visual - qualitative equivalent. The floor covering is placed over a pre-prepared and leveled base (self-leveling mass over a cement screed - included in the price).</p> <p>The position includes coating with a primer (primer) "Thomsit R777" or equivalent in accordance with the manufacturer's instructions, and then gluing the PVC floor in rolls, d = min. 3mm glue "Thomsit K188" or equivalent. The floor is glued to the substrate, and the joints are welded according to the manufacturer's recommendation using the same material in order to homogenize the color and texture. The position includes the purchase and installation of plinth moldings of the same material over the appropriate formatter PVC elements, as well as the finishing elements and the transition to the interior aluminum joinery.</p> <p>The characteristics that heterogeneous vinyl floor must meet are the following:</p> <ul style="list-style-type: none">- Product standard EN 10582;- Commercial designation of surface resistance (ISO 10874) - 34 - intended high-traffic areas;- Min. final layer thickness 0.8mm (ISO 24340);			

- Resistance to damage from furniture legs (EN 424) - without damage;
- Dimensional stability 0.10%;
- Min. thickness 2-3mm;
- Impact on indoor air quality (EN 16516) after 28 days $\leq 10 \mu\text{g} / \text{m}^3$;
- Slip resistance (EN 13893) DS class ($\mu \geq 0.30$);
- Reaction to fire (EN 13501-1) Bfl-s1;
- Resistance to chemicals (ISO 26987) High resistance;
- Color fastness - light (ISO 105-B02) 6;
- Possibility of recycling - Yes, 100%.

BoQ Item	3.3.4.6.2.	Unit	m²
Unit price definition	Procurement of materials and rehabilitation (rearrangement, planing and varnishing) of the existing beech parquet.		
Description			
Procurement of materials and rehabilitation (rearrangement, planing and varnishing) of the existing beech parquet floors in all rooms envisaged by the project. The position includes the following phases of works:			
1. Careful removal and sorting of parquet lamellas and associated plinth strips;			
2. Cleaning the substrate from adhesive residues, dirt and any unevenness. The position also includes the final dedusting of the surface;			
3. Gluing parquet - previously removed beech lamellas in natur class with two-component parquet glue. The position includes additional purchase of damaged lamellas in the amount of up to 30%;			
4. Application of joint mass in accordance with the state of joints of overlaid lamellas;			
5. Planing;			
6. Application of substrate - primer;			
7. Resanding;			
8. Application of substrate - primer;			
9. Fine grinding;			
10. Applying the first layer of varnish with max 60% gloss;			
11. Vacuuming and applying the second layer of varnish, taking care to close / protect the room from the effects of drafts, dust and insects until the varnish hardens, and			
12. Procurement and installation of new corner beech moldings.			

BoQ Item	3.3.4.6.3.	Unit	m ²
Unit price definition	Procurement of materials and rehabilitation (planing and varnishing) of existing beech parquet.		
Description			
Procurement of materials and rehabilitation (planing and varnishing) of existing beech parquet floors in all rooms envisaged by the project. The position includes the following phases of works:			
1. Removal of existing plinth moldings;			
2. Application of joint mass in accordance with the state of joints of overlaid lamellas;			
3. Planing to the level of removing all damage and unevenness;			
4. Application of the substrate - primer;			
5. Resanding;			
6. Application of substrate - primer;			
7. Fine grinding;			
8. Applying the first layer of varnish with max 60% gloss;			
9. Vacuuming and applying the second layer of varnish, taking care to close / protect the room from the effects of drafts, dust and insects until the varnish hardens and			

10. Procurement and installation of new corner beech moldings.

BoQ Item	3.3.4.6.4.	Unit	m ²
Unit price definition	Procurement, delivery and installation of 1st class laminates, treated edges with waterproof treatment		
Description	<p>Procurement, delivery and installation of 1st class laminates, treated edges with waterproof treatment in order to achieve high resistance to moisture (type "Tarkett Navigator 1233" in Gibraltar texture or similar) in all rooms except the bathroom. The laminate is laid over a suitable thermosilent substrate and pre-prepared and smoothed cement screed. The position includes the purchase and installation of appropriate PVC moldings in the color and texture of the laminate itself.- Slip resistance (EN 13893) DS class ($\mu \geq 0.30$);</p> <ul style="list-style-type: none"> - Reaction to fire (EN 13501-1) Bfl-s1; - Resistance to chemicals (ISO 26987) High resistance; - Color fastness - light (ISO 105-B02) 6; - Possibility of recycling - Yes, 100%. 		

BoQ Item	3.3.4.6.5.	Unit	m ¹
Unit price definition	Procurement and installation of transitional alu. moldings		
Description	<p>Procurement and installation of transitional aluminum moldings with a width of max 5 cm at all positions of the transition from one type of floor covering to another (stone - parquet, stone - ceramics). The moldings are placed in everything according to the manufacturer's instructions, by fixing them with double-sided adhesive tape.</p>		

VII JOINERY - LOCSMITH 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, $U_f \leq 2.3 \text{ W} / \text{m}^2\text{K}$;
2. Thermal insulation of packages in accordance with EN 10770 $U_w \leq 1.8 \text{ W} / \text{m}^2\text{K}$;
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 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	Procurement of materials, production and installation of facade joinery from aluminium profiles. - Glazed facade wall with two entrance double doors, with sidelights and transoms, dim. 524x372cm - F1		
Description	In accordance with, 'GENERAL DESCRIPTION FOR FACADE ALUMINIUM JOINERY' .		

BoQ Item	3.3.4.7.2.	Unit	Pcs.
Unit price definition	Glazed facade wall with two entrance double doors, with transoms, dim. 440x285cm - F2		

BoQ Item	3.3.4.7.3.	Unit	Pcs.
Unit price definition	Glazed facade wall with two windows with tilting mechanism, dim. 388x353cm - F3		

BoQ Item	3.3.4.7.4.	Unit	Pcs.
Unit price definition	Glazed facade wall, dim. 289x367cm - F19		

VIII 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 $U_f \leq 1.3W / m^2K$. 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	3.3.4.8.1.	Unit	Pcs.
Unit price definition	Procurement of materials, production and installation of facade joinery from PVC profiles. – Single-leaf door with transoms andsidelights (exit to the flat roof), dim. 255x320cm - F4		
Description	In accordance with, 'GENERAL DESCRIPTION FOR JOINERY - LOCSMITH WORKS – facade PVC joinery'';		

BoQ Item	3.3.4.8.2.	Unit	Pcs.
Unit price definition	Double doors with transom, dim. 230x355cm - F5		

BoQ Item	3.3.4.8.3.	Unit	Pcs.
Unit price definition	Double doors with transom, dim. 220x285cm - F6		

BoQ Item	3.3.4.8.4.	Unit	Pcs.
Unit price definition	Double doors, dim. 216x225cm - F7		

BoQ Item	3.3.4.8.5.	Unit	Pcs.
Unit price definition	Double doors with transom, dim. 210x355cm - F8		

BoQ Item	3.3.4.8.6.	Unit	Pcs.
Unit price definition	Double doors with transom, dim. 140x355cm - F10		

BoQ Item	3.3.4.8.7.	Unit	Pcs.
Unit price definition	Glazed facade wall with four wings with rotating tilting mechanism and transoms, dim. 472x287cm - F15		

BoQ Item	3.3.4.8.8.	Unit	Pcs.
Unit price definition	Glazed facade wall with two wings of transoms with tilting mechanism, dim. 470x370cm - F16		

BoQ Item	3.3.4.8.9.	Unit	Pcs.
Unit price definition	Single-leaf window with transom with ventus opening dim. 80x635cm - F35		

BoQ Item	3.3.4.8.10.	Unit	Pcs.
Unit price definition	Single-leaf window with skylight with ventus opening dim. 80x430cm - F36		

BoQ Item	3.3.4.6.11.	Unit	Pcs.
Unit price definition	Procurement of materials, production and installation of a		

standard roof window for flat roofs of the "Velux CVP" type or equivalent. - F38
<p>Description Procurement of materials, production and installation of a standard roof window for flat roofs of the "Velux CVP" type or equivalent with the possibility of manual opening for an angle of 60 °. The window is installed on a pre-installed suitable frame made of PVC profile with TI filling. The size of the opening is 100x100cm (adopt the position in accordance with the available dimensions of the window). The wing is glazed with a milky - opaque polycarbonate dome on the upper side and a thermopane package of appropriate glasses on the lower - inner side. The position includes all accompanying work, material, connecting means, etc.</p>

IX JOINERY - LOCSMITH WORKS – interior aluminum joinery

GENERAL DESCRIPTION FOR JOINERY - LOCSMITH WORKS – interior aluminium joinery

Procurement of materials, production and installation of internal joinery from aluminum profiles without interrupted thermal bridge (cold profiles) ("Alumil M9400" or equivalent), in natural aluminum (RAL 9006 or visual equivalent) and white (RAL 9003 or visual equivalent), and depending on the position and scheme of carpentry and locksmithing.

The wings are filled with pressed plywood - univer in the decor of a bright sonoma oak or visual equivalent and in yellow - " Falco 242 FS15 or visual equivalent and with PVC sandwich panels depending on the position and scheme of carpentry.

Glazing of all positions intended for glazing, excluding transoms, shall be done with single safety multilayer "pamplex" glass 3.3.1. d = 6mm, while the glazing of the overhead light is done with single float glass d = 4mm.

Supply carpentry with high-quality nickel and AL-alloy fittings ("Winkhaus Activ Pilot" or technical equivalent), handles, locks and keys. In terms of sealing, the minimum performance that the finished product must provide and which must be proven through an official certificate are:

EN 12207 - CLASS 4; EN 12208 - CLASS E750; EN 12210 - CLASS C4.

Positions V1 and V2 (windshield positions), include a hydraulic shutter on the main wing with the possibility of locking in position - open as well as the purchase and installation of aluminum profiles for additional reinforcement, all according to the graphic attachments.

Position P1 (position of the inner window - skylight on the library) includes gluing crystal foil (the effect of ground glass) as well as the installation of a PVC parapet bench on both sides.

BoQ Item	3.3.4.9.1.	Unit	Pcs.
Unit price definition	Procurement of materials, production and installation of interior joinery made from aluminium profiles. - Single-leaf doors with fixed transoms in classrooms, dim. 100x210cm (550x115cm) - S1		
Description	In accordance with, 'GENERAL DESCRIPTION FOR JOINERY - LOCSMITH WORKS – interior aluminium joinery';		

BoQ Item	3.3.4.9.2.	Unit	Pcs.
Unit price definition	Single-leaf doors with fixed overhead lights in classrooms, dim. 100x210cm (550x70cm) - S2		

BoQ Item	3.3.4.9.3.	Unit	Pcs.
Unit price definition	Single-leaf doors with fixed overhead lights in classrooms, dim. 100x210cm (540x70cm) - S3		
BoQ Item	3.3.4.9.4.	Unit	Pcs.
Unit price definition	Single-leaf door with fixed transom in the classroom, 100x210cm (470x60cm) - S4		
BoQ Item	3.3.4.9.5.	Unit	Pcs.
Unit price definition	Single-leaf door with fixed transom in the classroom, 100x210cm (370x55cm) - S5		
BoQ Item	3.3.4.9.6.	Unit	Pcs.
Unit price definition	Double doors with sidelight and transom, dim. 365x285cm - S6		
BoQ Item	3.3.4.9.7.	Unit	Pcs.
Unit price definition	Single-leaf doors with fixed transom on offices, dim. 100x210cm (270x115cm) - S7		
BoQ Item	3.3.4.9.8.	Unit	Pcs.
Unit price definition	Single-leaf doors with fixed transom on offices, dim. 100x210cm (250x115cm) - S8		
BoQ Item	3.3.4.9.9.	Unit	Pcs.
Unit price definition	Single-leaf doors with fixed transoms in classrooms, dim. 100x210cm (250x115cm) - S9		
BoQ Item	3.3.4.9.10.	Unit	Pcs.
Unit price definition	Single-leaf doors with fixed transoms, dim. 100x210cm (240x70cm) - S9.1		
BoQ Item	3.3.4.9.11.	Unit	Pcs.
Unit price definition	Single-leaf door with fixed transom on the library, dim. 100x210cm (220x70cm) - S10		
BoQ Item	3.3.4.9.12.	Unit	Pcs.
Unit price definition	Glazed wall with two entrance double doors, with sidelights and transoms, dim. 524x372cm - V1		
BoQ Item	3.3.4.9.13.	Unit	Pcs.
Unit price definition	Glazed wall with two entrance double doors, with transoms, dim. 440x285cm - V2		
BoQ Item	3.3.4.9.14.	Unit	Pcs.
Unit price definition	Double doors with transom, dim. 240x345cm - V3		
BoQ Item	3.3.4.9.15.	Unit	Pcs.
Unit price definition	Single-leaf door with transom, dim.100x298 (210 + 88) cm - V4		
BoQ Item	3.3.4.9.16.	Unit	Pcs.
Unit price definition	Single-leaf doors dim. 100x203cm - V5		
BoQ Item	3.3.4.9.17.	Unit	Pcs.

Unit price definition	Single-leaf doors dim. 100x203cm - V5'		
BoQ Item	3.3.4.9.18.	Unit	Pcs.
Unit price definition	Single-leaf door with transom, dim. 90x283cm - V6		
BoQ Item	3.3.4.9.19.	Unit	Pcs.
Unit price definition	Single-leaf door with transom, dim. 90x253 (210 + 43)cm - V7		
BoQ Item	3.3.4.9.20.	Unit	Pcs.
Unit price definition	Single-leaf doors dim. 90x203cm - V8'		
BoQ Item	3.3.4.9.21.	Unit	Pcs.
Unit price definition	Single-leaf door with transom, dim. 90x303 (210 + 93)cm - V9		
BoQ Item	3.3.4.9.22.	Unit	Pcs.
Unit price definition	Single-leaf doors dim. 80x198cm - V10		
BoQ Item	3.3.4.9.23.	Unit	Pcs.
Unit price definition	Single-leaf doors dim. 70x203cm - V11'		
BoQ Item	3.3.4.9.24.	Unit	Pcs.
Unit price definition	Single-leaf doors dim. 60x203cm - V12		
BoQ Item	3.3.4.9.25.	Unit	Pcs.
Unit price definition	Procurement and installation of single-leaf fireproof doors, dim. 102x205cm. - PP1		
Description Procurement and installation of single-leaf fire / smoke doors made of sheet steel through a steel substructure. The filling is fireproof. Finishing - MDF panels in white (RAL 9010). The door is equipped with smoke seals and a hydraulic door closing mechanism with the possibility of locking in the open position. The PP protection factor is 90 minutes.			
BoQ Item	3.3.4.9.26.	Unit	Pcs.
Unit price definition	Procurement of materials and installation of strip curtains on façade.		
Description Procurement of materials and installation of strip curtains on all facade positions defined by the project (restaurant part - positions of the new facade carpentry and administration). 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	3.3.4.9.27.	Unit	Pcs.
Unit price definition	Procurement of materials and installation of venetian blinds.		
Description Procurement of materials and installation of venetian blinds on all facade positions defined by the project (classrooms and cabinets). 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.			

X LOCSMITH WORKS

BoQ Item	3.3.4.10.1.	Unit	Pcs.
Unit price definition	Procurement of materials, construction and installation of a cantilever platform on the first floor for exit from the vertical - lifting platform for persons with disabilities.		
<p>Description</p> <p>Procurement of materials, construction and installation of a cantilever platform on the first floor for exit from the vertical - lifting platform for persons with disabilities. The platform is made in all respects according to the details from the project from box and tubular profiles of black hardware, as follows:</p> <ul style="list-style-type: none">- Boxes of dim. 40x40x2-3mm i- Tubular profiles Ø50x2-3mm (dimensioned in accordance with the existing handrail on the masonry fence), as well as- Floor platforms made of aluminum tread, in standard: EN 573-3; EN 485-2; EN 485-4; EN 10204 3.1, ENAW 5754. Sheet thickness is d = 4-5mm. The sheet metal is folded at all corners in accordance with the project. Over the sheet metal is glued rubber floor covering d = 3mm with nops (embossed circles) d = 1mm, in black. <p>The fence is made of tubular profiles with alubond filling, d = 4mm. The position of the fence includes a gate for controlled access to the platform, equipped with a handle, lock and keys, and in everything according to the details from the project.</p> <p>The platform is performed as a cantilever by fixing over the anchor plates to the existing AB beam and part of the monolithic AB plate. The dimensions of the platform are 150x150x50cm. The position includes all necessary work, material, assembly and disassembly of the necessary scaffolding, anti-corrosion protection in two layers and final treatment with polyurethane varnish in two layers in workshop conditions (on the construction site allowed corrections after installation and possible welding, etc.). The platform lining is made of alubond d = 4mm in the color of natur aluminum (RAL 9006 or visual equivalent - in accordance with the final treatment of the lifting shaft of the lifting platform, and in everything according to the project.</p> <p>Note: During the final positioning, leveling and processing of the details of the platform connections, coordinate the work with the work on the installation of the vertical lifting platform.</p>			

BoQ Item	3.3.4.10.2.	Unit	m ¹
Unit price definition	Procurement of materials and repair of existing handrails /railings - Railing, h=1m.		
Description			
Procurement of materials and repair of existing handrails and fences made of tubular profiles of black hardware. The position includes sanding the old paint - matting (do not reveal metal) and painting in two layers in the same - yellow polyurethane paint (RAL 1003). The position includes all accompanying work and materials, protection of all contact walls and floors, as well as assembly and disassembly of the necessary scaffolding.			
Calculation per m ¹ of rehabilitated fence h = 1m and handrail.			

BoQ Item	3.3.4.10.3.	Unit	m ¹
Unit price definition	Handrail		

BoQ Item	3.3.4.10.4.	Unit	m²
Unit price definition	Procurement of materials, repair and re-installation of locksmith elements - previously removed protective grilles on windows and doors.		
Description	Procurement of materials, repair and re-installation of locksmith elements - previously removed protective grilles on windows and doors, including the gate behind the dental office. The grilles are made of box profiles of black locksmith smoke. 20x20mm. The position includes sanding the old paint - matting (not revealing metal) and painting - painting with a compressor in two layers in the same - white polyurethane paint (RAL 9010). Also, it is necessary to repair all positions where it was subsequently welded during installation.		

BoQ Item	3.3.4.10.5.	Unit	m²
Unit price definition	Procurement of materials and production of protective window grilles.		
Description	Procurement of materials and production of protective window grilles in accordance with the existing one. The grille is made of box profiles of black smoke hardware. 20x20x2mm at a distance of approx. 12cm (depending on the dimensions of the opening on which they are installed). The position includes sanding the old paint - matting (not revealing metal) and painting - painting with a compressor in two layers in the same - white polyurethane paint (RAL 9010). Also, it is necessary to repair all positions where it was subsequently welded during installation.		

XI PLASTER – PAINTING WORKS

BoQ Item	3.3.4.11.1.	Unit	m²
Unit price definition	Procurement of materials and installation of a coffered / modular suspended ceiling 60x60cm.		
Description	Procurement of materials and installation of a coffered / modular suspended ceiling 60x60cm over a metal suspended substructure in all positions defined by the project. The boards are mineral "Fine stratos" or technical - visual equivalent, and in everything according to the graphic attachments of the project and the technical specification of the manufacturer.		

BoQ Item	3.3.4.11.2.	Unit	m²
Unit price definition	Procurement of materials and production of light gypsum -cardboard one-sided partitions in the parts above the overhead light.		
Description	Procurement of materials and production of light gypsum-cardboard one-sided partitions in the parts above the overhead light between the classrooms and the hallway (gypsum cardboard board is placed on one side - towards the classroom). Partitions should be made with classic gypsum plasterboards d = 1.25 cm of KNAUF system or equivalent, on BOHOR metal substructure or equivalent. The price includes smoothing the joints over the bandage tape and preparation for the final smoothing and painting.		

BoQ Item	3.3.4.11.3.	Unit	m²
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Unit price definition	Procurement of materials and production of gypsum -cardboard monolithic complex ceiling.
<p>Description</p> <p>Procurement of materials and production of gypsum-cardboard monolithic complex buildings in the part of the ceiling within the central - entrance hall. The bodies are in the form of cubes of different heights and surfaces, in modular dimensions 60x60, 60x120, 120x120cm, and in all according to the project - the base of the ceiling. The housings are made of plasterboard through a metal substructure in everything according to the specification and instructions of the manufacturer. The price includes smoothing of joints and transitions to the coffered part of the ceiling over the bandage tape and preparation for the final smoothing and painting, as well as harmonization of position processing with the planned built-in LED lighting (calculated separately).</p> <p>NOTE: When forming prices, take into account the complexity of the shapes themselves, as well as the number of edges that are processed.</p>	

BoQ Item	3.3.4.11.4.	Unit	m ²
Unit price definition	Procurement of materials and installation of a metal linear suspended ceiling. - Metal ceiling inside (toilets and technical rooms)		
Description Procurement of materials and installation of a metal linear suspended ceiling with a visible substructure ("Knauf metal linear" or equivalent). The disposition of the linear metal suspended ceiling is in everything according to the project. Calculation per m ² of the performed ceiling.and painting.			

BoQ Item	3.3.4.11.5.	Unit	m²
Unit price definition	Metal ceiling outside (covered entrance)		

BoQ Item	3.3.4.11.6.	Unit	Pcs.
Unit price definition	Procurement of materials and production of gypsum - cardboard monolithic bodies - lining of installation verticals.		
Description Procurement of materials and production of gypsum - cardboard monolithic bodies - lining of installation verticals. The cases are made of plasterboard boards d = 12.5 mm over a metal type substructure in accordance with the specification and instructions of the manufacturer. Dim. corpus is approx. 20x20cm x h (3-4m). Note: The case is made after the completion of works on water supply and sewerage installations (special item).			

BoQ Item	3.3.4.11.7.	Unit	m ²
Unit price definition	Procurement of materials and repair of all existing walls, beams and ceilings by sanding and smoothing. - New plastered walls (including plastered parts of the walls above the existing suspended ceiling to be removed) - smoothing		
Description			
Procurement of materials and repair of all existing walls, beams and ceilings by smoothing, as well as smoothing of new masonry walls and plasterboard partitions. Smooth all surfaces in both hands with sanding to the required flatness and smoothness. The price includes all the necessary pre-work (scraping as needed) as well as the costs for the protection of the finished final surfaces (windows, doors, etc.) and the installation of corner aluminum moldings. Calculation per m2 of cultivated area. NOTE: Facade openings of up to 3m2 are not rejected, openings of 3-5m2 are rejected over 3m2, while openings over 5m2 are rejected over 3m2 while			

spallettes are calculated separately per m¹. Considering that all positions are internal alu. locksmiths without parapets, openings are not deducted for calculation. Calculation per m² of the surveyed developed area.

BoQ Item	3.3.4.11.8.	Unit	m²
Unit price definition	Plastered ceilings (above the existing suspended ceiling that is removed) - smoothing		

BoQ Item	3.3.4.11.9.	Unit	m²
Unit price definition	Rehabilitation of existing walls by smoothing – 50% of the total wall area		

BoQ Item	3.3.4.11.10.	Unit	m²
Unit price definition	Rehabilitation of existing ceilings by smoothing – 50% of the total wall area		

BoQ Item	3.3.4.11.11.	Unit	m ²
Unit price definition	Procurement of materials and painting of walls and ceilings with water-based acrylic matte latex paint. -Walls and ceilings in white		
Description Procurement of materials and painting of walls and ceilings with water-based acrylic matte latex paint ("Tikkurila Harmony" or equivalent) resistant to cleaning with chemicals and weak solvents. All surfaces intended for painting should be previously cleaned, dusted and applied with a suitable substrate / primer ("Tikkurila Luja" primer with additives against the appearance of mold, or equivalent) in one layer, and the color depending on the manufacturer's instructions and the condition of the surface. is treated. The selected color should meet the parameters: Heat resistance min. 85 ° C, ISO 4211-2 and ISO 4211-3; Wet cleaning, class II, ISO 11998. (which is proven by the manufacturer's documentation, as well as the appropriate attestation documentation) for the specifically selected product. Calculation per painted area.			

BoQ Item	3.3.4.11.12.	Unit	m²
Unit price definition	Walls in dark turquoise color (RAL 6033)		

BoQ Item	3.3.4.11.13.	Unit	m²
Unit price definition	Walls and body parts in the central hall in yellow (RAL 1003)		

BoQ Item	3.3.4.11.14.	Unit	m²
Unit price definition	Plasterboard parts in the central hall in light gray (RAL 7004)		

BoQ Item	3.3.4.11.15.	Unit	m²
Unit price definition	Plasterboard parts in the central hall in dark gray (RAL 7012)		

XII FACADE WORKS

BoQ Item	3.3.4.12.1.	Unit	m ²
Unit price definition	Procurement of materials and renovation of the complete facade cladding of silicate brick.		
Description			
Procurement of materials and renovation of the complete facade cladding of silicate brick. The bricks are repaired according to the following description:			
1. Protection of all surrounding - contact surfaces (facade carpentry and plastered walls);			
2. Machine grinding of brick faces with the possibility of using water to cool the grinding wheels to obtain a flat and clean surface of uniform color equivalent to a new brick of the same type;			
3. Repair of all damaged joints (graphite paint residues, missing mortar, damage from water and moisture, etc.) by re-applying the mortar in a uniform thickness of the joint. All positions where joint repair is planned will protect the face of the brick from the effects of mortar;			
4. Coating of treated bricks with water-repellent impregnation based on silicone type "TKK Silofob V" or equivalent. Impregnation must provide the following characteristics of the treated surface of silicate brick:			
4.1 Prevented surface excretion of water-soluble salts (flowering);			
4.2 Vapor permeability (diffuse resistance) of the material to the outside remains unchanged – wall normally "breathes";			
4.3 The structure and color of the material remain unchanged, the resistance to the action of paint (graffiti) is improved and it is easier to clean them and			
4.4 Development of microorganisms: algae, molds and fungi is significantly reduced.			
The position includes all accompanying work, material, as well as assembly and disassembly of the required scaffolding.			
Note: When performing works on the floor - at flat roof levels, previously provide passability to all positions not specified in the project by setting temporary paths from OSB boards over the ballast layer of gravel in the manipulative width required to perform all works from the description.			

BoQ Item	3.3.4.12.2.	Unit	m ²
Unit price definition	Procurement of materials and treatment of all facade plastered surfaces by painting with high quality facade coating with silicone binder.		
Description			
Procurement of materials and treatment of all facade plastered surfaces (surfaces not coated with silicate brick) including pergola elements along the entrance facade (columns and reinforced concrete beam) by painting with high quality facade coating with silicone binder, according to the following description:			
1. Removal by scraping of damaged parts of existing facade coatings and unstable (separate) parts of mortar by washing the surface with water under pressure without the use of abrasives and chemicals;			
2. Substrate coating - bonding primer type "Baumit Multi Primer" or equivalent, which is diluted with water in a ratio of 1: 1 - 1: 5 depending on the porosity and absorbency of the substrate. If there is a need for application in two or more layers, the time interval between layers / coatings must not be less than 12 hours;			
3. Application of repair mass - repair mortar type "Baumit MultiWhite" or equivalent on dry mortar using a notched trowel made of stainless steel with the insertion of a fiberglass mesh. After gently drying the first layer, a second thin layer is applied. After drying, the surface should be rubbed with a sponge trowel.			

The layer of repair mass is 3-5 mm thick

4. Applying two coats of high quality facade paint with silicone binder. The first layer is applied diluted with 10-15% water. After a break of at least 12 hours, one to two coats of facade paint are applied, if necessary. Wait at least four hours between coats. The color is dark red / burgundy (RAL 3009) or visual equivalent - in accordance with the existing, as well as the color of the roofing sheet used in the previous renovation.

The position includes all the necessary preliminary work, all the necessary supporting material, as well as the assembly and disassembly of the necessary scaffolding.

BoQ Item	3.3.4.12.3.	Unit	m²
Unit price definition	Procurement of materials and coating of part of the facade walls with silicate brick t=7cm.		
Description	<p>Procurement of materials and coating of part of the facade walls with silicate brick d = 7cm in everything according to the project. The position includes the following phases of works:</p> <ol style="list-style-type: none"> 1. Cleaning of the existing wall that is protected from unevenness and existing paint and coating with a primer; 2. Installation - laying with silicate brick d = 7 (6,5) cm in extension mortar 1: 3: 6 with installation of anchors - stainless steel anchors - 5 pcs / m². The debtor's style is built without a bandage in everything according to the existing linings in the school. When masonry, pay attention to the regularity and uniformity of the thickness d = 1cm and the indentation of the joint d = 1cm due to the fact that the wall is not plastered; 		

BoQ Item	3.3.4.12.4.	Unit	m¹
Unit price definition	Procurement of materials and painting of all window jambs.		
Description	<p>Procurement of materials and painting of all window jambs planned - position of PVC and aluminum joinery. The joists are treated with silicate bricks, so that the repair refers to the cleaning of the joinery and brick joints and siliconizing. The position includes all the necessary pre-work, protection of the facade carpentry, facade silicate bricks, as well as the assembly and disassembly of the necessary scaffolding.</p>		

BoQ Item	3.3.4.12.5.	Unit	m¹
Unit price definition	Procurement of materials and renovation of existing steel structural elements - pergolas on the entrance facade.		
Description	<p>Procurement of materials and renovation of existing steel structural elements - pergolas on the entrance facade of the building. The position includes sanding the old paint to metal, coating with anti-corrosion coating in two layers and final protection with polyurethane dark red paint (RAL 3009 or visual equivalent) in two layers. The construction elements are "I" profiles dim. approx. 100x150mm.</p>		

XIII OTHER WORKS

BoQ Item	3.3.4.13.1.	Unit	Pcs.
Unit price definition	Procurement, delivery and installation of a vertical lifting platform with a protective shaft (lifting height> 4m), for persons with disabilities.		

Description

Procurement, delivery and installation of a vertical lifting platform with a protective shaft (lifting height > 4m), for persons with disabilities in the main entrance hall in everything according to the project. The platform is of the "Barduva SB200" type or equivalent.

Platform features:

- Lifting height: 430cm
- Load capacity: 400 kg
- Stations: 2 (ground floor - 1 floor)
- Lifting speed min. 0.15 m / sec (9m / min)
- Lifting height: 4300 mm
- Approaches: 2, 1 + 1 at 90 °
- Pit: not needed
- Drive shaft: aluminum construction lined with steel panels
- Internal dimensions of the drive shaft: min. 1540 x 1500 mm
- Internal dimensions of the platform plateau: 1100 x 1400 mm (minimum defined by the Ordinance)
- Access doors: manual, single-leaf, revolving
- Finishing of entrance doors: aluminum profiles with multilayer glass
- Dimensions of the entrance door opening: min. 900 x 2000 mm (1 pc.) And min. 940 x 2000 mm (1 pc.)
- Intended for indoor installation
- Power supply three-phase 3 x 380 V / 50Hz
- Drive: electric motor with threaded spindle
- Motor power: up to 2.2 kW
- Platform color: RAL 9006 (natural aluminum).

When assembling the platform, harmonize the access levels with the planned cantilever plateau - the platform on the first floor. The position includes all supporting work, materials, fasteners, restoration of contact zones of walls and floors to their original condition, training of users for handling and basic / current maintenance, certification and development of maintenance project.

Note: The platform and all its elements must comply with EN 81-41: 2010, as well as the Ordinance on detailed conditions and methods of adapting facilities for access and movement for persons with reduced mobility and persons with disabilities.

BoQ Item	3.3.4.13.2.	Unit Pcs.(aprx.)
Unit price definition	Final rough and fine cleaning of the facility with the removal of small remaining debris to a suitable landfill.	
Description	Final rough and fine cleaning of the facility with the removal of small remaining debris to a suitable landfill up to 10 km away.	

VOLUME 3.2

TECHNICAL DESCRIPTION / SPECIFICATIONS

02 ELECTRIC INSTALATIONS – HIGH (MID) VOLTAGE

TECHNICAL DESCRIPTION

Object:	P.I. Vocational High School „Danilo Kiš“ Budva
Location:	C.P. No 1617/1, C.M. Budva, Budva
Investor:	P.I. Vocational High School „Danilo Kiš“ Budva
Total Gross area:	5487,51m ²
Total Nett area:	4426,62m ²
Stories:	2 (GF+1)

TECHNICAL DESCRIPTION

INTRODUCTION

The subject of this project is the replacement of complete lighting, switches and sockets. It is also necessary to equip the computer classroom, assembly hall and rooms 2 and 3 for modern teaching.

LIGHTING INSTALLATION

All rooms in the building have appropriate lighting adapted to the purpose of the room and installation conditions, as indicated in the attached plans. The existing cable distribution is of good quality, so we will keep it. The lamps will be mounted on the existing outlets.

The lamps are switched on from the existing switch points and the existing mode of distribution of lamps by switches and circuits is maintained. In certain positions, it is planned to relocate the switches (rooms for the disabled), which are shown on the diagram.

Basic lighting is provided in all rooms.

Lighting is controlled by existing switches. All metal masses of lighting fixtures must be grounded. If it is necessary to continue the existing cables, do so properly with regular terminals and conductors type PP-y 3 x 1.5 mm².

EQUALIZATION OF POTENTIAL

In accordance with the technical regulations for the execution of electrical installations, an installation for equalizing the potential in the bathroom and sanitary facilities is also planned.

For this purpose, in bathrooms and sanitary facilities, in the wall at a height of 0.4 m from the floor, install PS-49 potential equalization boxes. A copper busbar is installed in the box, to which the water pipe of the sink, sewage pipes, water pipes, bathtub, or all metal masses in the bathroom are connected with a P/F 4 mm² conductor.

Make the connection to the bathtub with a cable foot and an M-6 screw with a nut, and to the water pipes, connect the conductor P/F 4 mm² through a copper foot and a copper clamp with an M-5 screw. Place a 3 mm thick lead insert between the copper clamp and the pipe.

From the potential equalization box PS-49 to the protective busbar of the associated distribution board, place the conductor P/F 6 mm² and make the connection.

It is also necessary to properly ground all other metal masses with a surface area of more than 2m².

If the plumbing installation is made of plastic pipes, and the shower cabins and sinks are not metal, then this equalization of the potential does not need to be done.

DISTRIBUTION PANELS

In the main distribution cabinet, it is necessary to add 3 automatic fuses of 40A for the supply cable of the distribution board of the computer room RT-RU and 5 automatic fuses of 16A for the new circuits for office 2 and 3. It is also necessary to add 3 automatic fuses of 40A to the existing RT-1 for powering the RT-ZB switchboard.

These new switchboards should be installed in the positions marked on the diagrams and with the equipment given in the specification.

In the existing switchboards, EZ fuses have already been replaced with automatic ones.

Distribution boards should be properly marked and equipped with single-pole schemes.

PROTECTION AGAINST INDIRECT TOUCH VOLTAGE AND POTENTIAL EQUALIZATION

Protection against indirect contact voltage in low-voltage installations is achieved by applying appropriate protection measures that depend on the type of distribution system (determined by JUS N.B2.720 and JUS N.B2.741 standards).

The project envisages a TN-C-S distribution system. In this system, protection against indirect contact voltage is achieved by grounding all exposed conductive parts of the installation, basic equalization of potential and automatic shutdown of the power supply using overcurrent protection devices (fuses and installation automatic switches).

The automatic disconnection of the power supply, in the event of a fault occurring anywhere in the installation, aims to prevent the generation of contact voltage of such a value and duration that it does not pose a danger to people in the facility. The protection condition in the TN-S system is met if the condition is met:

$$Z_s \leq U_o/I_a$$

Where is:

Z_s – the impedance of the fault loop, which includes the source, the live conductor to the fault point and the protective conductor between the fault point and the source,

I_a - the current that ensures the operation of the protective device for the automatic disconnection of the power supply in the determined time - nominal voltage to earth.

A check of the effectiveness of the protective measure of automatic disconnection is given in the attachment.

Basic potential equalization implies the connection to the protective busbar for potential equalization (J.P.S.), the following:

- main protective conductor PE
- the main map, including the basic grounding of the building
- main metal pipes of water supply, sewerage and the like
- metal cabinets
- metal masses of containers
- all protective conductors for the facility's installation, which must be sectioned as well as phase and neutral, marked yellow-green.

POWER BALANCE

Calculation of simultaneous load

The total simultaneous load is calculated according to the formula:

$$P_j = P_i \cdot K_j$$

Where is:

P_i – installed power

K_j – simultaneity factor of the average unit from the group

The total installed power for the added assembly hall is $P_{inst.}=9,000$ W. As the simultaneity coefficient at the level of the complete facility $K_j = 1$ was adopted, the simultaneous load on the 0.4 kV busbars in RT-ZB amounts to $P_j = 9,000$ W.

This simultaneous load corresponds to a current load of 13.68A with the adopted power factor $\cos \varphi = 1$.

4.2 Calculation of power cables

The calculation was made on the basis of the JUS.N.B2.752 standard (permanently permitted current), taking into account the requirements for:

1. Protection against excessive currents, according to JUS.N.B2.743 standard
2. Protection from thermal effects, according to standard JUS.N.B2.742
3. Protection against electric shock, according to standard JUS.N.B2.741
4. Voltage drops
5. Thermal resistance of soil.

The basis for the choice is the maximum current in the circuit (marked with I_b), which is determined based on the load analysis, i.e. the power balance.

From the corresponding tables and based on the type of distribution (according to standard JUS.N.B2.752), the permanently permitted current of the adopted cable or conductor is determined, for the conditions prescribed by the standard (marked as I_d) for that type of distribution.

Taking into account that the cables are laid in other conditions than prescribed by the standard, the following factors are taken into account:

- K_p -for groups containing more than one circuit;
- K_t -for the value of the ambient temperature that differs from the temperature provided by the standard;
- K_z -for the thermal resistance of the soil that differs from 2.5 Km/W of soil

Based on the above, we arrive at the permanently permitted current (marked as I_z) for the adopted cable.

Protection Check

The check is reduced to the selection of protective devices based on the JUS.N.B2.743 standard, that is, the check of protection against overload currents and protection against short-circuit currents.

4.3.1 Protection against overload current

Protective devices must be provided to interrupt any overload current flowing through the lines before it causes a rise in temperature harmful to the insulation, connections, terminals or the environment.

The operating characteristic of the device that protects the line against overload must meet the following conditions:

1. $I_b < I_n < I_z$
2. $I_2 < 1.45 I_n$

where are:

I_b - current for which the circuit is designed

I_n - nominal current of the protective device

Permanently withstand the current of the cable or conductor

I_2 - the current that ensures the reliable operation of the protective device and amounts to:

$I_2 = k \cdot I_n$, where "k" is a factor that depends on the type and size of the selected protective device.

Calculation of voltage drop

The voltage drop, from the source to the consumer, must be lower than the permitted voltage drop prescribed by the Rulebook on Technical Norms for Low Voltage Electrical Installations, which amounts to:

- for the lighting circuit 3%, and for the circuits of other consumers 5%, if the installation is powered from a low-voltage network;
- for the lighting circuit 5%, and for the circuits of other consumers 8%, if the installation is powered directly from the substation;
- for installations whose length is greater than 100 m, the permitted voltage drop is increased by 0.005% per meter, but not more than 0.5%;
- for electric motors, the voltage drop during start-up must not exceed the value at which there is a decrease in the motor's torque, which endangers its reliable start-up.

The voltage drop calculation for three-phase consumers is calculated according to the following formula:

$$u\% = (100 \times P \times l) / (p \times S \times U_l^2)$$

i.e. for single-phase consumers:

$$u\% = (100 \times P \times l) / (p \times S \times U_f^2)$$

where are:

- P (W) - consumer power
- l (m) - the length of the cable, that is, the conductor from the source to the consumer
- S (mm²) - cross-sectional area of the cable or conductor
- U_l (V) - line voltage
- U_f (V) - phase voltage
- p (Sm/mm²) - specific conductivity: for copper it is 56, for aluminum 34.

Checking the touch voltage

Depending on the nominal contact voltage and the ratio of the phase and neutral conductor sections, the actual contact voltage is calculated. Based on the data from JUS.N.B2.741.

CALCULATION OF THE TRANSIENT RESISTANCE OF THE OBJECT'S GROUNDING

For the grounding device of the lightning protection installation, the basic grounding device of the building was used. This grounding device is connected with a strip to the basic grounding device of the neighboring building (common grounding device), so the propagation resistance of such a grounding device can be obtained using the pattern for parallel connected grounding devices.

We calculate the transient resistance of the grounding device according to the form (TP.5):

$$R_r = \frac{\rho}{2D} (\Omega)$$

Where is:

R_r – propagation resistance (Ω)

ρ - specific soil resistance (Ωm)

D – equivalent diameter (m), which is calculated according to the formula:

$$D = \left(\frac{4P}{\pi} \right)^{1/2}$$

Where: P – object area (m²)

Object dimensions:

$a = 105.0m$

$b = 45.0 m$

Area: $4725.00m^2$

Specific soil resistance = $150\Omega m$

$D = 77.58m$

So: $R_r = 0.97\Omega$

Since the ground is less than 10 ohms the ground is satisfactory.

*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)*

2 GENERAL

2.1 LIST OF APPLIED REGULATIONS AND STANDARDS

- Law on Spatial Planning and Construction ("Official Gazette MN" no. 64/17)
- Energy Law ("Official Gazette MN" no. 5/16)
- Law on Occupational Safety ("Official Gazette MN" no. 34/14)
- Law on Protection and Rescue ("Official Gazette MN", no. 013/07 from 18.12.2007, 005/08 from 23.01.2008, 086/09 from 25.12.2009, 032/11 from 01.07.2011, 054/16 from 15.08.2016)
- Lawyer on technical standards for low voltage electrical installations ("Official Gazette SFRY" no. 53/88, no. 54/88 and "Official Gazette FRY" No. 28/95)
- MEST HD 60364-1:2011 Low - voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions
- MEST HD 60364-4-41:2011 Low-voltage electrical installations - Part 4-41: Safety protection - Protection against electric shock
- EST HD 60364-4-42:2011 Low-voltage electrical installations - Part 4-42: Safety protection - Protection against electric shock
- MEST HD 60364-4-42:2011/A1:2016 Low-voltage electrical installations - Part 4-42: Safety protection - Protection against thermal effects
- MEST HD 60364-4-43:2011 Low-voltage electrical installations - Part 4-43: Safety protection - Overcurrent protection
- MEST HD 60364-4-442:2014 Low-voltage electrical installations - Part 4-442: Safety protection - Protection of low voltage installations against temporary overvoltages due to earth fault in high voltage system and due to failures in low voltage system
- MEST HD 60364-4-444:2011 Low-voltage electrical installations - Part 4-444: Safety protection - Protection against voltage and electromagnetic interference
- MEST HD 60364-5-51:2011 Electrical installations of buildings - Part 5-51: Selection and installation of electrical equipment - General rules
- MEST HD 60364-5-52:2011 Electrical installations of buildings - Part 5-52: Selection and installation of electrical equipment - Wired systems
- MEST HD 60364-5-53:2016 Electrical installations of buildings - Part 5-53: Selection and installation of electrical equipment - Switchgear and controlgear
- MEST HD 60364-5-534:2011 Low - voltage electrical installations - Part 5-534: Selection and erection of electrical equipment - Isolation, interruption and control - Clause 534: Surge protection devices
- MEST HD 60364-5-54:2014 Low - voltage electrical installations - Part 5-54: Selection and installation of electrical equipment - Earthing and protective conductors
- MEST HD 60364-5-551:2011 Low - voltage electrical installations - Part 5- 551: Selection and erection of electrical equipment - Other equipment - Clause 551: Low voltage generators
- MEST HD 60364-5-557:2016 Low - voltage electrical installations - Part 5-557: Selection and installation of electrical equipment - Auxiliary circuits
- MEST HD 60364-5-559:2014 Low - voltage electrical installations - Part 5-55: Selection and installation of electrical equipment - Other equipment - Item 559: Luminaires and lighting installations
- MEST HD 60364-5-56:2011/A11:2014 Low - voltage electrical installations - Part 5-56: Selection and lifting of electrical equipment - Security services
- MEST HD 60364-7-701:2011 Low - voltage electrical installations - Part 7- 701: Requirements for special installations or locations - Locations where there are bathtubs or showers

- MEST HD 60364-7-704:2011 Low - voltage electrical installations - Part 7- 704: Requirements for special installations or locations - Construction and removal of construction sites
- MEST HD 60364-7-705:2013 Low - voltage electrical installations - Part 7- 705: Requirements for special installations and locations - Agricultural and horticultural facilities
- MEST HD 60364-7-706:2011 Low - voltage electrical installations - Part 7-706: Requirements for special installations or locations - Locations for laying conductors with limited displacement
- MEST HD 60364-7-708:2013 Low - voltage electrical installations - Part 7-708: Requirements for special installations or locations - Auto-camps, camps and similar locations
- MEST HD 60364-7-709:2013 Low - voltage electrical installations - Part 7- 709: Requirements for special installations or locations - Marinas and similar locations
- MEST HD 60364-7-710:2013 Low - voltage electrical installations - Part 7-710: Requirements for special installations or locations - Medical service locations
- MEST HD 60364-1:2011 Low - voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions
- MEST EN 62305-1:2012 Protection against atmospheric discharges - Part 1: General principles
- MEST EN 62305-2:2013 Lightning protection - Part 2: Risk management
- MEST EN 62305-3:2012 Protection against atmospheric discharges - Part 3: Physical damage to buildings and danger to life
- MEST EN 62305-4:2012 Protection against atmospheric discharges - Part 4: Electrical and electronic systems inside buildings
- MEST EN 62262:2012 Degrees of protection by the housing against external mechanical shocks (IR code) for electrical equipment
- MEST EN 60529:2010/A2:2015 Degrees of protection provided by the enclosure (IP code)
- MEST EN 50525-1:2011 Electric cables - Low voltage power cables of rated voltages up to and including 450/750 V (U0 / U) - Part 1: General requirements
- MEST EN 50525-3-21:2012 Electric cables - Low voltage power cables of rated voltages up to and including 450/750 V (U0 / U) - Part 3-21: Special performance cables for fire - Flexible cables with non-halogen cross-linked insulation and low smoke emission
- MEST EN 61534-1:2012 Parapet distribution - Part 1: General requirements
- MEST HD 22.1 S4:2011 Insulated conductors and cables with cross - linked

insulation for rated voltages up to and including 450 V / 750 V - Part 1: General requirements

- MEST HD 22.9 S3:2012 Cables with cross - linked insulation of rated voltages up to and including 450/750 V - Part 9: Single-core halogen-free installation insulated conductors with low smoke emission
- MEST EN 50274:2010 Low - voltage switchgear and controlgear - Protection against electric shock - Protection against accidental direct contact with dangerous active parts
- MEST EN 61439-1:2012 Low - voltage switchgear and controlgear - Part 1: General rules
- MEST EN 61439-2:2012 Low - voltage switchgear and controlgear - Part 2: Switchgear and controlgear
- MEST EN 61439-3:2012 Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by uninformed persons (DBO)
- MEST EN 60947-1:2012 Low - voltage switchgear and controlgear - Part 1: General rules

- MEST EN 60947-2:2010 Low - voltage switchgear and controlgear - Part 2: Circuit breakers
 - MEST EN 60947-3:2009 Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, disconnectors and fuse combinations
 - MEST EN 60947-4-1:2012 Low - voltage switchgear and controlgear - Part 4-1: Contactors and motor - starters - Electromechanical contactors and motor – starters
 - MEST EN 60947-4-2:2015 Low - voltage switchgear and controlgear - Part 4-2: Contactors and motor - starters - Semiconductor controls for AC motors and motor - starters
 - MEST EN 61439-6:2015 Low - voltage switchgear and controlgear assemblies - Part 6: Busbar systems
 - MEST EN 50085-1:2008 Carrier and cable management systems for electrical installations - Part 1: General requirements
 - MEST EN 60269-1:2010 Low - voltage fuses - Part 1: General requirements
 - MEST EN 60570:2010 Electric rail distribution for powering lamps
 - MEST EN 60669-1:2012 Switches for household and similar fixed electrical installations - Part 1: General requirements
 - MEST EN 61386-1:2012 Cable conduit systems - Part 1: General requirements
 - MEST EN 62423:2015 Differential current circuit breakers type B with built-in overcurrent protection and without built-in overcurrent protection for household and similar use (type B RCCB and type B RCBO)
 - MEST HD 62640:2015 Differential current devices with or without overcurrent protection
- as well as other technical regulations and recommendations for typification of elements of distribution networks.

2.2 APPENDIX ON PROTECTION AT WORK

For the investment-technical documentation with the names of all observed harms and dangers and measures for their elimination according to the Law on Occupational Safety (Official Gazette of the Republic of Montenegro No. 69/04 and 26/11), appropriate occupational safety measures were applied during the development of the project .

- Danger of accidentally touching live parts

Due to the construction of the main switchboards and apartment switchboards, as well as the correct selection of appropriate electrical equipment, it is impossible to accidentally touch live parts.

- Danger of too high touch voltage

The danger of excessively high contact voltage is eliminated by the correct selection of equipment and the application of Rulebook JUS N.B2.741 (Official Gazette SFRY No. 53-88), depending on the type of power supply system.

- Fire hazard

To eliminate the risk of fire, the following solutions were applied:

a) All electronic the equipment is of dry design without oil and other flammable materials.

b) Fire protection on cables and installation conductors in the event of a short circuit consists in the fact that the sections of the cables and conductors are sufficiently dimensioned according to the disconnection current of individual circuit drains.

- Risk of exposure to dust, water and moisture

The danger of the influence of dust, water and moisture is eliminated by the correct choice of equipment in relation to the degree of protection. Rubber sealing also prevents this effect in all consumer inlets that are directly affected by dust, water and moisture.

- Danger of overload and short circuit

The danger of short circuit and overload is eliminated by all circuits being protected by suitable fusible or automatic fuses, and motors by suitable overload protection. Anticipated cable protection against overload and short circuit is done in accordance with JUS N.B2.752.

- Unauthorized voltage drop

Unauthorized voltage drop is eliminated by proper dimensioning of power cables according to Article 20 of the Rulebook on technical norms for low voltage electrical installations.

- Insufficient lighting level

The insufficient level of lighting was eliminated by the correct selection and arrangement of lamps in accordance with the requirements and recommendations of JUS, taking into account the type of activity in the room and the choice of types of lighting and lamps, and in accordance with the requirements of JKO.

- Thunder strike

Protection against atmospheric discharge is provided by a grab with a device for early start, and in everything according to the Rulebook on technical norms for the protection of buildings against atmospheric discharge (Official Gazette of the SFRY No. 11/96), which achieved the appropriate class of protection level in accordance with the requirements of JUS IEC 1024-1-1.

- Danger of mechanical damage to the cables

The danger of mechanical damage to the cables is eliminated by the correct selection of cables and the way they are laid through sewerage and distribution, and through steel protective pipes in places where mechanical shocks can occur.

- Risk of mechanical damage to the grounding strap

The risk of mechanical damage to the grounding tape was eliminated by laying the tape on suitable supports for internal grounding of switchboards, along the route of laying racks and cables, and by inserting the tape through protective seamless steel pipes in places where mechanical injuries could occur.

GENERAL NOTES AND OBLIGATIONS OF THE WORK CONTRACTOR FROM THE OCCUPATIONAL SAFETY ASPECT

The contractor is obliged to make a special report on the arrangement of the construction site and work on the construction site and to adhere to it during the execution of the works.

The contractor is obliged to inform the competent labor inspection authority about the start of the works before starting the works.

The company is obliged to draft normative acts in the field of occupational safety (laboratory safety at work, Program for training workers in the field of occupational safety, Rulebook on inspections, tests and maintenance of tools, devices and tools).

The contractor is obliged to train the worker in occupational safety and to familiarize the worker with the working conditions, dangers and harms related to the work, and to check the worker's ability to work independently and safely.

The contractor is obliged to determine the workplaces with special working conditions to the extent that such exist.

CONCLUSION

This electrical installation project foresees the necessary measures to eliminate the dangers and harmful effects of electric current on electrical distribution, equipment and people in terms of occupational safety.

2.3 GENERAL TERMS

1. These technical conditions are an integral part of the project and are the obligation of the Contractor of the electrical installations provided for in this project.
2. All installations must be carried out according to the attached textual and graphic documentation from the project, in all respects according to the valid technical regulations for the execution of this type of installation.
3. The contractor is obliged to familiarize himself with the project in detail before starting the works and to request the necessary explanations from the designer in a timely manner.
4. For all deviations from the project, both in terms of the technical solution and in terms of the choice or replacement of materials, the Contractor must obtain the consent of the Investor's expert supervisory body. If he does not do this, the Contractor bears responsibility for all changes and works performed based on them.
5. All changes approved by the Expert Supervisory Body of the Investor, or with the consent of the designer, must be entered into the project, so that the Contractor can hand over the project of the finished state to the Investor upon completion of the works.
6. The contractor is obliged to keep a separate work diary for the works under this project. For unforeseen works or an increase in the scope of works in terms of quantity and consumption of materials, the approval of the Investor must be obtained, and the Contractor is obliged to enter them in the work diary, which is certified by the Supervisory Body of the Investor.
7. All installation material and equipment used to perform these installations must comply with valid standards and must be correct. Upon bringing the material to the construction site, the Supervisory Authority is obliged to receive the material and record its condition in the Construction Diary. The Contractor is obliged to replace used unsuitable material with correct material.
8. When making the installations according to this Project, the Contractor is obliged to take care that the damage to the building is reduced to the smallest possible extent and to repair it after the completion of the installation work.
9. For the correctness of the works performed and the quality of the materials used, the Contractor gives a guarantee, which cannot be shorter than one year, counting from the date of commissioning of the installations.
10. Upon completion of the works, the Contractor should obtain certificates and protocols on installation testing through an authorized institution (measurement of insulation of lines, testing of connections, commissioning of low-current devices and certification of the quality of the performed works and installed devices).
11. The acceptance of the installation is according to the current regulations and it is necessary to make a report in which all findings and measurement results are entered. The commission is formed by the competent authority.

2.4 REQUIREMENTS FOR INSTALLATION OF INTERIOR LIGHTING AND CONNECTIONS

1. For the production of lighting circuits and connectors, use the types of cables and conductors provided by the project. Place the conductors and cables as indicated in the graphic and textual part of this documentation.
2. All conductors and cables must be made of copper. Neutral and protective wires must not be secured, and the color of the insulation of these wires must be according to JUS. In the electrotechnical and mechanical sense, they must represent a whole. The phase line is interrupted in the outlets for the lamp posts in the switch.
3. Cut the lines only when the actual length of the lines is determined on the spot, according to the installed devices or exactly marked points of the outlet.

4. Lay conductors and cables in straight lines without unnecessary breaks and crossings. When changing direction, they must not bend sharply. The bending radius of the conductors and cables must correspond to the conditions of the manufacturer of the conductors and cables.
5. In installations carried out in watertight protection, at the introductions to the lamp, connector, distribution box and distribution board, introduce the entire conductor into the seal and separate the individual wires only behind the seal.
6. When laying lines and cables in places where mechanical damage is possible, protect them by laying them in metal pipes of the appropriate diameter up to a height of min. 2.0 m from the tread.

2.5 CONDITIONS FOR THE CREATION OF LIGHTNING RODERS INSTALLATION

1. The building already has a lightning protection installation and it is not necessary to consider it in this project.

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 DISASSEMBLY WORKS

BoQ Item	3.4.4.1.1.	Unit	Pcs.
Unit price definition	Dismantling of the existing obsolete electrical installation equipment in the school.		
Description	Dismantling of the existing obsolete electrical installation equipment in the school. The position implies dismantling, taking out and storing in a suitable place within the school yard and handing over the minutes to the Investor.		

II DISTRIBUTION CABINETS AND POWER CABLES

BoQ Item	3.4.4.2.1.	Unit	Pcs.
Unit price definition	Delivery and installation of the distribution cabinet of the computer classroom RT-RU.		
Description	Delivery and installation of the distribution cabinet of the computer classroom RT-RU. The cabinet is made in mechanical protection IP 43 for wall mounting. Install the following equipment in the cabinet: - FID switch 40 / 05A; - automatic fuses 10 and 16A pcs 21; - other necessary small material.		

BoQ Item	3.4.4.2.2.	Unit	Pcs.
Unit price definition	Delivery and installation of the distribution cabinet of the RT-ZB Chamber.		
Description	Delivery and installation of the distribution cabinet of the RT-ZB Chamber. The cabinet is made in mechanical protection IP 43 for wall mounting. Install the following equipment in the cabinet: - FID switch 40 / 05A; - circuit breakers 10 and 16A pcs 24; - other necessary small material.		

BoQ Item	3.4.4.2.3.	Unit	Pcs.
Unit price definition	Delivery and installation in the existing Main distribution cabinet GRO.		
Description	Delivery and installation in the existing Main distribution cabinet GRO of the following equipment: - automatic power supply fuse RT-RU 40A 3pcs; - automatic fuse for power supply of office circuits 2 and 3, 16A pcs 5; - other necessary small material.		

BoQ Item	3.4.4.2.4.	Unit	Pcs.
Unit price definition	Delivery and installation in the existing Distribution cabinet RT-1 on first floor.		
Description	Delivery and installation in the existing Distribution cabinet RT-1 on first floor of the following equipment: - automatic power supply fuse RT-ZB 40A 3pcs;- other necessary small material.		

BoQ Item	3.4.4.2.5.	Unit	Pcs.
Unit price definition	Delivery and installation of power cable PP-Y 5x10mm2 for power supply distribution cabinets RT-RU and RT-ZB.		
Description	Delivery and installation of power cable PP-Y 5x10mm2 for power supply distribution cabinets RT-RU and RT-ZB. The cable is laid on clamps above the suspended ceiling. The average length per supply point is 25m.		

III POWER SUPPLIES

BoQ Item	3.4.4.3.1.	Unit	m¹
Unit price definition	Delivery and laying of PP-Y 3x1.5mm² cable for connecting and continuing existing cables with designed luminaires.		
Description	Delivery and laying of PP-Y 3x1.5mm ² cable for connecting and continuing existing cables with newly designed luminaires. The cables are laid above the suspended ceiling in HF flexible pipes Φ 16mm. Keep the lights on according to the existing schedule. The price includes all materials, labor and all accompanying construction and craft works, stitching, fine plastering to smoothing.		

BoQ Item	3.4.4.3.2.	Unit	Pcs.
Unit price definition	Delivery and laying of PP-Y 3 x1.5mm² cable for moving existing switches to new locations shown in the diagrams.		
Description	Delivery and laying of PP-Y 3x1.5mm ² cable for connecting and continuing existing cables with newly designed luminaires. The cables are laid above the suspended ceiling in HF flexible pipes Φ 16mm. Keep the lights on according to the existing schedule. The price includes all materials, labor and all accompanying construction and craft works, stitching, fine plastering to smoothing.		

BoQ Item	3.4.4.3.3.	Unit	Pcs.
Unit price definition	Delivery and laying of cable PP-Y 3x2.5mm² for powering connection points.		
Description	Delivery and laying of PP-Y 3 x1.5mm ² cable for moving existing switches to new locations shown in the diagrams. Cables are laid under mortar with grooving in concrete through HF flexible pipes Φ 16mm. The price includes all materials, labor and all accompanying construction and craft works, stitching, fine plastering to smoothing. The average length per switch is 14m.		

BoQ Item	3.4.4.3.4.	Unit	m¹
Unit price definition	Delivery and laying of cable PP-Y 5x2.5mm² for power supply of vertical lifting platform.		
Description	Delivery and laying of cable PP-Y 5x2.5mm ² for power supply of vertical lifting platform. Cables are laid under mortar with grooving in concrete through HF flexible pipes Φ 16mm. The price includes all materials, labor and all accompanying construction and craft works, stitching, fine plastering to smoothing.		

IV INSTALLATION EQUIPMENT

BoQ Item	3.4.4.4.1.	Unit	Pcs.
Unit price definition	Removing the existing Ø60mm boxes, brazing in the concrete wall for the 4M box in the same place and using the existing cable.		
Description	Removing the existing Ø60mm boxes, brazing in the concrete wall for the 4M box in the same place and using the existing cable. Plastering the box finishing the wall until smoothing.		

BoQ Item	3.4.4.4.2.	Unit	Pcs.
Unit price definition	Delivery and installation of built-in pvc box, two modules – 2M.		
Description	Delivery and installation of built-in pvc box, two modules - 2M, catalog number 893 51, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.3.	Unit	Pcs.
Unit price definition	Delivery and installation of installation equipment brackets, two modules - 2M.		
Description	Delivery and installation of installation equipment brackets, two modules - 2M, catalog number 748 12, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.4.	Unit	Pcs.
Unit price definition	Delivery and installation of mask (frame), 2 M.		
Description	Delivery and instal. of mask(frame),2M, part number 750 02, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.5.	Unit	Pcs.
Unit price definition	Delivery and installation of built-in pvc box, four modules – 4M.		
Description	Delivery and installation of built-in pvc box, four modules - 4M, catalog number 893 42, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.6.	Unit	Pcs.
Unit price definition	Delivery and installation of installation equipment brackets, four modules - 4M.		
Description	Delivery and installation of installation equipment brackets, four modules - 4M, catalog number 748 04, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.7.	Unit	Pcs.
Unit price definition	Delivery and installation of mask (frame), 4 M..		
Description	Delivery and installation of mask (frame), 4 M, catalog number 750 10, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.8.	Unit	Pcs.
Unit price definition	Delivery and installation of the mechanism of the ordinary installation switch 10A, 1M.		
Description	Delivery and installation of the mechanism of the ordinary installation switch 10A, 1M, catalog number 740 00, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.9.	Unit	Pcs.
Unit price definition	Delivery and installation of ordinary installation switch mechanism 10A, 2M.		
Description	Delivery and installation of ordinary installation switch mechanism 10A, 2M, part number 740 10, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.10.	Unit	Pcs.
Unit price definition	Delivery and installation of socket with protective contacts, white.		
Description	Delivery and installation of socket with protective contacts, white - part number 741 31, LEGRAND or equivalent. The item includes the installation of connectors at newly designed positions and dismantled at existing positions.		

BoQ Item	3.4.4.4.11.	Unit	Pcs.
Unit price definition	Delivery and installation of OG power socket 2P + E, 16A, 230V, IP55.		
Description	Delivery and installation of OG power socket 2P + E, 16A, 230V, IP55, cat. No. 916 41, LEGRAND or equivalent.		

BoQ Item	3.4.4.4.12.	Unit	Pcs.
Unit price definition	Testing of the performed electrical installation commissioning.		
Description	Testing of the performed electrical installation commissioning.		

V LAMPS

BoQ Item	3.4.4.5.1.	Unit	Pcs.
Unit price definition	Delivery and installation of LED panels 45W, 4000K, dimensions 1195x295mm.		
Description	Delivery and installation of LED panels 45W, 4000K, dimensions 1195x295mm (length x width) catalog number 92PANEL015W, with the appropriate frame for surface mounting manufacturer ELMARK or equivalent.		

BoQ Item	3.4.4.5.2.	Unit	Pcs.
Unit price definition	Delivery and installation of BELLA lamp with LED tubes 2x18W, 4000K.		
Description	Delivery and installation of BELLA lamp with LED tubes 2x18W, 4000K part number 9BM218LED IP 65, manufacturer ELMARK or equivalent.		

BoQ Item	3.4.4.5.3.	Unit	Pcs.
Unit price definition	Delivery and installation of LED lamps for school boards LED tubes 1x18W, 4000K.		
Description	Delivery and installation of LED lamps for school boards LED tubes 1x18W, 4000K catalog number ELV 118, manufacturer TRACON or equivalent.		

BoQ Item	3.4.4.5.4.	Unit	Pcs.
Unit price definition	Delivery and installation of LED panels 45W, 4000K, dimensions 595x595mm.		
Description	Delivery and installation of LED panels 45W, 4000K, dimensions 595x595mm (length x width) part number 92PANEL014W, manufacturer ELMARK or equivalent.		

BoQ Item	3.4.4.5.5.	Unit	Pcs.
Unit price definition	Delivery and installation of ceiling lamp BERTA MEDIUM ROUND with socket E 27 Ø 275mm.		
Description	Delivery and installation of ceiling lamp BERTA MEDIUM ROUND with socket E 27 Ø 275mm in prot. IP 66 with LED bulb 11W, 4000K, made by FUMAGALLI or equivalent		

BoQ Item	3.4.4.5.6.	Unit	Pcs.
Unit price definition	Delivery and installation of built-in "Panic" lamps type "BEGHELI" 2 x 8 W LED		
Description	Delivery and installation of built-in "Panic" lamps type "BEGHELI" or equivalent 2 x 8 W LED (1h autonomy), marked output and with an arrow.		

VI EARTHING INSTALLATION

BoQ Item	3.4.4.6.1.	Unit	Pcs.
Unit price definition	Making connections of all metal masses, windows, doors, etc. in the premises of the building.		
Description	Making connections of all metal masses, windows, doors, etc. in the premises of the building with bridging of moving metal parts with copper braids. Make the connections with a P / F 1x6mm ² conductor and connect it all to the nearest local switchboard. The price includes screws, nuts, washers, feet, clamps and the like.		

VII OTHER WORKS

BoQ Item	3.4.4.7.1.	Unit	Pcs.
Unit price definition	Small unspecified works and material.		
Description	Small unspecified works and material.		

BoQ Item	3.4.4.7.2.	Unit	Pcs.
Unit price definition	Development of maintenance project (derived condition).		
Description	Development of maintenance project (derived condition).		

BoQ Item	3.4.4.7.3.	Unit	Pcs.
Unit price definition	Testing of the performed high current installation.		
Description	Testing of the performed high current installation, and commissioning with the issuance of the necessary certificates.		

VOLUME 3.3

TECHNICAL DESCRIPTION / SPECIFICATIONS

03 ELECTRIC INSTALATIONS – LOW VOLTAGE

TECHNICAL DESCRIPTION

Object:	P.I. Vocational High School „Danilo Kiš“ Budva
Location:	C.P. No 1617/1, C.M. Budva, Budva
Investor:	P.I. Vocational High School „Danilo Kiš“ Budva
Total Gross area:	5487,51m ²
Total Nett area:	4426,62m ²
Stories:	2 (GF+1)

1 TECHNICAL DESCRIPTION

1.1 INTRODUCTION

The subject of the Main Project are electrical installations of the low current of the JU SREDNJA MJEŠOVITA ŠKOLA "DANILO KIŠ" BUDVA is:

1. Connecting to telecommunication infrastructure
2. Structural cable system
3. Video surveillance system
4. Automatic fire alarm system
5. Sound system
6. Multimedia system
7. TV system
8. SOS disabled system in toilets

The contractor is obliged to comply with the applicable regulations and standards of the subject area as well as the technical conditions from this project during the implementation of this project.

The project is to do everything in accordance with the Law on Construction and Financing of Buildings (Official Gazette RCG No. 64/17) and other applicable technical regulations and standards for this type of electrical installation

1.2 INSTALLATION OF CABLETRAY AND PIPE SUPPORTS

Perforated cable trays - PNK100x50mm are provided for laying low current installations.

Before carrying out the installation, place the cable trays along their entire length above the suspended ceilings. The fastening of individual sections of the rack must provide reliable galvanic and mechanical contact, as well as its grounding.

The girders are made of galvanized sheet metal, standard lengths 2m.

At their ends, flat metal joints are placed, at the place where the direction of the angle joint changes, and at the fork point, forked joints are closed, and they are closed with appropriate covers.

Cable trays are mounted on standard ceiling brackets.

It is forbidden to lay any other cables in these channels. The distance between the rack and the floor slab must be at least 100mm. A distance less than the specified is allowed at a length not exceeding 500mm.

The horizontal metal channel must be at least 30 cm away from the water supply and sewerage installation, and 20 cm away from the high current installation.

1.3 STRUCTURAL CABLE SYSTEM

An integrated telephone and computer installation or structured cabling system, SKS, is the basis for the construction of the facility's information system, which should be formed on the basis of a modern approach in telecommunications technologies. In this way, the integration of the telephone and computer system is enabled, through a single cable network into a single telecommunication system.

The main telecommunication cabinet is a RACK cabinet of size 42U, 19 "which is planned in the technical room and, in addition to the equipment provided by this project, it can also accommodate devices that would be subsequently installed (telephone exchange, active equipment). Insert the 220VAC power supply from the special fuse into the RACK and be sure to ground it. At the front of the closet is a glass door with a lock. Other pages can be easily removed after opening the door to allow better access to cables and devices. The cabinet contains elements for orderly cable management (organizers).

The RACK cabinet connects to the low current concentration cabinet in the ROSS room and to the RACK-1 cabinet in the computer room with 2x FTP cat.6. RACK-1 in the computer room is existing from the chamber.

Connecting the facility to the public telecommunications network is provided in the TKO cabinet, by laying an optical cable 4VSM .

The facility envisages the use of a unique network infrastructure for the transmission of all types of communications (data / voice / video), which has a number of advantages over the separate networks used for the transmission of data (computer networks) and speech (telephone networks).

The horizontal installation is performed with an FTP cable of category 6. The protocol is IEEE 802.3 from version 10BaseT, over 100BaseT, gigabit Ethernet cat.6, bandwidth 250MHz, LSOH-FRNC-RoHS, VDE certificate. The cable does not release toxic gases during burning, and the foil with which the pairs are wrapped is made according to the ecological regulations of the European Union and does not contain heavy metals. Cables connect two-module connectors in classrooms and four-module connectors in workplaces and patch boxes installed in the RACK cabinet. The basic restriction is that each cable does not exceed a length of 90 m

The project envisages 2xRJ45 cat.6 sockets in each classroom, which are installed next to the existing energy sockets and at the same height.

4xRJ45 cat.6 socket is provided for each workstation.

In addition, the facility will provide connections that will enable wireless Internet access.

This installation is realized through access points AP (Access Points - wireless broadband routers) for wireless Internet (wireless Internet access points).

A direct connection to the ground point of the main electrical cabinet will be used for grounding the equipment housing of computer installations, metal cable ducts as well as the installations themselves, where a bus for joint grounding of the building

has been formed. They are connected to this bus with 6mm² wire. The wires are routed in 16mm diameter installation pipes.

Upon completion of the SKS installation, it should be tested individually for each link with the development of documentation and measurement protocol, the results of which must correspond to the parameters of the project network.

Installation requirements:

When performing installations, it is necessary to adhere to the rules defined by the standards. It is about the half-section of bending of cables and their distance from power lines.

The half-section of the curvature of the cable is defined in order to avoid physical damage to the cable and preserve its electrical performance. Values for different types of cables as well as routing methods are defined by the cable supplier.

The distance from the power cables is controlled to avoid unnecessary interception of the 50Hz signal and various interferences caused by switching the consumer on and off. allowed values are;

power cable up to 2kV laid in an open channel	distance from SFTP cable min 127mm
power cable up to 2kV laid near metal grounded ducts with lines	distance from SFTP cable min 64mm

Installation measurements:

Upon completion of the works, it is mandatory to check the connection parameters for computers with appropriate equipment, by an authorized organization.

Measurements include checking the conductor layout, identifying the cable, detecting the position of the cable, detecting the length and possible failure on the cable, and measuring the electrical characteristics of the cable.

Measurement of components is performed by the cable supplier and guaranteed by appropriate certificates.

After the performed measurements and during the handover of the facility, it is obligatory to submit the measurement lists and all attest documentation.

1.4 FIRE ALARM SYSTEM

The facility provides the installation of an addressable signaling and fire alarm system, which should provide timely detection of the appearance and location of the fire, as well as a warning to staff that there is a fire in the facility.

The system consists of a fire alarm with two loops of automatic and manual fire detectors, electronic sirens and cable installation.

The type of detector in certain areas is determined on the basis of expected early manifestations of fire, fire load, area of clearance that can be protected and possible disturbing effects. In the event of fire, smoke, temperature rise, and the appearance of characteristic infrared and ultraviolet radiation occur. Depending on which of the accompanying effects is expressed, a certain type of detector has been selected. Normally smoke detectors are used (-make the amount of smoke entering the detector by smashing the light air that falls on the photodiode), except in cases where there is smoke or vapor in the room that would cause false alarms (kitchens, boiler rooms ...) and then thermodynamic detectors ("triggering" when the temperature exceeds 58 ° C or if they rise rapidly with eg 10 ° C at 15 ° C) are used. According to the Regulations on Technical Norms for Stable Fire Signaling

Installations (Official Gazette of FRY No. 87/93), smoke detectors cover 60m²-80m² and the height of space up to 12m, while thermodiferential cover 20m²-30m² and height of space up to 7.5m. In the passages and corridors (a space of 3 meters in length), smoke detectors are set to max. 15 meters, and thermodiferential at max. 10 meters.

Considering the purpose of the facility, the possible causes of fire and conditions in the premises, for automatic fire detection, the following detectors are foreseen:

- optically - smoky,
 - thermal detector
- And a manual fire alarm.

The optical-smoke detector of the fire has been adopted as a basic detector because it performs a fire detection at an early stage of its development and is practically insensitive to the propagation. The sender is equally sensitive to black dense smoke (eg burnt rubber) and to white smoke (for example, Pvc).

The detection density was determined based on the analysis of the following parameters:

- the principle of control over premises,
- the height of the room
- number of air changes in the protected area
- area of the room

Based on the above, the following conclusions were reached:

- one smoke detector is set to monitor the surface of 60-80m²

The hand-held detectors are placed at a height of 1.5 meters, on evacuation routes, in corridors, in the vicinity of rooms with increased risk of fire.

Alarm sirens are activated on the pulse of any alarm in the entire or only part of the facility.

Installation is carried out with J-H (St) H2x2x0,8mm cables. They comply with the standards of VDE 0815 standards.

Alarm plan

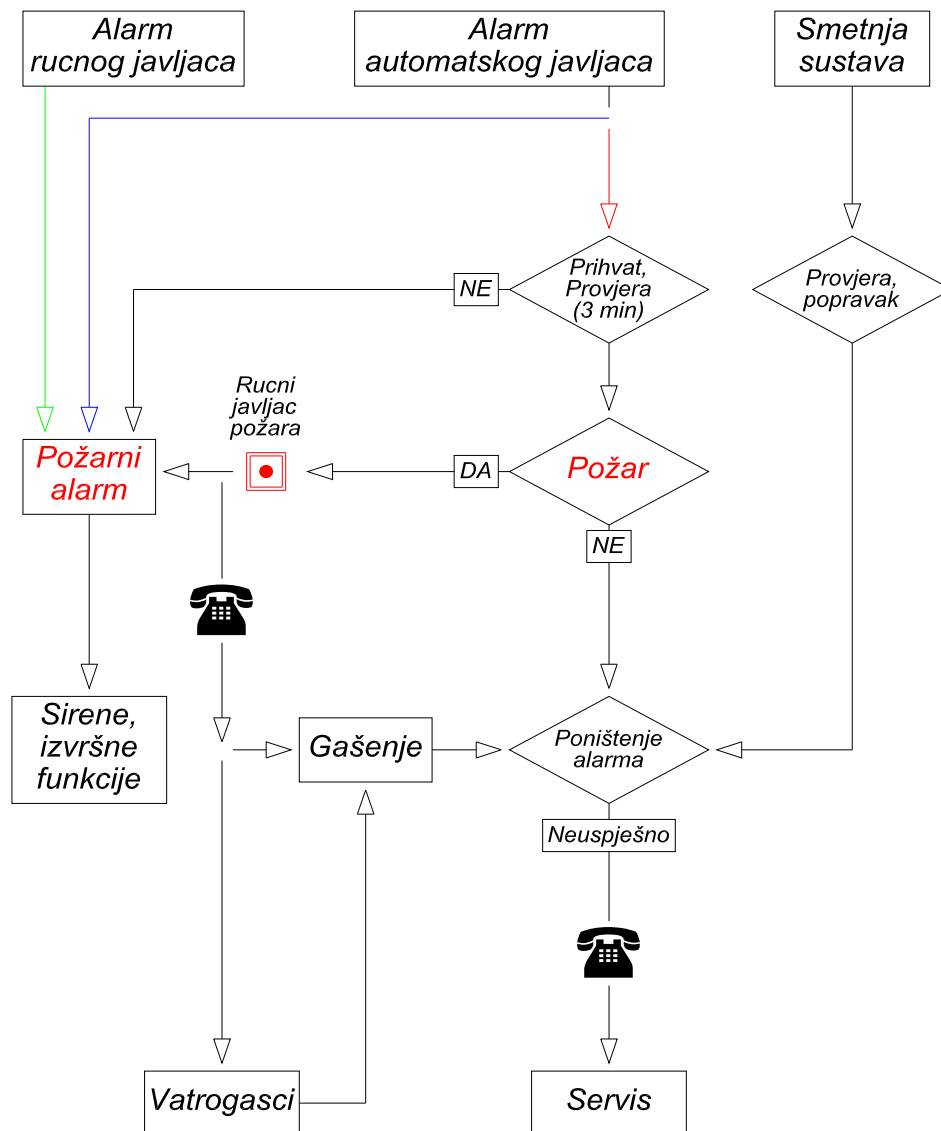
The alarm plan accurately describes the sequence of operations to be performed in the event of a fire. It also refers to the actions of security personnel that they are obliged to perform in the event that the exchange signals an alarm. Accordingly, the operations console is located in a room with a constant duty so that the duty person reacts quickly in accordance with the nature of the message he receives from the fire alarm system.

When the person on duty is present in the room where the fire station is located, the system works in the so-called Dan mode. In order to increase the efficiency of the fire alarm system, two types of alarms are envisaged, namely the alarm by automatic detectors and the alarm by manual detectors. The principle is that the alarm by manual detectors is immediately accepted by the control panel, while the alarm by automatic detectors is accepted only after a certain time during which it is checked whether it is a false alarm. Two check times are prescribed, the time of presence and the time of reconnaissance.

The presence time is short (approximately 20 seconds) in which the person on duty can press the accept event key and start the reconnaissance time. If by any time the presence time expires, the fire control panel enters the alarm state

Reconnaissance time is the time allotted to the person on duty to go and investigate whether a fire has actually occurred in the building. This time is set depending on the size of the object itself. During that time, the person on duty on the operational console reads the exact location of the detector that alarmed, goes to the place of the fire, extinguishes it if it is smaller, returns to the control panel and resets it, so that there is no general alarm and executive commands. If the duty officer determines that there is a fire at the location due to which the alarm should be started, they break the nearest manual call point. In case the duty person does not return to the control panel before the reconnaissance time expires, the control panel enters the alarm state.

When the person on duty is not present in the facility, the system works in the so-called Night mode. Then, in case of activation of the automatic detector, the drive alarm is activated immediately (the fire alarm system (siren) is activated, the foreseen executive functions are activated). In other words, then the control panel ignores all waiting times and immediately enters the alarm state.



-  Operation of manual fire detectors
-  Operation of automatic tellers organized by "NIGHT"
-  Operation of automatic tellers organized by "DAY"

In order to enable uninterrupted operation of the fire control panel even after the power outage in the building and to satisfy the autonomy of 72 hours, the same equipment is equipped with an additional energy source, ie batteries, and since the control panel is designed to operate on 24VDC, we choose two 12 V / 26 Ah. The batteries are connected in series of two (2x12V / 26Ah).

Checking the selected conductor cross section against the fire loop

The project envisages the diameter of the addressable loop cable 0,8mm. According to the characteristics of fire control panels, the total resistance of the line of one loop may be the maximum 100Ω. The maximum length of water in one addressable loop is determined by the expression:

$$L = \frac{R \times S}{2\rho}$$

L: maximum cable length in one loop
 R: maximum loop resistance allowed
 S: cable cross-sectional area. $R = 0,8 \text{ mm}$, $S = 0,5 \text{ mm}^2$
 r: specific resistance of copper $0,0175 \text{ } \Omega\text{mm}^2/\text{m}$

$$L = \frac{R \times S}{2\rho}$$

$$2\rho = 100 \times 0,5$$

$$2 \times 0,0175 = 1428,57$$

So the maximum allowed loop length is 1428m.

Because the length of the loop cca 750 m, which is considerably shorter than the maximum allowed, it follows that the length of the loop fully satisfies.

1.5 PUBLIC ADDRESS SYSTEM

The installation of ambient sound system is designed according to the international evacuation standard EVAC IEC60849 as a system with a central unit and peripherals (speakers) in the School with the possibility of processing, memory and broadcasting information such as voice information, automatic messages, gongs, alarms and program from RADIO / DVD / MP3 player (BGM).

The system of public address and evacuation aims to achieve the following functions:

- Distribution of ambient content (background music or audio content that is synchronized with the video system) in the building
- Distribution of voice information in the facility
- Distribution of predefined voice messages, which are automatically played from other elements of the security system
- Distribution of emergency warnings in accident situations.

The central audio system consists of the following elements:

- Preamp / mixer, as central unit

- Radio and DVD playback unit
- Unit for playing predefined voice messages
- Central microphone station, for broadcasting voice information
- Required number of amplifiers
- Required number of speakers.

Ceiling speakers are provided in the building in the hallways and halls. The speakers should have a metal cap on the back, for protection in case of fire. In addition, they are planned for reproduction and speech, ambient music, as well as other content, the following characteristics.

- Max. Power 9 W
 - (PHC) 6 W (6 - 3 - 1.5 W)
 - Sound pressure level na 6 W/1 W (at 1 kHz, 1 m)
 - 99 dB/91 dB (SPL)
 - (-10 dB) 70 Hz to 18 kHz
 - (na 1 kHz/4 kHz, -6 dB) 160° / 55°
 - 100 V/70 V

The central device is P.A. amplifier; choice of 6 speaker zones with independent sound control, playback of up to 5 recorded messages, USB / SD / MP3, player / recorder, digital FM receiver, internal memory for archive of messages and ringtones, auxiliary (phantom) power, priority answering, connection up to 3 answering microphones MZ-648 and 3 microphones with priority M-64,480 W RMS 4 balanced microphones / lines, combo (XLR and 6.3 mm connector) 600 Ω 2.5 mV and 10,000 Ω 300 mV, switching; 2 aux, 2 x RCA 10,000 Ω 500 mV, 1 input 6.3 mm connector 1 V, 1 signal via analog PBX, terminals with screws 10,000 Ω 250mV, 1 RJ-45 answering microphone, 1 priority microphone, RJ-45 230 VAC, 960 W, 483 x 133 x 433 mm, 3U 19 " for rack mounting

The unit for playing predefined voice messages is the Programmer of messages, events and background sound of the player with 4 output zones; scheduled messages and alarm activation via closed contact; player designed for messages and alarms, does not interrupt background music; play background music from USB / SD or from internal memory with the possibility of creating multiple channels; PC software for programming, transferring music files and managing via LAN and the Internet; priority of alarms and messages over background music; 8 GB of internal memory for music files; USB port and SD card reader for music file playback and software upgrade

SOUND SYSTEM BUDGET

The project envisages a sound system that has the function of distributing sound and voice alarm messages (in case of fire). The function of voice alarm messages is to regulate the evacuation process in emergencies.

minimum frequency range (Hz)	Coverage area (purpose)
400 - 3000	Public address systems in noisy spaces
200 - 4000	

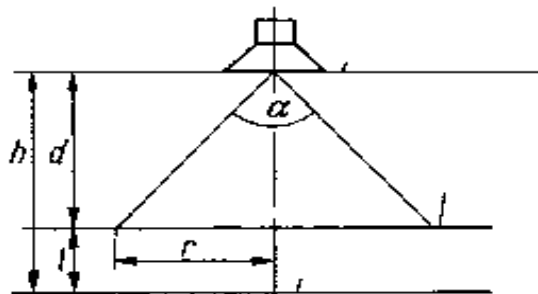
	Speech transmission at sporting events
100 - 8000	Transmission of information and entertainment program in halls, shops, waiting rooms
80 - 10 000	Transmission of popular music in restaurants, cultural institutions Transmission of music and sound effects in theaters, concert halls, multifunctional halls
31 - 15 000	Direktan prenos muzike sa elektronskih instrumenata

Required level [dB]	Purpose
86	Speech in areas of low background noise (conference halls, lobbies, churches, sports fields, outdoor pools)
92	Speech and pop music in areas of high background noise (warehouses, waiting rooms, indoor pools, stations)
96	Speech and music in areas of high background noise (sports halls, large stadiums, outdoor theaters)
104	Concerts, electronic music performances, theater effects (concert halls, theaters, opera houses, multifunctional halls)

The speaker power calculation was done for a noise level of 92dB and 96dB (noise level for public spaces and music transmission of moderate volume) according to the following patterns:

$$P(W) = \frac{V^{2/3}}{8}, i$$

$$P(W) = \frac{V^{2/3}}{4}, i$$



Optimal α:
 60° - amphitheatres
 90° - restaurants, halls
 120° - background music
 with infrequent notification

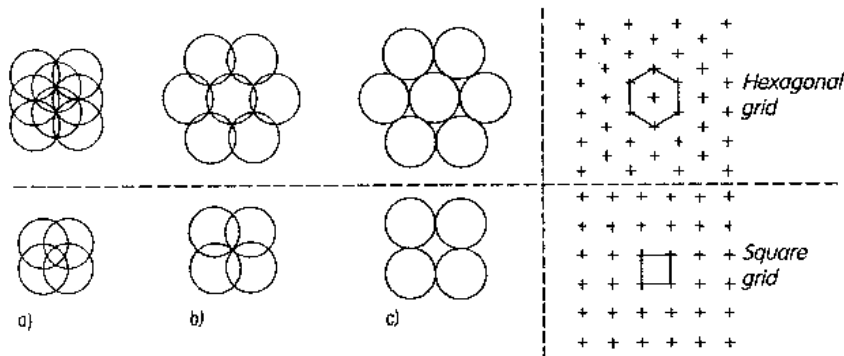
CALCULATION OF THE NUMBER OF SPEAKERS IN THE CEILING SYSTEM

Number of speakers N in a room of dimensions a x b:

$$N = F \frac{x \cdot y}{r^2}$$

Speaker radius r:

$$r = d \cdot \tan \frac{\alpha}{2}$$



Vrsta	Fq(Square grid)	Fh(Hexagonal grid)
a	1	$2/\sqrt{3}$
b	$1/2$	$2/3\sqrt{3}$
c	$1/4$	$1/2\sqrt{3}$

When determining the number of speakers, the input parameters when calculating the number of speakers will be the ceiling height x and the angle α . For a specific case, these parameters have the following values:

$$h=3,0 \text{ m}$$

$$\alpha=90^\circ$$

To reduce the total number of speakers, we will equalize the parameter d from the picture with the height h.

$$r=d \times \tan(\alpha/2)=h \times \tan(\alpha/2)$$

$$r=3,0 \times \tan (90^\circ/2)$$

$$r=3,0 \times \tan (45^\circ)$$

$$r=3,0 \times 1$$

$$r=3$$

where r represents the radius of the speaker.

We use the r parameter when determining the total number of speakers using the form:

$$N = F \times (a \times b) / r^2,$$

where a and b represent the dimensions of a given room and we choose the constant F depending on whether we want the areas, which are covered in the projection on the floor of the speakers, to overlap or not.

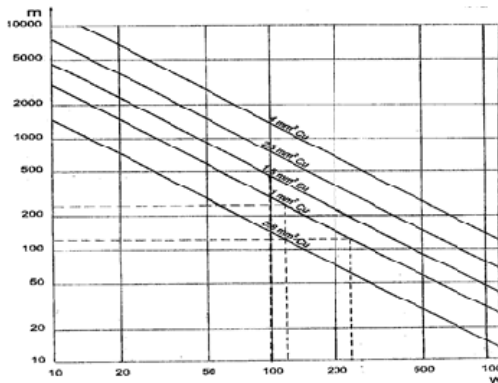
In narrow corridors we cannot apply the pattern $N = F (axb) / r^2$, because it does not give a realistic picture. Namely, 2 speakers cannot be placed at an adequate distance along the width of the corridor, which is a basic condition for the reality of the mentioned pattern. In such spaces, we will be guided by the distance between the speakers, which is $2 \times 3 = 6.0$ m.

As for the sound pressure level, the well-known fact that the sound pressure decreases by 6dB with a double increase in distance and that the sound level in the areas of low background noise 86dB is required to justify the choice of the mentioned speaker

Calculation of the cross section of the conductor of the speaker lines

For a 100V speaker line, the conductor cross-section is chosen according to the condition that the energy losses do not exceed 10%. The nomogram, which is shown in the figure, shows the dependence of the line length and the transmitted power in the conductors, for which the losses in the conductors are 10% of the transmitted power at a voltage of 100V. Since the length of the speaker lines for the power of the amplifier of 480 W does not exceed 200 m, so that the copper conductor with a cross section of 1.5 mm² satisfies in terms of allowable losses

N1 – Nomogram za izbor Cu provodnika



1.6 MULTIMEDIA SYSTEM

According to the terms of reference, a multimedia system is planned in the Hall. This would enable the hall, in addition to being a gym, to be a multimedia hall: for holding lectures, seminars, analytical gatherings, presentations and press conferences. Therefore, it is necessary for the project to include the following:

1. Active audio system
2. Video presentation system
3. Ambient sound system

Installation for an active audio system provides:

- installation of 3 connection boxes for active speakers and microphones in the Hall, as well as archival recording of audio recordings of the basic tone of the conference system

- Connecting to a video presentation system for the purpose of reproducing the accompanying tone of video presentations.

The video presentation system provides:

- Installation of a video projector under technical direction
- Installation of an electromotive projection screen in the hall
- Video projections of multimedia content from the presentation computer from the director
- View picture and sound reproduction from a laptop connected to a conference table or speaker.
- Display of images and sound reproduction from USB memory modules connected on the conference table of the chairman or on the speaker and with the use of a presentation computer directed by a local wireless mouse and keyboard.
- Archive video recording including audio recording with the possibility of distribution of recordings via computer network.

To build the infrastructure of the multimedia system, the following should be provided:

- Single phase power supply for all AV system devices
- Provide special circuits in switchboards
- Provide technical earthing for all equipment and schuko sockets, specially designed for this purpose, conductor $\geq 16\text{mm}^2$ directly for TS nodes, earthing resistance $\leq 0.5\Omega$
- Provide a stable supply of $220\text{V} \pm 5\%$.
- For technical direction, provide air-conditioned conditions for equipment and staff, in case of central air conditioning system pay attention to noise from these openings, in case of installing split units make sure that the indoor unit is not mounted above the equipment, provide room temperature in the range $22\text{-}25^\circ\text{C}$, humidity air $50\% \pm 5\%$, as well as the delivery of fresh air into the room.

1.7 VIDEO SURVEILLANCE

For the needs of visual surveillance around the building, the installation of an IP video surveillance system in color technology is planned. The cable installation of the system is concentrated in the RACK cabinet in the technical room.

The installation of an IP video surveillance system enables local or remote Internet surveillance, security and safety of people and property. IP video surveillance allows you to receive live images and audio over the Internet, to perform remote surveillance.

The IP video surveillance system (CCTV) has a multiple function. The main principles are: Supervision of space in the so-called. live mode, recognizing persons and / or events in live mode, recording and storing these events, and the ability to view such events in the next period, whenever the need arises.

Four IP fixed dome color TV cameras for outdoor installation are planned to be installed on this facility.

IP technology makes it easy to view, control and manage all networked cameras, using any standard Web browser (Mozilla Firefox, Internet Explorer, Google Chrome, Safari and others) or video surveillance management software, from any computer connected to the Internet.

The video surveillance system is connected to the LAN via the Ethernet port, which provides the possibility of remote monitoring and control. Via the local LAN network, it is possible to view current video signals from the computer on which the client software (system administrator) is installed. For protection, it is necessary to identify the person (using a password) when running the client software. This video surveillance solution is provided in the director's office.

If you want special control of cameras from somewhere else, it is necessary to install the appropriate software and define user rights for normal use of the system.

The transmission of the video signal from each of the cameras is done with FTP cat.6 cables, laid in PNK cable trays and through pvc fi 16mm pipes.

The layout and disposition of the equipment is given in the graphic part of the project.

1.8 TV SYSTEM

Provide cabling of systems for receiving TV signals that are available at a given location, as well as the possibility of easy introduction of cable television. Enable that the cable television signal can be supplied by cable from the external network and from the antenna system.

The elements of the system are installed in the ZAU cabinet, which is provided in the technical room.

TV sockets are mounted at a height of 0.4 m from the level of the finished floor, in an installation box □60 mm.

Installation is performed with RG6A / U cables. Cables are laid on PNK cable trays I through installation pipes fi16mm

1.9 SOS DISABLED SYSTEM

The project envisages an SOS disabled system that serves for a call from the toilet for disabled people in case of need. Consists of:

- central power unit,
- pull release button and
- signal lamps with pepper

The BIS SOS C1T central unit is housed in a 4M built-in box above the entrance door to the disabled toilet.

Calling and dismissing calls is done on the pull-release button, which is mounted next to the toilet in the bathroom at a height of 180-200 cm from the floor.

The button has a built-in so-called. a soothing LED that lights up when a call is activated.

The button is placed in the prepared fi60 mounting box.

The built-in signal lamp with a beeper for call signaling is placed in front of the entrance door in the built-in box fi60.

*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)*

THE APPENDIX FOR THE PROTECTION AT WORK

During the building of the facility, regarding the investment and technical documentation with a names of all observed detrimental aspects and dangers for their removal according to the Law on protection at work (The Off. Gazette of Montenegro no. 35-94) , the following measures of the protection at work are applied.

a. Danger from an accidental contact of parts under voltage

The accidental contact with parts under voltage is prevented by the design of main distribution boards and the adequate choice of the electrical equipment.

b. Danger from excessive contact voltage

The danger from excessive contact voltage is removed by the correct choice of the equipment and use
applying The Rulebook JUS N.B2.741 (Off . gazette SFRJ no. 53-88) , depending on the type of a supply system.

c. Dangers form fires

The following solutions are applied for the removal of dangers from fires:

- a) All electrical equipment is of dry oil, without oil and other flammable materials.
- b) protection against fires on cables and installation conductors in case of a short circuit is made in a way that the cross-sections of cables and conductors sized according to a current of termination of current circuit outputs .

d. Dangers from impacts of dust , water and moisture

The dangers from the influence of dust , water and moisture is removed by the correct choice of the
equipment in relation to the degree of protection. Additionally, by rubber sealing , this impact is prevented in all entries of consumers that are under an immediate impact of dust, water and moisture.

e. Dangers from overload and short circuit

The danger from a short circuit and overload is removed in a way that all current circles are protected
with adequate fusible plugs or automatic fuses , and motors with adequate protection against overload. The planned protection against overload and short circuit was carried out according to JUS N.B2.752.

f. Unallowable potential drop (voltage sag)

The unallowable potential drop was eliminated by correct sizing of feeder cables according to article 20 of The rulebook for technical norms for low-voltage electrical installations.

g. Unallowable level of illumination

The unallowable level of illumination is eliminated by correct choice and arrangement of bulbs according to the demands and recommendations of the JUS

, regarding the type of activity in the room and by the choice of types of illumination and bulbs , and according to the demands of the JKO.

h. Thunderbolts

The protection against atmospheric discharges is planned by the building of a classic lightning rod installation , completely by The rulebook of technical norms for the protection of buildings against atmospheric discharges (Off. Gazette of SRJ no. 11/96) , and by this, the adequate class of protection according to the demands of the IEC 1024-1-1.

i. Danger from mechanical damages of cables

The dangers from mechanical damages of cables is removed by the correct choice of cables and their way of mounting through the pipework and distribution system , and through steel protective pipes at the places where mechanic impacts could occur.

j. Danger from mechanical damage of the grounding strip

The danger from a mechanical damage of a grounding strip was removed by setup of a strip at the adequate supports and inserting of a strip through the protective steel seamless pipes at places where mechanical impacts could occur.

THE GENERAL NOTES AND OBLIGATIONS OF THE BUILDING SUBCONTRACTOR FROM THE STANDPOINT OF PROTECTION AT WORK

The building subcontractor (work executant) is obligated to make a separate elaborate about the building site management and to apply it during the works.

The building subcontractor is obligated to, before start of works, to inform the responsible bodies about the start of works.

The enterprise is obligated to design normative acts from the area of the protection at work (Elaborate of the protection at work, programme for the training of workers about the protection at work, The rulebook fro inspections , testing and maintenance of machines , devices and tools.

The building subcontractor is obligated to perform training of workers about the protection at work and to introduce them with the conditions at work , and to check skills of workers for an independent and safe work.

The building subcontractor is obligated to define working positions with special working conditions if such positions exist.

CONCLUSION

This design of the electrical installations prescribes the necessary measures for the removal of dangers and detrimental activities of current to electric distribution , equipment and people in sense of protection at work.

THE TECHNICAL CONDITIONS

GENERAL PART:

1. These technical conditions are an accompanying part of the design and represent the obligation of the subcontractor of electrical installations prescribed by this design.
2. All the installations must be made according to the attached textual and graphical documentation of the design, completely by the valid technical provisions for execution of such type of installations.
3. The building subcontractor is obligated, before the start of works, to comprehensively analyse the design and timely demand necessary explanations.
4. For all deflections from the design, both in sense of the technical solution and in sense of a choice or replacement of material, the building subcontractor must provide the agreement of the expert supervision body of The investor. If The building subcontractor fails to do it, he is responsible for all changes and works based on them.
5. All the changes approved by the professional supervision body of the investor, or with the agreement of the designer, must be enrolled into the design, in order that the building subcontractor, on the completion of works, handover the as-built design to the Investor.
6. The building subcontractor is obliged to keep a diary of works for all works on this facility. For unplanned works or the increase of a volume of works by a quantity or material, the subcontractor must have an approval by the investor, and the building subcontractor is obligated to enrol them into work diary, verified by the supervision body of the investor.
7. All installation material and equipment that are used for execution of these installations must be adjusted to the valid standards and must be valid. On providing of material on the building site, the supervision body is obligated to approve the material and to enter its state into the construction diary. The building subcontractor is obligated to replace inadequate material, if used, with the adequate material.
8. During the installation setup based on this design, the building subcontractor is obligated to reduce the damages to the smallest possible extent, and to repair them on the completion of mounting works.
9. For the correctness of the completed works and quality of used material, the building subcontractor gives the warranty that cannot be shorter than one year from the day of approval of the installations by the commission.
10. On completion of works, the building subcontractor should, with help of authorised organisation, obtain the attestations and protocols about the test of installations (measurement of the insulation of power lines, testing of links, commissioning of low current devices and attesting of quality of the completed works and embedded apparatuses).

11. The approval of the installation is according to valid provisions and it is necessary to make a minute with all findings and results of measurements . The responsible body should establish a commission.

THE LOW VOLTAGE INSTALLATIONS

1. Each extension or branching of lines is allowed only in input boxes and cabinets.
2. PVC pipes are put into deep canals in walls , and steel , seam -, dark pipes , are fastened to the steel structure by welding or with metal grips (as fasteners).
3. In case of repetition of several pipes in one direction (whether on wall or cabinet) , the pipes are together in plane of mounting , not one above other.
4. Front side of PVC pipe must be in a plane of a brick (namely wall= , thence a pipe is covered by entire layer of mortar.
5. In reinforced concrete walls and pillars, the deepening of canals is forbidden and these are finished during the making of walls and pillars.
6. PVC and steel dark seam pipes should always be put in a straight line , horizontally and vertically.
7. The course changes of pipes at free surfaces is executed in boxes.
8. The laying of ascent lines in walls of a chimney is not allowed , and the laying of other pipes should also be avoided.
9. In case of parallel leading of pipes, namely the cables, the phone installations in pipes and other installations , the following provisions must be applied:
 - the pipes , namely the cables for telephone installations are placed at 0,10 m, bellow the attic;
 - the pipes , namely the cables, for the signalling installations are placed at 0.10 m, bellow these pipes , namely the cables;
 - the pipes , namely the cables, for the electrical installations are placed at 0,10 m, bellow the pipes, namely the signalling installations.
10. In any other case with a parallel direction of pipes , namely cables for telephone installation with pipes , namely cables for high current , mutual distance must be at least 0.2 m.
11. For crossing of pipes for a telephone installation with pipes for high current , if this is unavoidable, the crossing should be executed under the angle of 90 degrees , and the spacing between the pipes must be at least 10 mm, and at least 3 mm with special measures of installation.
12. For a big spacing between the distribution boxes or, if the pipe has several bents between the distribution boxes, before mortar works, a steel wire should be reeved through the pipe for the purpose of lines reeving.
13. Before concreting of pipes , all the distribution boxes should be covered by paper in order not to be filled with cement, mortar etc.
14. The smallest mutual spacing for parallel laying of cables:
 - telecommunication beside the signalling is 0,05 m,
 - telecommunication beside energy is 0,30 m.
15. The extensions of cables in pipes is not allowed.
16. The extension of conductors is done with connectors and fasteners in cabinets. In case of a smaller number of lines , the extensions are done in input boxes , on their terminals.
17. No other power lines should not be put into the pipes for telephone lines.
18. A cable that only passes through the pipe should be fastened by cable grips to a wall of the cabinet or box.

19. Telephone lines in the distribution cabinet or box should be arranged in a way that the changes or elongations are easy to perform. This applies also for other lines of the signalling installations.

20. The installation for fire alarm must be executed according to technical provisions for execution of electrical installations in buildings. Given the differences among these installations, as an amendment of "Technical provisions", it is necessary to apply the following recommendations.

21. If the fire protective system is connected to PTT devices, it is obligatory to apply the technical provisions, recommendations of Yugoslavian PTT.

22. The cross-section of the conductors is 0.8 mm and are laid in non-metal or with an insulation clad, in metal pipes. Instead of some conductors, the conductors resistant to corrosion, or those with an insulation of thermoplastic can be (PP, PPO or similar.)

23. Colour of conductors –negative conductors: black insulation. If it is impossible, then the PVC pipes are put on the conductors on their connecting positions, and are adequately designated.

The positive conductors; for each group of alarms the different colour is chosen. If it is not possible, then an insulated coloured PVC pipe (bužur) is used, and it is put on the conductors on the connecting places. The protective conductor: colour of insulation is yellow-green. Negative and positive conductor of the same alarm must be placed in the same installation pipe or the same cable.

24. The conductor from bottom (socket) to bottom is in one piece, without an extension. It can be cut only by the connecting grips in bottoms.

25. Connecting boxes (distribution boxes) are used only in exceptional cases and their use can be allowed only by the designer.

26. In cases where an alarm can cause atmospheric disruptions, the clad cables must not be used for alarms and clad (armoured) bottoms for mounting on walls. The armoured cables are of IY(St)Y 1 x 2 x 0.8mm type.

27. during the mounting, it is necessary:

For automatic fire alarms:

- arrange and connect only a bottom(socket) of alarm, and alarm inserts should stay intact in PVC bags,
- the bottoms of alarms should be arranged in a way that embedded alarm inserts are directed vertically descending,
- due to the repair works, the alarms must have a good access.
- at least 30 cm of free height must be present below the bottom.
- indicators of actions should be arranged towards the doors for entry in case of a fire alarm.
- adequate and permanent fastening of alarm is very significant..

For manual alarms, it is necessary::

- button must be visible,
- button must be distant from places of frequent presence of workers.,
- button must be accessible,
- button must be at a height of 120 cm, not higher than 150 cm from the floor.

For the central device, it is necessary;

- the room must be dry,
- permanent temperature max. 30C, min. 5C,
- protected against the impact of sunlight,
- the centre of housing is max. at 1.7m, and min. 1.5m above the floor.
- there must be at least 50 cm of a free space on left and right from the central device, ,
- the socket and adequate illumination should be present in the immediate vicinity.

28. The same conditions are also valid for the location of device for remote signalling. For the connection of the central device and remote signalling, the

conductors for low current installations with the thermoplastic insulation can be used.

29. The feeder batteries for power supply must be placed in the vicinity of the central device. The positive plug of the battery is red and negative is blue.

30. The grounding: fire alarms must be grounded according to the valid provisions.

31. Only one wire within the cable or separately can be used for grounding of the housing and alarm lines. The system that will be installed depends on the system in electrical installation, namely it is important that they are the same.

32. The commissioning of fire alarm system is made by service authorised by the manufacturer or the organization issuing the minute and certificate about the integrity of complete system for announcing of fires.

THE MOUNTING AND COMMISSIONING

1. Before the commissioning, all distribution cabinets must be grounded.

2. The value of resistance must be measured and submit within the documentation for the technical approval.

3. Make the connection of cables, completely according to this design and documentation of the manufacturer of the equipment – without the switching-on of the devices.

4. The training of the representatives of users of devices must be performed. All suppliers of devices must give the investor the documentation for utilisation and maintenance

5. The equipment is commissioned exclusively in presence of the supervision body. After the inspection of the equipment and created links, the feeder voltage is provide and the devices are switched on.

6. The programme of final directives and inspections of the devices are defined by the supervision body.

LIST OF APPLICABLE PROVISIONS AND STANDARDS

Prilikom izrade projekta korišćeni su sledeći zakoni, pravilnici, tehnički propisi, standardi i literatura:

Zakon o planiranju prostora i izgradnji objekata ("Sl. list CG" br. 64/17),

Zakon o zaštiti od požara ("Sl. list SRCG " br. 47/92, br. 27/94),

Zakon o izmjenama i dopunama Zakona o zaštiti i spašavanju ("Sl. list CG " br. 32/11)

Zakon o zaštiti i zdravlju na radu ("Sl. list CG " br. 34/14),

Pravilnik o tehničkim normativima za električne instalacije niskog napona (Sl.list SFRJ, br. 53/88, 54/88 i 28/95);

Pravilnik o tehničkim normativima stabilne instalacije za dojavu požara (Sl.list SFRJ, br. 87/93);

MEST EN 50173-1:2009 Informaciona tehnologija - Osnovni sistemi kabliranja - Dio 1: Opšti zahtjevi

ME ST E N 5 0173 -2: 2009 Informa cion a teh no log i ja - Osnovn i siste mi kab l i ran ja - Dio 2 : Kancelarijski prstor

ME S T E N 5 01 73 -3:20 09 Into rmacion a tehno log i ja - Osno vn i siste mi ka b l i ra n ja - Dio 3 : Industrijske prostorije

MEST EN 50174-3:2009 Informaciona tehnologija - Instalacija kabliranja - Dio 3: Planiranje i praksa instaliranja kablova izvan zgrada

MEST EN 50290-2-1:2009 Komunikacioni kablovi - Dio 2-1: Opšta pravila za projektovanje i izgradnj

MEST EN 50310:2009 Primjena izjednačavanja potencijala i uzemljenja u zgradarna pomoću opreme

MEST EN 50346:2009/A2:2011 Informaciona tehnologija - instalacija kabliranja - Ispitivanje instaliranog kabliranja
MEST EN 50441-1:2009 Kablovi za unutrašnje stambene telekomunikacione instalacije - Dio 1: Neoklopljeni kablovi
MEST EN 50441-2:2009 Kablovi za unutrašnje stambene telekomunikacione instalacije - Dio 2: Oklopljeni kablovi -
MEST EN 50441-3:2009 Kablovi za unutrašnje stambene telekomunikacione instalacije - Dio 3: Oklopljeni kablovi
MUST EN 60603-7-3:2010 Konektori za elektronsku opremu - Dio 7-3: Detaljna specifikacija za 8-pinske, oklopljene, slobodne i pričvršćene konektore, za prenos podataka na frekvencijama do 100 MHz /

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 PERFORATED CABLE TRAYES AND PIPES

BoQ Item	3.5.4.1.1.	Unit	Pcs.
Unit price definition	Delivery, installation Perforated cable trays 100mm, with appropriate equipment		
Description	Delivery, installation Perforated cable trays 100mm, with appropriate equipment		

BoQ Item	3.5.4.1.2.	Unit	m¹
Unit price definition	Delivery, installation pvc Ø16mm HF		
Description	Delivery, installation pvc Ø16mm HF.		

II SKS SYSTEM

BoQ Item	3.5.4.2.1.	Unit	Pcs.
Unit price definition	Delivery, installation and connection RACK telecommunication cabinet 42U/19" 800x800x2108mm.		
Description	Delivery, installation and connection RACK telecommunication cabinet 42U/19" 800x800x2108mm.		

BoQ Item	3.5.4.2.2.	Unit	m¹
Unit price definition	Delivery, installation and connection cable FTP (4x2x0,5mm) 100OHM LSHF-FR cat.6.elivery and installation of the distribution cabinet of the RT-ZB Chamber.		
Description	Delivery, installation and connection cable FTP (4x2x0,5mm) 100OHM LSHF-FR cat.6		

BoQ Item	3.5.4.2.3.	Unit	m¹
Unit price definition	Delivery, installation and connection optical cable 4V SM.		
Description	Delivery, installation and connection optical cable 4V SM.		

BoQ Item	3.5.4.2.4.	Unit	Pcs.
Unit price definition	Delivery, installation and connection optical patch panel 4V SM.		
Description	Delivery, installation and connection optical patch panel 4V SM.		

BoQ Item	3.5.4.2.5.	Unit	Pcs.
Unit price definition	Delivery, installation and connection FTP patch panel, cat.6 24x RJ45,1U.		
Description	Delivery, installation and connection FTP patch panel, cat.6 24x RJ45,1U.		

BoQ Item	3.5.4.2.6.	Unit	Pcs.
Unit price definition	Delivery, installation organizer,1U.		
Description	Delivery, installation organizer,1U.		

BoQ Item	3.5.4.2.7.	Unit	Pcs.
Unit price definition	Delivery, installation and connection power supplay 6x220V.		
Description	Delivery, installation and connection power supplay 6x220V.		

BoQ Item	3.5.4.2.8.	Unit	Pcs.
Unit price definition	Delivery, installation and connection 2xRJ45 cat.6 in socket 2M.		
Description	Delivery, installation and connection 2xRJ45 cat.6 in socket 2M.		

BoQ Item	3.5.4.2.9.	Unit	Pcs.
Unit price definition	Delivery, installation and connection 1xRJ45 cat.6 in socket 2M.		
Description	Delivery, installation and connection 1xRJ45 cat.6 in socket 2M.		

BoQ Item	3.5.4.2.10.	Unit	Pcs.
Unit price definition	Delivery, installation shelf 19".		
Description	Delivery, installation shelf 19".		

BoQ Item	3.5.4.2.11.	Unit	Pcs.
Unit price definition	Delivery, installation and connection floor box 12M with 4xRJ45 cat.6.		
Description	Delivery, installation and connection floor box 12M with 4xRJ45 cat.6.		

BoQ Item	3.5.4.2.12.	Unit	Pcs.
Unit price definition	Delivery, installation HDMI cable 10m.		
Description	Delivery, installation HDMI cable 10m.		

BoQ Item	3.5.4.2.13.	Unit	Pcs.
Unit price definition	Small material.		
Description	Small material.		

BoQ Item	3.5.4.2.14.	Unit	Pcs.
Unit price definition	Testing, measuring and issuing of measurement protocols, production of documentation.		
Description	Testing, measuring and issuing of measurement protocols, production of documentation.		

III FIRE ALARM SYSTEM

BoQ Item	3.5.4.3.1.	Unit	Set
Unit price definition	Delivery, installation and connection fire alarm panel 2 loops.		
Description	Delivery, installation and connection fire alarm panel 2 loops.		

BoQ Item	3.5.4.3.2.	Unit	Set
Unit price definition	Delivery, installation and connection aku battery 12V 26Ah.		
Description	Delivery, installation and connection aku battery 12V 26Ah.		

BoQ Item	3.5.4.3.3.	Unit	Pcs.
Unit price definition	Delivery, installation and connection adres optical fire detector.		
Description	Delivery, installation and connection adres optical fire detector.		

BoQ Item	3.5.4.3.4.	Unit	Pcs.
Unit price definition	Delivery, installation and connection adres termic fire detector.		
Description	Delivery, installation and connection adres termic fire detector.		

BoQ Item	3.5.4.3.5.	Unit	Pcs.
Unit price definition	Delivery, installation and connection adres manuel call point.		
Description	Delivery, installation and connection adres manuel call point.		

BoQ Item	3.5.4.3.6.	Unit	Pcs.
Unit price definition	Delivery, installation and connection adres siren.		
Description	Delivery, installation and connection adres siren.		

BoQ Item	3.5.4.3.7.	Unit	Pcs.
Unit price definition	Delivery, installation and connection base.		
Description	Delivery, installation and connection base.		

BoQ Item	3.5.4.3.8.	Unit	Pcs.
Unit price definition	Delivery, installation and connection adres siren.		
Description	Delivery, installation and connection adres siren.		

BoQ Item	3.5.4.3.9.	Unit	Pcs.
Unit price definition	Delivery, installation and connection outdoor siren.		
Description	Delivery, installation and connection outdoor siren.		

BoQ Item	3.5.4.3.10.	Unit	Pcs.
Unit price definition	Delivery, installation and connection adres output modul.		
Description	Delivery, installation and connection adres output modul.		

BoQ Item	3.5.4.3.11.	Unit	Pcs.
Unit price definition	Delivery, installation and connection telephone alarm modul.		
Description	Delivery, installation and connection telephone alarm modul.		

BoQ Item	3.5.4.3.12.	Unit	m¹
Unit price definition	Delivery, installation and connection cable JH(St)H2x2x0.8mm.		
Description	Delivery, installation and connection cable JH(St)H2x2x0.8mm.		

BoQ Item	3.5.4.3.13.	Unit	Pcs.
Unit price definition	Delivery, installation and connection cable JH(St)H FE 180E302x2x0.8mm.		
Description	Delivery, installation and connection cable JH(St)H FE 180E302x2x0.8mm.		

BoQ Item	3.5.4.3.14.	Unit	Pcs.
Unit price definition	Small material.		
Description	Small material.		

BoQ Item	3.5.4.3.15.	Unit	Pcs.
Unit price definition	Testing, measuring and issuing of measurement protocols, production of documentation.		
Description	Testing, measuring and issuing of measurement protocols, production of documentation.		

IV SOS SYSTEM FOR DISABLED PERSONS

BoQ Item	3.5.4.4.1.	Unit	Pcs.
Unit price definition	Delivery, installation and connection power supply for SOS system.		
Description	Delivery, installation and connection power supply for SOS system.		

BoQ Item	3.5.4.4.2.	Unit	Pcs.
Unit price definition	Delivery, installation and connection pull release key.		
Description	Delivery, installation and connection pull release key.		

BoQ Item	3.5.4.4.3.	Unit	Pcs.
Unit price definition	Delivery, installation and connection signal lamp.		
Description	Delivery, installation and connection signal lamp.		

BoQ Item	3.5.4.4.4.	Unit	m¹
Unit price definition	Delivery, installation and connection cable JH(St)H2x2x0.8mm.		
Description	Delivery, installation and connection cable JH(St)H2x2x0.8mm.		

BoQ Item	3.5.4.4.5.	Unit	Pcs.
Unit price definition	Testing, measuring and issuing production of documentation.		
Description	Testing, measuring and issuing production of documentation.		

V SOUND SYSTEM

BoQ Item	3.5.4.5.1.	Unit	Set
Unit price definition	Delivery, installation and connection P.A. 6 zone amplifier; USB/SD/MP3,480 W RMS RJ-45 230 VAC, 960 W,483 x 133 x 433 mm, 3U 19".		
Description	Delivery, installation and connection P.A. 6 zone amplifier; USB/SD/MP3,480 W RMS RJ-45 230 VAC, 960 W,483 x 133 x 433 mm, 3U 19".		

BoQ Item	3.5.4.5.2.	Unit	Set
Unit price definition	Delivery, installation and connection Message programmer.		
Description	Delivery, installation and connection Message programmer.		

BoQ Item	3.5.4.5.3.	Unit	Set
Unit price definition	Delivery, installation and connection Desktop microphone for 6 zones ,RJ45.		
Description	Delivery, installation and connection Desktop microphone for 6 zones ,RJ45.		

BoQ Item	3.5.4.5.4.	Unit	Set
Unit price definition	Delivery, installation and connection outdoor horn 20W RMS IP66.		
Description	Delivery, installation and connection outdoor horn 20W RMS IP66.		

BoQ Item	3.5.4.5.5.	Unit	Set
Unit price definition	Delivery, installation and connection wall speaker : 20W, 100V.		
Description	Delivery, installation and connection wall speaker : 20W, 100V.		

BoQ Item	3.5.4.5.6.	Unit	Set
Unit price definition	Delivery, installation and connection volume control : 20W, 100V.		
Description	Delivery, installation and connection volume control : 20W, 100V.		

BoQ Item	3.5.4.5.7.	Unit	Set
Unit price definition	Delivery, installation and connection speaker 12 - 6 - 3W (100V) , IP55 in the toaletes.		
Description	Delivery, installation and connection speaker 12 - 6 - 3W (100V) , IP55 in the toaletes.		

BoQ Item	3.5.4.5.8.	Unit	Set
Unit price definition	Delivery, installation and connection ceiling speaker 12 - 6 - 3W (100V) IP44.		
Description	Delivery, installation and connection ceiling speaker 12 - 6 - 3W (100V) IP44.		

BoQ Item	3.5.4.5.9.	Unit	m¹
Unit price definition	Delivery, installation and connection cable LIHCH 2x51,mm².		
Description	Delivery, installation and connection cable LIHCH 2x51,mm ² .		

BoQ Item	3.5.4.5.10.	Unit	Pcs.
Unit price definition	Small material.		
Description	Small material.		

BoQ Item	3.5.4.5.11.	Unit	Pcs.
Unit price definition	Testing, measuring and issuing production of documentation.		
Description	Testing, measuring and issuing production of documentation.		

VI MULTIMEDIA EQUIPMENT

BoQ Item	3.5.4.6.1.	Unit	Pcs.
Unit price definition	Delivery, installation and connection profesional projector, Laser projector WUXGA (1920x1200), 6500 lumena SONY VPL-FHZ75L or equivalent.		
Description	Delivery, installation and connection profesional projector, Laser projector WUXGA (1920x1200), 6500 lumena SONY VPL-FHZ75L.		

BoQ Item	3.5.4.6.2.	Unit	Pcs.
Unit price definition	Delivery, installation and connection ZOOM LENS for VPL-FHZ75L VPL-FHZ65, FHZ60, FH65 & FH60 (WUXGA 3.18 to 4.84:1)VPLL-Z3032 or equivalent.		
Description	Delivery, installation and connection ZOOM LENS for VPL-FHZ75L VPL-FHZ65, FHZ60, FH65 & FH60 (WUXGA 3.18 to 4.84:1)VPLL-Z3032.		

BoQ Item	3.5.4.6.3.	Unit	Pcs.
Unit price definition	Delivery, installation and connection console for projector, Edbak PM8.1 KITMC04508 or equivalent.		
Description	Delivery, installation and connection console for projector, Edbak PM8.1 KITMC04508.		

BoQ Item	3.5.4.6.4.	Unit	Pcs.
Unit price definition	Delivery, installation and connection Infrared controle.		
Description	Delivery, installation and connection Infrared controle.		

BoQ Item	3.5.4.6.5.	Unit	Pcs.
Unit price definition	Delivery, installation and connection electric projection screen , Wave, Front projection, 406 x 228cm, 183" ,WA406DHV or equivalent.		
Description	Delivery, installation and connection electric projection screen , Wave, Front projection, 406 x 228cm, 183" ,WA406DHV.		

BoQ Item	3.5.4.6.6.	Unit	Pcs.
Unit price definition	Delivery, installation and connection Miksete 12ch Yamaha tip MG-12XU or equivalent.		
Description	Delivery, installation and connection Miksete 12ch Yamaha tip MG-12XU.		

BoQ Item	3.5.4.6.7.	Unit	Set
Unit price definition	Delivery, installation and connection active speaker 700W Yamaha DBR10 or equivalent.		
Description	Delivery, installation and connection active speaker 700W Yamaha DBR10.		

BoQ Item	3.5.4.6.8.	Unit	Pcs.
Unit price definition	Delivery, installation console LS-SS-180.		
Description	Delivery, installation console LS-SS-180.		

BoQ Item	3.5.4.6.9.	Unit	Pcs.
Unit price definition	Delivery, installation and connection receiver for wireless mikrophone , 722-746 MHz.,Bosch MW1-RX-F5 or equivalent.		
Description	Delivery, installation and connection receiver for wireless mikrophone , 722-746 MHz.,Bosch MW1-RX-F5.		

BoQ Item	3.5.4.6.10.	Unit	Pcs.
Unit price definition	Delivery, installation and connection Wireless Microphone,722-746 MHz: Bosch MW1-HTX-F5 or equivalent.		
Description	Delivery, installation and connection Wireless Microphone,722-746 MHz: Bosch MW1-HTX-F5.		

BoQ Item	3.5.4.6.11.	Unit	Pcs.
Unit price definition	Delivery, installation and connection HDMI Extendera HDMI Extender (Transmitter + Receiver / Set) or equivalent.		
Description	Delivery, installation and connection HDMI Extendera HDMI Extender (Transmitter + Receiver / Set).		

BoQ Item	3.5.4.6.12.	Unit	Pcs.
Unit price definition	Testing, measuring and issuing production of documentation.		
Description	Testing, measuring and issuing production of documentation.		

VII VIDEO SURVEILLANCE

BoQ Item	3.5.4.7.1.	Unit	Pcs.
Unit price definition	Delivery, installation and connection IP NVR 16 ch Real Time 8Mpx/25fps; 5Mpx/25fps; 4Mpx/25fps; 3Mpx/25fps;1080p /25fps,H.264/H.265, 2 x SATA, (2 x 8TB max), Android, iOS or equivalent.		
Description	Delivery, installation and connection IP NVR 16 ch Real Time 8Mpx/25fps; 5Mpx/25fps; 4Mpx/25fps; 3Mpx/25fps; 1080p/25fps,H.264/H.265, 2 x SATA, (2 x 8TB max), Android, iOS.		

BoQ Item	3.5.4.7.2.	Unit	Pcs.
Unit price definition	Delivery, installation and connection HDD 4TB.		
Description	Delivery, installation and connection HDD 4TB.		

BoQ Item	3.5.4.7.3.	Unit	Pcs.
Unit price definition	Delivery, installation and connection16-portni PoE switch + 2 x uplink port.		
Description	Delivery, installation and connection16-portni PoE switch + 2 x uplink port.		

BoQ Item	3.5.4.7.4.	Unit	Pcs.
Unit price definition	Delivery, installation and connection 2 Mpix day/night camera bullet , 3DNR, 1/2.8" H.265 25/30fps@1080p(1920x1080), ICR filter, WDR(120dB), 2,8 – 12 mm, , micro SD card slot do 128GB. ONVIF , IVS: Tripwire, Intrusion. 12VDC / . IP67, PoE or equivalent.		
Description	Delivery, installation and connection 2 Mpix day/night camera bullet , 3DNR, 1/2.8" H.265 25/30fps@1080p(1920x1080), ICR filter, WDR(120dB), 2,8 - 12 mm, , micro SD card slot do 128GB. ONVIF , IVS: Tripwire, Intrusion. 12VDC / . IP67, PoE.		

BoQ Item	3.5.4.7.5.	Unit	Pcs.
Unit price definition	Delivery, installation and connection wall box fi 122.0mm x34.2mm.		
Description	Delivery, installation and connection wall box fi 122.0mm x34.2mm.		

BoQ Item	3.5.4.7.6.	Unit	m¹
Unit price definition	Delivery, installation and connection cable FTP (4x2x0,5mm) 100OHM LSHF-FR cat.6.		
Description	Delivery, installation and connection cable FTP (4x2x0,5mm) 100OHM LSHF-FR cat.6.		

BoQ Item	3.5.4.7.7.	Unit	Pcs.
Unit price definition	Delivery, installation and connection LED monitora 24".		
Description	Delivery, installation and connection LED monitora 24".		

BoQ Item	3.5.4.7.8.	Unit	Pcs.
Unit price definition	Small material.		
Description	Small material.		

BoQ Item	3.5.4.7.9.	Unit	Pcs.
Unit price definition	Testing, measuring and issuing production of documentation.		
Description	Testing, measuring and issuing production of documentation.		

VII TV SYSTEM

BoQ Item	3.5.4.8.1.	Unit	Pcs.
Unit price definition	Delivery, installation and connection ZAU cabinet 300x300x100mm.		
Description	Delivery, installation and connection ZAU cabinet 300x300x100mm.		

BoQ Item	3.5.4.8.2.	Unit	Pcs.
Unit price definition	Delivery, installation and connection antene TV antene LOGO or equivalent.		
Description	Delivery, installation and connection antene TV antene LOGO.		

BoQ Item	3.5.4.8.3.	Unit	Pcs.
Unit price definition	Delivery, installation and connection Spaun HNV 30 UPE or equivalent.		
Description	Delivery, installation and connection Spaun HNV 30 UPE.		

BoQ Item	3.5.4.8.4.	Unit	Pcs.
Unit price definition	Delivery, installation and connection splitter 1/4.		
Description	Delivery, installation and connection splitter 1/4.		

BoQ Item	3.5.4.8.5.	Unit	Pcs.
Unit price definition	Delivery, installation and connection divider 1/2.		
Description	Delivery, installation and connection divider 1/2.		

BoQ Item	3.5.4.8.6.	Unit	Pcs.
Unit price definition	Delivery, installation and connection TV modul.		
Description	Delivery, installation and connection TV modul.		

BoQ Item	3.5.4.8.7.	Unit	Pcs.
Unit price definition	Small material.		
Description	Small material.		

BoQ Item	3.5.4.8.8.	Unit	m¹
Unit price definition	Delivery, installation and connection cable RG-6 75Ω.		
Description	Delivery, installation and connection cable RG-6 75Ω.		

BoQ Item	3.5.4.8.9.	Unit	Pcs.
Unit price definition	Testing, measuring and issuing production of documentation.		
Description	Testing, measuring and issuing production of documentation.		

VOLUME 3.4

TECHNICAL DESCRIPTION / SPECIFICATIONS

04 WATER AND SEWERAGE INSTALLATIONS

TECHNICAL DESCRIPTION

Object:	P.I. Vocational High School „Danilo Kiš“ Budva
Location:	C.P. No 1617/1, C.M. Budva, Budva
Investor:	P.I. Vocational High School „Danilo Kiš“ Budva
Total Gross area:	5487,51m ²
Total Nett area:	4426,62m ²
Stories:	2 (GF+1)

INTRODUCTION

On the basis of the project task, architectural-construction project and technical conditions for the design, the main project of the water supply and sewerage phases for the Public Institution Vocational High School "Danilo Kiš" was done - on C.p. no. 1617/1, C.M. Budva, Municipality of Budva.

This project deals with the technical solution for internal installations of water supply and sewerage with drainage of fecal water in accordance with the project task.

I PLUMBING

The water supply project was made on the basis of the following data and bases: - projected task,

- architectural-construction project,
- applicable technical regulations.

Based on the project task, the facility is planned to be connected to the existing water supply installation in the adjacent sanitary facilities with a supply pipe with a diameter of DN 20 or 3/4 "from where the water is delivered to the boiler and sanitary devices.

In accordance with the architectural disposition of sanitary facilities and all other sources, a certain scheme of water supply installations is planned.

The provision of hot water to the sanitary facilities is planned through low-prefabricated instantaneous water heaters located below the sanitary elements with a power of 2 kW.

All internal plumbing installations are made of hard polypropylene from a reputable manufacturer. Plumbing verticals are laid visibly, along the wall, and in the wall. After installation and testing, wall them with adequate material.

Each vertical is supplied with a valve for possible closure. Each toilet has its own central valve for the possibility of shutting off water for the entire toilet. Also, each spout has its own valve.

Provide appropriate openings for all pipe passages through the structural elements, in order to prevent subsequent shrinkage. Depending on the installation location, the pipes must be thermally protected.

Upon completion of the works, the Contractor is obliged to perform the testing of the complete network in accordance with the regulations and make a report on that with the Supervisory Body, and then proceed to the insulation and piping. After the trial testing of the water supply network, the Contractor, ie the competent service will perform rinsing and disinfection of the constructed water supply network and give a finding on the chemical and bacteriological correctness of the water.

II SEWERAGE - used water

A separate sewer system around the facility is envisaged.

Based on the project task, the restaurant is planned to be connected to the existing sewer verticals.

Horizontal and vertical sewer network-fittings in the building is provided from PVC-PP material, and as given in the graphic attachment of the details of the sanitary facilities.

All sewer verticals are provided with ventilation pipes that end with a ventilation head above the roof surface. Place the verticals in the wall slots or visibly next to the wall. After the installation, it is necessary to test and rinse the sewer network.

The sewerage network is made of pipes and fittings made of hard polyvinyl chloride (PVC). This material was chosen because it is waterproof, as well as rubber seals on the joints. During installation, strictly take into account the projected falls, indicated in the base and cross section. Finish the sewer vertical above the roof with a ventilation head.

The graphic appendices show the distribution scheme of the sewerage network with slopes, profiles and the necessary fittings.

Channel profiles and depressions were performed within optimal limits.

Acceptance of water from the floors is done by drains with a siphon in the sanitary and technical room. The longitudinal fall of the floors is adjusted to the position of the drains and amounts to 0.5 - 2% of the walls towards the drains. The entire sewerage network is provided by PP and PVC sewer pipes with connection to the nozzle, of appropriate diameter and according to the projected drop, which for individual diameters is:

- Ø 70 mm i = 1.5%
- Ø 100 mm i = 1.5 - 2%
- Ø 160 mm i = 1.5 - 1%
- Ø 250 mm i = 1.5 - 2%

For good ventilation of the sewerage network and prevention of self-suction of the siphon, in addition to adequately selected dimensions of pipes (not full of water) in which there is space and for unimpeded air circulation, sewerage extension in unreduced diameter to at least 1.00 m above the roof with ventilation cap is planned.

III SANITARY APPLIANCES

The project envisages standard sanitary devices with the appropriate associated fittings and accessories of the first class in the color provided by the architectural project, defined by the standards and certified by the manufacturer. They cannot be procured without consulting the Supervisory Body and with its consent.

Each sanitary device should be equipped with a siphon in order to prevent the penetration of gases from the sewage network into the premises and with an appropriate check valve.

LIST OF LAWS AND REGULATIONS USED

During the development of the project, the valid regulations and standards for this type of technical documentation were used:

- Law on Spatial Planning and Construction of Facilities (Official Gazette of Montenegro, No. 51/08, 40/10, 34/11, 47/11, 35/13, 39/13 and 33/14)
- Ordinance on the manner of preparation, scale and more detailed content of technical documentation,
- Rulebook on conditions for design, construction and maintenance of water supply system, fecal and atmospheric sewage,
- Rulebook on quality and sanitary-technical conditions for wastewater discharge into the recipient and public sewerage, manner and procedure of wastewater quality testing, minimum number of tests and content of the report on determined wastewater quality ("Official Gazette of Montenegro", No. 45 / 08 of 31 July 2008) and other acts in accordance with the Law on Waters
- DIN I EN technical standards for water supply and sewerage facilities and installations.

TECHNICAL CONDITIONS FOR CONDUCTING INTERNAL
INSTALLATIONS OF WATER SUPPLY AND SEWERAGE QUALITY
CONTROL PROGRAM

TECHNICAL CONDITIONS FOR CONDUCTING INTERNAL INSTALLATIONS OF WATER SUPPLY AND SEWERAGE QUALITY CONTROL PROGRAM

General conditions

The Contractor is obliged to study the obtained projects well and compare them with the condition of the facilities, and to submit all his disagreements, observations and remarks to the supervisory body of the investor, which in case of need informs the Designer. In parallel with the analysis of the project, the contractor also analyzes the material, ie makes its own material specification, taking care not to change the material provided by the project unless it is necessary. If water and sewage pipes cross during construction, place the water pipe above the sewer. When performing water supply and sewerage installations, take into account the harmonization with the architectural and structural part of the building and other installations in the buildings.

If there is a need to adjust the reinforced concrete elements of the building and the foundation, it is necessary to seek the consent of the designer of the structural part of the building through the supervisory body. The contractor is obliged to keep a (installer's) diary on the construction site in which, together with the supervisory body, he enters in addition to the regularly performed work and his observations, remarks, requests and orders. Also, the contractor must properly keep a construction book with all the data for all work performed on the installation, as well as information on the type of material and certificates.

1. Plumbing

Scope of works

Works entered in the bill of quantities: delivery of pipes, fittings and other materials, transport to the construction site, sorting, stacking and matching, cutting and connecting the water supply network. All materials and works must be according to JUS standards, and with the approval of the supervisory body.

The contractor is obliged to study the project well and systematically, to check all lengths and dimensions according to the projects and drawings, to check the specification and to correct the specification for the order material. Before procuring the material, he must seek the approval of the supervisory body and after the procurement to sort it at a certain place. This applies to both the material and the mounting equipment. After this, the Contractor is obliged to do the assembly project of the pipeline installations. The project should contain a complete distribution network of pipelines and all the necessary materials, fittings and the organization of internal transport of materials. Only after the approval of the supervisory body can the installation begin

water pipes. All materials and works that are not included in the bill of quantities and estimate, but without which the safety of the installations could not be guaranteed, will be performed in full, subsequent payment will be made only with the approval of the supervisory authority.

2. Technical data and project

All installation works must be performed in accordance with the attached drawings, but if they are not mentioned in some conditions or omitted by mistake, they will be performed as if they were fully shown in the relevant project items. The positions of the pipelines and equipment and connections are shown in the drawings and will be done so. Any change must be approved by the supervisory authority. The contractor must do a project of the performed

installation. Any change must be approved by the Supervisory Authority.

Contents of papers

The works described in the bill of quantities and estimate include: procurement, transport, installation of pipelines and equipment and other devices provided in the water supply network, pipeline insulation with pressure testing, disinfection and flushing of the water supply network as well as chemical and bacteriological analysis of water samples from 89 performed installations. in facilities.

The contractor is obliged to provide complete devices, equipment plants, workers and materials required to complete all works in accordance with the instructions of the supervisory authority, without item, if not paid separately.

Technical data and drawings

Any work in the execution of water supply installations required in the project for the safety of the water supply network, which is not included in the specification, ie in the bill of quantities and estimate of works, will be performed as if fully described in the specification and bill of quantities and estimate of works. The positions of pipelines, connections and equipment are shown in the drawings and should be adhered to as much as possible in accordance with the construction spaces and aesthetic requirements. Accurate and correct adjustment is necessary to ensure maximum levels in the aesthetic and functional connection of sanitary devices to the water supply network. Careful placement and positioning of the pipeline provides access to the pipeline and in that case the cutting and mixing of the pipeline with other installations will be avoided.

Material and performance - general

Prior to ordering any piece of material and equipment, the contractor is required to submit to the supervisory authority for approval three sets of performance drawings with a complete list (in duplicate) of all materials, fittings and equipment to be applied. The contractor should have all other detailed information on materials and equipment that may be required for each item. Material approval is based on the data declared manufacturers. Any fitting material or equipment that does not comply with the specification and description from the bill of quantities and estimate may be rejected. Any material that does not comply with JUS standards cannot be used. The contractor is obliged to organize in time the procurement of materials and equipment that cannot be found on the surrounding market. Requests for extension of the deadline or change of material will not be considered if this is due to the contractor's lack of timeliness. At the special request of the contractor but with the approval of the supervisor, materials not specified in the bill of quantities and estimate of works will not be used. In that case, the supervisory authority must issue a written declaration on materials and equipment, which do not comply with those

selected by the investor or with the technology envisaged in the project and which will be applied during the execution of works, namely: - laying of pipes, materials, works, testing and other.

Implementation of water supply network in facilities

The connecting lines should be laid in a straight line perpendicular to the building with a small slope towards object. The depth of the connecting pipelines from the building to the connection is defined in the external water supply project.

The water supply network in the building is laid under the floor in a concrete floor channel. The passage of the pipeline through the structural walls is reported in a protective pipe that has a profile 40 mm larger than the outer diameter of the pipeline. The interspace should be filled with plastic putty, and the ends should be closed with cement mortar. Ascending vertical lines with their branches on the floors are provided in the wall grooves (slots). The pipes are fastened every 2.0 m with clamps. The pipes should not be glued to the wall but should be 2-3 cm apart. The verticals must be placed under the pendulum, and the horizontal branches in a slight fall towards the vertical. After installation, disinfect and rinse the net and perform an analysis of the sanitary correctness of the water from the taps, after which the net is put into operation.

Slopes

All horizontal pipelines should be laid at a slope of at least 1-2%.

Fastening of pipelines for the construction of the building

Horizontal and vertical fastening of pipes for construction should be done exclusively with steel clamps, with rubber or plastic pads. Hang the horizontal piping for the construction with hanging "U" clamps, for hanging for the construction, with an adjustment hook with a notch. Material for clamps according to JUS standard.

Test pressure piping

Test the hydraulic pressure pipe at 12.0 bar according to JUS standards. A certain pressure of 12.0 bar will be for 1 hour, ie until a complete inspection of all joints is performed. Putting the net under test pressure should be reported consecutively for 2 to 4 hours.

Insulation

Galvanized pipelines that are laid in the field outside the building and in the field below the ground floor should be anticorrosively protected as follows:

Clean the pipes well, clean all the threads that are being cut and protect the threads with a mini. The pipes are then coated with bitulite in two layers, after which they are wrapped with bituminous alutriks that adhere well to the pipes.

Before backfilling the trench, the pipe insulation should be received by the supervisory body and it should be noted that anti-corrosion protection has been performed. Pipelines for which the supervisory authority does not receive the performed insulation cannot be accepted in the minutes.

Cold and hot water pipes that are placed in the concrete channel vertical and risers and all horizontal branches placed on the ceilings should be anticorrosively protected with two layers of mini or wrapped with anti-corrosion plastisol tapes, then thermally insulated against sweating with plamaflex pipes, or tervol d = 5cm or antiperspirant insulation.

3. Sewage

Technical data and project

All works must be performed according to the attached drawings, but if they are not mentioned in some parts or omitted by mistake, they will be performed as if they are fully shown in the relevant project items. The position of the canals, sanitary

facilities, equipment and connections are shown in the drawings and will be done so. Any change must be approved by the supervisory authority. The contractor is obliged to make the performed installation project.

Contents of papers

The works described in the specification include the procurement, transport, installation of pipes and equipment and other devices provided on the network, and everything else provided for in the specifications, bill of quantities and estimate. The Contractor is obliged to provide complete devices, plants, workers and materials and equipment for installation of PVC pipes from the same manufacturer from which he orders pipes and other accessories needed for installation, or supplier, all according to the instructions of the supervisory authority, whether specifically stated or no. In that case, the contracted prices will include all these items if not paid separately.

Technical data and drawings

Any work in the execution of sewerage installations required in the project for the safety of the sewerage network which is not included in the specification shall be performed as if it were fully described in the specification. The position and arrangement of sewer pipes and equipment is given in the drawing and they should be adhered to as much as possible, in accordance with structural and spatial requirements. Proper adjustment should be done to achieve the maximum level of installation, while careful placement ensures access to drainage channels. Mixing should be avoided sewer drains with other installations.

Materials and construction - general

Before ordering any material and piece of equipment, the contractor is required to submit three sets of projects including a complete duplicate sheet with all materials, devices and equipment as well as pipe mounting equipment. The Contractor shall have at his disposal all information that may be required in respect of any 91 items and all attestations for pipes and equipment. On-demand approval for material is based on data obtained from the manufacturer. Any material that does not comply with JUS standards will not be able to be used in sewer installation. At the special request of the contractor, but after the approval of the supervisor and the designer, materials that are not listed in the bill of quantities and estimate of works will be able to be used. In that case, the supervisory body must issue a written declaration on materials and equipment that are not in accordance with the one selected by the investor or with the technology provided in the project and which will be applied to the works, namely: -laying pipes, materials, works testing and more.

The Contractor undertakes to organize in time the procurement of materials and equipment that cannot be found on the local market. Requests for extension of the deadline or change of material will not be considered if this is due to the contractor's lack of timeliness.

Pipes

- Plastic sewer pipes

Hard PVC plastic pipes type KK for home sewerage and type MB for outdoor installation. Pipe quality according to JUS C.C6.502 standard.

- Pipe connection

The connection of plastic pipes and fittings is done in a socket on a rubber sealing ring.

- Pipe fastening

Sewer pipes that run along walls or in gutters should only be secured with pipe clamps under the pipe nipple. For BC pipes, pipe clamps that are matched to the outside diameter must be used. Fix the pipeline with fixed and movable clamps. Fix the fixed clamps directly to the socket with these clamps and fit the fittings directly to the socket. Movable clamps allow axial movement, the mutual distance of pipe clamps is at:

-horizontal connecting pipelines $10 \times d$ (d- outer diameter),

-vertical pipelines maximum 2.0 m.

- Installation

Before starting the installation and installation of sewers, the whole procedure must be well and carefully planned, in order to avoid subsequent drilling of the walls. The contractor is obliged to provide in advance all openings in the walls and slabs to prevent subsequent drilling.

Once the inspection body has approved the samples submitted to it by the contractor, it must carry out precise dimensional measurements.

All necessary connections should be made even if they are not shown in the drawings. Subsequent drilling of the walls should be done with the consent of the Structural Designer with the utmost care. Any damage caused by subsequent drilling will have to be repaired at the expense of the contractor. During installation, the pipe openings must be temporarily closed with plugs or lids. The pipes must be firmly connected. At the bottom of each vertical, inspection pieces are provided on which openings are made in the wall and nickel-plated ones should be installed. door, nice looking and good quality. Also in all provided places on the horizontal also install inspection pieces or kinets through the collection channels as shown in the project and provide access to them. Finish all outlets of the ventilation verticals on the roof with a ventilation extension.

Complete installation according to JUS standards.

Place the net in the field on a surface of fine dry sifted sand in the designed floors.

For control in the facility on the network, inform the concrete manholes in everything according to the attached drawings in the project. The manholes are made of compacted concrete MB-20 with reinforced concrete slabs with an opening on which to install cast-iron covers and climbers, the manholes are plastered and smoothed to a black sheen.

After installation, perform a watertightness test. If a defect or failure occurs, the system must be repaired. All alterations made to bring the system into line with the contractor's standards will be made at the contractor's expense, and the contractor is not entitled to a price increase caused by these additional works.

Verticals, drains and sanitary facilities will be tested separately and within the entire sewage system. Possible pipe blockages should be found and removed while the entire system should be charged with hydraulic effects, including the lag of relevant water at all floor openings.

Sanitary equipment and accessories

All sanitary equipment and accessories must be the product of a well-known and recognized company, and the colors and shapes and sizes chosen by the architectural designer. A detailed description of the sanitary facilities with the associated accessories is given in the bill of quantities and estimate. The installation of equipment should be performed cleanly, neatly and precisely, taking into

account the good usability and aesthetic appearance of the entire space. Sanitary items are fastened to the walls by means of pine corners of conical shape and sufficient size, fixed to the wall with cement mortar. For cantilevered objects, it is

necessary that they can withstand a force of 200 kg at the most unfavorable place. The installation heights of the sanitary elements, unless otherwise stated in the design, are:

Washbasin, front edge 80 cm

Mirror up to the middle 155 cm

Wall faucet or mixer 110 cm Kitchen sink 85 cm

Cistern 200 cm

Urinal shell 65 cm

Manholes

Sewer manholes on the external canal network should be located at all canal junctions or sudden changes of direction, as shown in the drawings. Sewer manholes should be made of ready-made concrete rings MB-20, in all respects according to the attached drawings in the project. Manholes must be of good quality with a properly made inlet and all the equipment according to the bill of quantities and estimate. The bottom of the sewer manhole should be concreted, at a slope of 1: 6 towards the inlet channel, treated to have a strong but also smooth surface, which is achieved by coating with cement mortar with smoothing to a black sheen.

Testing of sewage installations in the building

Testing the correctness of the sewerage network in buildings is performed in three stages: The first stage involves testing the lower drainage network of KC pipes before the trenches are buried. The slope of the channel and the tightness of the pipe composition are then controlled. The slope is checked by leveling or leveling and leveling.

To check the correctness of the composition (joints), the whole system should be filled with water, since the channel is previously clogged at the lowest end. The end pipelines are filled with water and held under a pressure of 5 m of water column for 1 hour. Satisfactory impermeability is achieved when no water loss occurs within 15 minutes.

The second stage is performed when the entire vertical network with branches is implemented. The test is performed using water or air. The water test is performed partially for individual verticals, since all ends of the branches are previously well sealed, except for the highest part through which the filled nets are made, the test is performed under a water column pressure of about 0.3 bar outflow. If all compositions hold within 15 minutes, it is a sign that all joints are correct.

The entire vertical network is tested by air, using a compressor with a manometer. The compressor is connected to one of the openings and all the others are well plugged. The test pressure is 0.35 bar for 15 min.

The slightest drop in pressure means that a joint is leaking and must be brought to the correct condition.

The third stage, includes the control of sanitary devices with flushing and accumulation of water and the like, so if there is no change in the network (all siphons hold, the water installation is correct). Until the test is completed, the pipe grooves or floor mats must not be closed.

During the examination of the sewerage network, a record should be kept and attached to other documentation.

After the installation of sanitary devices is completed, the entire installation should be regulated so that all spilled places are opened as much as possible and water is released into the sewer. On that occasion, the sewage network is flushed, the functioning of toilet flushers, electric water heaters and other sanitary accessories is controlled. Use this regulation for another check of the correctness of the sewer by controlling the flow of water.

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 DISASSEMBLY WORKS

BoQ Item	3.6.4.1.1.	Unit	Pcs.
Unit price definition	Trimming and making slits in the wall and in the floor for dismantling the existing water supply and sewerage installations.		
Description	Trimming and making slits in the wall and in the floor for dismantling the existing water supply and sewerage installations, as well as the installation of the hydrant network, with loading and removal of rubble to the landfill. Dismantling of all water supply, sewerage pipes as well as pipes for the hydrant network, with loading and transport to the landfill.		

BoQ Item	3.6.4.1.2.	Unit	m¹
Unit price definition	Dismantling with loading and removal to the landfill.		
Description	Dismantling with loading and removal to the landfill of existing sanitary elements and hydrants.		

II PLUMBING

BoQ Item	3.6.4.2.1.	Unit	m¹
Unit price definition	Procurement, transport and installation of PPR water pipes with the required fittings.		
Description	Procurement, transport and installation of PPR water pipes with the required fittings (Aquatherm fusiotherm SRD 7.4 faser composite or equivalent). The position includes: all used material with raster, fittings, preparatory finishing works, transfer of materials to the place of installation, dimensioning of lines according to the plan, testing of the water supply network according to the valid technical conditions. Calculation per meter of installed and tested water pipe of appropriate diameter.		

BoQ Item	3.6.4.2.2.	Unit	Pcs.
Unit price definition	Procurement, transport and installation of permeable brass valves with square head nickel-plated rosette and cap.		
Description	Procurement, transport and installation of permeable brass valves with square head nickel-plated rosette and cap. Calculation per piece of mounted profile valve.		

BoQ Item	3.6.4.2.3.	Unit	Pcs.
Unit price definition	Procurement, transport and installation of valves on wheels.		
Description	Procurement, transport and installation of valves on wheels in the places shown by the project. Calculation per piece of mounted profile valve.		

BoQ Item	3.6.4.2.4.	Unit	m¹
Unit price definition	Testing of the water supply network at test pressure.		
Description	Testing of the water supply network at test pressure, in accordance with the technical conditions. Calculation per meter length of the tested pipeline.		

BoQ Item	3.6.4.2.5.	Unit	Pcs.
Unit price definition	Flushing and disinfection of the water supply network by the competent service with the preparation of analyzes on the correctness of drinking water.		
Description	<p>Flushing and disinfection of the water supply network by the competent service with the preparation of analyzes on the correctness of drinking water.</p> <p>Calculation per meter required.</p>		

III WASTE WATER - SEWERAGE

BoQ Item	3.6.4.3.1.	Unit	m¹
Unit price definition	Polypropylene low-noise sewer pipes with fittings and sealing tires. - DN 50		
Description	<p>Polypropylene low-noise sewer pipes with fittings and sealing tires. Attach the vertical pipes to the wall with the original pipe clamps with a protective rubber every 2.0 m, and install a fixed clamp under the socket. Horizontal divorces below fasten the structures to the ceiling with original pipe clamps with a protective rubber at a distance of 10 D. Behind the couplings, fasten them with fixed clamps. The works include all adjustments for floor and wall distribution and patching damaged wall surfaces. Carry out the installation in accordance with the pipe manufacturer's instructions. Pipes as Raupiano manufacturer REHAU or equivalent. Calculation per ml of pipe with all described works</p>		

BoQ Item	3.6.4.3.2.	Unit	m¹
Unit price definition	DN 75		

BoQ Item	3.6.4.3.3.	Unit	m¹
Unit price definition	DN 110		

BoQ Item	3.6.4.3.4.	Unit	Pcs.
Unit price definition	Procurement, transport and installation of drains with siphon 14x14 cm.		
Description	<p>Procurement, transport and installation of drains with siphon 14x14 cm. Connect the waterproofing layer to the channel. The grille should be at the level of the finished floor.</p> <p>Drain body with vertical spout DN50.</p> <p>Upper part of the drain, for free and locked grilles, with flange for shallow installation. Stainless steel grilles for upper parts with stainless steel edge, dimensions 140x140 mm and thickness 5.5 mm.</p> <p>Drains type Aco Easy flow or equivalent.</p> <p>Calculation per piece of built-in drain.</p>		

BoQ Item	3.6.4.3.5.	Unit	m¹
Unit price definition	Testing of the pipeline on test pressure		
Description	<p>Testing of the pipeline on test pressure according to the enclosed instructions, valid technical regulations and the consent of the supervisory body.</p> <p>The calculation is performed per m 'of the tested pipeline.</p>		

IV SANITARY ELEMENTS

BoQ Item	3.6.4.4.1.	Unit	Pcs.
Unit price definition	Procurement of transport and installation of ceramic toilet bowls for the disabled.		
Description Procurement of transport and installation of ceramic toilet bowls for the disabled. Load capacity 400 kg, length approx. 70 cm, height approx. 45-50 cm, with disassembly seat with cup board, locking sleeves and sound insulation set, screws for cup fastening and all necessary installation accessories according to the manufacturer's instructions, double-sided wall supports for the disabled (fixed and foldable) set with toilet paper holder with mounting elements for fixing the holder and all necessary installation accessories, according to the manufacturer's instructions (model of the holder to match the type of electronic toilet activation), chrome wall bracket for toilet brush, electronic activation of toilet flushing and on handrails for the disabled with a metal cover plate with a button with additional manual flush activation with a built-in set with mains supply. Calculation per piece.			

BoQ Item	3.6.4.4.2.	Unit	Pcs.
Unit price definition	Procurement, transport and installation of toilet bowl made of sanitary ceramics.		
Description Procurement, transport and installation of toilet bowl made of sanitary ceramics together with cistern, EC valve and brinox hose, with vertical spout, cover board with frame made of quality plastic, with paper box and roll paper holder and toilet brush stand. Calculation per piece.			

BoQ Item	3.6.4.4.3.	Unit	Pcs.
Unit price definition	Procurement transport and installation of a sink set.		
Description			
Procurement transport and installation of a sink set. The set consists of a one-piece ceramic sink of the first class with a nickel-plated siphon with a drain d32 mm, a worktop and a cabinet of the investor's choice. The price includes a battery for hot and cold water, a mirror and a set of accessories as well as a set of razor material for connection and connection to installations. Calculation per piece.			

BoQ Item	3.6.4.4.4.	Unit	Pcs.
Unit price definition	Procurement, transport and installation of nickel-plated single-lever sink faucets.		
Description Procurement, transport and installation of nickel-plated single-lever sink faucets. It is calculated and paid per mounted piece.			

BoQ Item	3.6.4.4.5.	Unit	Pcs.
Unit price definition	Procurement, transport and installation of a siphon for the connection of a one-part sink.		
Description Procurement, transport and installation of a siphon for the connection of a one-part sink to sewage installations. Calculation per piece.			

BoQ Item	3.6.4.4.6.	Unit	Pcs.
Unit price definition	Procurement and installation of nickel-plated doors measuring 15x20cm.		
Description Procurement and installation of nickel-plated doors measuring 15x20cm for installation in places of inspection pieces. Anchor the door to the wall. It is calculated according to the piece of built-in openings.			

BoQ Item	3.6.4.4.7.	Unit	Pcs.
Unit price definition	Procurement transport and installation of instantaneous water heater 2 kW.		
Description Procurement transport and installation of instantaneous water heater 2 kW, for the preparation of domestic hot water, with the possibility of installation under the sink, manufacturer Bosch product Tronic 4000 ET or equivalent. Calculation per piece of built-in boiler.			