

**Detailed Design**

No.:	DOCUMENTATION:	DOC. No.:
4 4/1	DOCUMENTATION IN THE FIELD OF MECHANICAL ENGINEERING Shelter	JULFS--7S/01P

Faculty of Mechanical Engineering

NEW CONSTRUCTION



PPROJECT No.:	FOLDER No.:	COPY No.:	PLACE AND DATE:
362-19	JULFS--7S/M01P	A	Ljubljana, May 2026

ANNEX 1C

TITLE PAGE

CONSTRUCTION DATA

name of construction	Faculty of Mechanical Engineering
brief description of construction	The new building of the Faculty of Mechanical Engineering (FS) with the associated shelter facility, including connections to the common communal infrastructure. The common entrance to the underground garage and the common external and communal arrangement of the area are the subject of a separate project No. 380-20.
TYPES OF CONSTRUCTION	☒ NEW CONSTRUCTION
	☐ NEW CONSTRUCTION - EXTENSION
	☐ RECONSTRUCTION
	☐ CHANGE IN INTENDED USE
	☐ ENTIRE STRUCTURE REMOVAL
	☐ LEGALISATION
	☐ MINOR RECONSTRUCTION
	☐ MAINTENANCE
	☐ MAINTENANCE WORKS IN THE PUBLIC INTEREST

DESIGN DOCUMENTATION DATA

design documentation type	Detailed Design (PZI)
project No.	362-19

DETAILS OF DOCUMENTATION

documentation expertise area	4	DOCUMENTATION IN THE FIELD OF MECHANICAL ENGINEERING
documentation title	4/1	Shelter
documentation No.		JULFS--7S/01P
date		november 2023
date of revision		/

INFORMATON ABOUT THE DESIGN ENGINEER

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identification No.	IZS S-0739
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ANNEX 2C
STATEMENT BY DESIGN ENGINEER
AND CERTIFIED EXPERT
WHO ELABORATED THE DOCUMENTATION

DESIGN ENGINEER

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AND CERTIFIED EXPERT WHO ELABORATED THE DOCUMENTATION

certified expert	Marko Lubej, univ. dipl. inž. str.
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DECLARE

that the documentation

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date		november 2023

complies with the relevant regulations and other normative documents and that the relevant essential and other requirements are observed.

certified expert	Marko Lubej, univ. dipl. inž. str.
identification No.	IZS S-0739
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general manager	Marko Lubej, univ. dipl. inž. str.
general manager signature	

DOCUMENTATION ADDITIONAL DATA

OTHER CO-OPERATORS

elaboration of documentation

Hinko Samec

WARNING!

All translations into English have been produced by machine translation and are provided for informational purposes only. In the event of any ambiguity or uncertainty, the original Slovenian text shall prevail exclusively.

The covers, title pages of documentation, technical reports, and bills of quantities have been translated into English. Technical calculations and drawings have not been translated into English.

REMARKS

The scope of the tender documents covers all necessary works and equipment, excluding interior finishes, furniture, laboratory and kitchen equipment. All data and information regarding the above-mentioned equipment, which is not the subject of the tender, is provided for informational purposes only.

The selected contractor shall be required to coordinate the timing and technical aspects of the execution of the works forming the subject of this tender with the contractor and/or the above-mentioned equipment supplier, which is not included in the scope of this tender, as well as with the contractors of all other projects being carried out within the wider construction area.

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INVESTOR 1	
name and surname or company name	UNIVERZA V LJUBLJANI
address ali poslovni address družbe	Kongresni trg 12, 1000 LJUBLJANA
CONSTRUCTION DATA	
name of construction	Faculty of Mechanical Engineering
DESIGN DOCUMENTATION DATA	
design documentation type	Detailed Design (PZI)
project No.	362-19
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documentation No.	JULFS--7S/01P

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TECHNICAL REPORT

INVESTOR

INVESTOR 1

name and surname or company name

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documentation expertise area

4

DOCUMENTATION IN THE FIELD OF MECHANICAL
ENGINEERING

documentation title

4/1

Shelter

documentation No.

JULFS--7S/01P

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Investor:		 Univerza v Ljubljani Kongresni trg 12 1000 Ljubljana, Slovenija				Construction/Facility: Faculty of Mechanical Engineering	
Designer:		 DRUŽBA ZA INŽENIRING, STORITVE, TRGOVINO IN PROIZVODNJO d.o.o.				Part of the building/system: Shelter	
				Type of documentation: 4 DOCUMENTATION IN THE FIELD OF MECHANICAL ENGINEERING			
		Name and surname:		Ident. No.:		Content of the drawing (document):	
Design Manager:		Boštjan Vuga, univ. dipl. inž. arh., grad. dip. (AA)		ZAPS 0035 PA PPN		Technical report	
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TECHNICAL REPORT

FOR THE PROTECTIVE FUNCTION OF THE TWO DUAL-PURPOSE BASIC PROTECTION SHELTERS, ONE WITH A CAPACITY FOR 300 PEOPLE AND ONE WITH A CAPACITY FOR 200 PEOPLE, IN THE BUILDING OF THE UNIVERSITY OF LJUBLJANA - FACULTY OF MECHANICAL ENGINEERING IN LJUBLJANA

The design of the UL - Faculty of Mechanical Engineering in Ljubljana, which is a facility for regular education, took into account the requirement of the Decree on the Construction and Maintenance of Shelters (Official Gazette of the Republic of Slovenia, No. 57/96 and 54/15), which allows investors of facilities intended for regular education for more than 100 participants in the educational programme in the regulatory areas of cities with more than 10,000 inhabitants, obliges them to also build basic protection shelters for these facilities. The required number of sheltering places is specified in Article 6 of the Rules on Technical Norms for Shelters and Shelters (Official Gazette of the Republic of Slovenia, No. 17/98, 26/98, 25/00, 38/01 and 66/06). In the second indent of this article, there is a requirement that the total number of sheltering places for 2/3 of students in a shift and for 2/3 of employees in the maximum work shift must be located. Other provisions of the regulations, the concept of the layout of the premises in the building and the standard shelter technology available on the market allow for the most rational implementation if two separate shelters are built, one with a capacity for 300 shelters and one with a capacity for 200 shelters.

Both shelters are dual-purpose.

A larger shelter is intended for a bicycle shelter in the function of a second purpose (peacetime function) - without major permanent sources of air pollution, and in a protective function (shelter function) it is designed and equipped to shelter 300 people.

A smaller shelter is intended for a bicycle shed in its function for another purpose (peacetime function) - without major permanent sources of air pollution, while in its protective function (shelter function) it is designed and equipped to shelter 200 people.

For the protection function, both shelters will have all the prescribed housing, sanitary and auxiliary equipment for a seven-day continuous stay for the entire number of shelter places envisaged. Accommodation equipment can and is permissible, after successfully passing a technical test, dismantled and stored in an orderly manner in the equipment storage within each individual shelter. This frees up the living quarters of the shelter for peaceful equipment and use. All peacetime equipment must be dismantled. Closing devices (doors), ventilation systems, electrical installations and installations, devices and installations for the control of microclimatic conditions, and means for signalling and communication shall not be dismantled.

The shelter technology plan for the protective function also takes into account the fact that shelters need to be regularly maintained and that each individual shelter must be checked every ten years.

The clear height of shelter spaces is 2,70 m, which is higher than the minimum required height for indoor shelter spaces of 2,60 m. The described design requires the external walls and the lower and upper panels to be at least 40 cm thick, which the designer of the structure took into account and thus provided the individual shelter with adequate protection from external influences.

Both shelters are partially dug in. The location of the shelters was dictated by the configuration of the terrain and the determined groundwater level.

Shelters of up to 300 shelters must be forcibly ventilated in a protective function, without the need for air conditioning and no separate cable supply or other source of electricity, independent of the rest of the power supply. In this plan, the routes of pipelines and lines of lights, as well as the micro-locations of the passages of all wiring through the walls of the outer and inner gasification zones, are experientially and by agreement coordinated in each individual shelter.

Each shelter shall be designed and equipped in such a way that it can operate autonomously in a protective function, regardless of whether the neighbouring shelter is also in use in a protective function, in accordance with the following regulations and instructions currently applicable to shelters in the Republic of Slovenia:

1. Act on Protection against Natural and Other Disasters – ZVNDN-UPB1 (Official Gazette of the Republic of Slovenia, No. 51/06)
2. Decree on the Construction and Maintenance of Shelters (Official Gazette of the Republic of Slovenia, Nos. 57/96 and 54/15)
3. Instruction on the Shelter Order (Official Gazette of the Republic of Slovenia, No. 1/97)
4. Rules on Technical Norms for Shelters and Shelters (Official Gazette of the Republic of Slovenia, No. 17/98, 26/98, 25/00, 38/01 and 66/06)
5. Decree on the Organisation, Equipping and Training of Protection, Rescue and Assistance Forces (Official Gazette of the Republic of Slovenia, Nos. 92/07 and 54/09)
6. Instruction for the technical and control test of the shelter (MORS – Administration of the Republic of Slovenia for Protection and Rescue, No. 843-154/2007-2 of 25.10.2007)

All descriptions below refer to both shelters.

The layout of the indoor spaces of the shelters took into account the following requirements for the size of the individual rooms and the required area for each device:

PURPOSEFULNESS SPACE	REQUIREMENTS IN THE REGULATION
ENTRANCE BARRIER	0.03 m ² /person and at least 3.00 m ²
EMERGENCY EXIT CLOSURE	at least 3.00 m ²
LIVING SPACE for shelters that are not air-conditioned	0.10(6+N/100) m ² /per person; n = the number of persons or shelter places envisaged in each shelter; individual living space, as a rule, for a maximum of 100 sheltering places
TOILETS AND WASHROOM	one toilet cubicle for 34 people with a floor area of at least (1,2 × 0,9) m = 1,08 m ² ; There must be at least 9 toilet cubicles in a shelter for 300 people There must be at least 6 toilet cubicles in a shelter for 200 people provision must also be made for a free floor area for opening doors outwards from each cabin and a minimum of 1 m ² for the door for access to the toilets; provision must be made for at least one washbasin per three cubicles; the washbasin room must have an area of at least 0,035 m ² /person; There must be at least 3 wall-mounted dry sinks in a shelter for 300 people In a shelter for 200 people, there must be at least 2 wall-mounted dry sinks
SPACE FOR WASTE, SEWAGE	at least 0.03 m ² /per person; It is also necessary to provide a free area for opening the door inwards (at least 1.0 m ²)
DEVICE SPACE	A floor area is required according to the type of devices and installations envisaged by the designer, which is: for each manual generator for powering replacement electric lighting - at least (0.8 × 1.2) m = 0.96 m ² ; a minimum of 3 hand-held generators are required in a shelter for 300 people (these generators must be included in the electrical plan inventory); a minimum of 2 hand-held generators are required in a shelter for 200 people (these generators must be included in the electrical plan inventory); for each electrical distribution box - at least 1 m ² , in which case there should be at least 0.8 m of empty space in front of the cabinet; Two electrical distribution boxes are required in each shelter (for general and backup power supply); aeration devices and associated filters with a capacity for 100 persons shall require a free floor area of at least 2,5 m ² for each installation; in a shelter for 300 people, 3 devices for 100 people with associated filters are required; in a shelter for 200 people, 2 devices for 100 people with associated filters are required; free area for opening an ordinary door to this room - at least 1 m ² ; As a rule, all these devices must be in this room
SAND PRE-FILTER SPACE	according to the type, number, size and arrangement of units as envisaged by the designer in relation to the type of ventilation devices required; for ventilation devices with a capacity for 100 people, it is necessary to provide at least 2.0 m ² for each individual device (for air flow 100 m ³ /h, m ² for sand filling with a granulation of 4 to 8 mm)
WATER STORAGE	at least 0.025 m ² /per person
EQUIPMENT STORAGE	is not precisely defined, but the same area as needed to store water is sufficient
EMERGENCY EXIT (dilatated from the shelter structure)	at least one bend 90° in the vertical or horizontal direction and at least the following distance from the object: in the case of brick buildings, at least H/3 of the height of the building must be at the lower edge of the roof in the case of skeletal buildings, it must be at least H/4 of the height of the building at the bottom. the edge of the roof; corridor dimensions - at least (0.8×1.4) m - for a rectangular cross-section; shaft dimensions - at least (0.6×0.6) m - for a rectangular cross-section;

	The minimum thickness of the boards and walls of the corridor and the shaft of the emergency exit is 30 cm.
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SEALANTS

Characteristics of the shut-off devices at the boundary of the outer gas-tightness zone (external gate of the entrance barrier and external door of the emergency exit barrier):

impact-resistant, gas-tight, fire-rated EI-90, for an overpressure of 300 kPa (positive effect on the outside of the sash) and 20 % positive impact on the inside of the sash (as a negative impact), equipped on both sides with levers for opening and closing, equipped on the inside with latches to prevent uncontrolled opening from the outside, the structure must allow the door leaf to be removed from the frame from the inside in the closed position or must have accessories for hinged opening and debris removal behind the sash, the opening and closing directions must be indicated along the handles and the original declaration plate must be affixed to each sealing device fitted; The project envisages reinforced concrete external closing agents that meet the listed properties.

Characteristics of the shut-off devices at the boundary of the internal gas-tightness zone (internal doors of the entrance and emergency exit barriers, doors for the entrance to the waste and sewage compartment and doors for the entrance to the sand pre-filter compartment):

gas-tight, fire-rated EI-90, for an overpressure of 10 kPa (alternating in both directions), fitted on both sides with opening and closing levers, the opening and closing directions must be marked along the levers, and the original declaration plate must be affixed to each fitted closing device; The project provides for steel internal closing agents that meet the listed properties.

Properties of ordinary inter-room closures in the internal gas-tightness zone (water and equipment storage, washroom and toilet room, and appliance room):

they must be vibration-resistant, fitted on both sides with hooks and, in toilet cubicles, with a mechanism to prevent the toilet from opening when the toilet is occupied, with grilles to equalise the pressure wherever it is not otherwise possible to equalise the air pressure between spaces, with a self-closing mechanism on the doors intended for access to the toilets; The project provides for steel internal closing agents that meet the listed properties.

Ladder:

The passage through the emergency exit has a shaft at the end, so a ladder is provided there, and the ladder must also be installed on the wall under the steel door to enter the sand pre-filter compartment in the emergency exit barrier.

Partitions and doors for closing toilet cubicles:

these walls and doors are made of lightweight compact panels that are moisture resistant and easy to clean, and the accessories are made of a material that is well protected from corrosion; Cab access doors must have a handle on the outside to open the door leaf and a pin inside to prevent opening from the outside when the cab is occupied.

LIVING, SANITARY AND ANCILLARY EQUIPMENT FOR THE PROTECTIVE FUNCTION OF SHELTERS

The living quarters of the shelters will be equipped with the following living facilities:

- seat-couch and couchette combinations for the foreseeable number of persons, with the possibility of additional rearrangements, which the provided equipment allows; in terms of number, the equipment is specified for 1/3 of the sheltering places as beds and 2/3 of the sheltering places as seats, and it is also possible to rearrange for more beds or more seats; the equipment provided is free-standing;
- a rack for food and other necessities (one open rack for every 100 shelter spaces and one closed, two-part steel cabinet for each shelter).

Sanitary equipment for the shelter:

- water containers (for 3,0 litres/day per person for seven days) and an appropriate quantity of water preservative (for the total quantity distributed over the volume of water in each storage container)
- Lockers with first-aid kit (one medium-sized plastic suitcase for every 50 sheltering places, protected from moisture and dirt)
- sewage storage tanks (1 litre/day per person for seven days)

- Containers for storing faeces (1.3 litres/day per person for seven days)
- waste storage containers (2 litres/day per person for seven days)
- bags for these containers
- partitions for separating sanitary facilities and doors in these walls
- dry toilets (one for 34 people) and bags for dry toilets (100 pieces for one toilet)
- a washbasin (one sink for three toilets) and a hanger for the water bowl above the sink.

Auxiliary equipment for the shelter:

- a set of tools for rescue from rubble with a lifting device (according to Annex A, one set in a shelter of up to 100 shelters and two sets of 100 to 300 shelter places)
- Water fire extinguishers and stretchers (according to Annex A)
- signs of access to the shelter and indication of the direction of emergency exits, as well as designations of individual internal shelter spaces
- information markings (shelter order and plan with drawn escape routes).

VENTILATION OF THE SHELTER IN A PROTECTIVE FUNCTION

The purpose and size or capacity of the shelter for the protective function shall include a forced ventilation system for each individual shelter. The provided ventilation system in the protective function in the shelter shall ensure normal and protective ventilation and a rapid transition from one mode of ventilation to another or to the state of isolation of the shelter. Such a ventilation system, on a limited scale and with minor modifications, shall allow shelters to be ventilated even in the function of shelters for other purposes, if this is permitted by the supply of fresh air and overpressure in the shelters, which limits the purpose of the premises directly adjacent to both shelters.

General - description of the ventilation system

In the protective function of the shelter, immediately after the entry of the anticipated number of persons, it is necessary to close and close (block against opening from the outside) all doors leading to the shelter through the walls of the outer and inner gas zones.

For air supply, 3 ventilation devices are planned in the shelter for 300 people, each with a capacity for 100 shelter places. In the shelter for 200 people, two ventilation devices are planned, each with a capacity for 100 sheltering places.

The devices are installed and connected to the ventilation system in the premises with devices, which is located in the internal gasification zone of each shelter. These devices capture outside the environment outside the rubble area, through the emergency exit corridor through shock valves and built-in coarse dust filters into the sand pre-filter spaces, and from there over the sand or through the sand - depending on the ventilation method, into the interior of the shelters. The air supply exchanges used air (including exhaled CO₂) and removes heat, increased air humidity and human odours from shelters.

The exhaust of air from each shelter is carried out from the residential part of the shelter through the entrance barriers (through each barrier 60%) and from the sanitary facilities through the waste, sewage and faeces storage facilities (40%) as a result of the pressure difference between the inside of each shelter in which there is overpressure and the exterior directly next to each shelter.

These devices shall be positioned in such a way that it is possible to simultaneously operate manually with the drive levers (for each device two persons at the same time).

During the use of shelters in the protective function, the following modes of ventilation or condition are enabled:

- normal ventilation when the outside air is clean and has a normal temperature depending on the current external state
- protective ventilation due to high ambient air or ambient temperatures
- protective ventilation due to radiological, biological or chemical contamination of ambient air or the environment

- the state of isolation of the shelter, which means complete elimination from the environment by closing all shut-off devices and valves and ceasing of operation of all installed ventilation devices, which is applied directly in the event of an attack by RBK means, in the event of similar accidents (natural or technological) in the environment or in the event of a high concentration of CO in the ambient air. This condition also applies, exceptionally, if there is a breakdown of devices and installations, but only for a short time.

Normal radiation

It is used during the use of shelters until the receipt of information about an enemy attack or in similar circumstances in the immediate vicinity of shelters. In this case, clean or harmless dust and particle-contaminated ambient air is collected and supplied from the external environment, which is cleaned only in coarse dust filters. In this method of aeration, the prescribed and required amount of fresh air is at least 6 m³/h per person. Ventilation devices can be driven by electric motors or, if the power supply is interrupted, by levers and manual drive. During the operation of the ventilation system in this mode, the overpressure in each shelter is not limited by regulation, but is usually up to 350 Pa.

Protective ventilation due to high ambient air or ambient temperatures

It is necessary to switch to this method of ventilation immediately after receiving the information or upon one's own determination of any attack or change in the situation in the external environment of the shelters. In this aeration, air is collected from the outside environment and supplied to the shelter through coarse dust filters and then through a sand pre-filter, where the air is cooled and the concentration of CO and natural air humidity are partially reduced. This method of ventilation requires a minimum of 2 m³/h per person to be supplied to each shelter. The ventilation devices can be driven by electric motors or with the built-in manual drive option. During the operation of the ventilation system, in this mode, the overpressure in each shelter is limited to a value between 50 and 200 Pa.

Protective ventilation due to radiological, biological or chemical contamination of ambient air or the environment

It is necessary to switch to this method of ventilation immediately after receiving the data or upon one's own finding of this type of outdoor air pollution in the outdoor environment of shelters. In this aeration, the air, after flowing through the coarse dust filters and through the sand pre-filter, is directed through the RBK protection filters. In the case of protective ventilation, the total volume of air supplied to the shelter shall be at least 2 m³/h per person. The ventilation devices can be driven by electric motors or with the built-in manual drive option. During the operation of the ventilation system, in this mode, the overpressure in the shelter is limited to a value between 50 and 200 Pa.

Shelter insulation status

In a state of isolation, the time of stay is limited by the amount of air in a particular shelter in the sense that for one hour of stay it is necessary to provide 1.5 m³ of air space per person.

It is necessary to switch to the state of insulation in the following cases:

- in the event of a fire in the immediate vicinity of the building in which the shelters are located, when the sand pre-filter is no longer able to cool the outside air and the air temperature at the entrance to the shelter is higher than 30 °C
- at high concentrations of CO in the immediate external environment of shelters
- upon receipt of a communication or own conclusion of heavy ambient air pollution by RBK means
- if, during protective ventilation, malfunctions or saturation occur in appliances and installations, as well as air supply and purification filters.

When switching to the state of insulation, it is necessary to simultaneously and very quickly close all suction pipe inlets with the help of quick-closing flaps (they are installed directly next to the ventilation devices) and all drain valves for overpressure regulation (they are located on the inside of the walls between the living area of the individual shelter and the entrance barrier and between the toilets and the waste, sewage and faeces storage).

The possible duration of the isolation state is from one to a maximum of three hours, which must be specified in the operation and maintenance project for each shelter. During the state of insulation, the overpressure in the shelter slowly decreases, the content of exhaled carbon dioxide increases, the air humidity and air temperature increase, and the oxygen content in the interior of the shelter decreases.

VENTILATION INSTALLATIONS AND INSTALLATIONS

The procedures for the transition from one mode of ventilation to another and the positions of the individual flaps or valves must be prescribed by means of a diagram and instructions, which must be placed in a visible place in the installation space and with detailed instructions in the operation and maintenance (POV) design.

Devices for protection against air shock wave

Fixed installed parts (straight and angled pipes with flanges for attaching valves to the air inlet and outlet from shelters, overpressure gauge tube, cable sealing pipes, etc.) must be installed and firmly clamped between the formwork before concreting the walls of the shelters and connected to the intended reinforcement mesh.

The built-in parts are:

- Fresh air hoses at the emergency exit shaft
- Pipes for anti-shock valves
- Pipes for supplying air to ventilation devices in normal ventilation mode
- air supply pipes to ventilation devices in protective ventilation mode
- Valve tubes for overpressure control
- Valve pipes for exhaust air from the entrance barrier and from the waste, sewage and faeces storage facility
- overpressure gauge tubes
- pipes for draining condensation water from sand prefills, and
- pipes for gas cable passages.

The pipes of the exhaust air valves must have openings on the outside protected by protective grilles, by the bends of the reinforced concrete structure and, if necessary - in the event of direct exposure to external influences, also by shock plates, and the inlet opening must be protected by protective meshes and bends already at the air intakes and in the corridors of the emergency exits.

The following valves are upgraded to the flanges of the concreted pipes located on the inside of the premises during the final installation:

- Shock protection valves for shock wave protection
- quick-release valves for quick gas-tight shut-off of air intakes, conveniently positioned at a height where quick manual intervention and regular maintenance are possible from the ground
- overpressure control valves or suitable valve combinations with latches on the air outlets, located at a height where quick manual intervention and regular maintenance are possible from the ground
- anti-shock valves to regulate overpressure on air outlets, conveniently installed for quick intervention and regular maintenance
- grommets for double-sided cable sealing through all walls with gas-tightness requirements.

Air purification and cooling devices

These devices are:

- Coarse powder filters
- Sand pre-filters
- filters for RBK-protection

Air supply, distribution and control devices

These devices are:

- quick-release valves or shut-off valves, they must be located at a height where rapid manual intervention and regular maintenance can be carried out from the ground
- control valves must be installed at a height where rapid manual intervention and regular maintenance can be carried out from the ground

- Electrically and hand-operated ventilation devices
- Displays for controlling the amount of air flow at the air outlet from ventilation devices
- Pipelines with control flaps for air distribution throughout the interior of the shelter
- Control ventilation valves for uniform air supply to the interior of the shelter
- overpressure gauges in shelters with connection to the external atmosphere - to the corridor of the emergency exit
- thermometers for controlling the air temperature in shelters
- hygrometers for control of relative humidity in shelters
- detectors for the control of the presence of carbon monoxide (CO) in the supplied air.

IMPLEMENTATION AND INSTALLATION OF VENTILATION INSTALLATION DEVICES

Anti-shock valves

They need to be installed on the flanges of pre-concreted pipes on the inside of the sand pre-fill spaces. They must be fastened with all the screws provided and suitable in the correct position.

Sand pre-filters

The grid blocks and all connecting pieces must be hot-dip galvanized. Condensation water drainage pipes must be directed to the emergency exit barrier and installed when concreting the walls of shelters. The inner end of the pipe must be in the space of the sand pre-filter at the lowest point of the decreasing pressure (pressure inclination of at least 2 % in the direction of the outlet tube). A latch must be installed on the outside of the pipe to tightly close the pipe.

Under the latch there should be a hole or galvanized container with a volume of at least 7 liters. In this state, the authorized organization must carry out the first check of the adequacy of the execution - the slope of the floor, the adequacy of the execution and the connection of the steel blocks, as well as the adequacy of the installation location of the condensate water outlet pipe.

After a written assessment of the suitability of the implementation, it is necessary to pour certified granulate with the appropriate grain size (4-8 mm) into the room to the intended height (1.2 m above the upper surface of the grate blocks), which must be completely dry and dedusted. Granulate of volcanic (eruptive) origin or natural washed and dried river granulate for the preparation of concrete is prescribed. The granulation and filling height of the two sand fillers is the same.

RBK-protection filters

They are used to clean the air that is contaminated with RBK-agents. They must be connected to the air circulation, by means of movable hose connections, only after receiving a notification or after one's own determination of such contamination of the ambient air. Filters do not filter polluted air with carbon monoxide.

Coarse powder filters

Filters must be installed with carrier nets in the prepared fittings on the impact valves.

Ventilation devices

Each device consists of the following parts:

- Supporting frame with attachment brackets that are resistant to vibrations of the structure (on shock absorbers)
- Fan
- indicator for continuous checking of the amount or flow of air in all ventilation modes
- Reducer with extended axis and lever for manual drive
- Electric motor
- connecting pipe pieces on the suction and pressure sides and movable pipes with flanges for quick connection of the filter for RBK protection.

The device is powered by an electric motor, and in the event of an external power failure, it is powered by one or a maximum of two adults, for which, depending on the type of device, there must be enough space.

Air distribution devices

Galvanized steel spiro ventilation pipes with all the necessary parts for connection and accessories for the vibration-resistant method of fastening the structure are provided. The pipes shall be fixed under the ceiling according to a plan which takes into account the arrangement of housing, sanitation, ancillary equipment and equipment for the function of shelters for other purposes. Painting these pipes is not necessary. On the pipes are installed ventilation valves for regulated air supply and control flaps for setting and distributing the required volumes on all branches of the pipelines for air distribution.

Overpressure control valves with shut-off damper

The valves are mounted on the flanges of pre-concreted pipes and regulate the overpressure in the shelters when ventilating the shelters in the protective function (in normal and in the protective ventilation mode), and they are regulated in such a way that the overpressure in the internal shelter spaces is in the prescribed range (between 50 and 200 Pa). The regulation is carried out after all valves have been installed and is set to a proportion of 60 % of the exhaust of used air through the inlet barriers and a proportion of 40 % of the used air through the toilets and the waste, sewage and faeces storage. To restore the state of insulation in shelters, quick-closing shut-off flaps are installed in the extension of these valves. With such a valve combination, it is possible to constantly adjust the overpressure, flow rates and the proportion of exhaust air used.

Overpressure control valves

They need to be attached to the flanges of pre-concreted pipes to drain air from the entrance barrier and from the waste, sewage and faeces storage. The flanges of the concreted pipes must be completely vertical, because this is a condition for the proper operation of these valves. On the outside of these valves, the openings must be protected by rodent, bird and insect protection nets and by shock protection plates wherever the outer openings of the valves are directly exposed to the action of the shock wave or weapons.

VENTILATION OF SHELTER IN FUNCTION FOR ANOTHER PURPOSE

Natural ventilation of shelters is made possible by means of open or closed doors and open valves.

Forced ventilation is made possible by periodically switching on the built-in ventilation devices, using the entire ventilation system for a protective function in normal ventilation mode. All these procedures and instructions must be included in the operation and maintenance design for each shelter that the contractor or contractor is required to construct and must also inform at least one authorized representative of the user for each shelter of these procedures.

No additional devices and installations are provided for the peacetime function.

PIPES AND GLANDS FOR SEALING CABLES

This project covers all the necessary pipes and gaskets to seal the passages of all weak and strong cables, as well as tubes for overpressure gauges and cables for carbon monoxide detector probes. An RGP sealing system is provided. According to this system, it is also possible to replace cables later or install additional cables without making additional holes in the walls.

DEVICES FOR THE CONTROL OF MICROCLIMATIC CONDITIONS

Overpressure gauge

It must be fixed in a conspicuous place in the room with devices at a height of 1.8 m from the floor. One terminal of the meter shall be subjected to overpressure in the shelter, the other connector shall be connected by a tube to the emergency outlet to a point where there is as little air vortex as possible when the shelter is ventilated, at least from the opening of the nearest shock valve and shall be closed by the valve until the meter is used. The tube must be sealed through the walls with the gasification requirement in the same way as the electrical cables. 1,5 m

Thermometer and hygrometer

These two instruments are intended for the control of the thermal environment in shelters during use in a protective function and occasionally also in the function of shelters for another purpose. They must be installed next to the gauge.

A conventional measuring kit for living spaces can be used.

Detector for monitoring the presence of carbon monoxide in the supply air

The control-signal part of the detector must be located in the room with the devices, it must have a light and sound alarm, and the probe (sensor) must be above the heaped sand granulate in the space of the sand

pre-filter. The detector must be connected to the power connectors (24 V and 230 V). The alarm threshold on the detector must be calibrated to a concentration of 50 ppm of toxic CO gas.

SANITARY FACILITIES

For the protective function of shelters, dry toilets (plastic housing with seat and lid, as well as buckets and bags) are provided. For storing water, a special room with plastic containers (handles with taps) is provided, into which, during the preparation of the shelter for the protective function, clean water for drinking and personal hygiene is poured. In a special, gas-separated room, dry waste, sewage, and faeces are stored in larger plastic containers and plastic bags.

GENERAL INSTRUCTIONS FOR CONTRACTORS

TAGS

The directions of opening and closing of the door leaf in a logical direction and shape must be clearly marked on both sides (along the handles). Access to shelters must be marked in a logical direction and form, and must guide staff and students from the ground floor of the facility to each individual shelter. Indoor shelter spaces must be marked with inscriptions on the walls or above the doors for access to individual spaces, and access to the emergency exit inside each shelter must also be marked. A shelter order must be present in the living area, with the content specified for these spaces and a plan with routes of retreat.

CERTIFICATES FOR EMBEDDED APPLIANCES

(downloaded from the website of the Protection and Rescue Directorate of the Republic of Slovenia)

The technological equipment of shelters must be installed and implemented in accordance with the Rules on Technical Standards for Shelters and Shelters (Official Gazette of the Republic of Slovenia No. 17/98, 26/98, amended 25/00, 38/01 and 66/06) and the Construction Products Act (ZGPro-1, Official Gazette of the Republic of Slovenia No. 52/00, 110/02 and 82/2013) (hereinafter referred to as ZGPro-1) for non-harmonised products, and in accordance with Delegated Regulation (EU) No 574/2014 for harmonised products.

The shelter elements envisaged to be installed must be tested and certified prior to installation. Pursuant to Article 13 of the Building Act (GZ, Official Gazette of the Republic of Slovenia, Nos. 61/17 and 72/17 as amended), construction supervision is responsible, among other things, to accept, collect and verify certificates of conformity and suitability of construction and other products, materials and equipment from all contractors.

Tests of the technological equipment of shelters are carried out by accredited laboratories in accordance with Delegated Regulation (EU) No. 574/2014 for harmonized products and the Construction Products Act ZGPro-1 for non-harmonized products. In accordance with Article 12 of the ZGPro-1, the manufacturer must submit the declarations in Slovenian. The list of accredited laboratories in the European Union is called the NANDO database and is located: <https://ec.europa.eu/growth/tools-databases/nando/index.cfm>.

CORROSION PROTECTION

All devices must be pre-protected and finished painted by the manufacturer, with the exception of the steel parts of reinforced concrete doors, which are protected against corrosion by a primer and finished painted on the building with a paint specified by the architect. When painting these doors, it is necessary, beforehand, to protect all sealing tapes and strips of laminate to protect the seals from thermal influence, as well as lubricants for lubricating the door hinges and plates with an indication of the type, type and quality of the elements. Coatings for corrosion protection after air drying must not emit toxic substances at a temperature of 363 K.

TECHNICAL TEST OF THE SHELTER

After the completion of the installation of all devices and installations, it is necessary to check the properties, characteristics, quality and functionality of each individual shelter as a whole in accordance with the instructions prescribed by the Administration of the Republic of Slovenia for Protection and Rescue on the basis of the Rules on Technical Norms for Shelters and Shelters. After rectifying any deficiencies identified in the technical test by the technical examiner of the approved body, the approved organisation shall issue a certificate of completion of the technical test for each individual shelter, which shall be a prescribed document for demonstrating suitability and final performance for the technical inspection of the facility as a whole and thus for obtaining an operating permit. This document must be valid for ten years.

At the time of the technical test, each shelter must be fully equipped for a protective function and, after a positive assessment by an authorised technical inspector, it is permissible to dismantle the housing, sanitary and auxiliary equipment and to store it in an orderly manner in those areas of each shelter which are not intended to be used as shelters for another purpose. A special space shall be provided in the shelters for the purpose of storing equipment. The room with the equipment for the protective function must be locked to protect this equipment from damage, dirt and theft. When dismantling equipment, it is necessary to do so only for those parts of the equipment that absolutely need to be removed due to the installation of equipment for the function of shelters for another purpose. Individual components or the entire system for the ventilation of shelters in a protective function, control and communication devices and installations, shut-off devices and electrical installations and installations shall not be dismantled.

The design of all internal partitions and fittings (e.g. racks, cabinets, bicycle racks) for the function of shelters for another purpose must be dismantled and interchangeable with equipment for the protective function of shelters within a maximum of 24 hours.

During the technical test, the contractors or suppliers of the equipment must submit all the required supporting documentation, and the designer must submit a study on the conversion of an individual shelter from a function for another purpose (peacetime) to a protective (shelter) function, with all instructions on the manner of use, servicing and maintenance of individual installed devices and installations and the entire shelter and the design of the works performed.

Any changes during construction must also be confirmed by the organisation that carried out the revision of the project documentation, which must provide its expert opinion in writing. The construction site management and supervision should also have a report and a certificate of the audit carried out on the construction site. It is also necessary to take into account all the instructions of the auditors, which are recorded in the audit report.

INSTRUCTIONS FOR SAFE WORK

When constructing and equipping shelters, it is necessary to fully and professionally comply with all applicable regulations for safe work and protection of the health of employees and passers-by, for fire protection and for environmental protection, and to take into account all the experience of positive practice for this type of construction.

/		/		/			
Sprememba:		Opis spremembe:		Datum spr.:		Podpis:	
Investitor:  Univerza v Ljubljani Kongresni trg 12 1000 Ljubljana, Slovenija				Gradnja/Objekt: Fakulteta za strojništvo			
Projektant:  DRUŽBA ZA INŽENIRING, STORITVE, TRGOVINO IN PROIZVODNJO d.o.o.				Del objekta/sistem: Zaklonišče			
				Vrsta načrta: 4 NAČRT S PODROČJA STROJNIŠTVA			
		Ime in priimek:		Ident. št.:		Vsebina risbe (dokumenta): Tehnični izračun prezračevanja	
Vodja projektiranja:		Boštjan Vuga, univ. dipl. inž. arh., grad. dip. (AA)		ZAPS 0035 PA PPN			
Pooblaščen inženir:		Marko Lubej, univ. dipl. inž. str.		IZS S-0739			
				Številka projekta:		362-19	
Izdela:				Klasifikac. oznaka:		-	
Datum izdelave:		22.11.2023		Merilo:		/	
				Identifikac. oznaka:		J U L F S - - 7 S 0 1 0 2	
						Spr.:	

TEHNIČNI IZRAČUN PREZRAČEVANJA

**ZA ZAŠČITNO FUNKCIJO DVEH DVONAMENSKIH ZAKLONIŠČ OSNOVNE ZAŠČITE,
ENO S KAPACITETO ZA 300 OSEB IN ENO S KAPACITETO ZA 200 OSEB,
V OBJEKTU UL - FAKULTETA ZA STROJNIŠTVO V LJUBLJANI**

Potrebne količine zraka:

n_1	= predvideno število zaklonilnih mest v večjem zaklonišču	= 300 oseb
n_2	= predvideno število zaklonilnih mest v manjšem zaklonišču	= 200 oseb
V_{nz}	= minimalna količina zraka za osebo pri normalnem zračenju	= 6,0 m ³ /h
V_{zz}	= minimalna količina zraka za osebo pri zaščitnem zračenju	= 2,0 m ³ /h
N_{pn}	= potrebno število oseb za pogon posamezne prezračevalne naprave hkrati	= 2 osebi
V_{pn}	= količina zraka za vsako osebo, ki poganja prezračevalno napravo	= 10 m ³ /h
H	= višina notranjih prostorov v zakloniščih	= 2,70 m

Predpisana minimalna količina zraka pri zaščitnem načinu zračenja zaklonišča

po zahtevi za zaščitno zračenje za 300 oseb $\times$ 2,0 m ³ /h za osebo v večjem zaklonišču	= 600 m ³ /h
po zahtevi za zaščitno zračenje za 200 oseb $\times$ 2,0 m ³ /h za osebo v manjšem zaklonišču	= 400 m ³ /h

Pri tem načinu zračenja je nadtlak omejen in mora biti med 50 in 200 Pa.

Predpisana minimalna količina zraka pri normalnem načinu zračenja zaklonišča

po zahtevi za normalno zračenje za 300 oseb $\times$ 6,0 m ³ /h za osebo v večjem zaklonišču	= 1800 m ³ /h
po zahtevi za normalno zračenje za 200 oseb $\times$ 6,0 m ³ /h za osebo v manjšem zaklonišču	= 1200 m ³ /h

Nadtlak pri tem načinu zračenja ni omejen, običajno pa je do 350 Pa.

**Pretok zraka pri nasipni višini peska 1,2 m nad zgornjo ploskvijo rešetke,
z granulacijo od 4 do 8 mm, s specifično površino 6 m²/g,
za ostrorobi granulat vulkanskega porekla:**

$$= 100 \text{ (m}^3\text{/h)/m}^2$$

Dovod zraka preko peščenega predfiltra:

Tlorisna površina peščenega predfiltra v večjem zaklonišču:	= 6,7 m ²
Dovedeni zrak v večjem zaklonišču:	$6,7 \text{ m}^2 \times 100 \text{ m}^3\text{/h/m}^2 = 670 \text{ m}^3\text{/h}$
Tlorisna površina peščenega predfiltra v manjšem zaklonišču:	= 5,03 m ²
Dovedeni zrak v manjšem zaklonišču:	$5,03 \text{ m}^2 \times 100 \text{ m}^3\text{/h/m}^2 = 503 \text{ m}^3\text{/h}$

V večjem zaklonišču so potrebne tri prezračevalne naprave, vsaka s kapaciteto za 100 oseb.

V manjšem zaklonišču sta potrebni dve prezračevalni napravi, vsaka s kapaciteto za 100 oseb.

Vmesne cevne povezave z regulacijskimi loputami za priključitev posamezne prezračevalne naprave na dovodna priključka normalnega in zaščitnega zračenja omogočajo natančno nastavitve količine dovedenega zraka na dejansko zahtevano količino pri obeh načinih zračenja. To je omogočeno tudi pri povišanih padcih tlaka zaradi delno že zamašenih filtrov za grobi prah, polnila peščenega predfiltra in tudi delno zmanjšane pretočnosti filtrov za RBK zaščito. Pri tem uravnavanju pretokov zraka se uspešno uravnava tudi nadtlak v posameznem zaklonišču.

Okrajšave v nadaljevanju pomenijo:

ÜV-ESV 75	- funkcionalni naziv:	protiudarni ventil za uravnavanje nadtlaka
	- originalni naziv:	nadtlačni eksplozijsko-zaščitni ventil
ALV 150	- funkcionalni naziv:	ventil za uravnavanje nadtlaka
	- originalni naziv:	regulacijski ventil za odvod zraka

Odvod zraka pri zaščitnem zračenju

(pri dovodu zraka 600 m³/h v večjem zaklonišču in 400 m³/h v manjšem zaklonišču - izračun je izveden na zahtevano količino zraka pri zaščitnem načinu zračenja, ki je najmanj 2,0 m³/h za osebo):

Preko zapore vhoda:

volumen zapore vhoda v večjem zaklonišču:	16,41 m ² × 2,70 m	≈ 44,31 m ³
delež zraka ≈ 60 % od 600 m ³ /h		≈ 360 m ³ /h
število izmenjav zraka v zapori vhoda v večjem zaklonišču:		≈ 8,1-krat
volumen zapore vhoda v manjšem zaklonišču:	8,08 m ² × 2,70 m	≈ 21,82 m ³
delež zraka ≈ 60 % od 400 m ³ /h		≈ 240 m ³ /h
število izmenjav zraka v zapori vhoda v manjšem zaklonišču:		≈ 11,0-krat

prehod skozi steno med bivalnim prostorom in zaporo vhoda v večjem zaklonišču:

2 × ALV 150	zaprta z zapornima loputama	
2 × ALV 150	Δp = 55 Pa (H ≈ 7÷8 mm; 2 × 180 m ³ /h)	= 360 m ³ /h
<u>prehod skozi steno med zaporo vhoda in zunanostjo večjega zaklonišča:</u>		
4 × ÜV-ESV 75	Δp = 80 Pa (4 × 90 m ³ /h)	= 360 m ³ /h
	Δp = 135 Pa	Q_{zv} = 360 m³/h

prehod skozi steno med bivalnim prostorom in zaporo vhoda v manjšem zaklonišču:

2 × ALV 150	zaprta z zapornima loputama	
1 × ALV 150	Δp = 55 Pa (H ≈ 10 mm; 1 × 240 m ³ /h)	= 240 m ³ /h
<u>prehod skozi steno med zaporo vhoda in zunanostjo manjšega zaklonišča:</u>		
3 × ÜV-ESV 75	Δp = 65 Pa (3 × 80 m ³ /h)	= 240 m ³ /h
	Δp = 120 Pa	Q_{zv} = 240 m³/h

Preko skladišča odpadkov in odplak:

volumen skladišča odpadkov in odplak v večjem zaklonišču:	$10,10 \text{ m}^2 \times 2,70 \text{ m}$	$\approx 27,27 \text{ m}^3$
delež zraka $\approx 40\%$ od $600 \text{ m}^3/\text{h}$		$\approx 240 \text{ m}^3/\text{h}$
število izmenjav zraka v skladišču odpadkov in odplak v večjem zaklonišču:		$\approx 8,8\text{-krat}$
volumen skladišča odpadkov in odplak v manjšem zaklonišču:	$8,59 \text{ m}^2 \times 2,70 \text{ m}$	$\approx 23,19 \text{ m}^3$
delež zraka $\approx 40\%$ od $400 \text{ m}^3/\text{h}$		$\approx 160 \text{ m}^3/\text{h}$
število izmenjav zraka v skladišču odpadkov in odplak v manjšem zaklonišču:		$\approx 6,9\text{-krat}$

prehod skozi steno med sanitarijami in skladiščem odpadkov in odplak v večjem zaklonišču:

2 $\times$ ALV 150	zaprt z zapornima loputama	
1 $\times$ ALV 150	$\Delta p = 60 \text{ Pa}$ ($H \approx 8 \div 9 \text{ mm}$; $1 \times 240 \text{ m}^3/\text{h}$)	$= 240 \text{ m}^3/\text{h}$
<u>prehod skozi steno med skladiščem odpadkov in odplak in zunanostjo večjega zaklonišča:</u>		
3 $\times$ ÜV-ESV 75	$\Delta p = 75 \text{ Pa}$ ($3 \times 80 \text{ m}^3/\text{h}$)	$= 240 \text{ m}^3/\text{h}$
	$\Delta p = 135 \text{ Pa}$	$Q_{\text{sfo}} = 240 \text{ m}^3/\text{h}$

prehod skozi steno med sanitarijami in skladiščem odpadkov in odplak v manjšem zaklonišču:

1 $\times$ ALV 150	zaprt z zaporno loputo	
1 $\times$ ALV 150	$\Delta p = 55 \text{ Pa}$ ($H \approx 6 \div 7 \text{ mm}$; $1 \times 160 \text{ m}^3/\text{h}$)	$= 160 \text{ m}^3/\text{h}$
<u>prehod skozi steno med skladiščem odpadkov in odplak in zunanostjo manjšega zaklonišča:</u>		
2 $\times$ ÜV-ESV 75	$\Delta p = 65 \text{ Pa}$ ($2 \times 80 \text{ m}^3/\text{h}$)	$= 160 \text{ m}^3/\text{h}$
	$\Delta p = 120 \text{ Pa}$	$Q_{\text{sfo}} = 160 \text{ m}^3/\text{h}$

Skupna odvedena količina zraka iz večjega zaklonišča:

$$Q_{\text{sk}} = Q_{\text{zv}} + Q_{\text{sfo}} = 600 \text{ m}^3/\text{h}$$

Skupna odvedena količina zraka iz manjšega zaklonišča:

$$Q_{\text{sk}} = Q_{\text{zv}} + Q_{\text{sfo}} = 400 \text{ m}^3/\text{h}$$

Pri zaščitnem zračenju ($Q = 600 \text{ m}^3/\text{h}$) je nadtlak v notranjosti večjega zaklonišča med 135 in 145 Pa, kar ustreza zahtevi (med 50 in 200 Pa).

Pri zaščitnem zračenju ($Q = 400 \text{ m}^3/\text{h}$) je nadtlak v notranjosti manjšega zaklonišča med 120 in 130 Pa, kar ustreza zahtevi (med 50 in 200 Pa).

Odvod zraka pri normalnem zračenju

(pri dovodu zraka 1800 m³/h v večjem zaklonišču in 1200 m³/h v manjšem zaklonišču - izračun je izveden na zahtevano količino zraka pri normalnem načinu zračenja, ki je najmanj 6,0 m³/h za osebo):

Preko zapore vhoda:

volumen zapore vhoda v večjem zaklonišču:	16,41 m ² × 2,70 m	≈ 44,31 m ³
delež zraka ≈ 60 % od 1800 m ³ /h		≈ 1080 m ³ /h
število izmenjav zraka v zapori vhoda v večjem zaklonišču:		≈ 24,3-krat
volumen zapore vhoda v manjšem zaklonišču:	8,08 m ² × 2,70 m	≈ 21,82 m ³
delež zraka ≈ 60 % od 1200 m ³ /h		≈ 720 m ³ /h
število izmenjav zraka v zapori vhoda v manjšem zaklonišču:		≈ 33,0-krat

prehod skozi steno med bivalnim prostorom in zaporo vhoda v večjem zaklonišču:

2 × ALV 150	Δp = 65 Pa	(H ≈ 13÷14 mm; 2 × 330 m ³ /h)	= 660 m ³ /h
2 × ALV 150	Δp = 65 Pa	(H ≈ 7÷8 mm; 2 × 210 m ³ /h)	= 420 m ³ /h
<u>prehod skozi steno med zaporo vhoda in zunanostjo večjega zaklonišča:</u>			
4 × ÜV-ESV 75	Δp = 115 Pa	(4 × 270 m ³ /h)	= 1080 m ³ /h
	Δp = 180 Pa		Q_{zv} = 1080 m³/h

prehod skozi steno med bivalnim prostorom in zaporo vhoda v manjšem zaklonišču:

2 × ALV 150	Δp = 100 Pa	(H ≈ 6÷7 mm; 2 × 200 m ³ /h)	= 400 m ³ /h
1 × ALV 150	Δp = 100 Pa	(H ≈ 10 mm; 1 × 320 m ³ /h)	= 320 m ³ /h
<u>prehod skozi steno med zaporo vhoda in zunanostjo manjšega zaklonišča:</u>			
3 × ÜV-ESV 75	Δp = 80 Pa	(3 × 240 m ³ /h)	= 720 m ³ /h
	Δp = 180 Pa		Q_{zv} = 720 m³/h

Preko skladišča odpadkov in odplak:

volumen skladišča odpadkov in odplak v večjem zaklonišču:	$10,10 \text{ m}^2 \times 2,70 \text{ m}$	$\approx 27,27 \text{ m}^3$
delež zraka $\approx 40\%$ od $1800 \text{ m}^3/\text{h}$		$\approx 720 \text{ m}^3/\text{h}$
število izmenjav zraka v skladišču odpadkov in odplak v večjem zaklonišču:		$\approx 26,4\text{-krat}$
volumen skladišča odpadkov in odplak v manjšem zaklonišču:	$8,59 \text{ m}^2 \times 2,70 \text{ m}$	$\approx 23,19 \text{ m}^3$
delež zraka $\approx 40\%$ od $1200 \text{ m}^3/\text{h}$		$\approx 480 \text{ m}^3/\text{h}$
število izmenjav zraka v skladišču odpadkov in odplak v manjšem zaklonišču:		$\approx 20,7\text{-krat}$

prehod skozi steno med sanitarijami in skladiščem odpadkov in odplak v večjem zaklonišču:

$2 \times \text{ALV } 150$	$\Delta p = 70 \text{ Pa}$	$(H \approx 7 \div 8 \text{ mm}; 2 \times 235 \text{ m}^3/\text{h})$	$= 470 \text{ m}^3/\text{h}$
$1 \times \text{ALV } 150$	$\Delta p = 70 \text{ Pa}$	$(H \approx 8 \div 9 \text{ mm}; 1 \times 250 \text{ m}^3/\text{h})$	$= 250 \text{ m}^3/\text{h}$
<u>prehod skozi steno med skladiščem odpadkov in odplak in zunanostjo večjega zaklonišča:</u>			
$3 \times \ddot{\text{UV}}\text{-ESV } 75$	$\Delta p = 110 \text{ Pa}$	$(3 \times 240 \text{ m}^3/\text{h})$	$= 720 \text{ m}^3/\text{h}$
	$\Delta p = 180 \text{ Pa}$		$Q_{\text{sfo}} = 720 \text{ m}^3/\text{h}$

prehod skozi steno med sanitarijami in skladiščem odpadkov in odplak v manjšem zaklonišču:

$1 \times \text{ALV } 150$	$\Delta p = 100 \text{ Pa}$	$(H \approx 9 \text{ mm}; 1 \times 300 \text{ m}^3/\text{h})$	$= 300 \text{ m}^3/\text{h}$
$1 \times \text{ALV } 150$	$\Delta p = 100 \text{ Pa}$	$(H \approx 6 \div 7 \text{ mm}; 1 \times 180 \text{ m}^3/\text{h})$	$= 180 \text{ m}^3/\text{h}$
<u>prehod skozi steno med skladiščem odpadkov in odplak in zunanostjo manjšega zaklonišča:</u>			
$2 \times \ddot{\text{UV}}\text{-ESV } 75$	$\Delta p = 80 \text{ Pa}$	$(2 \times 240 \text{ m}^3/\text{h})$	$= 480 \text{ m}^3/\text{h}$
	$\Delta p = 180 \text{ Pa}$		$Q_{\text{sfo}} = 480 \text{ m}^3/\text{h}$

Skupna odvedena količina zraka iz večjega zaklonišča:

$$Q_{\text{sk}} = Q_{\text{zv}} + Q_{\text{sfo}} = 1800 \text{ m}^3/\text{h}$$

Skupna odvedena količina zraka iz manjšega zaklonišča:

$$Q_{\text{sk}} = Q_{\text{zv}} + Q_{\text{sfo}} = 1200 \text{ m}^3/\text{h}$$

Pri normalnem zračenju ($Q = 1800 \text{ m}^3/\text{h}$) je nadtlak v notranjosti večjega zaklonišča med 180 in 190 Pa.

Nadtlak pri normalnem načinu zračenja ni omejen.

Pri normalnem zračenju ($Q = 1200 \text{ m}^3/\text{h}$) je nadtlak v notranjosti manjšega zaklonišča med 180 in 190 Pa.

Nadtlak pri normalnem načinu zračenja ni omejen

OPOZORILO!

Vsi prevodi v angleščino so strojno izdelani in zgolj informativne narave.
V primeru kakršnekoli nejasnosti ali dvoma izključno velja izvirno besedilo v slovenščini.

WARNING!

All translations into English have been produced by machine translation and are provided for informational purposes only. In the event of any ambiguity or uncertainty, the original Slovenian text shall prevail exclusively.

/		/		/	
Sprem./Rev.:		Opis spremembe/Description of Changes:		Datum/Date:	
Investitor/Investor:		Gradnja/Facility			
 Univerza v Ljubljani Kongresni trg 12 1000 Ljubljana, Slovenija		Fakulteta za strojništvo/Faculty of Mechanical Engineering			
Projektant/Design Engineer:		Del objekta/sistem/Building/System:			
 VAREN d.o.o. Dogoška cesta 35 2000 Maribor, Slovenija		ZAKLONIŠČE/SHELTER			
Projektant/Design Engineer:		Vrsta načrta/Documentation:			
		4 NAČRT S PODROČJA STROJNIŠTVA/ DOC. IN THE FIELD OF MECHANICAL ENGINEERING			
Ime in priimek/Name and Surname:		Id. št./Id. No:		Vsebina risbe (dokumenta)/Document Title:	
Vodja proj./Des. Manager:	Boštjan Vuga, univ. dipl. inž. arh., grad. dip. (AA)	ZAPS 0035 PA PPN		PR. POPIS STROJNIH DEL/BOQ OF MECHANICAL WORKS	
Poobl. strok./Cert. Profess.:	Marko Lubej, univ. dipl. inž. str.	IZS S-0739		4/1 Zaklonišče/Shelter	
Poobl. strok./Cert. Profess.:				Št. proj./Proj. No.:	362-19
				Vrsta dokument./Document. Type:	PZI
Izdelal/Creator:	Marko Lubej, univ. dipl. inž. str.	IZS S-0739		Klas. ozn./Class. No.:	--
				Stran/Page:	1/*
Datum/Date:		maj/May 2026		Ident. ozn./Id. No:	JULFS--7S0103P

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER****POOBlašČENI STROKOVNJAKI, ODGOVORNI ZA IZDELAVO PROJEKTANTSKEGA POPISA:**

Id. št. ZAPS/IZS	PooblašČeni strokovnjak	Strokovno področje
IZS S-0739	Marko Lubej, univ. dipl. inž. str.	Strojništvo

SODELAVCI PRI IZDELAVI PROJEKTANTSKEGA POPISA:

/	Hinko Samec	Tehnologija zaklonišča
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CERTIFIED EXPERTS RESPONSIBLE FOR ELABORATING THE BILL OF QUANTITIES:

Id. No ZAPS/IZS	Certified Expert	Area of Expertise
IZS S-0739	Marko Lubej, univ. dipl. inž. str.	Mechanical Engineering

COLABORATORS IN THE ELABORATING THE BILL OF QUANTITIES:

/	Hinko Samec	Shelter technology
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Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER**

0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
	Izvajalec je gospodarski subjekt s katerim naročnik sklene pogodbo o izvedbi javnega naročila in je v fazi oddaje naročila kot ponudnik oddal ekonomsko najugodnejšo ponudbo.	The contractor is the economic operator with which the contracting authority concludes the public procurement contract and which has submitted the most economically advantageous tender as the tenderer in the award phase.
0.1.1	Izvajalec se obveže, da bo upošteval veljavno zakonodajo, ki ureja graditev objektov v Republiki Sloveniji, vključno s povezanimi podzakonskimi akti, predpisi, tehničnimi smernicami, standardi, pravili stroke in dobro gradbeno prakso. Prav tako mora izvajalec upoštevati vse zahteve izdanega integralnega gradbenega dovoljenja in vsa dela izvesti skladno s projektno dokumentacijo ter ostalimi pogoji, objavljenimi v razpisni dokumentaciji.	The Contractor undertakes to comply with the applicable legislation governing the construction of buildings in the Republic of Slovenia, including related by-laws, regulations, technical guidelines, standards, professional rules and good construction practice. The Contractor shall also comply with all the requirements of the integral building permit issued and shall carry out all works in accordance with the project documentation and other conditions published in the tender documentation.
0.1.2	Dela lahko izvaja samo izvajalec, ki je registriran za opravljanje gradbene dejavnosti in ima za tovrstna dela ustrezno zavarovanje za škodo, certifikate, tehnično izobražen kader, sredstva ter je usposobljen za samostojno pripravo in izvedbo del.	The work may only be carried out by a contractor who is registered to carry out construction work and who has the appropriate insurance for such work, certificates, technically trained staff, resources and is qualified to prepare and carry out the work independently.
0.1.3	Izvajalec odgovarja za kakovost izvedbe vseh del.	The Contractor shall be responsible for the quality of the execution of all works.
0.1.4	Izvajalec nosi vso odgovornost za nesreče in škodo, ki nastane na objektu ali v okolici zaradi njegovega dela.	The Contractor shall bear all liability for accidents and damage to the installation or the surrounding area caused by his work.
0.1.5	Pred oddajo ponudbe se je izvajalec dolžan seznaniti z območjem predvidenim za gradnjo in temu prilagoditi vsa potrebna dela, kar mora biti zajeto v ponudbi. V neposredni bližini predvidene gradnje se nahajajo stavbe, v katerih potekajo izobraževalni in raziskovalni procesi. Zato bo izvajalec moral izvajati kontrolo hrupa in kontrolo vibracij. Dela, ki so hrupna in dela, ki povzročajo vibracije bo izvajalec moral preprečiti oziroma jih izvesti na način, da povzročajo minimalne vplive. Tehnologijo rušenja, pilotiranja in tehnologijo izvedbe ostalih del bo izvajalec moral prilagoditi tako, da bo vpliv minimalen. Izvajalec mora preprečiti in zmanjšati emisije delcev iz gradbišča na najmanjšo možno mero.	Before submitting a tender, the contractor is obliged to familiarise himself with the area to be constructed and to adapt any necessary works accordingly, which must be included in the tender. In the immediate vicinity of the proposed construction, there are buildings in which educational and research processes take place. The contractor will therefore be required to carry out noise and vibration control. Noise and vibration works will have to be avoided or carried out in such a way as to minimise the impact. Demolition, piling and other works will have to be adapted to minimise the impact. The contractor must avoid and minimise the emission of particulates emitted from the construction site as far as is reasonably practicable.
0.1.6	Izvajalec je pred oddajo ponudbe dolžan pregledati projektno dokumentacijo in ostale pogoje, ki so del razpisne dokumentacije. V primeru morebitnih napak in neskladij je izvajalec dolžan na to opozoriti naročnika pred oddajo ponudbe.	The Contractor is obliged to review the project documentation and other conditions forming part of the tender documentation before submitting the tender. In case of any errors or inconsistencies, the Contractor is obliged to bring these to the attention of the Contracting Authority before submitting the tender.

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0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
0.1.7	Pred oddajo ponudbe je izvajalec dolžan preveriti ustreznost popisov del in količin v teh popisih ter njihovo skladnost z ostalimi dokumenti projektne dokumentacije, ki so del razpisne dokumentacije. Prav tako je izvajalec dolžan preveriti vse detajle in sheme. Vse izmere je potrebno preveriti po posameznih projektih oz. načrtih, ki sestavljajo razpisno dokumentacijo. V primeru ugotovljenih neskladij je v času priprave ponudbe obvezan o tem obvestiti naročnika.	Before submitting a tender, the Contractor shall check the adequacy of the inventories of works and quantities in these Bills of Quantities and their conformity with the other documents of the project documentation forming part of the tender documentation. The Contractor shall also check all details and diagrams. All measurements shall be checked against the individual projects or plans forming part of the tender documentation. In the event of any discrepancies, the Contractor shall inform the Contracting Authority at the time of preparing the tender.
0.1.8	Pred oddajo ponudbe je izvajalec dolžan v tem popisu preveriti zmnožke in seštevke ter prenose le-teh v rekapitulacijo. Izvajalec se s pripravo ponudbe obvezuje, da je prebral vse celice in elemente celotnega popisa, vključno z vsemi postavkami in splošnimi navodili ali določili in je preveril pravilnost preračuna ter s tem zagotavlja ponudbeno vrednost.	Before submitting a tender, the Contractor is required to check the products and totals in this Bill of Quantities (BoQ) and their transfer to the recapitulation. The Contractor undertakes, by preparing a tender, to have read all the cells and elements of the complete BoQ, including all headings and general instructions or provisions, and to have checked the correctness of the conversion, thereby guaranteeing the value of the tender.
0.1.9	Dela bo izvajalec moral izvajati po predloženi projektni dokumentaciji, detajlih in z upoštevanjem navodil in potrditev projektanta, nadzornika in investitorja. Vso potrebno delavniško dokumentacijo zagotovi izvajalec del v okviru ponujene cene.	The Contractor shall carry out the works in accordance with the submitted design documents, details and subject to the instructions and approvals of the Designer, the Supervisor and the Investor. All necessary workshop documentation shall be provided by the Contractor within the scope of the price quoted.
0.1.10	Pred izvedbo posameznih del je izvajalec dolžan pregledati projektno dokumentacijo za izvedbo gradnje (PZI) in elaborate. Na morebitne napake v dokumentaciji ali neskladja med posameznimi načrti ali deli načrtov (popisi del, tehnična poročila, lokacijski in tehnični prikazi) izvajalec opozori nadzornika in projektanta, in se z njima pravočasno uskladi.	The Contractor shall review the Detailed Design documentation (PZI) and the studies before carrying out the individual works. The Contractor shall draw the attention of the Supervisor and the Designer to any errors in the documentation or discrepancies between the individual designs or parts of designs (BoQ, technical reports, location and technical drawings) and shall coordinate with them in good time.
0.1.11	Tehnični opisi, prikazi, detajli, sheme ter ostali dokumenti v PZI dokumentaciji predstavljajo dodaten opis popisnih postavk gradbeno obrtniških in inštalacijskih del ter jih je potrebno dosledno upoštevati skupaj s popisom del.	The technical descriptions, illustrations, details, diagrams and other documents in the Detailed Design documentation (PZI) are additional descriptions of the BoQ inventory items of the building, construction and installation works and must be strictly followed together with the BoQ.
0.1.12	Specifikacije in zahteve, navedene v popisu, se ne smejo upoštevati kot edine zahteve. Izvajalec je dolžan v ceni zajeti in dobaviti vse elemente opreme ter opraviti dela in storitve, ki niso eksplicitno navedeni, a so bistvenega pomena za funkcionalnost, skladnost s predpisi ter kontinuirano, zanesljivo in varno obratovanje opreme.	The specifications and requirements set out in the BoQ shall not be taken as the only requirements. The Contractor shall be obliged to include in the price and supply all items of equipment and to carry out works and services which are not expressly mentioned but which are essential for the functionality, regulatory compliance and continuous, reliable and safe operation of the equipment.

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0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
0.1.13	Vsa dela morajo biti izvedena kvalitetno in iz materialov z zahtevanimi lastnostmi, izvedena skladno z veljavno zakonodajo in z upoštevanjem navodil za vgradnjo za izbrane materiale in opremo, s predložitvijo predpisanih izjav o lastnostih in/ali certifikatov. Vsi gradbeni proizvodi (GP) morajo biti označeni s CE oznako.	All work shall be of good quality and be executed with materials of the required characteristics, in accordance with the applicable legislation and in compliance with the installation instructions for the materials and equipment selected, and shall be accompanied by the prescribed declarations of performance and/or certificates. All construction products (GP) shall bear the CE marking.
0.1.14	Za vsako opisano delo v popisu je potrebno upoštevati celotno potrebno delo, ves osnovni in pomožni material, prevoz materiala in orodja na objekt, notranje Transporte, delovne in pomožne odre, zaključno čiščenje in odstranitev odpadkov po dovršenem delu.	For each work described in the inventory, the total work required, all basic and ancillary materials, the transport of materials and tools to the site, internal transports, working and ancillary scaffolding, final cleaning and the disposal of waste after the work has been completed must be taken into account.
0.1.15	Vsa delovna sredstva, organizacija in koordinacija del, pripravljajna, spremljajoča in zaključna dela, potrebni montažni in tesnilni materiali ter podkonstrukcije so sestavni del posameznih postavk.	All labour, organisation and coordination of the works, preparatory, accompanying and finishing works, necessary prefabrication and sealing materials and substructures are part of the individual items.

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0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
0.1.16	V enotnih cenah posameznih postavk mora biti zajeto oz. upoštevano tudi naslednje: - načrt organizacije gradbišča s podrobnim terminskim planom in izvedba vseh pripravljanih del, postavitev, organizacija, zaščita in prijava gradbišča, gradbiščnih objektov, ureditev začasnih deponij, tekoče vzdrževanje, skupaj s plačilom splošnih stroškov pristojbin in davkov upravnih organov, pridobivanju raznih dovoljenj in soglasij za izvedbo, ograditev gradbišča in postavitev gradbene table in prometne signalizacije, zagotavljanje ustrezne varnosti na gradbišču, tekoče vzdrževanje in končna odstranitev gradbišča; - zagotovitev potrebnih začasnih površin za transportne poti in gradnjo izven območja gradbišča s plačilom stroškov za sanacijo in vzpostavitev okoliških zemljišč in objektov v prvotno stanje (soglasja, odškodnine, itd.); - začasni odvoz, deponiranje in vračanje izkopanega materiala, ki ga ne bo možno deponirati na gradbišču; - odvoz in zagotovitev odstranjevanja odpadnega gradbenega materiala skladno z zakonodajo na področju ravnanja z odpadki (odvoz na urejene deponije s plačilom komunalnih prispevkov in taks itd.); - oteženi izkop v mokrem terenu, izkop v vodi, odvod meteorne vode iz gradbene jame in vode, ki se izceja iz bočnih strani izkopov; - ustrezno varovanje izkopa gradbene jame za objekt in ostalih manjših posameznih izkopov za izvedbo komunalne infrastrukture brez posegov na sosednja zemljišča; - ustrezno varovanje obstoječih objektov, infrastrukture in okolice v času gradnje ter dokumentiranje vseh morebitnih škodnih dogodkov; - pripravljalna, spremljajoča in zaključna dela (zakoličbe, zagotovitev potrebnih komunalnih priključkov za potrebe izvajanja gradnje, izvedba začasnih inštalacij, označevanje podzemnih vodov, postavljanje in vzdrževanje zakoličbenih profilov, izvedba in označevanje novih in starih križanj ter morebitna zaščita križanj komunalnih vodov, geodetski posnetki in izdajanje vmesnih posnetkov izvedene infrastrukture naročniku, izdelava zbirnih kart, itd.), v kolikor ni to drugače določeno; - pridobivanje soglasij in izvedba morebitnih zapor na vseh cestah s plačilom stroškov, nadomestil in pristojbin; - zagotovitev oz. postavitev in končna odstranitev po zaključku gradnje začasnih skladišč in začasnega pisarniškega kontejnerskega objekta vključno z opremo za dve delovni mesti in za skupne operativne sestanke vel. ca. 40 m2 za potrebe naročnika, s tekočim vzdrževanjem in čiščenjem.	The following must also be included or taken into account in the uniform prices for individual items: - a construction site organisation plan with a detailed timetable and the execution of all preparatory works, the setting-up, organisation, protection and registration of the construction site, site facilities, the arrangement of temporary storage facilities, ongoing maintenance, including the payment of general costs of fees and taxes of the administrative authorities, the obtaining of various permits and consents for the execution, the fencing of the site and the erection of construction signs and traffic signals, the provision of adequate security on the site, ongoing maintenance and the final dismantling of the construction site; - provision of the necessary temporary areas for transport routes and off-site construction, with costs for restoration and reinstatement of surrounding land and buildings (consents, compensation, etc.); - temporary removal, storage and return of excavated material that cannot be stored on site; - removing and disposing of waste building materials in accordance with waste management legislation (removal to regulated landfill sites with payment of municipal fees and charges, etc.); - difficult excavation in wet ground, excavation in water, drainage of rainwater from the construction pit and water draining from the sides of excavations; - adequate protection of the excavation of the construction pit for the building and other small individual excavations for the implementation of the utility infrastructure without encroaching on neighbouring land; - adequate protection of existing facilities, infrastructure and the surrounding area during construction, and documentation of any damage incidents; - preparatory, accompanying and finishing works (stake-out, provision of the necessary utility connections for the needs of construction, execution of temporary installations, marking of underground lines, installation and maintenance of stake-out profiles, execution and marking of new and old crossings and possible protection of crossings of utility lines, geodetic surveys and issuing of intermediate images of the completed infrastructure to the client, production of summary maps, etc.), unless otherwise specified; - obtaining consents and implementing any road closures, with costs, compensation and fees; - provision or erection and final removal on completion of construction of temporary storage and temporary office container building including equipment for two workstations and for joint operational meetings of approx. 40 m2 for the needs of the client, with ongoing maintenance and cleaning.

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0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
0.1.17	V enotnih cenah posameznih postavk mora biti zajeto oz. upoštevano tudi naslednje: - izdelava montažne tehnične dokumentacije, detajlov izvedbe in vse druge potrebne delavniške dokumentacije (s področja arhitekture, gradbeništva, elektrotehnike, strojništva in zunanje ter krajinske ureditve) ter pridobitev obvezne potrditve s strani projektanta, nadzornika in investitorja; - odprava vseh vrst inštalacijskih kolizij z izvajanjem potrebnih premikov inštalacij in njihovim usklajevanjem na mestu montaže, vse v obsegu, ki ne vpliva na projektirano rešitev ali tip inštalacij oz. opreme; - zagotavljanje kompletnosti elektro-inštalacijskih sistemov s področja avtomatike za doseganje njihove popolne funkcionalnosti delovanja; - stroški za nadzor in koordinacijo izvedbe vseh elektro napeljav, ki so predmet končne instalacije proizvoda (senčila, vrata, okna,...); - izdelava montažnih skic in detajlov za izvedbo v dogovoru z vodjo gradnje in nadzornikom; - izdelava in predstavitev vzorcev v ustrezni velikosti za potrditev projektanta, nadzornika in investitorja; - zagotavljanje varnosti in zdravja pri delu, zlasti izvajanje vseh del, ki izhajajo in ukrepov, ki izhajajo iz določil veljavnih predpisov varstva pri delu in zahtev Varnostnega načrta;- stroški garancij, ki jih mora izvajalec predložiti naročniku.	The following must also be included or taken into account in the uniform prices for individual items: - preparation of prefabricated technical documentation, construction details and all other necessary workshop documentation (architectural, civil, electrical, mechanical, exterior and landscaping) and obtaining the mandatory approval of the designer, the supervisor and the investor; - elimination of all types of installation conflicts by carrying out the necessary relocation of installations and their coordination at the installation site, all to the extent that it does not affect the design solution or the type of installation or equipment; - ensuring the completeness of electrical installation systems in the automation sector to achieve their full operational functionality; - the cost of supervising and coordinating the installation of all the electrical installations that are the subject of the final installation of the product (blinds, doors, windows, etc.); - preparation of erection drawings and details for implementation in agreement with the construction manager and supervisor; - production and presentation of samples in appropriate sizes for the approval of the designer, the supervisor and the investor; - ensuring health and safety at work, in particular the implementation of all the works arising from and the measures resulting from the provisions of the applicable occupational safety regulations and the requirements of the Safety Plan; - the cost of the guarantees to be provided by the contractor to the client.

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0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
0.1.18	V enotnih cenah posameznih postavk mora biti zajeto oz. upoštevano tudi naslednje: - strošek vodje del glavnega izvajalca, ki bo izvajal tudi koordinacijo s podizvajalci in z drugimi izvajalci, ki jih bo izbral naročnik in bo opravljal delo vodje gradbišča; - koordinacija del z ostalimi izvajalci oz. podizvajalci del, projektantom, nadzornikom in investitorjem pri medsebojnem usklajevanju organizacije gradbišča in časovnega načrta del ter pri usklajevanju izdelave plana montaže, potrjenih s strani vseh udeležencev gradnje; - stroški koordinacije, sodelovanja in usklajevanja z dobavitelji tehnološke, laboratorijske, eksperimentalne in vse ostale pohištvene ter multimedijske opreme ter z vsemi ostalimi dobavitelji oz. podizvajalci na objektu; - stroški izdelave situacij; - stroški zavarovanja objekta v času izvedbe del in delavcev ter materiala na gradbišču v času izvajanja del, od začetka del do pridobitve uporabnega dovoljenja za objekt. Zavarovanje mora biti sklenjeno pri ustrezni zavarovalni družbi najmanj v višini pogodbene vrednosti ali v zakonsko predpisani vrednosti (v kolikor zavarovanje v višini pogodbene vrednosti presega zakonsko dovoljeno), za ves čas trajanja izvedbe del do uspešne primopredaje objekta; - preizkušanje kvalitete materiala, ki se vgrajuje in dokazovanje kvalitete s certifikati oz. tehničnimi soglasji; - izvedba vseh zahtevanih testov in preizkusov (npr. tlačni preizkusi, termografski pregledi, meritve elektromagnetnega sevanja, hrupa, itd.), poskusnega obratovanja celotnega objekta s poudarkom na vseh inštalacijah ter izvajanje predpisanega monitoringa v skladu s Poročilom o vplivih na okolje (pred gradnjo, med gradnjo in po končani gradnji); - izdelava izkaza požarne varnosti, vključno s sprotim spremljanjem gradnje in izvajanjem požarnovarnostnih zahtev ter izdelava Požarnega reda z obveznimi prilogami; - izdelava Izkaza zaščite pred hrupom v stavbah; - izdelava Izkaza energijskih lastnosti stavbe in energetske izkaznice; - sodelovanje z izvajalci gradbenega in projektantskega nadzora in investitorjem za izvedbo tehničnega pregleda in priprava primopredaje, ki mora vsebovati vso zahtevano dokumentacijo, predvsem pa: izjave o skladnosti, požarni izkaz in ostale izkaze ter obvezne tabele, dokazilo o zanesljivosti objekta (DZO), certifikate in ateste za vgrajene materiale in opremo, zapisnike preizkusov in meritev, navodila za uporabo in vzdrževanje ter vse ostale dokumente v skladu s predpisi in pogodbenimi določili.	The following must also be included or taken into account in the uniform prices of the individual items: - the cost of a works manager for the main contractor, who will also coordinate with subcontractors and other contractors selected by the client and act as site manager; - coordination of the works with other contractors or subcontractors, the designer, the supervisor and the investor in coordinating the organisation of the construction site and the timetable for the works, and in coordinating the production of an installation plan approved by all the participants in the construction; - the costs of coordination, cooperation and coordination with suppliers of technological, laboratory, experimental and all other furniture and multimedia equipment, as well as with all other suppliers or subcontractors on the site; - the cost of drawing up situations; - the cost of insuring the building during the execution of the works and the workers and materials on site during the execution of the works, from the start of the works until the building has been licensed for occupation. The insurance must be taken out with a suitable insurance company for at least the contract value or the legal value (if the insurance for the contract value exceeds the legal value), for the entire duration of the works until the successful handover of the building; - testing the quality of the material to be installed and proving it with certificates or technical approvals; - carrying out all required tests and trials (e.g. pressure tests, thermographic inspections, electromagnetic radiation measurements, noise measurements, etc.), trial operation of the entire building, with emphasis on all installations, and carrying out the required monitoring in accordance with the Environmental Impact Assessment Report (before, during and after construction); - preparation of a fire safety statement, including ongoing monitoring of construction and implementation of fire safety requirements, and preparation of a Fire Safety Order with mandatory annexes; - preparation of a Noise Protection Statement for buildings; - preparation of the Building Energy Performance Report and Energy Performance Certificate; - cooperation with the construction and design supervision contractors and the investor to carry out the technical inspection and prepare the handover, which must include all the required documentation, in particular: declarations of conformity, fire and other statements and mandatory tables, proof of reliability of the building (DZO), certificates and attestations for the materials and equipment installed, records of tests and measurements, instructions for use and maintenance, and all other documents in accordance with the regulations and the contractual provisions

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0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
0.1.19	V enotnih cenah posameznih postavk, ki se nanašajo na opremo in posamezne sisteme, mora biti zajeto oz. upoštevano tudi naslednje: - dobava oz. transport, - stroški za vse delovne stroje za dvigovanje bremen in delovne košare za dostope do delovišč; - morebitni stroški povzročeni upravljavcem GJI, ki bi nastali v zvezi s predmetno gradnjo; - montaža, vključno s pomožnim montažnim materialom (vezni, tesnilni in pritrdilni material, sidra, nosilni profili, podkonstrukcije in podobno) in navodili proizvajalca, - odprava vseh kolizij sistemov s stenami in med sistemi, - izvedba vseh potrebnih tesnjenj, - priključitev in nastavitve, vključno z morebitnim kalibriranjem, - zagon, testiranje in meritve, vključno s poročili, - šolanje uporabnikov oz. vzdrževalnega osebja za uporabo in vzdrževanje sistemov, - navodila za obratovanje in vzdrževanje, - vsi potrebni certifikati, izjave o skladnosti oz. potrdila ter - vsa druga pomožna dela in material, da se zagotovi funkcionalnost posamezne postavke popisa.	The following must also be included or taken into account in the uniform prices for individual items relating to equipment and individual systems: - delivery/transport, - the cost of all lifting machines and work baskets for access to work sites; - any costs incurred to the operators of utility infrastructure (GJI) in connection with the subject construction; - installation, including ancillary installation materials (bonding, sealing and fixing materials, anchors, support profiles, substructures, etc.) and manufacturer's instructions, - eliminating all system-to-wall and system-to-system collisions, - all necessary sealing work, - connection and set-up, including calibration if necessary, - commissioning, testing and measurements, including reports, - training users or maintenance staff in the use and maintenance of the systems, - operating and maintenance instructions, - any necessary certificates, declarations of conformity or attestations; and - all other ancillary works and materials to ensure the functionality of each inventory item.
0.1.20	Vsi odri morajo biti upoštevani v enotnih cenah navedenih postavk, razen tistih, ki so posebej navedeni.	All scaffolding must be included in the uniform prices of the items listed, except where specifically mentioned.
0.1.21	Vsi delovni in pomožni odri, lestve in ostala potrebna pomožna sredstva, kot tudi čiščenje vseh elementov po končanih delih, mora biti upoštevano v enotnih cenah navedenih postavk, razen tistih, ki so posebej navedeni.	All working and auxiliary scaffolding, ladders and other necessary ancillaries, as well as the cleaning of all elements after completion of the works, shall be included in the uniform prices of the items listed, except those specifically mentioned.
0.1.22	Delavniško dokumentacijo za vse nosilne jeklene konstrukcije in podkonstrukcije izdelava izvajalec, strošek izdelave delavniške dokumentacije se upošteva v ponujenih cenah in se ne obračuna posebej.	The cost of the shop drawings for all steelwork and substructures shall be included in the prices quoted and shall not be charged separately.
0.1.23	V enotnih cenah postavk mora biti vključeno tudi vgrajevanje vseh instalacijskih razvodov v opaže armirano betonskih elementov in izdelava prehodov inštalacij ter dodatno izrezovanje utorov in prebojev v kamnite, zidane ali armirano-betonske stene, ponovno demontiranje in montiranje vseh vrst montažnih sten, vsa dodatna dela za zagotavljanje primernih križanj med posameznimi instalacijskimi vodi, izdelava vseh vrst ojačitev konstrukcij in podobna dela, ki zagotavljajo kakovostno vgradnjo vseh vrst instalacijskih vodov in niso posebej navedena v popisu GOI del. V ponudbi morajo biti upoštevana vsa drobna strojna in elektro instalacijska dela in transporti.	The installation of all installation ducts in the formwork of reinforced concrete elements and the construction of installation penetrations, as well as the additional cutting of grooves and penetrations in stone, masonry or reinforced concrete walls, the reassembly and reinstallation of all types of prefabricated walls, all additional work to ensure adequate crossings between individual installation ducts, the construction of all types of structural reinforcement and similar work to ensure the quality installation of all types of installation ducts and not specifically mentioned in the BoQ of the Construction, installation and finishing works (GOI) shall also be included in the uniform prices of the items. The tender shall take into account all minor mechanical and electrical installation work and transport.

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0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
0.1.24	Vsi kovinski elementi in konstrukcije, ki bi lahko bili izpostavljeni atmosferskim in ostalim korozijskim vplivom, morajo biti ustrezno protikorozijsko zaščiteni.	All metallic elements and structures that could be exposed to atmospheric and other corrosive influences must be adequately protected against corrosion.
0.1.25	Za vse večje jeklene dele se skladno s predpisi, izdelajo ustrezne ozemljitve, nevidno pritrjene in speljane na splošno ozemljitev objekta.	For all major steel parts, appropriate earth connections shall be made in accordance with the regulations, invisibly attached and connected to the general earth of the building.
0.1.26	Za vse vidne elemente in serijske elemente je obvezna predhodna uskladiitev obdelav, barv in materialov s projektantom na podlagi dostavljenih vzorcev v ustrezni velikosti. Obvezna je preveritev dejanskih mer na licu mesta in posledična prilagoditev elementov in njihove montaže.	For all visible elements and serial elements, it is mandatory to coordinate the finishes, colours and materials with the designer beforehand on the basis of the supplied samples in the appropriate size. It is mandatory to check the actual dimensions on site and to adjust the elements and their installation accordingly.
0.1.27	Dimenzije obrtniških izdelkov in količine je potrebno pred naročanjem preveriti na objektu. Potrebna je uskladiitev vseh elementov (kljuke, okovje, detajlne konstrukcije in obdelave, itd.) s projektantom, nadzornikom in investitorjem. Izvajalec je dolžan pred izdelavo predložiti projektantu v potrditev ustrezne delavniške načrte in detajle.	The dimensions of the workmanship and quantities must be checked on site before ordering. All elements (hooks, fittings, detailed construction and finishes, etc.) must be coordinated with the designer, the supervisor and the investor. The contractor is obliged to submit the relevant workshop plans and details to the designer for approval before manufacture.
0.1.28	V posameznih postavkah popisa so navedeni proizvajalci in/ali tipi posameznih sistemov, materialov ali opreme, s čimer so zgolj natančno opredeljene zahtevane tehnične lastnosti. Izvajalec del lahko ponudi nadomesten sistem, material ali opremo drugega proizvajalca in tipa, pri čemer morajo biti tehnične lastnosti ponujenega sistema, materiala ali opreme enakovredne ali boljše od opredeljenih v popisu, dimenzijsko pa ne smejo presegati projektiranih dimenzij. Vse funkcijske in tehnične karakteristike nadomestnih sistemov, materialov ali opreme mora izvajalec dokazati z ustrezno dokumentacijo. Vse morebitne posledice zaradi spremembe sistemov, materialov ali opreme vključno z morebitnimi spremembami oz. dopolnitvami BIM modelov in projektne dokumentacije, stroškovno in časovno bremenijo izvajalca.	The individual items of the Inventory shall specify the manufacturers and/or types of the individual systems, materials or equipment, thereby merely specifying the required technical characteristics. The Contractor may offer a substitute system, material or equipment of a different manufacturer and type, provided that the technical characteristics of the offered system, material or equipment shall be equivalent to or better than those specified in the BoQ, and shall not exceed the design dimensions. All functional and technical characteristics of the substitute systems, materials or equipment shall be demonstrated by the Contractor with appropriate documentation. Any consequences resulting from changes to systems, materials or equipment, including any changes or additions to the BIM models and project documentation, shall be borne by the Contractor in terms of cost and time.
0.1.29	Vsako zamenjavo, uporabo in končni izbor nadomestnih sistemov, materialov, proizvodov in opreme morajo obvezno in pravočasno (pred dobavo in vgradnjo) pisno potrditi projektant (vseh sodelujočih strok), nadzornik in investitor.	Any replacement, use and final selection of alternative systems, materials, products and equipment must be approved in writing by the designer (of all disciplines involved), the supervisor and the investor in a timely manner (prior to delivery and installation).

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0.1	SPLOŠNI TEHNIČNI POGOJI	GENERAL TECHNICAL CONDITIONS
0.1.30	Izvajalec mora v ponudbeno ceno vključiti tudi: - ves čas gradnje sprotno beleženje sprememb oz. odstopanj od PZI dokumentacije, vključno z izdelavo tekstualnega opisa sprememb, - pripravo podlog na nivoju PZI, ki so potrebne za posodobitev oz. uskladitev BIM modela z izvedenim stanjem (LOD 500) in izdelavo projektne dokumentacije izvedenih del (PID), - mesečno predajanje potrjenih sprememb opreme in materiala, ki vplivajo na BIM model, v formatu IFC, - vzdrževanje in uporabljanje pri izvedbi zadnje veljavne revizije PZI dokumentacije, vključno z dopolnitvami PZI načrtov, ki so nastali zaradi sprememb med gradnjo.	The contractor must also include in the tender price: - keeping a record of changes or deviations from the construction documentation (PZI) throughout construction, including a textual description of the changes, - preparation of the Detailed Design (PZI) level documents required to update or align the BIM model with the as-built condition (LOD 500) and the preparation of the as-built project documentation for the works (PID), - monthly submission of approved equipment and material changes affecting the BIM model in IFC format, - maintenance and use in the execution of the last valid revision of the construction documentation (PZI), including additions to the construction design documentation (PZI) resulting from changes during construction.
	OPOMBE:	REMARKS:
0.1.31	Tribune vzhodnega trga (na severni strani objekta zaklonišča), ki so oz. bodo služile kot vhod na športno igrišče, obsip objekta na V in J strani objekta, humuziranje in zatravitev, so predmet projekta št. 380-20 (Skupni uvoz in zunanja ureditev območja FS in FFA) in niso upoštevane v tem popisu.	The stands of the eastern square (on the north side of the shelter building), which are or will be used as the entrance to the sports ground, the building envelope on the E and S sides of the building, the humidification and the grassing, are the subject of project No 380-20 (Joint access and external landscaping of the FS and FFA areas) and are not included in this bill of quantities.
0.1.32	Vsa predvidena oprema mora biti skladna s Pravilnikom o tehničnih normativih za zaklonišča in zaklonilnike (Uradni list RS, št. 17/98, 26/98 – popr., 25/00, 38/01 in 66/06).	All equipment must comply with the Regulation on Technical Standards for Shelters and Defenders (Official Gazette of the Republic of Slovenia, No. 17/98, 26/98 - corrected, 25/00, 38/01 and 66/06).

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0.2	SPLOŠNI TEHNIČNI POGOJI ZA PODROČJE DGNB CERTIFICIRANJA	GENERAL TECHNICAL CONDITIONS FOR DGNB CERTIFICATION
	Izvajalec je gospodarski subjekt s katerim naročnik sklene pogodbo o izvedbi javnega naročila in je v fazi oddaje naročila kot ponudnik oddal ekonomsko najugodnejšo ponudbo.	The contractor is the economic entity with which the contracting authority concludes the public procurement contract and which has submitted the most economically advantageous tender as the tenderer in the award phase.
	Splošni pogoji za področje DGNB certificiranja predstavljajo dopolnilo splošnim tehničnim pogojem in ne odpravljajo drugih obveznosti in odgovornosti, ki jih ima izvajalec v skladu s predpisi in pogodbo.	The General Conditions for DGNB Certification are complementary to the General Technical Conditions and do not exclude other obligations and responsibilities that the Contractor has under the Regulations and the Contract.
0.2.1	Izvajalec mora v svojih ponudbah upoštevati, da se bo objekt certificiral v skladu z zahtevami DGNB sistema certificiranja trajnostne gradnje, ter pravočasno (vsaj 60 dni pred vgradnjo posameznega produkta) dostaviti vso ustrezno dokumentacijo za vse v ponudbi zajete materiale, elemente in opremo. Zahtevana je uporaba materialov, elementov ali opreme, ki so okolju in ljudem prijazni, energetsko učinkoviti in obenem ustrezajo zahtevam DGNB sistema. Zahtevan nivo certifikata je: ZLATI CERTIFIKAT	The Contractor shall take into account in its tenders that the building will be certified in accordance with the requirements of the DGNB Sustainable Building Certification Scheme and shall deliver all relevant documentation for all materials, elements and equipment included in the tender in a timely manner (at least 60 days before the installation of each product). The use of materials, elements or equipment that are environmentally and human friendly, energy efficient and at the same time meet the requirements of the DGNB system is required. The required level of certification is: GOLD CERTIFICATE
0.2.2	Podrobnejši opis DGNB sistema in navodila za posamezne kriterije so dostopna v dokumentu "DGNB Criteria Set New Construction Buildings, Version 2020 International", ki je na voljo na DGNB spletni strani https://www.dgnb.de/en/certification/important-facts-about-dgnb-certification/criteria	A more detailed description of the DGNB system and guidance on the individual criteria is available in the document "DGNB Criteria Set New Construction Buildings, Version 2020 International", available on the DGNB website https://www.dgnb.de/en/certification/important-facts-about-dgnb-certification/criteria
0.2.3	Izvajalec mora v svojih ponudbah upoštevati, da je potrebno skladno z določili DGNB certifikacijskega sistema, pravočasno (pred pričetkom gradnje) dostaviti vso ustrezno dokumentacijo, za vse v ponudbi zajete materiale, elemente in opremo (tehnični list, varnostni list, izjava o lastnostih, tehnična navodila za ravnanje, servisiranje, vzdrževanje,...) v slovenskem jeziku. Vgradnja kakršnihkoli materialov, elementov ali opreme, se izvede zgolj na podlagi predhodne preveritve posredovane dokumentacije in obenem potrditve s strani nadzornika.	The Contractor must take into account in its tenders that, in accordance with the provisions of the DGNB certification system, all relevant documentation for all materials, elements and equipment included in the tender (technical data sheet, safety data sheet, declaration of properties, technical instructions for handling, servicing, maintenance,...) must be delivered on time (prior to the start of construction) in the Slovene language (in accordance with the provisions of the DGNB certification system). The installation of any materials, elements or equipment shall be subject to prior checking of the submitted documentation and, at the same time, to the approval of the Supervisor.
0.2.4	Izbrani materiali, elementi, naprave, sistemi in oprema morajo prispevati k večji trajnosti stavbe v smeri zagotavljanja energetske učinkovitosti, ekonomičnega in enostavnega vzdrževanja ter čiščenja, dolge življenjske dobe, uporabe okolju prijaznih materialov ipd.	The materials, elements, appliances, systems and equipment chosen must contribute to the sustainability of the building in terms of energy efficiency, economic and easy maintenance and cleaning, long lifetime, use of environmentally friendly materials, etc.
0.2.5	Predloženi dokumenti za vse uporabljene materiale, elemente in opremo morajo izpolnjevati zahteve najmanj kakovostne stopnje QS3 (zaželeno QS4), iz dokumenta: <u>DGNB Razredi kakovosti vgrajenih materialov, elementov in opreme (JULFS--7X9001)</u>	The documents submitted for all materials, components and equipment used shall meet the requirements of at least quality level QS3 (preferably QS4) of the document <u>DGNB Quality Grades for Materials, Components and Equipment (JULFS--7X9001)</u>

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0.2	SPLOŠNI TEHNIČNI POGOJI ZA PODROČJE DGNB CERTIFICIRANJA	GENERAL TECHNICAL CONDITIONS FOR DGNB CERTIFICATION
0.2.6	V kolikor izbrani materiali oz. elementi, navedeni v posameznih postavkah, ne ustrezajo vsaj kakovostni stopnji QS3 iz seznama: DGNB razredi kakovosti vgrajenih materialov, elementov in opreme (JULFS--7X9001), je izvajalec dolžan na to opozoriti projektanta, nadzor in investitorja ter podati predlog ustreznega materiala oz. elementa.	If the selected materials or elements listed in the individual items do not meet at least quality level QS3 of the list of DGNB quality classes for materials, elements and equipment (JULFS--7X9001), the Contractor shall draw this to the attention of the Designer, the Supervisor and the Investor, and shall make a proposal for a suitable material or element.
0.2.7	Izvajalec lahko v svoji ponudbi predlaga alternativne produkte in rešitve glede na predvidene s projektom, pod pogojem, da le-te prav tako izpolnjujejo vse navedene zahteve. Pri morebitnih predlaganih alternativnih produktih oz. rešitvah je potrebno upoštevati najmanj enake ali boljše lastnosti v smislu življenjske dobe, obstojnosti, ter enostavnosti in stroška čiščenja ter vzdrževanja v primerjavi s projektom predpisanimi rešitvami. Za alternativne rešitve izvajalec pridobi soglasje projektanta, nadzornika in investitorja pred pričetkom gradnje.	The Contractor may propose alternative products and solutions to those envisaged by the project in its tender, provided that they also meet all the requirements set out above. Any alternative products or solutions proposed shall have at least the same or better characteristics in terms of service life, durability, and ease and cost of cleaning and maintenance compared to the solutions envisaged by the project. For alternative solutions, the contractor shall obtain the agreement of the designer, the supervisor and the investor before starting construction.
0.2.8	Izvajalec med gradnjo dnevno beleži vsa eventualna odstopanja od PZI projektne dokumentacije ter podatke pravočasno posreduje naročniku, nadzoru in projektantu. Potrjene spremembe vnese v podlage za izdelavo PID in posodobitev BIM modelov.	During construction, the Contractor shall record on a daily basis any deviations from the Detailed Design documentation (PZI) and shall provide the information to the Client, Supervision and the Designer in a timely manner. Confirmed changes shall be entered into the basis for the As-built documentation (PID) and BIM model updates.
0.2.9	Izvajalec med gradnjo sproti izpolnjuje Seznam vseh konstrukcijskih sestav s pripadajočimi vgrajenimi gradbenimi materiali in dokumentira naslednje podatke o vgrajenih materialih (v slovenskem jeziku): - Varnostni list - Tehnični list - Izjavo o lastnostih (če je relevantno) - Izkazovanje morebiti obstoječega okoljskega certifikata (Tip I - okoljski znak ali Tip III - okoljska produktna deklaracija /EPD) - Izjavo proizvajalca ali dobavitelja, da produkt ustreza zahtevam ENV1.2 - Tehnična navodila za ravnanje, servisiranje, vzdrževanje oziroma ostale, z zakonom predpisane dokumente in dokumentacijo.	During construction, the Contractor shall keep a List of all structural assemblies with their associated construction materials and document the following information on the materials installed (in Slovene language): - Safety Data Sheet - Technical Data Sheet - Declaration of performance (if applicable) - Demonstration of any existing environmental certification (Type I - Ecolabel or Type III - Environmental Product Declaration /EPD) - A declaration by the manufacturer or supplier that the product complies with the requirements of ENV1.2 - Technical instructions for handling, servicing, maintenance or other documents and documentation required by law.

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0.2	SPLOŠNI TEHNIČNI POGOJI ZA PODROČJE DGNB CERTIFICIRANJA	GENERAL TECHNICAL CONDITIONS FOR DGNB CERTIFICATION
0.2.10	Za vse vgrajene bistvene tehnične sisteme mora izvajalec zagotoviti obstoj pooblaščenega servisa, ki deluje na območju Republike Slovenije, da ima investitor možnost skleniti ustrezno pogodbo o vzdrževanju. Med bistvene tehnične sisteme sodijo npr.: sistemi ogrevanja in hlajenja, priprava tehnoloških medijev, prezračevanje in klimatizacija, sistemi detekcije in gašenja požara, sistemi tehničnega varovanja, BMS in CNS sistemi upravljanja stavbe, razsvetljava, komunikacijski in WI-FI sistemi,...	For all installed essential technical systems, the contractor must ensure the existence of an authorised service centre operating in the territory of the Republic of Slovenia, so that the investor has the possibility of concluding an appropriate maintenance contract. The essential technical systems include, for example: heating and cooling systems, technological media preparation, ventilation and air conditioning, fire detection and extinguishing systems, technical security systems, BMS and CNS building management systems, lighting, communication and WI-FI systems,...
0.2.11	Zaželeno je, da imajo uporabljeni elementi in materiali okoljsko oznako Tip I. (kot npr. ENCODE, BLUE ANGEL, ipd...).	It is preferable that the elements and materials used have a Type I environmental label (such as ENCODE, BLUE ANGEL, etc...).
0.2.12	Izvajalec bo za elemente iz lesa moral dokazovati izvor z navedbo izvorne države in tipa lesa, FSC / PEFC certifikat z dodatnim pripadajočim potrdilom Chain of custody-trgovski certifikat dobavitelja - ta se dokazuje z dobavnicami, računi ali enakovredno. Za izdelke iz naravnega kamna iz EU držav je potrebna deklaracija, da je izvor in procesiranje teh izdelkov v celoti v EU državah. Za izdelke iz naravnega kamna, ki prihajajo iz držav izven EU, je potrebno predložiti dokazilo o izpolnjevanju ILO konvencije 182, ki vključuje neodvisna inšpekcijska poročila.	For wood elements, the contractor will be required to provide proof of origin, indicating the country of origin and the type of wood, FSC/PEFC certification with an additional Chain of Custody certificate - the supplier's trade certificate - this shall be evidenced by delivery notes, invoices or equivalent. For natural stone products from EU countries, a declaration that the sourcing and processing of these products is entirely in EU countries is required. For natural stone products from non-EU countries, proof of compliance with ILO Convention 182, including independent inspection reports, is required.

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0.2	SPLOŠNI TEHNIČNI POGOJI ZA PODROČJE DGNB CERTIFICIRANJA	GENERAL TECHNICAL CONDITIONS FOR DGNB CERTIFICATION
0.2.13	<u>Izobraževanje udeležencev pri gradnji</u> Izvajalec je dolžan vse udeležence pri gradnji podrobneje seznaniti tudi z relevantnimi koncepti, študijami, elaborati, ki opredeljujejo trajnostni način gradnje za naslednja področja: - zaščita pred hrupom (Poročilo o vplivih na okolje št. 100123-11523, z dne 11.5.2023, dopolnitev 13. 11. 2023 in 28. 3. 2024 (E-NET OKOLJE d.o.o. in GIGA-R d.o.o.)) - zaščita pred prašenjem - zaščita tal in podzemne vode (Poročilo o vplivih na okolje št. 100123-11523, z dne 11.5.2023, dopolnitev 13. 11. 2023 in 28. 3. 2024 (E-NET OKOLJE d.o.o. in GIGA-R d.o.o.)), Analiza tveganja za onesnaženje vodnega telesa podzemne vode št. 0346-023/2023, maj 2023 (Geološko projektiranje d.o.o.)) - ravnanje z gradbenimi odpadki (Načrt gospodarjenja z gradbenimi odpadki) Izobraževanja se izvajajo skladno z navodili DGNB sistema opredeljenimi v merilu: <u>PRO 2.1</u> <i>1.2, 2.2, 3.2 in 4.2 Training for the parties implementing the construction work</i>	<u>Training of construction participants</u> The contractor is also obliged to inform all construction participants in detail about relevant concepts, studies, elaborations defining sustainable construction methods for the following areas: - noise protection (Environmental Impact Assessment Report No 100123-11523, dated 11.5.2023, supplemented on 13.11.2023 and 28.3.2024 (E-NET OKOLJE d.o.o. and GIGA-R d.o.o.)) - dust protection - protection of soil and groundwater (Environmental Impact Assessment Report No. 100123-11523, dated 11.5.2023, supplemented 13.11.2023 and 28.3.2024 (E-NET OKOLJE d.o.o. and GIGA-R d.o.o.)), Risk analysis for contamination of the groundwater No. 0346-023/2023, May 2023 (Geološko projektiranje d.o.o.)) - construction waste management (Construction Waste Management Plan) The training shall be carried out in accordance with the DGNB system guidelines defined in the benchmark: <u>PRO 2.1</u> <i>1.2, 2.2, 3.2 and 4.2 Training for the parties implementing the construction work</i>
0.2.14	<u>Navodila za obratovanje in vzdrževanje objekta</u> Izvajalec pripravi Navodila za obratovanje in vzdrževanje objekta skladno z veljavno slovensko zakonodajo in navodili DGNB sistema opredeljenimi v merilih: <u>PRO 1.5</u> <i>1.1 Production and provision of maintenance, inspection, operating and care instructions</i> <i>3.1 Production and provision of a facility management manual</i>	<u>Instructions for the operation and maintenance of the facility</u> The Contractor shall prepare the Operation and Maintenance Instructions for the Facility in accordance with the applicable Slovenian legislation and the DGNB System Instructions specified in the Criteria: <u>PRO 1.5</u> <i>1.1 Production and provision of maintenance, inspection, operating and care instructions</i> <i>3.1 Production and provision of a facility management manual</i>

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0.2	SPLOŠNI TEHNIČNI POGOJI ZA PODROČJE DGNB CERTIFICIRANJA	GENERAL TECHNICAL CONDITIONS FOR DGNB CERTIFICATION
0.2.15	<u>Meritve kontrole kakovosti gradnje</u> Izvajalec mora upoštevati, da se bodo po koncu gradnje izvedle naslednje meritve: - meritve zrakotesnosti - meritve s termokamero (termografija) - meritve akustike - meritve zvočne zaščite ovoja stavbe - meritve zvočne zaščite ločilnih elementov med posameznimi prostori različnih namembnosti - meritve udarnega zvoka - meritve vlažnosti vgrajenih elementov, pred vgradnjo finalnih tlakov - test odvoda dima in toplote Meritve morajo opraviti ustrezno usposobljeni preskusni organi ali strokovnjaki ter rezultate oceniti in primerjati z zahtevami. Obseg opravljenih meritev mora biti sorazmeren z velikostjo zgradbe in mora ustrezno odražati cilj preverjanja kakovosti zgradbe. Smiselno je, da izvajalec del tekom gradnje za sprotno kontrolo kakovosti vgrajenih materialov, elementov in opreme, sam izvaja meritve. Končne meritve (ob primopredaji) izvede tretja oseba kot neodvisna potrditev doseganja zahtev. Meritve se izvajajo skladno z veljavno slovensko zakonodajo in navodili DGNB sistema opredeljenimi v merilu: <u>PRO 2.2</u> <i>2. Quality control measurements</i>	<u>Construction quality control measurements</u> The contractor must take into account that the following measurements will be carried out after completion of the construction: - airtightness measurements - thermal camera measurements (thermography) - acoustics measurements - measurements of the sound insulation of the building envelope - measurements of the sound insulation of the separating elements between different rooms of different uses - impact sound measurements - moisture measurements of the installed elements, prior to the installation of the final flooring - smoke and heat extraction test The measurements shall be carried out by suitably qualified test bodies or experts and the results evaluated and compared with the requirements. The extent of the measurements carried out shall be proportionate to the size of the building and shall adequately reflect the objective of the building quality verification. It is reasonable for the contractor to carry out his own measurements during construction to check the quality of the materials, elements and equipment installed. Final measurements (at handover) are carried out by a third party as an independent confirmation of compliance with the requirements. The measurements shall be carried out in accordance with the applicable Slovenian legislation and the DGNB system instructions specified in the benchmark: <u>PRO 2.2</u> <i>2. Quality control measurements</i>
0.2.16	<u>Zagotavljanje kakovosti za uporabljene gradbene proizvode</u> Izvajalec mora zagotavljati izvajanje primerjav med definiranim in dejansko uporabljenim materialom, elementom ali opremo skladno seznamom: DGNB razredi kakovosti vgrajenih materialov, elementov in opreme (JULFS--7X9001), vključno z dokazno dokumentacijo ugotovitev primerjav ter skladno z navodili DGNB sistema opredeljenimi v merilu: <u>PRO 2.2</u> <i>3.1 Quality assurance for the used construction products</i>	<u>Quality assurance for the construction products used</u> The Contractor shall ensure that comparisons are made between the defined and the actual material, element or equipment used in accordance with the list: DGNB Quality Grades of Installed Materials, Elements and Equipment (JULFS--7X9001), including supporting documentation of the findings of the comparisons, and in accordance with the DGNB system instructions defined in the Criterion: <u>PRO 2.2</u> <i>3.1 Quality assurance for the used construction products</i>

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0.2	SPLOŠNI TEHNIČNI POGOJI ZA PODROČJE DGNB CERTIFICIRANJA	GENERAL TECHNICAL CONDITIONS FOR DGNB CERTIFICATION
0.2.17	<u>Zaščita pred vlago</u> Izvajalec predloži dokumentacijo, ki dokazuje, da je bil izveden program prezračevanja, prilagojen stavbi, s čimer se zagotovi pogoje, da so vgrajeni gradbeni elementi ustrezno suhi, skladno z navodili DGNB opredeljenimi v merilu: <u>PRO 2.2</u> <i>4.1 Mould prevention</i>	<u>Protection against moisture</u> The Contractor shall provide documentation demonstrating that a building-specific ventilation programme has been implemented to ensure that the building elements installed are adequately dry, in accordance with the DGNB guidelines specified in the criteria: <u>PRO 2.2</u> <i>4.1 Mould prevention</i>
0.2.18	<u>Preizkusi delovanja sistemov</u> Izvajalec sodeluje pri izvedbi predhodnega in končnega preizkusa delovanja vseh bistvenih tehničnih komponent stavbe in pripravi ustrezne dokazne dokumentacije ter pri usposabljanju vzdrževalcev/upravljalcev stavbe, skladno z navodili DGNB sistema opredeljenimi v merilu: <u>PRO 2.3</u> <i>3.1 Performance of a preliminary function test</i> <i>4.1 Performance and documentation of a function test and training for the operators</i>	<u>System performance tests</u> The Contractor shall be involved in the performance of the preliminary and final performance tests of all essential technical components of the building and the preparation of the relevant supporting documentation, as well as in the training of the maintenance/management staff of the building, in accordance with the DGNB system guidelines defined in the Criterion: <u>PRO 2.3</u> <i>3.1 Performance of a preliminary function test</i> <i>4.1 Performance and documentation of a function test and training for the operators</i>
0.2.19	<u>Poročilo o zagonu objekta</u> Izvajalec sodeluje pri pripravi končnega poročila o zagonu objekta, skladno z navodili DGNB sistema opredeljenimi v merilu: <u>PRO 2.3</u> <i>5.1 Creation of a detailed final report</i>	<u>Commissioning report</u> The Contractor shall be involved in the preparation of the final commissioning report, in accordance with the DGNB system guidelines defined in the Criterion: <u>PRO 2.3</u> <i>5.1 Creation of a detailed final report</i>
0.2.20	<u>Koncept celovitega delovanja sistemov v stavbi</u> Izvajalec sodeluje pri procesu implementiranja stalnega nadzora in nastavitev delovanja stavbe ter usposabljanju vzdrževalcev/upravljalcev stavbe. Navedeno se izvede v skladu z navodili DGNB sistema opredeljenimi v merilu: <u>PRO 2.3</u> <i>6.1 Creation and handover of an integral operating concept</i>	<u>The concept of integrated building systems</u> The contractor is involved in the process of implementing the building's continuous monitoring and settings and training the building's maintenance/management staff. This shall be done in accordance with the DGNB system instructions defined in the benchmark: <u>PRO 2.3</u> <i>6.1 Creation and handover of an integral operating concept</i>

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0.2	SPLOŠNI TEHNIČNI POGOJI ZA PODROČJE DGNB CERTIFICIRANJA	GENERAL TECHNICAL CONDITIONS FOR DGNB CERTIFICATION
0.2.21	<u>Prilagoditev nastavitve sistemov po začetni fazi uporabe objekta</u> Izvajalec sodeluje pri ponovnem pregledu delovanja vseh bistvenih tehničnih sistemov ter eventualni ponovni prilagoditvi teh sistemov s strani strokovnjaka oz. (neodvisne) tretje osebe. Postopek se izvede po približno 10–14 mesecih po zaključku gradnje, skladno z navodili DGNB sistema opredeljenimi v merilu: <u>PRO 2.3</u> <i>7.1 Readjustment of the system following initial operating phase</i>	<u>Adjusting system settings after the initial phase of use of the building</u> The Contractor shall be involved in the re-examination of the functioning of all essential technical systems and the possible re-adjustment of these systems by an expert or (independent) third party. The procedure shall be carried out approximately 10-14 months after completion of construction, in accordance with the DGNB system guidelines defined in the benchmark: <u>PRO 2.3</u> <i>7.1 Readjustment of the system following initial operating phase</i>

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0.3	SPLOŠNI TEHNIČNI POGOJI ZA POPIS ZAKLONIŠČA	GENERAL TECHNICAL CONDITIONS FOR THE SHELTER BILL OF QUANTITIES
	Splošne opombe, veljavne za celotno obdobje gradnje in za vse sodelujoče pri gradnji zaklonišča	General notes applicable to the entire construction period and to all those involved in the construction of the shelter
0.3.0.1	V prvi fazi del - ob opaženju in betoniranju spodnje plošče in sten zaklonišča - morajo biti dobavljeni in vgrajeni vsi deli in naprave, ki so v popisu točk 1.0 in 2.0.	During the first phase of the works - the formwork and concreting of the bottom slab and the shelter walls - all the parts and appliances listed in items 1.0 and 2.0 shall be supplied and installed.
0.3.0.2	V drugi fazi del se dobavijo in vgradijo vsi deli in naprave, ki so v popisu točk 3.0 in 4.0.	In the second phase of the works, all the parts and appliances listed under items 3.0 and 4.0 shall be supplied and installed.
0.3.0.3	Dejavnosti iz točke 5.0 se izvajajo sprotno.	The activities referred to in point 5.0 shall be carried out on an ongoing basis.
	Opombe za pozicije točke 1.0 (prva faza gradnje zaklonišča)	Notes for the items of point 1.0 (first phase of shelter construction)
0.3.1.1	Vse cevi morajo biti vstavljene med opaže pred betoniranjem. Puščanje odprtih za naknadno vgradnjo cevi ni dovoljeno, ker ne zagotavlja ustrezne protiudarne trdnosti in plinotesnosti zaklonišča.	All pipes must be inserted between the formwork before concreting. Leaving openings for the subsequent installation of pipes is not permitted as it does not ensure adequate impact strength and gas tightness of the shelter.
0.3.1.2	Vsi jekleni deli morajo biti v celoti vroče cinkani, imeti morajo ustrezne prirobnice (DIN 2501) za nadgradnjo ventilov in cevni podaljškov ter nastavke za pritrditev med opaže.	All steel parts must be fully hot-dip galvanised, have suitable flanges (DIN 2501) for valve and pipe extension superstructures and fittings for fixing between the formwork.
0.3.1.3	Beton, ki se ob betoniranju sten in zgornje plošče zateče v cevi, je potrebno, po razopaženju, takoj odstraniti in vse cevi očistiti tudi znotraj.	Concrete that gets stuck in the pipes during the concreting of the walls and the top slab must be removed immediately after formwork removal and all pipes must be cleaned inside.
0.3.1.4	Sledove posušenega cementnega mleka je potrebno, po razopaženju, takoj obrisati, da ne bi prišlo do najedanja površine jeklenih delov in površinske zaščite.	Traces of dried cement milk should be wiped off immediately after formwork removal to avoid corrosion of the surface of the steel parts and the surface protection.
0.3.1.5	Cevi za prehode in tesnjenje kablov se vgradijo v vodoravni legi 200 mm pod stropom.	The conduits for cable passage and sealing shall be installed horizontally 200 mm below the ceiling.
0.3.1.6	Ravne in zalomljene cevi se vgradijo tako, da imajo prirobnice navpično lego.	Straight and curved pipes shall be installed so that the flanges are vertical.
0.3.1.7	Zalomljene cevi se vgrajujejo v legi daljše središčnice vodoravno, navpično ali pod kotom 45°.	Curved pipes shall be installed in the position of the longer centreline horizontally, vertically or at an angle of 45°.

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0.3	SPLOŠNI TEHNIČNI POGOJI ZA POPIS ZAKLONIŠČA	GENERAL TECHNICAL CONDITIONS FOR THE SHELTER BILL OF QUANTITIES
0.3.1.8	Cevi, ki so predvidene za dovod in odvod zraka z ventili in loputami, na katerih je potrebno ročno posredovanje, se vgradijo tako, da je ročno posredovanje omogočeno odrasli osebi s tal (v prostoru z napravami, v smeri zapore vhoda in v smeri skladišča odpadkov in odplak). Medsebojna lega teh cevi je takšna, da je posredovanje na ventilih in loputih z ročicami medsebojno nemoteno. Lego in vgradnjo cevi mora prilagoditi dobavitelj sistema za zračenje v zaščitni funkciji glede na tip izbranih ventilov in loput.	Pipes provided for the supply and extract of air with valves and dampers requiring manual intervention shall be installed in such a way that manual intervention is possible for an adult from the floor (in the appliance room, in the direction of the entrance barrier and in the direction of the waste and sewage storage). The relative position of these pipes shall be such that the intervention at valves and dampers with levers is mutually unobstructed. The positioning and installation of the pipes shall be adapted by the supplier of the ventilation system in the protective function according to the type of valves and dampers selected.
	Opombe za pozicije točke 2.0 (prva faza gradnje zaklonišča):	Notes for the items of point 2.0 (first phase of shelter construction):
0.3.2.1	Vsa zapiralna sredstva morajo biti vstavljena med opaže pred betoniranjem. Puščanje odprtin za naknadno vgradnjo zapiralnih sredstev ni dovoljeno, ker ne zagotavlja ustrezne protiudarne trdnosti in plinotesnosti zaklonišča; za vgradnjo navadnih vrat za sanitarije in umivalnice za funkcijo zaklonišča za drugi namen se prehodne odprtine smejo pustiti, ta vrata je dopustno vgraditi pozneje; navadna vrata, ki so predvidena samo za funkcijo zaklonišča za drugi namen, v tem popisu niso zajeta.	All closing means must be inserted between the formwork before concreting. Leaving openings for the subsequent installation of closing means is not permitted as it does not provide adequate impact strength and gas-tightness of the shelter; for the installation of ordinary doors for toilets and washbasins for the function of the shelter for another purpose, the passage openings may be left and these doors may be installed at a later date; ordinary doors intended only for the function of a shelter for another purpose are not covered by this BoQ.
0.3.2.2	Izvajalec gradbenih del mora ob dobavi zapiralnih sredstev dobiti vsa potrebna navodila za vgradnjo.	The building contractor must be provided with all necessary installation instructions at the time of delivery of the closures.
0.3.2.3	Pred dobavo in vgradnjo je potrebno ponovno preveriti ustreznost smeri odpiranja vratnih kril vseh zapiralnih sredstev.	Before delivery and installation, all door closers must be rechecked to ensure that the direction of opening of the door leaf is correct.
0.3.2.4	Dobavitelj armiranobetonskih zapiralnih sredstev mora dobaviti okvirje in krila z vso potrebno armaturo, krila pa opaži in z betonom zapolni izvajalec gradbenih del po navodilih in ob prisotnosti dobavitelja.	The supplier of the reinforced concrete closures shall supply the frames and leaves with all necessary reinforcement, and the leaves shall be formworked and filled with concrete by the contractor as directed and in the presence of the supplier.
0.3.2.5	Izvajalec gradbenih del mora v svoji ponudbi zajeti tudi opaženje in betoniranje vratnih kril armiranobetonskih vrat (poz.: 2.0.1 in 2.0.2).	The contractor shall also include in his tender the formwork and concreting of the reinforced concrete door leaves (items.: 2.0.1 and 2.0.2).
0.3.2.6	Vsa armiranobetonska vrata morajo imeti jeklene dele zaščitene pred korozijo s temeljnim premazom, pred tehničnim preizkusom je te dele potrebno prebarvati s končnim premazom, ki ga določi arhitekt.	All reinforced concrete doors shall have the steel parts protected against corrosion by a primer, and shall be repainted with a finish to be specified by the architect prior to the technical test.
0.3.2.7	Izbrani premaz po osušitvi ne sme biti škodljiv za zdravje v vročem stanju (pri 363 K).	The selected coating shall not be harmful to health when hot (at 363 K) after drying.
0.3.2.8	Vsa jeklena vrata morajo biti pocinkana, zato dodatni premaz ni potreben, je pa dopusten.	All steel doors must be galvanised, so an additional coating is not necessary but is acceptable.

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0.3	SPLOŠNI TEHNIČNI POGOJI ZA POPIS ZAKLONIŠČA	GENERAL TECHNICAL CONDITIONS FOR THE SHELTER BILL OF QUANTITIES
0.3.2.9	Pri barvanju je potrebno zaščititi gumijasta tesnila, laminat za požarno zaščito tesnil, deklaracijske tablice ter nastavke za mazanje tečajev.	When painting, the rubber seals, the laminate for fire protection of the seals, the declaration plates and the hinge grease fittings must be protected.
0.3.2.10	Vsa med gradnjo poškodovana tesnila in trakove laminata za požarno zaščito tesnil je potrebno zamenjati z originalnimi materiali. Vsa nova tesnila morajo biti v enem kosu.	All gaskets and laminate strips for fire protection of gaskets damaged during construction shall be replaced with original materials. All new gaskets shall be in one piece.

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0.3	SPLOŠNI TEHNIČNI POGOJI ZA POPIS ZAKLONIŠČA	GENERAL TECHNICAL CONDITIONS FOR THE SHELTER BILL OF QUANTITIES
	Opombe za pozicije točke 3.0 (druga faza gradnje zaklonišča):	Notes for the items of point 3.0 (second phase of shelter construction):
0.3.3.1	Ob posameznih pozicijah mora biti že zajeta potrebna količina tesnilnega, mazalnega pritrdilnega in povezovalnega materiala, skladnega s tipi posameznih delov in naprav.	The necessary quantities of sealing, lubricating, fastening and joining materials, corresponding to the types of individual parts and appliances, shall already be included in each item.
0.3.3.2	Jekleni deli morajo biti vroče cinkani (razen litoželeznih) ali na kvalitetno primerljiv način zaščiteni pred korozijo.	Steel parts shall be hot-dip galvanised (except cast iron) or protected against corrosion in a comparable quality manner.
	Opombe za pozicije točke 4.0 (druga faza gradnje zaklonišča):	Notes for the items of point 4.0 (second phase of shelter construction):
0.3.4.1	V posameznih pozicijah mora biti zajet ves potreben pritrdilni in povezovalni material, skladen s tipi naprav in opreme.	All necessary fixing and connecting material, compatible with the types of installations and equipment, shall be included in the individual items.
0.3.4.2	Po prilogi A je potrebno zaklonišča opremiti še z nosilnimi okvirji za suha stranišča, kar pa velja le v primeru, ko so v zaklonišču vgrajena mokra stranišča z odtoki, ki jih je na ta način potrebno preurediti v suha stranišča. V tem zaklonišču mokra stranišča niso vgrajena, zato v popisu teh nosilnih okvirjev ni.	Annex A requires that the shelters also be fitted with support frames for dry toilets, but this is only the case if the shelter has wet toilets with drains that need to be converted to dry toilets. In this shelter, the wet toilets are not fitted, so these support frames are not included in the BoQ.
0.3.4.3	Po prilogi A je potrebno vsako zaklonišče, ki ima ambulanto, opremiti tudi s papirjem za medicinske potrebe (5 zavitkov za zaklonišče do 100 zaklonilnih mest oziroma 10 zavitkov za zaklonišče nad 100 do 300 zaklonilnih mest). V zaklonišču v tem objektu ni ambulate, zato dobava papirja za medicinske potrebe ni potrebna in ga popis ne zajema.	According to Annex A, each shelter with a medical room must also be supplied with medical paper (5 rolls for shelters up to 100 shelter places or 10 rolls for shelters above 100 shelter places up to 300 shelter places). There is no medical room in the shelter in this facility, therefore the supply of medical paper is not required and is not covered by the BoQ.
0.3.4.4	Sedežno-ležalne in ležalne konstrukcije morajo biti dobavljene in vgrajene demontažno v količini za 2/3 zaklonilnih mest kot sedeži in za 1/3 zaklonilnih mest kot ležišča, z vmesnimi vzdolžnimi in prečnimi hodniki, skladno z zahtevami predpisa; če bodo vgrajene postelje in sedišča s platni, morajo biti iz snovi, ki ne plesni (samougasljiva umetna vlakna); dobavitelj mora ta del popisa prilagoditi svojim kataloškim podatkom in v celoti zahtevam predpisa.	The seat-bed and bed structures shall be supplied and installed dismantled in a quantity of 2/3 of the shelter places as seats and 1/3 of the shelter places as beds, with longitudinal and transverse aisles in between, in accordance with the requirements of the Regulation; if beds and seats with canvas are to be installed, they shall be made of non-mould-resistant material (self-extinguishing plastic fibres); the supplier shall adapt this part of the BoQ to his catalogue data and to the full requirements of the Regulation.
	Opombe za pozicije točke 5.0 (obe fazi gradnje zaklonišča):	Notes for the items of point 5.0 (both phases of shelter construction):
0.3.5.1	Nepredvidena dela se opravijo po predhodnem naročilu, načrtu in dogovoru o vrednosti teh del, s potrditvijo nadzorne organizacije.	Unforeseen works shall be carried out after prior order, design and agreement on the value of the works, with the approval of the Supervisory Organisation.

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0.3	SPLOŠNI TEHNIČNI POGOJI ZA POPIS ZAKLONIŠČA	GENERAL TECHNICAL CONDITIONS FOR THE SHELTER BILL OF QUANTITIES
0.3.5.2	V poziciji 5.0.4 mora biti zajeta tudi demontaža in urejeno vskladiščenje bivalne, sanitarne in pomožne (zaklonske) opreme zaradi sprostite prostorov za funkcijo za drugi (mirnodobni) namen zaklonskega - po pozitivnem tehničnem preizkusu zaklonskega!	Item 5.0.4 must also include the dismantling and orderly storage of the living, sanitary and auxiliary (shelter) equipment in order to free the premises for the other (peacetime) function of the shelter - after a positive technical test of the shelter!

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Objekt: **ZAKLONIŠČE**

SHELTER

REKAPITULACIJA STROŠKOV STROJNIH DEL

COST SUMMARY OF MECHANICAL WORKS

4 NAČRT S PODROČJA STROJNIŠTVA

4 DOCUMENTATION IN THE FIELD OF MECHANICAL ENGINEERING

4/1 Zaklonišče

4/1 Shelter

4.1	STROJNA DELA	MECHANICAL WORKS	
4.1.1	STROJNA DELA - VEČJE ZAKLONIŠČE S 300 ZAKLONILNIMI MESTI	MECHANICAL WORKS - LARGE SHELTER WITH 300 SHELTER SPACES	0,00
0%	NEPREDVIDENA DELA	UNFORSEEN WORKS	0,00
4.1.2	STROJNA DELA - MANJŠE ZAKLONIŠČE Z 200 ZAKLONILNIMI MESTI	MECHANICAL WORKS - SMALLER SHELTER WITH 200 SHELTER SPACES	0,00
0%	NEPREDVIDENA DELA	UNFORSEEN WORKS	0,00
SKUPAJ STROJNA DELA		TOTAL MECHANICAL WORKS	0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER**

REKAPITULACIJA STROŠKOV STROJNIH DEL

COST SUMMARY OF MECHANICAL WORKS

4 NAČRT S PODROČJA STROJNIŠTVA

4/1 Zaklonišče

4 DOCUMENTATION IN THE FIELD OF MECHANICAL ENGINEERING

4/1 Shelter

4.1.1	STROJNA DELA - VEČJE ZAKLONIŠČE S 300 ZAKLONILNIMI MESTI	MECHANICAL WORKS - LARGE SHELTER WITH 300 SHELTER SPACES	
4.1.1.1	VGRADNI DELI	BUILDING WORKS	0,00
4.1.1.2	ZAPIRALNA SREDSTVA IN PRIBOR	CLOSURES AND ACCESSORIES	0,00
4.1.1.3	SISTEM ZA ZRAČENJE ZAKLONIŠČA V ZAŠČITNI FUNKCIJI IN UVODNICE ZA TESNENJE KABLOV	SHELTER VENTILATION SYSTEM IN PROTECTIVE FUNCTION AND CABLE SEALING GLANDS	0,00
4.1.1.4	BIVALNA, SANITARNA IN POMOŽNA OPREMA	LIVING, SANITARY AND ANCILLARY EQUIPMENT	0,00
4.1.1.5	VGRADNJA NAPRAV, NAPELJAV IN OPREME TER OSTALE DEJAVNOSTI	INSTALLATION OF PLANT, FIXTURES AND FITTINGS AND OTHER ACTIVITIES	0,00
			0,00
0%	NEPREDVIDENA DELA	UNFORSEEN WORKS	0,00
SKUPAJ STROJNA DELA - VEČJE ZAKLONIŠČE S 300 ZAK. MESTI		TOTAL MECHANICAL WORKS - LARGE SHELTER WITH 300 SHELTER SPACES	0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER**
4.1.1 STROJNA DELA - VEČJE ZAKLONIŠČE S 300 ZAKLONILNIMI MESTI
MECHANICAL WORKS - LARGE SHELTER WITH 300 SHELTER SPACES

4.1.1.1 VGRADNI DELI

BUILDING WORKS

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
1.0	VGRADNI DELI	BUILDING WORKS				
1.0.1	Ravna jeklena cev z nastavkom za vgradnjo protiudarnega ventila (vel. 4) - DN 200/750 z dvema prirobnicama kot npr.: KROBATH tip MF Gr. 4 DN 200/750 2F	Straight steel pipe with spigot for installation of backflow preventer (size 4) - DN 200/750 with two flanges as e.g. KROBATH type MF Gr. 4 DN 200/750 2F	kos	3,0		0,00
1.0.2	Ravna jeklena cev za dovod zraka na prezračevalno napravo pri zaščitnem zračenju DN 150/400 z eno prirobnico IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for air supply to the ventilation unit for protective ventilation DN 150/400 with one flange MADE TO SUPPLIER'S DETAIL	kos	3,0		0,00
1.0.3	Zalomljena jeklena cev za dovod zraka na prezračevalno napravo pri normalnem zračenju DN 200/400 z eno prirobnico, Z-zalom IZDELANO PO DETAJLU DOBAVITELJA	Broken steel pipe for air supply to the ventilation unit during normal ventilation DN 200/400 with one flange, Z-end MADE TO SUPPLIER'S DETAIL	kos	2,0		0,00
1.0.4	Zalomljena jeklena cev za dovod zraka na prezračevalno napravo pri normalnem zračenju DN 200/400 z eno prirobnico, U-zalom IZDELANO PO DETAJLU DOBAVITELJA	Broken steel pipe for air supply to the ventilation unit during normal ventilation DN 200/400 with one flange, U-joint MADE TO SUPPLIER'S DETAIL	kos	1,0		0,00
1.0.5	Zalomljena jeklena cev za ventil za regulacijo nadtlaka DN 150/750 z eno prirobnico (za odvod zraka iz bivalnega prostora v smeri zapore vhoda) IZDELANO PO DETAJLU DOBAVITELJA	Broken steel pipe for overpressure control valve DN 150/750 with one flange (for air extraction from the living space in the direction of the entrance barrier) MADE TO SUPPLIER'S DETAIL	kos	4,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
1.0.6	Ravna jeklena cev za ventil za regulacijo nadtlaka DN 150/300 z eno prirobnico (za odvod zraka iz sanitarij v smeri skladišča odpadkov in odplak) IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for overpressure control valve DN 150/300 with one flange (for air discharge from the toilet towards the waste and sewage storage) MADE TO SUPPLIER'S DETAIL	kos	3,0		0,00
1.0.7	Zalomljena jeklena cev za odvod zraka pri zaščitnem in normalnem zračenju DN 150/750 z dvema prirobnicama, Z-zalom (odvod zraka iz zapore vhoda) IZDELANO PO DETAJLU DOBAVITELJA	Fused steel pipe for air exhaust for protective and normal ventilation DN 150/750 with two flanges, Z-end (air exhaust from the entrance barrier) MADE TO SUPPLIER'S DETAIL	kos	4,0		0,00
1.0.8	Zalomljena jeklena cev za odvod zraka pri zaščitnem in normalnem zračenju DN 150/750 z dvema prirobnicama, Z-zalom (odvod zraka iz skladišča odpadkov in odplak) IZDELANO PO DETAJLU DOBAVITELJA	Fused steel pipe for protective and normal ventilation air discharge DN 150/750 with two flanges, Z-end (air discharge from waste and sewage storage) MADE TO SUPPLIER'S DETAIL	kos	3,0		0,00
1.0.9	Ravna jeklena cev za odvod kondenzne vode z navojnim nastavkom za zasun DN 25/600 IZDELANO PO DETAJLU DOBAVITELJA	Flat steel condensate drain pipe with threaded plug DN 25/600 MADE TO SUPPLIER'S DETAIL	kos	1,0		0,00
1.0.10	Ravna jeklena cev za tesnjenje kablov DN 100/300 z nastavki za pritrditev med opaže IZDELANO PO DETAJLU DOBAVITELJA	Flat steel cable sealing hose DN 100/300 with fittings for fixing between the formwork MADE TO SUPPLIER'S DETAIL	kos	2,0		0,00
1.0.11	Ravna jeklena cev za tesnjenje kablov DN 100/400 z nastavki za pritrditev med opaže IZDELANO PO DETAJLU DOBAVITELJA	Flat steel cable sealing hose DN 100/400 with fittings for fixing between the formwork MADE TO SUPPLIER'S DETAIL	kos	4,0		0,00
1.0.12	Ravna jeklena cev za tesnjenje kablov DN 100/750 z nastavki za pritrditev med opaže IZDELANO PO DETAJLU DOBAVITELJA	Flat steel cable sealing hose DN 100/750 with fittings for fixing between the formwork MADE TO SUPPLIER'S DETAIL	kos	4,0		0,00
1.0.13	Ravna jeklena cev za pretok zraka in kondenzne vode med komorami peščenega predfiltra DN 150/400 z nastavki za pritrditev med opaže IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for air and condensate water flow between the sand pre-filter chambers DN 150/400 with fittings for fixing between the formwork MADE TO SUPPLIER'S DETAIL	kos	9,0		0,00
1.0.14	Ravna jeklena cev za prehod vodovodne napeljave skozi steno DN 25/750 – obojestransko z navojno tuljavo za zaščitno funkcijo zaklonišča IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for the passage of the water supply through the wall DN 25/750 - both sides with threaded sleeve for the shelter protection function MADE TO SUPPLIER'S DETAIL	kos	1,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
1.0.15	Ravna jeklena cev za prehod vodovodne napeljave skozi steno DN 20/300 – obojestransko z navojno tuljavo za zaščitno funkcijo zaklonišča IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for the passage of the water supply through the wall DN 20/300 - both sides with threaded sleeve for the shelter protection function MADE TO SUPPLIER'S DETAIL	kos	2,0		0,00
	VGRADNI DELI	BUILDING WORKS				0,00

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4.1.1 STROJNA DELA - VEČJE ZAKLONIŠČE S 300 ZAKLONILNIMI MESTI
MECHANICAL WORKS - LARGE SHELTER WITH 300 SHELTER SPACES

4.1.1.2 ZAPIRALNA SREDSTVA IN PRIBOR

CLOSURES AND ACCESSORIES

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
2.0	ZAPIRALNA SREDSTVA IN PRIBOR	CLOSURES AND ACCESSORIES				
2.0.1	Armiranobetonska protiudarna vrata, plinotesna in požarna (EI-90), s priborom za odmik ruševin, za nadtlak 300 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim in blokadnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v zapori vhoda, z dimenzijami 1200/2050/200 mm – leva kot npr.: KROBATH tip DT-B 1200 L	Reinforced concrete anti-ram door, gas-tight and fire-resistant (EI-90), with debris deflection fittings, for an overpressure of 300 kPa, with integrated rubber seal, with closing and locking mechanism, with opening and closing directions marked on both sides, in the entrance barrier, with dimensions 1200/2050/200 mm - left such as KROBATH type DT-B 1200 L	kpl	2,0		0,00
2.0.2	Armiranobetonska protiudarna vrata, plinotesna in požarna (EI-90), s priborom za odmik ruševin, za nadtlak 300 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim in blokadnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v zapori zasilnega izhoda, z dimenzijami 825/2050/200 mm – leva kot npr.: KROBATH tip DT-B 825 L	Reinforced concrete anti-accident door, gas-tight and fire-resistant (EI-90), with debris deflection fittings, for an overpressure of 300 kPa, with built-in rubber seal, with closing and locking mechanism, with opening and closing directions marked on both sides, in emergency exit barrier, dimensions 825/2050/200 mm - left such as KROBATH type DT-B 825 L	kpl	1,0		0,00
2.0.3	Jeklana, plinotesna in požarna vrata (EI-90), za nadtlak 10 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v zapori vhoda, z dimenzijami 1200/2050/100 mm – desna kot npr.: KROBATH tip GT 1200 R	Steel, gas-tight and fire-resistant door (EI-90), for overpressure of 10 kPa, with integrated rubber seal, with closing mechanism, with opening and closing directions marked on both sides, in the entrance barrier, with dimensions 1200/2050/100 mm - right such as KROBATH type GT 1200 R	kpl	2,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
2.0.4	Jeklena, plinotesna in požarna vrata (EI-90), za nadtlak 10 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v skladišču odpadkov in odplak, z dimenzijami 825/2050/100 mm – leva kot npr.: KROBATH tip GT 825 L	Steel, gas-tight and fire-resistant door (EI-90), for overpressure of 10 kPa, with integrated rubber seal, with closing mechanism, with opening and closing directions marked on both sides, in waste and sewage storage, dimensions 825/2050/100 mm - left such as KROBATH type GT 825 L	kpl	1,0		0,00
2.0.5	Jeklena, plinotesna in požarna vrata (EI-90), za nadtlak 10 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v zapori zasilnega izhoda, z dimenzijami 825/2050/100 mm – leva kot npr.: KROBATH tip GT 825 L	Steel, gas-tight and fire-resistant door (EI-90), for overpressure 10 kPa, with integrated rubber seal, with closing mechanism, with opening and closing directions marked on both sides, in emergency exit barrier, dimensions 825/2050/100 mm - left such as KROBATH type GT 825 L	kpl	1,0		0,00
2.0.6	Jeklena, plinotesna in požarna vrata (EI-90), za nadtlak 10 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v peščeni predfilter, z dimenzijami 600/800/100 mm – desna kot npr.: KROBATH tip GKL 90 R	Steel, gas-tight and fire-resistant door (EI-90), for 10 kPa overpressure, with integrated rubber seal, with closing mechanism, with opening and closing directions marked on both sides, in sand pre-filter, dimensions 600/800/100 mm - right such as KROBATH type GKL 90 R	kpl	1,0		0,00
2.0.7	Jeklena navadna notranja vrata, odporna na tresljaje konstrukcije, z vgrajeno rešetko za izenačevanje zračnega tlaka med notranjimi prostori, z dimenzijami 825/2050 mm – desna – za vstop v prostor z napravami kot npr.: KROBATH tip IT 825 R	Structural vibration-resistant plain steel interior door with integrated grille for air pressure equalisation between interior spaces, dimensions 825/2050 mm - right-hand - for access to the equipment room such as KROBATH type IT 825 R	kpl	1,0		0,00
2.0.8	Jeklena navadna notranja vrata, odporna na tresljaje konstrukcije, z vgrajeno rešetko za izenačevanje zračnega tlaka med notranjimi prostori, s samozapiralnim mehanizmom, z dimenzijami 825/2050 mm – leva – za vstop v sanitarije kot npr.: KROBATH tip IT 825 L	Steel ordinary internal door, resistant to structural vibrations, with integrated grille to equalise the air pressure between the internal compartments, with self-closing mechanism, dimensions 825/2050 mm - left-hand - for entrance to sanitary facilities such as KROBATH type IT 825 L	kpl	1,0		0,00
2.0.9	Jeklena navadna notranja vrata, odporna na tresljaje konstrukcije, z vgrajeno rešetko za izenačevanje zračnega tlaka med notranjimi prostori, z dimenzijami 825/2050 mm – leva – za vstop v shrambo vode in opreme kot npr.: KROBATH tip IT 825 L	Steel ordinary internal door, resistant to structural vibration, with integrated grille to equalise air pressure between internal spaces, dimensions 825/2050 mm - left - for access to water and equipment storage such as KROBATH type IT 825 L	kpl	1,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
2.0.10	Jeklena lestev za dostop do prostora peščenega predfiltra, s priborom za montažno pritrditev DOBAVLJIVO V SLO	Steel ladder for access to the sand pre-filter compartment, with mounting accessories AVAILABLE IN SLO	kpl	2,0		0,00
	ZAPIRALNA SREDSTVA IN PRIBOR	CLOSURES AND ACCESSORIES				0,00

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4.1.1.3 SISTEM ZA ZRAČENJE ZAKLONIŠČA V ZAŠČITNI FUNKCIJI IN UVODNICE ZA TESNENJE KABLOV

SHELTER VENTILATION SYSTEM IN PROTECTIVE FUNCTION AND CABLE SEALING GLANDS

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
3.0	SISTEM ZA ZRAČENJE ZAKLONIŠČA V ZAŠČITNI FUNKCIJI IN UVODNICE ZA TESNENJE KABLOV	SHELTER VENTILATION SYSTEM IN PROTECTIVE FUNCTION AND CABLE SEALING GLANDS				
3.0.1	Protitudarni ventil (vel. 4) za dovod zraka s prigrajenim filtrom za grobi prah DN 200 kot npr.: KROBATH tip ESV GR. 4	Air inlet check valve (size 4) with coarse dust filter DN 200 such as KROBATH type ESV GR. 4	kpl	3,0		0,00
3.0.2	Nadtlačni protitudarni ventil za odvod zraka skozi zaporo vhoda in skozi skladišče odpadkov DN 150 kot npr.: KROBATH tip ÜV-ESV 75	Overpressure backdraft valve for air outlet through the entrance barrier and through the waste storage DN 150 such as KROBATH type ÜV-ESV 75	kpl	7,0		0,00
3.0.3	Regulacijski ventil za odvod zraka DN 150 kot npr.: KROBATH tip ALV 150	Control valve for air outlet DN 150 such as KROBATH type ALV 150	kpl	7,0		0,00
3.0.4	Vroče cinkana rešetka za peščeni predfilter kot npr.: KROBAT SFR VERZ.	Hot-dip galvanised grating for sand pre-filter such as KROBAT SFR VERZ.	m2	6,7		0,00
3.0.5	Certificirani ostrorobi peščeni granulati, eruptivnega porekla, odprašeni, zrna granulacije 4-8 mm, embaliran v vrečah s težo največ 30 kg v SLO pri dobavitelju peska asfaltnim bazam	Certified coarse sandy granulate, eruptive origin, dust-free, grain size 4-8 mm, packed in bags weighing not more than 30 kg in SLO, supplier of sand to asphalt bases	m3	9,4		0,00
3.0.6	Vmesna zalomljena cev DN 150 za dovod zraka na prezračevalno napravo pri zaščitnem zračenju, z dvema prirobnicama, L-zalom DOBAVLJIVO V SLO	Intermediate broken pipe DN 150 for air supply to the ventilation unit in protective ventilation, with two flanges, L-bend AVAILABLE IN SLO	kpl	3,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
3.0.7	Vmesna zalomljena cev DN 200 za dovod zraka na prezračevalno napravo pri normalnem zračenju, z dvema prirobnicama, L-zalom DOBAVLJIVO V SLO	Intermediate broken pipe DN 200 for air supply to the ventilation unit under normal ventilation, with two flanges, L-shaped AVAILABLE IN SLO	kpl	3,0		0,00
3.0.8	Krogelni ventil za zapiranje odvoda kondenzne vode DN 25 iz prostora peščenega predfiltra DOBAVLJIVO V SLO	Ball valve for closing the condensate drain DN 25 from the sand pre-filter compartment AVAILABLE IN SLO	kos	1,0		0,00
3.0.9	Plinotesna loputa z ročico DN 200-RS DOBAVLJIVO V SLO	Gas-tight butterfly valve with handle DN 200-RS AVAILABLE IN SLO	kpl	3,0		0,00
3.0.10	Plinotesna loputa z ročico DN 150-RS DOBAVLJIVO V SLO	Gas-tight butterfly valve with handle DN 150-RS AVAILABLE IN SLO	kpl	10,0		0,00
3.0.11	Prezračevalna naprava z ročnim in električnim pogonom (400 V, 50 Hz, 400 W, IP 54), pogonsko ročico, stikalom, prikazovalnikom pretoka zraka (načina zračenja), z navodilom za uporabo v različnih načinih zračenja, za nazivni pretok najmanj 600 m ³ /h kot npr.: KROBATH tip VA-300	Ventilation appliance with manual and electric drive (400 V, 50 Hz, 400 W, IP 54), drive lever, switch, air flow display (ventilation mode), with instructions for use in different ventilation modes, for a nominal flow of at least 600 m ³ /h such as KROBATH type VA-300	kpl	3,0		0,00
3.0.12	Filter za RBK-zaščito s priključnima prirobnicama, s podnožjem za vgradnjo in pritrditev, za nazivni pretok 200 m ³ /h in padec tlaka največ 600 Pa; filter mora imeti veljavni certifikat in nalepko KI Ljubljana kot npr.: COLF tip ECS-250	RBK-protection filter with two connection flanges, with mounting and fixing base, for a nominal flow of 200 m ³ /h and a pressure drop of maximum 600 Pa; the filter must have a valid certificate and a label from KI Ljubljana such as COLF type ECS-250	kpl	3,0		0,00
3.0.13	Razstavljiva spojka s prirobnicama in gibljivimi cevmi za hitro priključitev filtra za RBK-zaščito, vse skladno s tipom dobavljenega filtra kot npr.: KROBATH tip SKU	Expandable coupling with flanges and flexible hoses for quick connection of the RBC protection filter, all according to the type of filter supplied such as KROBATH type SKU	kpl	3,0		0,00
3.0.14	Tekočinski merilnik nadtlaka (U-cevka) z merilnim območjem najmanj 1500 Pa kot npr.: KROBATH tip SRM-7031	Liquid pressure gauge (U-tube) with a measuring range of at least 1500 Pa such as KROBATH type SRM-7031	kpl	1,0		0,00
3.0.15	Pribor za neprekinjeno cevno povezavo merilnika nadtlaka v hodnik zasilnega izhoda, z ventilom DOBAVLJIVO V SLO	Accessories for continuous hose connection of an overpressure gauge to the emergency exit corridor, with valve AVAILABLE IN SLO	kpl	1,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
3.0.16	Merilnik temperature zraka (od 0 do + 40 °C) in relativne vlažnosti zraka (od 20 do 100 %) DOBAVLJIVO V SLO	Air temperature gauge (0 to + 40 °C) and relative humidity (from 20 to 100%) AVAILABLE IN SLO	kpl	1,0		0,00
3.0.17	Jeklena spiro cev za razvod zraka s potrebnimi fazonskimi kosi DN 200 DOBAVLJIVO V SLO - PICHLER	Steel spiro pipe for air distribution with necessary phasing pieces DN 200 AVAILABLE IN SLO - PICHLER	m	95,0		0,00
3.0.18	Jeklena spiro cev za razvod zraka s potrebnimi fazonskimi kosi DN 160 DOBAVLJIVO V SLO - PICHLER	Steel spiro pipe for air distribution with necessary phasing pieces DN 160 AVAILABLE IN SLO - PICHLER	m	30,0		0,00
3.0.19	Jeklena spiro cev za razvod zraka s potrebnimi fazonskimi kosi DN 100 DOBAVLJIVO V SLO - PICHLER	Steel spiro pipe for air distribution with necessary phasing pieces DN 100 AVAILABLE IN SLO - PICHLER	m	20,0		0,00
3.0.20	Prezračevalni ventil za dovod zraka DN 160 DOBAVLJIVO V SLO - PICHLER	Ventilation valve for air inlet DN 160 AVAILABLE IN SLO - PICHLER	kpl	22,0		0,00
3.0.21	Prezračevalni ventil za dovod zraka DN 100 DOBAVLJIVO V SLO - PICHLER	Ventilation valve for air inlet DN 100 AVAILABLE IN SLO - PICHLER	kpl	20,0		0,00
3.0.22	Pribor za vertikalno elastično obešanje spiro cevi DN 200 za razvod zraka SESTAVLJENO PO DETAJLU	Accessories for vertical elastic suspension of spiro tubes DN 200 for air distribution ASSEMBLED IN DETAIL	kpl	62,0		0,00
3.0.23	Pribor za vertikalno elastično obešanje spiro cevi DN 160 za razvod zraka SESTAVLJENO PO DETAJLU	Accessories for vertical elastic suspension of spiro tubes DN 160 for air distribution ASSEMBLED IN DETAIL	kpl	20,0		0,00
3.0.24	Pribor za vertikalno elastično obešanje spiro cevi DN 100 za razvod zraka SESTAVLJENO PO DETAJLU	Accessories for vertical elastic suspension of spiro tubes DN 100 for air distribution ASSEMBLED IN DETAIL	kpl	14,0		0,00
3.0.25	Regulacijska loputa DN 200 DOBAVLJIVO V SLO - PICHLER	Regulating flap DN 200 AVAILABLE IN SLO - PICHLER	kpl	9,0		0,00
3.0.26	Regulacijska loputa DN 100 DOBAVLJIVO V SLO - PICHLER	Regulating flap DN 100 AVAILABLE IN SLO - PICHLER	kpl	4,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
3.0.27	Tesnilna uvodnica s polnilnimi kosi za tesnjenje kablov DN 100 kot npr.: KROBATH tip RGP-100	Sealing gland with filler pieces for sealing cables DN 100 such as KROBATH type RGP-100	kpl	20,0		0,00
3.0.28	Zaščitna plošča z mrežico za zunanjo stran cevi za odvod zraka DN 150 SESTAVLJENO PO DETAJLU DOBAVITELJA	Protective plate with mesh for the outside of the air outlet pipe DN 150 ASSEMBLED TO SUPPLIER'S DETAIL	kpl	7,0		0,00
3.0.29	Zaščitna plošča z mrežico za zunanjo stran cevi za dovod zraka DN 200 SESTAVLJENO PO DETAJLU DOBAVITELJA	Protective plate with mesh for the outside of the air inlet pipe DN 200 ASSEMBLED TO SUPPLIER'S DETAIL	kpl	3,0		0,00
3.0.30	Vmesna spiro cevna povezava z dušilno loputo za priključitev prezračevalne naprave na dovodna priključka normalnega in zaščitnega zračenja DN 200/150 DOBAVLJIVO V SLO - PICHLER	Intermediate spiro hose connection with throttle valve for the connection of the ventilation appliance to the normal and protective ventilation inlet connections DN 200/150 AVAILABLE IN SLO - PICHLER	kpl	3,0		0,00
3.0.31	Ravna vmesna cev za nadgradnjo plinotesne lopute nad ventilom za regulacijo nadtlaka DN 150 z dvema prirobnicama PO DETAJLU DOBAVITELJA	Straight intermediate pipe for the gas-tight hatch upgrade above the pressure relief valve DN 150 with two flanges AS DETAILED BY THE SUPPLIER	kos	7,0		0,00
3.0.32	Detektor ogljikovega monoksida (s kabelsko povezavo krmilno-signalnega dela in senzorja), z napajalnima električnima priključkoma 230 in 24 V, s svetlobnim in zvočnim alarmom, kalibriran na alarmni prag 50 ppm CO, z navodilom za uporabo kot npr.: FISCHER tip LIFE GM 040-6 + FRFCO	Carbon monoxide detector (with cable connection of the control-signalling part and the sensor), with 230 and 24 V power supply, with light and sound alarm, calibrated to an alarm threshold of 50 ppm CO, with instruction manual such as FISCHER type LIFE GM 040-6 + FRFCO	kpl	1,0		0,00
3.0.33	Jekleni čep DN 25 za obojestransko plinotesno zatesnitev cevi vodovodne napeljave do uporabe vodovodnega priključka DOBAVLJIVO V SLO	Steel plug DN 25 for double-sided gas-tight sealing of the water supply pipe until the water connection is used AVAILABLE IN SLO	kos	2,0		0,00
3.0.34	Jekleni čep DN 20 za obojestransko plinotesno zatesnitev cevi vodovodne napeljave do uporabe vodovodnega priključka DOBAVLJIVO V SLO	Steel plug DN 20 for double-sided gas-tight sealing of the water supply pipe until the water connection is used AVAILABLE IN SLO	kos	4,0		0,00
	SISTEM ZA ZRAČENJE ZAKLONIŠČA V ZAŠČITNI FUNKCIJI IN UVODNICE ZA TESNENJE KABLOV	SHELTER VENTILATION SYSTEM IN PROTECTIVE FUNCTION AND CABLE SEALING GLANDS				0,00

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER**
4.1.1 STROJNA DELA - VEČJE ZAKLONIŠČE S 300 ZAKLONILNIMI MESTI
MECHANICAL WORKS - LARGE SHELTER WITH 300 SHELTER SPACES

4.1.1.4 BIVALNA, SANITARNA IN POMOŽNA OPREMA

LIVING, SANITARY AND ANCILLARY EQUIPMENT

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
4.0	BIVALNA, SANITARNA IN POMOŽNA OPREMA	LIVING, SANITARY AND ANCILLARY EQUIPMENT				
	Sedežno-ležalne in ležalne konstrukcije morajo biti dobavljene in vgrajene demontažno v količini za 2/3 zaklonilnih mest kot sedeži in za 1/3 zaklonilnih mest kot ležišča, z vmesnimi vzdolžnimi in prečnimi hodniki, skladno z zahtevami predpisa; če bodo vgrajene postelje in sedišča s platni, morajo biti iz snovi, ki ne plesni (samougasljiva umetna vlakna); dobavitelj mora ta del popisa prilagoditi svojim kataloškim podatkom in v celoti zahtevam predpisa, za zaklonišče za 300 oseb.	The seating and bedding structures shall be supplied and installed dismantled in a quantity for 2/3 of the shelter positions as seats and for 1/3 of the shelter positions as beds, with longitudinal and transverse corridors in between, in accordance with the requirements of the Regulation; if beds and seats with canvas are to be installed, they shall be made of non-mould-resistant material (self-extinguishing plastic fibres); the supplier shall adapt this part of the inventory to his catalogue data and to the full requirements of the Regulation, for a shelter for 300 persons.				
4.0.1	Demontažna sedišča SESTAVLJENO PO DETAJLU DOBAVITELJA	Dismantling seating ASSEMBLED TO SUPPLIER'S DETAIL	kpl	200,0		0,00
4.0.2	Demontažna ležišča SESTAVLJENO PO DETAJLU DOBAVITELJA	Dismantling mattresses ASSEMBLED TO SUPPLIER'S DETAIL	kpl	100,0		0,00
4.0.3	Odperti kovinski regal za hrano in pribor, sestavljiv z vijačnimi zvezami DOBAVLJIVO V SLO	Open metal food and cutlery rack, assemblable with screw ties AVAILABLE IN SLO	kpl	3,0		0,00
4.0.4	Kovinska omara za pribor in potrošni material DOBAVLJIVO V SLO	Metal cabinet for cutlery and consumables AVAILABLE IN SLO	kpl	1,0		0,00
4.0.5	Omarica s kompletom za prvo pomoč DOBAVLJIVO V SLO	First aid kit AVAILABLE IN SLO	kpl	6,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
4.0.6	Plastična posoda s pokrovom - za odplake, s prostornino 27 litrov za skupno potrebno prostornino (1 liter na dan za osebo za sedem dni = 2100 litrov) DOBAVLJIVO V SLO	Plastic container with lid - for sewage, with a capacity of 27 litres for the total required capacity (1 litre per person per day for seven days = 2100 litres) AVAILABLE IN SLO	kos	78,0		0,00
4.0.7	Plastična posoda s pokrovom - za fekalije, s prostornino 27 litrov za skupno potrebno prostornino (1,3 litra na dan za osebo za sedem dni = 2730 litrov) DOBAVLJIVO V SLO	Plastic container with lid - for faeces, with a capacity of 27 litres for the total required capacity (1.3 litres per person per day for seven days = 2730 litres) AVAILABLE IN SLO	kos	102,0		0,00
4.0.8	Plastična posoda s pokrovom - za odpadke, s prostornino 27 litrov za skupno potrebno prostornino (2 litra na dan za osebo za sedem dni = 4200 litrov) DOBAVLJIVO V SLO	Plastic container with lid - for waste, with a capacity of 27 litres for the total required capacity (2 litres per person per day for seven days = 4200 litres) AVAILABLE IN SLO	kos	156,0		0,00
4.0.9	Plastična posoda s pipico - za pitno vodo, s prostornino 20 litrov za skupno potrebno prostornino v zaklonišču (3 litre na dan za osebo za sedem dni = 6300 litrov) DOBAVLJIVO V SLO	Plastic container with tap - for drinking water, with a capacity of 20 litres for the total required shelter capacity (3 litres per person per day for seven days = 6300 litres) AVAILABLE IN SLO	kos	315,0		0,00
4.0.10	Suho stranišče s podnožjem DOBAVLJIVO V SLO	Dry toilet with base AVAILABLE IN SLO	kpl	9,0		0,00
4.0.11	Nosilec posode za vodo in vedro, emajlirani umivalnik za stensko pritrditvev, z odtokom v vedro SESTAVLJENO PO DETAJLU DOBAVITELJA	Water tank and bucket holder, enamelled washbasin for wall mounting, with drain into bucket ASSEMBLED TO SUPPLIER'S DETAIL	kpl	3,0		0,00
4.0.12	Tablice za označitev dostopa in namembnosti prostorov v zaklonišču PO DETAJLU DOBAVITELJA	Signs to indicate access and use of shelter spaces AS DETAILED BY THE SUPPLIER	kos	30,0		0,00
4.0.13	Zaklonski red z načrtom zaklonišča in z označenimi potmi umika iz zaklonišča – 2 x plastificirani A3 PO DETAJLU DOBAVITELJA	Shelter order with shelter plan and marked escape routes - 2 x laminated A3 AS DETAILED BY THE SUPPLIER	kpl	12,0		0,00
4.0.14	Montažne predelne stene s povezovalnim in pritrdilnim priborom za ureditev straniščnih kabin DOBAVLJIVO V SLO	Prefabricated partitions with connecting and fixing accessories for toilet cubicle arrangements AVAILABLE IN SLO	m2	60,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
4.0.15	Pribor za vrata v montažnih predelnih stenah straniščnih kabin DOBAVLJIVO V SLO	Door accessories in prefabricated toilet cubicle partitions AVAILABLE IN SLO	kpl	9,0		0,00
4.0.16	Komplet gasilske in samoreševalne opreme za reševanje iz zaklonišča (po prilogi A, Ur. l. RS št. 26/98 in 38/01):	Firefighting and self-rescue equipment kit for shelter rescue (according to Annex A, Official Journal of the RS No 26/98 and 38/01):				
	gasilni aparat na vodo V9	v9 water extinguisher	kpl	4,0		0,00
	rezervna tesnila za vrata (SR) (v zavitku)	spare door seals (SR) (in a pack)	kos	2,0		0,00
	nosila za poškodovance	stretchers for the injured	kpl	2,0		0,00
	zložljiva nosila za poškodovance	foldable stretchers for injured persons	kpl	2,0		0,00
	nosilni okvir za suho stranišče (ni potrebno, ker v tem zaklonišču ni mokrih stranišč)	a support frame for a dry toilet (not necessary as there are no wet toilets in this shelter)	kpl	0,0		0,00
	črne PVC vrečke za suho stranišče (po 100 kosov za eno stranišče)	black PVC bags for dry toilets (100 pieces per toilet)	kos	900,0		0,00
	toplotno - odporna tesnilna vrv (bela) (v zvitku)	heat-resistant sealing rope (white) (roll)	kos	2,0		0,00
	dvigalka 100 kN	100 kN hoist	kpl	2,0		0,00
	papir za medicinske potrebe (ni potrebno, ker v tem zaklonišču ni ambulate) (v zavitku)	medical paper (not needed as there is no clinic in this shelter) (in a roll)	kos	0,0		0,00
	rezervne vrečke za posodo z odpadki za 30 litrov vsebine (po 10 kosov na eno posodo z odpadki, v tem zaklonišču je 336 posod)	spare waste bin bags for 30 litres (10 per bin, 336 bins in this shelter)	kpl	3.360,0		0,00
	sredstvo za konzervacijo pitne vode (za celotni volumen posod za pitno vodo, odmerjeno v zavitkih za posamezno posodo, v količini za celotno število posod; v tem zaklonišču je predvidenih 315 posod) (v zavitku)	drinking water preservative (for the total volume of drinking water containers, measured in packs per container, in the quantity for the total number of containers; 315 containers are foreseen in this shelter) (per pack)	kos	315,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
	dodatno pa še osnovni komplet na plošči, ki se namesti na steno v zapori vhoda ter v zapori zasilnega izhoda in vsebuje sledeče predpisano ročno orodje: - kladivo 1500 g (1 kos) - kladivo 2000 g (1 kos) - klini iz trdega lesa (250×80×40) mm, (6 kosov) - matični ključ (46 mm, 1 kos) - zložljiva lopata (1 kos) - sekač za beton – koničasti 400 mm (1 kos) - sekač za beton – koničasti 500 mm (1 kos) - sekač za beton – ravni 500 mm (1 kos) - obod žage za kovino – 300 mm (1 kos) - sekira navadna – večja (1 kos) - kramp (1 kos) - lomilni drog 1,2 m (1 kos) - sekira manjša z nastavkom za izruvanje žebeljev (1 kos) - lističi za žago za kovino (300×22) mm, (10 kosov) - ročna žaga za les 500 mm VSE DOBAVLJIVO V SLO	in addition, a basic kit on a panel to be mounted on the wall in the entrance and emergency exit barriers, containing the following prescribed hand tools: - hammer 1500 g (1 piece) - hammer 2000 g (1 piece) - hardwood dowels (250×80×40) mm, (6 pieces) - wrench (46 mm, 1 piece) - folding shovel (1 piece) - concrete cutter - pointed 400 mm (1 piece) - concrete cutter - pointed 500 mm (1 piece) - concrete chisel - straight 500 mm (1 piece) - metal saw rim - 300 mm (1 piece) - hatchet - larger (1 piece) - pick (1 piece) - breaking bar 1,2 m (1 piece) - small axe with grubbing attachment nails (1 piece) - metal saw blades (300×22) mm, (10 pcs.) - hand-held wood saw 500 mm ALL AVAILABLE IN SLO				
			kpl	2,0		0,00
	BIVALNA, SANITARNA IN POMOŽNA OPREMA	LIVING, SANITARY AND ANCILLARY EQUIPMENT				0,00

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER****4.1.1 STROJNA DELA - VEČJE ZAKLONIŠČE S 300 ZAKLONILNIMI MESTI****MECHANICAL WORKS - LARGE SHELTER WITH 300 SHELTER SPACES**

4.1.1.5 VGRADNJA NAPRAV, NAPELJAV IN OPREME TER OSTALE DEJAVNOSTI

INSTALLATION OF PLANT, FIXTURES AND FITTINGS AND OTHER ACTIVITIES

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
5.0	VGRADNJA NAPRAV, NAPELJAV IN OPREME TER OSTALE DEJAVNOSTI	INSTALLATION OF PLANT, FIXTURES AND FITTINGS AND OTHER ACTIVITIES				
5.0.1	Namestitev vgradnih delov v opaže - pozicije od 1.01 do 1.15 DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Installing fittings in the formwork - positions 1.01 to 1.15 SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.2	Vgradnja zapiralnih sredstev in pribora v opaže in na stene - pozicije od 2.01 do 2.10 DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Installation of closures and fittings in sheathing and on walls - positions 2.01 to 2.10 SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.3	Vgradnja sistema za zračenje zaklониšča v zaščitni funkciji in uvodnice za tesnjenje kablov - pozicije od 3.01 do 3.34 DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Installation of a shelter ventilation system in protective function and cable glands - positions 3.01 to 3.34 SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.4	Vgradnja bivalne, sanitarne in pomožne opreme - pozicije od 4.01 do 4.16 DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Installation of living, sanitary and ancillary equipment - positions 4.01 to 4.16 SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
5.0.5	Izdelava navodil za uporabo, servisiranje in vzdrževanje sistema za zračenje in zaklonišča kot celote v zaščitni funkciji (projekt za obratovanje in vzdrževanje - POV) DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Preparation of instructions for the use, servicing and maintenance of the ventilation system and the shelter as a whole in its protective function (Operation and Maintenance Project - O&M Project) SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.6	Nastavitve prezračevalnih količin in tlakov sistema za zračenje v zaščitni funkciji zaklonišča DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Settings of ventilation volumes and pressures of the ventilation system in the shelter protection function SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.7	Predhodni preizkus celotnega zaklonišča in priprava zaklonišča na tehnični preizkus (za vse izvajalce v zaklonišču - brez izdaje javne listine) DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Preliminary test of the entire shelter and preparation of the shelter for the technical test (for all shelter operators - without issuing a public charter) SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.8	Tehnični preizkus zaklonišča kot celote za pridobitev javne listine (potrdila o opravljenem tehničnem preizkusu zaklonišča), kar izvede pooblaščen zavod POOBLAŠČENI ZAVOD	Technical test of the shelter as a whole to obtain a public document (certificate of completion of the technical test of the shelter), carried out by an approved institute AUTHORISED INSTITUTION	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.9	Izdelava elaborata o preureditvi zaklonišča iz funkcije za drugi namen v zaščitno funkcijo DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Preparation of a study on the conversion of a shelter from a function for another purpose to a protective function SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.10	Dobava, nastavitev in izpolnitev knjige vzdrževanja z začetnimi podatki DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Supply, setup and completion of the maintenance book with initial data SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.11	Seznanitev predstavnika uporabnika z načini uporabe in vzdrževanja zaklonišča DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Briefing the user representative on how to use and maintain the shelter SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.12	Izdelava posnetka in projekta izvedenih del za zaklonišče v obsegu dobave in del po tem popisu (PID) DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Preparation of a survey and design of the works to be carried out for the shelter to the extent of the supply and the works according to this Inventory (PID) SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
5.0.13	Kompletiranje vse potrebne in spremljajoče dokazne dokumentacije (certifikati, izjave o skladnosti, navodila, garancijski listi, poročila in zapisniki o meritvah, itd.) v obsegu dobave in del po tem popisu DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Completion of all necessary and accompanying supporting documentation (certificates, declarations of conformity, instructions, warranty certificates, reports and records of measurements, etc.) within the scope of the supply and the works according to this Inventory SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.14	Sodelovanje na operativnih sestankih na gradbišču DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Participation in operational meetings on site SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.15	Stroški transporta, souporabe pomožnih objektov, napeljav in zavarovanja na gradbišču DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Costs of transport, sharing of ancillary facilities, installations and on-site insurance SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
	VGRADNJA NAPRAV, NAPELJAV IN OPREME TER OSTALE DEJAVNOSTI	INSTALLATION OF PLANT, FIXTURES AND FITTINGS AND OTHER ACTIVITIES			Skupni znesek pozicij te točke mora biti zajet v	

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER**

REKAPITULACIJA STROŠKOV STROJNIH DEL

COST SUMMARY OF MECHANICAL WORKS

4 NAČRT S PODROČJA STROJNIŠTVA

4 DOCUMENTATION IN THE FIELD OF MECHANICAL ENGINEERING

4/1 Zaklonišče

4/1 Shelter

4.1.2	STROJNA DELA - MANJŠE ZAKLONIŠČE Z 200 ZAKLONILNIMI MESTI	MECHANICAL WORKS - SMALLER SHELTER WITH 200 SHELTER SPACES	
4.1.2.1	VGRADNI DELI	BUILDING WORKS	0,00
4.1.2.2	ZAPIRALNA SREDSTVA IN PRIBOR	CLOSURES AND ACCESSORIES	0,00
4.1.2.3	SISTEM ZA ZRAČENJE ZAKLONIŠČA V ZAŠČITNI FUNKCIJI IN UVODNICE ZA TESNENJE KABLOV	SHELTER VENTILATION SYSTEM IN PROTECTIVE FUNCTION AND CABLE SEALING GLANDS	0,00
4.1.2.4	BIVALNA, SANITARNA IN POMOŽNA OPREMA	LIVING, SANITARY AND ANCILLARY EQUIPMENT	0,00
4.1.2.5	VGRADNJA NAPRAV, NAPELJAV IN OPREME TER OSTALE DEJAVNOSTI	INSTALLATION OF PLANT, FIXTURES AND FITTINGS AND OTHER ACTIVITIES	0,00
			0,00
0%	NEPREDVIDENA DELA	UNFORSEEN WORKS	0,00
SKUPAJ STROJNA DELA - MANJŠE ZAKLONIŠČE Z 200 ZAK. MESTI		TOTAL MECHANICAL WORKS - SMALLER SHELTER WITH 200 SHELTER SPACES	0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER****4.1.2 STROJNA DELA - MANJŠE ZAKLONIŠČE Z 200 ZAKLONILNIMI MESTI****MECHANICAL WORKS - SMALLER SHELTER WITH 200 SHELTER SPACES**

4.1.2.1 VGRADNI DELI

BUILDING WORKS

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
1.0	VGRADNI DELI	BUILDING WORKS				
1.0.1	Ravna jeklena cev z nastavkom za vgradnjo protiudarnega ventila (vel. 4) - DN 200/750 z dvema prirobnicama kot npr.: KROBATH tip MF Gr. 4 DN 200/750 2F	Straight steel pipe with spigot for installation of backflow preventer (size 4) - DN 200/750 with two flanges as e.g. KROBATH type MF Gr. 4 DN 200/750 2F	kos	2,0		0,00
1.0.2	Ravna jeklena cev za dovod zraka na prezračevalno napravo pri zaščitnem zračenju DN 150/400 z eno prirobnico IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for air supply to the ventilation unit for protective ventilation DN 150/400 with one flange MADE TO SUPPLIER'S DETAIL	kos	2,0		0,00
1.0.3	Zalomljena jeklena cev za dovod zraka na prezračevalno napravo pri normalnem zračenju DN 200/400 z eno prirobnico, Z-zalom IZDELANO PO DETAJLU DOBAVITELJA	Broken steel pipe for air supply to the ventilation unit during normal ventilation DN 200/400 with one flange, Z-end MADE TO SUPPLIER'S DETAIL	kos	2,0		0,00
1.0.4	Zalomljena jeklena cev za ventil za regulacijo nadtlaka DN 150/750 z eno prirobnico (za odvod zraka iz bivalnega prostora v smeri zapore vhoda), U-zalom IZDELANO PO DETAJLU DOBAVITELJA	Fused steel pipe for overpressure control valve DN 150/750 with one flange (for air exhaust from the living space in the direction of the entrance barrier), U-joint MADE TO SUPPLIER'S DETAIL	kos	3,0		0,00
1.0.5	Ravna jeklena cev za ventil za regulacijo nadtlaka DN 150/300 z eno prirobnico (za odvod zraka iz sanitarij v smeri skladišča odpadkov in odplak) IZDELANO PO DETAJLU DOBAVITELJA	Flat steel hose for overpressure control valve DN 150/300 with one flange (for air discharge from toilets towards waste and sewage storage) MADE TO SUPPLIER'S DETAIL	kos	2,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
1.0.6	Zalomljena jeklena cev za odvod zraka iz zapore vhoda pri zaščitnem in normalnem zračenju DN 150/750 z dvema prirobnicama, Z-zalom IZDELANO PO DETAJLU DOBAVITELJA	Fused steel pipe for air outlet from the entrance barrier for protective and normal ventilation DN 150/750 with two flanges, Z-end MADE TO SUPPLIER'S DETAIL	kos	3,0		0,00
1.0.7	Zalomljena jeklena cev za odvod zraka iz skladišča odpadkov in odplak pri zaščitnem in normalnem zračenju DN 150/750 z dvema prirobnicama, Z-zalom IZDELANO PO DETAJLU DOBAVITELJA	Fused steel waste and sewage storage air pipe for protective and normal ventilation DN 150/750 with two flanges, Z-end MADE TO SUPPLIER'S DETAIL	kos	2,0		0,00
1.0.8	Ravna jeklena cev za odvod kondenzne vode z navojnim nastavkom za zasun DN 25/600 IZDELANO PO DETAJLU DOBAVITELJA	Flat steel condensate drain pipe with threaded plug DN 25/600 MADE TO SUPPLIER'S DETAIL	kos	1,0		0,00
1.0.9	Ravna jeklena cev za tesnjenje kablov DN 100/750 z nastavki za pritrditev med opaže IZDELANO PO DETAJLU DOBAVITELJA	Flat steel cable sealing hose DN 100/750 with fittings for fixing between the formwork MADE TO SUPPLIER'S DETAIL	kos	4,0		0,00
1.0.10	Ravna jeklena cev za tesnjenje kablov DN 100/400 z nastavki za pritrditev med opaže IZDELANO PO DETAJLU DOBAVITELJA	Flat steel cable sealing hose DN 100/400 with fittings for fixing between the formwork MADE TO SUPPLIER'S DETAIL	kos	4,1		0,00
1.0.11	Ravna jeklena cev za tesnjenje kablov DN 100/300 z nastavki za pritrditev med opaže IZDELANO PO DETAJLU DOBAVITELJA	Flat steel cable sealing hose DN 100/300 with fittings for fixing between the formwork MADE TO SUPPLIER'S DETAIL	kos	3,0		0,00
1.0.12	Ravna jeklena cev za pretok zraka in kondenzne vode med komorami peščenega predfiltra DN 150/400 z nastavki za pritrditev med opaže IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for the flow of air and condensate water between the sand pre-filter chambers DN 150/400 with fittings for fixing between the formwork MADE TO SUPPLIER'S DETAIL	kos	5,0		0,00
1.0.13	Ravna jeklena cev za prehod vodovodne napeljave skozi steno DN 25/750 – obojestransko z navojno tuljavo za zaščitno funkcijo zaklonišča IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for the passage of the water supply through the wall DN 25/750 - both sides with threaded sleeve for the shelter protection function MADE TO SUPPLIER'S DETAIL	kos	1,0		0,00
1.0.14	Ravna jeklena cev za prehod vodovodne napeljave skozi steno DN 20/300 – obojestransko z navojno tuljavo za zaščitno funkcijo zaklonišča IZDELANO PO DETAJLU DOBAVITELJA	Flat steel pipe for the passage of the water supply through the wall DN 20/300 - both sides with threaded sleeve for the protective function of the shelter MADE TO SUPPLIER'S DETAIL	kos	2,0		0,00
VGRADNI DELI		BUILDING WORKS				0,00

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER**
4.1.2 STROJNA DELA - MANJŠE ZAKLONIŠČE Z 200 ZAKLONILNIMI MESTI
MECHANICAL WORKS - SMALLER SHELTER WITH 200 SHELTER SPACES

4.1.2.2 ZAPIRALNA SREDSTVA IN PRIBOR

CLOSURES AND ACCESSORIES

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
2.0	ZAPIRALNA SREDSTVA IN PRIBOR	CLOSURES AND ACCESSORIES				
2.0.1	Armiranobetonska protiudarna vrata, plinotesna in požarna (EI-90), s priborom za odmik ruševin, za nadtlak 300 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim in blokadnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v zapori vhoda, z dimenzijami 1200/2050/200 mm – desna kot npr.: KROBATH tip DT-B 1200 R	Reinforced concrete anti-ram door, gas-tight and fire-resistant (EI-90), with debris deflection fittings, for an overpressure of 300 kPa, with integrated rubber seal, with closing and locking mechanism, with opening and closing directions marked on both sides, in the entrance barrier, with dimensions 1200/2050/200 mm - right such as KROBATH type DT-B 1200 R	kpl	1,0		0,00
2.0.2	Armiranobetonska protiudarna vrata, plinotesna in požarna (EI-90), s priborom za odmik ruševin, za nadtlak 300 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim in blokadnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v zapori zasilnega izhoda, z dimenzijami 825/2050/200 mm – desna kot npr.: KROBATH tip DT-B 825 R	Reinforced concrete anti-accident door, gas-tight and fire-resistant (EI-90), with debris deflection fittings, for an overpressure of 300 kPa, with built-in rubber seal, with closing and locking mechanism, with opening and closing directions marked on both sides, in emergency exit barrier, dimensions 825/2050/200 mm - right such as KROBATH type DT-B 825 R	kpl	1,0		0,00
2.0.3	Jeklana, plinotesna in požarna vrata (EI-90), za nadtlak 10 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v zapori vhoda, z dimenzijami 1200/2050/100 mm – leva kot npr.: KROBATH tip GT 1200 L	Steel, gas-tight and fire-resistant door (EI-90), for overpressure of 10 kPa, with integrated rubber seal, with closing mechanism, with opening and closing directions marked on both sides, in the entrance barrier, with dimensions 1200/2050/100 mm - left such as KROBATH type GT 1200 L	kpl	1,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
2.0.4	Jeklena, plinotesna in požarna vrata (EI-90), za nadtlak 10 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v skladišču odpadkov in odplak, z dimenzijami 825/2050/100 mm – desna kot npr.: KROBATH tip GT 825 R	Steel, gas-tight and fire-resistant door (EI-90), for overpressure of 10 kPa, with integrated rubber seal, with closing mechanism, with opening and closing directions marked on both sides, in waste and sewage storage, dimensions 825/2050/100 mm - right such as KROBATH type GT 825 R	kpl	1,0		0,00
2.0.5	Jeklena, plinotesna in požarna vrata (EI-90), za nadtlak 10 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v zapori zasilnega izhoda, z dimenzijami 825/2050/100 mm – desna kot npr.: KROBATH tip GT 825 R	Steel, gas-tight and fire-resistant door (EI-90), for overpressure of 10 kPa, with integrated rubber seal, with closing mechanism, with opening and closing directions marked on both sides, in emergency exit barrier, dimensions 825/2050/100 mm - right such as KROBATH type GT 825 R	kpl	1,0		0,00
2.0.6	Jeklena, plinotesna in požarna vratca (EI-90), za nadtlak 10 kPa, z vgrajenim gumijastim tesnilom, z zapiralnim mehanizmom, z obojestransko označenimi smermi odpiranja in zapiranja, v peščeni predfilter, z dimenzijami 600/800/100 mm – leva kot npr.: KROBATH tip GKL 90 L	Steel, gas-tight and fire-tight door (EI-90), for 10 kPa overpressure, with integrated rubber seal, with closing mechanism, opening and closing directions marked on both sides, in sand pre-filter, dimensions 600/800/100 mm - left such as KROBATH type GKL 90 L	kpl	1,0		0,00
2.0.7	Jeklena navadna notranja vrata, odporna na tresljaje konstrukcije, z vgrajeno rešetko za izenačevanje zračnega tlaka med notranjimi prostori, z dimenzijami 825/2050 mm – leva – za vstop v prostor z napravami kot npr.: KROBATH tip IT 825 L	Structural vibration-resistant plain steel interior door with integrated grille to equalise air pressure between interior spaces, dimensions 825/2050 mm - left - for access to the equipment room such as KROBATH type IT 825 L	kpl	1,0		0,00
2.0.8	Jeklena navadna notranja vrata, odporna na tresljaje konstrukcije, z vgrajeno rešetko za izenačevanje zračnega tlaka med notranjimi prostori, s samozapiralnim mehanizmom, z dimenzijami 825/2050 mm – leva – za vstop v sanitarije kot npr.: KROBATH tip IT 825 L	Steel ordinary internal door, resistant to structural vibrations, with integrated grille to equalise the air pressure between the internal compartments, with self-closing mechanism, dimensions 825/2050 mm - left-hand - for entrance to sanitary facilities such as KROBATH type IT 825 L	kpl	1,0		0,00
2.0.9	Jeklena navadna notranja vrata, odporna na tresljaje konstrukcije, z vgrajeno rešetko za izenačevanje zračnega tlaka med notranjimi prostori, z dimenzijami 825/2050 mm – desna – za vstop v shrambo vode in opreme kot npr.: KROBATH tip IT 825 R	Steel ordinary internal door, resistant to structural vibrations, with integrated grille to equalise air pressure between internal spaces, dimensions 825/2050 mm - right - for access to water and equipment storage such as KROBATH type IT 825 R	kpl	1,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
2.0.10	Jeklena lestev za dostop do prostora peščenega predfiltra, s priborom za montažno pritrditev DOBAVLJIVO V SLO	Steel ladder for access to the sand pre-filter compartment, with mounting accessories AVAILABLE IN SLO	m	2,0		0,00
	ZAPIRALNA SREDSTVA IN PRIBOR	CLOSURES AND ACCESSORIES				0,00

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER****4.1.2 STROJNA DELA - MANJŠE ZAKLONIŠČE Z 200 ZAKLONILNIMI MESTI****MECHANICAL WORKS - SMALLER SHELTER WITH 200 SHELTER SPACES**

4.1.2.3 SISTEM ZA ZRAČENJE ZAKLONIŠČA V ZAŠČITNI FUNKCIJI IN UVODNICE ZA TESNENJE KABLOV

SHELTER VENTILATION SYSTEM IN PROTECTIVE FUNCTION AND CABLE SEALING GLANDS

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
3.0	SISTEM ZA ZRAČENJE ZAKLONIŠČA V ZAŠČITNI FUNKCIJI IN UVODNICE ZA TESNENJE KABLOV	SHELTER VENTILATION SYSTEM IN PROTECTIVE FUNCTION AND CABLE SEALING GLANDS				
3.0.1	Protitudarni ventil (vel. 4) za dovod zraka s prigrajenim filtrom za grobi prah DN 200 kot npr.: KROBATH tip ESV GR. 4	Air inlet check valve (size 4) with coarse dust filter DN 200 such as KROBATH type ESV GR. 4	kpl	2,0		0,00
3.0.2	Nadtlačni protitudarni ventil za odvod zraka skozi zaporo vhoda in skozi skladišče odpadkov DN 150 kot npr.: KROBATH tip ÜV-ESV 75	Overpressure backdraft valve for air outlet through the entrance barrier and through the waste storage DN 150 such as KROBATH type ÜV-ESV 75	kpl	5,0		0,00
3.0.3	Regulacijski ventil za odvod zraka DN 150 kot npr.: KROBATH tip ALV 150	Control valve for air outlet DN 150 such as KROBATH type ALV 150	kpl	5,0		0,00
3.0.4	Vroče cinkana rešetka za peščeni predfilter kot npr.: KROBAT SFR VERZ.	Hot-dip galvanised grating for sand pre-filter such as KROBAT SFR VERZ.	m2	5,0		0,00
3.0.5	Certificirani ostrorobi peščeni granulati, eruptivnega porekla, odprašen, zrna granulacije 4-8 mm, embaliran v vrečah s težo največ 30 kg v SLO pri dobavitelju peska asfaltnim bazam	Certified coarse sandy granulate, eruptive origin, dust-free, grain size 4-8 mm, packed in bags weighing not more than 30 kg in SLO, supplier of sand to asphalt bases	m3	7,1		0,00
3.0.6	Vmesna zalomljena cev DN 150 za dovod zraka na prezračevalno napravo pri zaščitnem zračenju, z dvema prirobnicama, L-zalom DOBAVLJIVO V SLO	Intermediate broken pipe DN 150 for air supply to the ventilation unit in protective ventilation, with two flanges, L-bend AVAILABLE IN SLO	kpl	2,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
3.0.7	Vmesna zalomljena cev DN 200 za dovod zraka na prezračevalno napravo pri normalnem zračenju, z dvema prirobnicama, L-zalom DOBAVLJIVO V SLO	Intermediate broken pipe DN 200 for air supply to the ventilation unit under normal ventilation, with two flanges, L-shaped AVAILABLE IN SLO	kpl	2,0		0,00
3.0.8	Krogelni ventil za zapiranje odvoda kondenzne vode DN 25 iz prostora peščenega predfiltra DOBAVLJIVO V SLO	Ball valve for closing the condensate drain DN 25 from the sand pre-filter compartment AVAILABLE IN SLO	kos	1,0		0,00
3.0.9	Plinotesna loputa z ročico DN 200-RS DOBAVLJIVO V SLO	Gas-tight butterfly valve with handle DN 200-RS AVAILABLE IN SLO	kpl	2,0		0,00
3.0.10	Plinotesna loputa z ročico DN 150-RS DOBAVLJIVO V SLO	Gas-tight butterfly valve with handle DN 150-RS AVAILABLE IN SLO	kpl	7,0		0,00
3.0.11	Prezračevalna naprava z ročnim in električnim pogonom (400 V, 50 Hz, 400 W, IP 54), pogonsko ročico, stikalom, prikazovalnikom pretoka zraka (načina zračenja), z navodilom za uporabo v različnih načinih zračenja, za nazivni pretok najmanj 600 m ³ /h kot npr.: KROBATH tip VA-300	Ventilation appliance with manual and electric drive (400 V, 50 Hz, 400 W, IP 54), drive lever, switch, air flow display (ventilation mode), with instructions for use in different ventilation modes, for a nominal flow of at least 600 m ³ /h such as KROBATH type VA-300	kpl	2,0		0,00
3.0.12	Filter za RBK-zaščito s priključnima prirobnicama, s podnožjem za vgradnjo in pritrditev, za nazivni pretok 200 m ³ /h in padec tlaka največ 600 Pa; filter mora imeti veljavni certifikat in nalepko KI Ljubljana kot npr.: COLF tip ECS-250	RBK-protection filter with two connection flanges, with mounting and fixing base, for a nominal flow of 200 m ³ /h and a pressure drop of maximum 600 Pa; the filter must have a valid certificate and a label from KI Ljubljana such as COLF type ECS-250	kpl	2,0		0,00
3.0.13	Razstavljiva spojka s prirobnicama in gibljivimi cevmi za hitro priključitev filtra za RBK-zaščito, vse skladno s tipom dobavljenega filtra kot npr.: KROBATH tip SKU	Expandable coupling with flanges and flexible hoses for quick connection of the RBC protection filter, all according to the type of filter supplied such as KROBATH type SKU	kpl	2,0		0,00
3.0.14	Tekočinski merilnik nadtlaka (U-cevka) z merilnim območjem najmanj 1500 Pa kot npr.: KROBATH tip SRM-7031	Liquid pressure gauge (U-tube) with a measuring range of at least 1500 Pa such as KROBATH type SRM-7031	kpl	1,0		0,00
3.0.15	Pribor za neprekinjeno cevno povezavo merilnika nadtlaka v hodnik zasilnega izhoda, z ventilom DOBAVLJIVO V SLO	Accessories for continuous hose connection of an overpressure gauge to the emergency exit corridor, with valve AVAILABLE IN SLO	kpl	1,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
3.0.16	Merilnik temperature zraka (od 0 do + 40 °C) in relativne vlažnosti zraka (od 20 do 100 %) DOBAVLJIVO V SLO	Air temperature gauge (0 to + 40 °C) and relative humidity (from 20 to 100%) AVAILABLE IN SLO	kpl	1,0		0,00
3.0.17	Jeklena spiro cev za razvod zraka s potrebnimi fazonskimi kosi DN 200 DOBAVLJIVO V SLO - PICHLER	Steel spiro pipe for air distribution with necessary phasing pieces DN 200 AVAILABLE IN SLO - PICHLER	m	60,0		0,00
3.0.18	Jeklena spiro cev za razvod zraka s potrebnimi fazonskimi kosi DN 160 DOBAVLJIVO V SLO - PICHLER	Steel spiro pipe for air distribution with necessary phasing pieces DN 160 AVAILABLE IN SLO - PICHLER	m	30,0		0,00
3.0.19	Jeklena spiro cev za razvod zraka s potrebnimi fazonskimi kosi DN 100 DOBAVLJIVO V SLO - PICHLER	Steel spiro pipe for air distribution with necessary phasing pieces DN 100 AVAILABLE IN SLO - PICHLER	m	15,0		0,00
3.0.20	Prezračevalni ventil za dovod zraka DN 160 DOBAVLJIVO V SLO - PICHLER	Ventilation valve for air inlet DN 160 AVAILABLE IN SLO - PICHLER	kpl	15,0		0,00
3.0.21	Prezračevalni ventil za dovod zraka DN 100 DOBAVLJIVO V SLO - PICHLER	Ventilation valve for air inlet DN 100 AVAILABLE IN SLO - PICHLER	kpl	8,0		0,00
3.0.22	Pribor za vertikalno elastično obešanje spiro cevi DN 200 za razvod zraka SESTAVLJENO PO DETAJLU	Accessories for vertical elastic suspension of spiro tubes DN 200 for air distribution ASSEMBLED IN DETAIL	kpl	40,0		0,00
3.0.23	Pribor za vertikalno elastično obešanje spiro cevi DN 160 za razvod zraka SESTAVLJENO PO DETAJLU	Accessories for vertical elastic suspension of spiro tubes DN 160 for air distribution ASSEMBLED IN DETAIL	kpl	20,0		0,00
3.0.24	Pribor za vertikalno elastično obešanje spiro cevi DN 100 za razvod zraka SESTAVLJENO PO DETAJLU	Accessories for vertical elastic suspension of spiro tubes DN 100 for air distribution ASSEMBLED IN DETAIL	kpl	10,0		0,00
3.0.25	Regulacijska loputa DN 200 DOBAVLJIVO V SLO - PICHLER	Regulating flap DN 200 AVAILABLE IN SLO - PICHLER	kpl	6,0		0,00
3.0.26	Regulacijska loputa DN 100 DOBAVLJIVO V SLO - PICHLER	Regulating flap DN 100 AVAILABLE IN SLO - PICHLER	kpl	3,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
3.0.27	Tesnilna uvodnica s polnilnimi kosi za tesnjenje kablov DN 100 kot npr.: KROBATH tip RGP-100	Sealing gland with filler pieces for sealing cables DN 100 such as KROBATH type RGP-100	kpl	22,0		0,00
3.0.28	Zaščitna plošča z mrežico za zunanjo stran cevi za odvod zraka DN 150 SESTAVLJENO PO DETAJLU DOBAVITELJA	Protective plate with mesh for the outside of the air outlet pipe DN 150 ASSEMBLED TO SUPPLIER'S DETAIL	kpl	5,0		0,00
3.0.29	Zaščitna plošča z mrežico za zunanjo stran cevi za dovod zraka DN 200 SESTAVLJENO PO DETAJLU DOBAVITELJA	Protective plate with mesh for the outside of the air inlet pipe DN 200 ASSEMBLED TO SUPPLIER'S DETAIL	kpl	2,0		0,00
3.0.30	Vmesna spiro cevna povezava z dušilno loputo za priključitev prezračevalne naprave na dovodna priključka normalnega in zaščitnega zračenja DN 200/150 DOBAVLJIVO V SLO - PICHLER	Intermediate spiro hose connection with throttle valve for the connection of the ventilation appliance to the normal and protective ventilation inlet connections DN 200/150 AVAILABLE IN SLO - PICHLER	kpl	2,0		0,00
3.0.31	Ravna vmesna cev za nadgradnjo plinotesne lopute nad ventilom za regulacijo nadtlaka DN 150 z dvema prirobnicama PO DETAJLU DOBAVITELJA	Straight intermediate pipe for the gas-tight hatch upgrade above the pressure relief valve DN 150 with two flanges AS DETAILED BY THE SUPPLIER	kos	5,0		0,00
3.0.32	Detektor ogljikovega monoksida (s kabelsko povezavo krmilno-signalnega dela in senzorja), z napajalnima električnima priključkoma 230 in 24 V, s svetlobnim in zvočnim alarmom, kalibriran na alarmni prag 50 ppm CO, z navodilom za uporabo kot npr.: FISCHER tip LIFE GM 040-6 + FRFCO	Carbon monoxide detector (with cable connection of the control-signalling part and the sensor), with 230 and 24 V power supply, with light and sound alarm, calibrated to an alarm threshold of 50 ppm CO, with instruction manual such as FISCHER type LIFE GM 040-6 + FRFCO	kpl	1,0		0,00
3.0.33	Jekleni čep DN 25 za obojestransko plinotesno zatesnitev cevi vodovodne napeljave do uporabe vodovodnega priključka DOBAVLJIVO V SLO	Steel plug DN 25 for double-sided gas-tight sealing of the water supply pipe until the water connection is used AVAILABLE IN SLO	kos	2,0		0,00
3.0.34	Jekleni čep DN 20 za obojestransko plinotesno zatesnitev cevi vodovodne napeljave do uporabe vodovodnega priključka DOBAVLJIVO V SLO	Steel plug DN 20 for double-sided gas-tight sealing of the water supply pipe until the water connection is used AVAILABLE IN SLO	kos	4,0		0,00
	SISTEM ZA ZRAČENJE ZAKLONIŠČA V ZAŠČITNI FUNKCIJI IN UVODNICE ZA TESNENJE KABLOV	SHELTER VENTILATION SYSTEM IN PROTECTIVE FUNCTION AND CABLE SEALING GLANDS				0,00

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER**
4.1.2 STROJNA DELA - MANJŠE ZAKLONIŠČE Z 200 ZAKLONILNIMI MESTI
MECHANICAL WORKS - SMALLER SHELTER WITH 200 SHELTER SPACES

4.1.2.4 BIVALNA, SANITARNA IN POMOŽNA OPREMA

LIVING, SANITARY AND ANCILLARY EQUIPMENT

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
4.0	BIVALNA, SANITARNA IN POMOŽNA OPREMA	LIVING, SANITARY AND ANCILLARY EQUIPMENT				
	Sedežno-ležalne in ležalne konstrukcije morajo biti dobavljene in vgrajene demontažno v količini za 2/3 zaklonilnih mest kot sedeži in za 1/3 zaklonilnih mest kot ležišča, z vmesnimi vzdolžnimi in prečnimi hodniki, skladno z zahtevami predpisa; če bodo vgrajene postelje in sedišča s platni, morajo biti iz snovi, ki ne plesni (samougasljiva umetna vlakna); dobavitelj mora ta del popisa prilagoditi svojim kataloškim podatkom in v celoti zahtevam predpisa, za zaklonišče za 250 oseb.	The seating and bedding structures shall be supplied and installed dismantled in a quantity of 2/3 of the shelter positions as seats and 1/3 of the shelter positions as beds, with longitudinal and transverse corridors in between, in accordance with the requirements of the Regulation; if beds and seats with canvas are to be installed, they shall be of non-mould-resistant material (self-extinguishing plastic fibres); the supplier shall adapt this part of the inventory to his own catalogue and to the full requirements of the Regulation, for a shelter for 250 persons.				
4.0.1	Demontažna sedišča SESTAVLJENO PO DETAJLU DOBAVITELJA	Dismantling seating ASSEMBLED TO SUPPLIER'S DETAIL	kpl	134,0		0,00
4.0.2	Demontažna ležišča SESTAVLJENO PO DETAJLU DOBAVITELJA	Dismantling mattresses ASSEMBLED TO SUPPLIER'S DETAIL	kpl	67,0		0,00
4.0.3	Odperti kovinski regal za hrano in pribor, sestavljen z vijačnimi zvezami DOBAVLJIVO V SLO	Open metal food and cutlery rack, assemblable with screw ties AVAILABLE IN SLO	kpl	2,0		0,00
4.0.4	Kovinska omara za pribor in potrošni material DOBAVLJIVO V SLO	Metal cabinet for cutlery and consumables AVAILABLE IN SLO	kpl	1,0		0,00
4.0.5	Omarica s kompletom za prvo pomoč DOBAVLJIVO V SLO	First aid kit AVAILABLE IN SLO	kpl	4,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
4.0.6	Plastična posoda s pokrovom - za odplake, s prostornino 27 litrov za skupno potrebno prostornino (1 liter na dan za osebo za sedem dni = 1400 litrov) DOBAVLJIVO V SLO	Plastic container with lid - for sewage, with a capacity of 27 litres for the total required capacity (1 litre per person per day for seven days = 1400 litres) AVAILABLE IN SLO	kos	52,0		0,00
4.0.7	Plastična posoda s pokrovom - za fekalije, s prostornino 27 litrov za skupno potrebno prostornino (1,3 litra na dan za osebo za sedem dni = 1820 litrov) DOBAVLJIVO V SLO	Plastic container with lid - for faeces, with a capacity of 27 litres for the total required capacity (1.3 litres per person per day for seven days = 1820 litres) AVAILABLE IN SLO	kos	68,0		0,00
4.0.8	Plastična posoda s pokrovom - za odpadke, s prostornino 27 litrov za skupno potrebno prostornino (2 litra na dan za osebo za sedem dni = 2800 litrov) DOBAVLJIVO V SLO	Plastic container with lid - for waste, with a capacity of 27 litres for the total required capacity (2 litres per person per day for seven days = 2800 litres) AVAILABLE IN SLO	kos	104,0		0,00
4.0.9	Plastična posoda s pipico - za pitno vodo, s prostornino 20 litrov za skupno potrebno prostornino v zaklonišču (3 litre na dan za osebo za sedem dni = 4200 litrov) DOBAVLJIVO V SLO	Plastic container with tap - for drinking water, with a capacity of 20 litres for the total required shelter capacity (3 litres per person per day for seven days = 4200 litres) AVAILABLE IN SLO	kos	210,0		0,00
4.0.10	Suho stranišče s podnožjem DOBAVLJIVO V SLO	Dry toilet with base AVAILABLE IN SLO	kpl	6,0		0,00
4.0.11	Nosilec posode za vodo in vedro, emajlirani umivalnik za stensko pritrditvev, z odtokom v vedro SESTAVLJENO PO DETAJLU DOBAVITELJA	Water tank and bucket holder, enamelled washbasin for wall mounting, with drain into bucket ASSEMBLED TO SUPPLIER'S DETAIL	kpl	2,0		0,00
4.0.12	Tablice za označitev dostopa in namembnosti prostorov v zaklonišču PO DETAJLU DOBAVITELJA	Signs to indicate access and use of shelter spaces AS DETAILED BY THE SUPPLIER	kos	22,0		0,00
4.0.13	Zaklonski red z načrtom zaklonišča in z označenimi potmi umika iz zaklonišča – 2 x plastificirani A3 PO DETAJLU DOBAVITELJA	Shelter order with shelter plan and marked escape routes - 2 x laminated A3 AS DETAILED BY THE SUPPLIER	kpl	10,0		0,00
4.0.14	Montažne predelne stene s povezovalnim in pritrdilnim priborom za ureditev straniščnih kabin DOBAVLJIVO V SLO	Prefabricated partitions with connecting and fixing accessories for toilet cubicle arrangements AVAILABLE IN SLO	m2	32,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
4.0.15	Pribor za vrata v montažnih predelnih stenah straniščnih kabin DOBAVLJIVO V SLO	Door accessories in prefabricated toilet cubicle partitions AVAILABLE IN SLO	kpl	6,0		0,00
4.0.16	Komplet gasilske in samoreševalne opreme za reševanje iz zaklonišča (po prilogi A, Ur. l. RS št. 26/98 in 38/01):	Firefighting and self-rescue equipment kit for shelter rescue (according to Annex A, Official Journal of the RS No 26/98 and 38/01):				
	gasilni aparat na vodo V9	v9 water extinguisher	kpl	4,0		0,00
	rezervna tesnila za vrata (SR) (v zavitku)	spare door seals (SR) (in a pack)	kos	2,0		0,00
	nosila za poškodovance	stretchers for the injured	kpl	2,0		0,00
	zložljiva nosila za poškodovance	foldable stretchers for injured persons	kpl	2,0		0,00
	nosilni okvir za suho stranišče (ni potrebno, ker v tem zaklonišču ni mokrih stranišč)	a support frame for a dry toilet (not necessary as there are no wet toilets in this shelter)	kpl	0,0		0,00
	črne PVC vrečke za suho stranišče (po 100 kosov za eno stranišče)	black PVC bags for dry toilets (100 pieces per toilet)	kos	600,0		0,00
	toplotno - odporna tesnilna vrv (bela) (v zvitku)	heat-resistant sealing rope (white) (roll)	kos	2,0		0,00
	dvigalka 100 kN	100 kN hoist	kpl	2,0		0,00
	papir za medicinske potrebe (ni potrebno, ker v tem zaklonišču ni ambulate) (v zavitku)	medical paper (not needed as there is no clinic in this shelter) (in a roll)	kos	0,0		0,00
	rezervne vrečke za posodo z odpadki za 30 litrov vsebine (po 10 kosov na eno posodo z odpadki, v tem zaklonišču je 224 posod)	spare waste bin bags for 30 litres of waste (10 per bin, 224 bins in this shelter)	kpl	2.240,0		0,00
	sredstvo za konzervacijo pitne vode (za celotni volumen posod za pitno vodo, odmerjeno v zavitkih za posamezno posodo, v količini za celotno število posod; v tem zaklonišču je predvidenih 210 posod) (v zavitku)	drinking water preservative (for the total volume of drinking water containers, measured in packs for each container, in the quantity for the total number of containers; 210 containers are foreseen in this shelter) (in a pack)	kos	210,0		0,00

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
	dodatno pa še osnovni komplet na plošči, ki se namesti na steno v zapori vhoda ter v zapori zasilnega izhoda in vsebuje sledeče predpisano ročno orodje: - kladivo 1500 g (1 kos) - kladivo 2000 g (1 kos) - klini iz trdega lesa (250×80×40) mm, (6 kosov) - matični ključ (46 mm, 1 kos) - zložljiva lopata (1 kos) - sekač za beton – koničasti 400 mm (1 kos) - sekač za beton – koničasti 500 mm (1 kos) - sekač za beton – ravni 500 mm (1 kos) - obod žage za kovino – 300 mm (1 kos) - sekira navadna – večja (1 kos) - kramp (1 kos) - lomilni drog 1,2 m (1 kos) - sekira manjša z nastavkom za izruvanje žebeljev (1 kos) - lističi za žago za kovino (300×22) mm, (10 kosov) - ročna žaga za les 500 mm VSE DOBAVLJIVO V SLO	in addition, a basic kit on a panel to be mounted on the wall in the entrance and emergency exit barriers, containing the following prescribed hand tools: - hammer 1500 g (1 piece) - hammer 2000 g (1 piece) - hardwood dowels (250×80×40) mm, (6 pieces) - wrench (46 mm, 1 piece) - folding shovel (1 piece) - concrete cutter - pointed 400 mm (1 piece) - concrete cutter - pointed 500 mm (1 piece) - concrete chisel - straight 500 mm (1 piece) - metal saw rim - 300 mm (1 piece) - hatchet - larger (1 piece) - pick (1 piece) - breaking bar 1,2 m (1 piece) - small axe with grubbing attachment nails (1 piece) - metal saw blades (300×22) mm, (10 pcs.) - hand-held wood saw 500 mm ALL AVAILABLE IN SLO				
			kpl	2,0		0,00
	BIVALNA, SANITARNA IN POMOŽNA OPREMA	LIVING, SANITARY AND ANCILLARY EQUIPMENT				0,00

Investitor: **UNIVERZA V LJUBLJANI****UNIVERSITY IN LJUBLJANA**Gradnja: **Fakulteta za strojništvo****Faculty of Mechanical Engineering**Objekt: **ZAKLONIŠČE****SHELTER****4.1.2 STROJNA DELA - MANJŠE ZAKLONIŠČE Z 200 ZAKLONILNIMI MESTI****MECHANICAL WORKS - SMALLER SHELTER WITH 200 SHELTER SPACES**

4.1.2.5 VGRADNJA NAPRAV, NAPELJAV IN OPREME TER OSTALE DEJAVNOSTI

INSTALLATION OF PLANT, FIXTURES AND FITTINGS AND OTHER ACTIVITIES

0,00

Opomba: Cene so v EUR brez DDV-ja / Note: Prices are in EUR excluding VAT

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
5.0	VGRADNJA NAPRAV, NAPELJAV IN OPREME TER OSTALE DEJAVNOSTI	INSTALLATION OF PLANT, FIXTURES AND FITTINGS AND OTHER ACTIVITIES				
5.0.1	Namestitve vgradnih delov v opaže - pozicije od 1.01 do 1.14 DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Installing fittings in the formwork - positions 1.01 to 1.14 SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.2	Vgradnja zapiralnih sredstev in pribora v opaže in na stene - pozicije od 2.01 do 2.10 DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Installation of closures and fittings in sheathing and on walls - positions 2.01 to 2.10 SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.3	Vgradnja sistema za zračenje zaklonskega v zaščitni funkciji in uvodnice za tesnjenje kablov - pozicije od 3.01 do 3.34 DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Installation of a shelter ventilation system in protective function and cable glands - positions 3.01 to 3.34 SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.4	Vgradnja bivalne, sanitarne in pomožne opreme - pozicije od 4.01 do 4.16 DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Installation of living, sanitary and ancillary equipment - positions 4.01 to 4.16 SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
5.0.5	Izdelava navodil za uporabo, servisiranje in vzdrževanje sistema za zračenje in zaklonišča kot celote v zaščitni funkciji (projekt za obratovanje in vzdrževanje - POV) DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Preparation of instructions for the use, servicing and maintenance of the ventilation system and the shelter as a whole in its protective function (Operation and Maintenance Project - O&M Project) SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.6	Nastavitve prezračevalnih količin in tlakov sistema za zračenje v zaščitni funkciji zaklonišča DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Settings of ventilation volumes and pressures of the ventilation system in the shelter protection function SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.7	Predhodni preizkus celotnega zaklonišča in priprava zaklonišča na tehnični preizkus (za vse izvajalce v zaklonišču - brez izdaje javne listine) DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Preliminary test of the entire shelter and preparation of the shelter for the technical test (for all shelter operators - without issuing a public charter) SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.8	Tehnični preizkus zaklonišča kot celote za pridobitev javne listine (potrdila o opravljenem tehničnem preizkusu zaklonišča), kar izvede pooblaščen zavod POOBLAŠČENI ZAVOD	Technical test of the shelter as a whole to obtain a public document (certificate of completion of the technical test of the shelter), carried out by an approved institute AUTHORISED INSTITUTION	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.9	Izdelava elaborata o preureditvi zaklonišča iz funkcije za drugi namen v zaščitno funkcijo DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Preparation of a study on the conversion of a shelter from a function for another purpose to a protective function SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.10	Dobava, nastavitve in izpolnitev knjige vzdrževanja z začetnimi podatki DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Supply, setup and completion of the maintenance book with initial data SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.11	Seznanitev predstavnika uporabnika z načini uporabe in vzdrževanja zaklonišča DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Briefing the user representative on how to use and maintain the shelter SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.12	Izdelava posnetka in projekta izvedenih del za zaklonišče v obsegu dobave in del po tem popisu (PID) DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Preparation of a survey and design of the works to be carried out for the shelter to the extent of the supply and the works according to this Inventory (PID) SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	

Poz.	Opis	Description	EM	Količina	Cena/EM	Cena
5.0.13	Kompletiranje vse potrebne in spremljajoče dokazne dokumentacije (certifikati, izjave o skladnosti, navodila, garancijski listi, poročila in zapisniki o meritvah, itd.) v obsegu dobave in del po tem popisu DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Completion of all necessary and accompanying supporting documentation (certificates, declarations of conformity, instructions, warranty certificates, reports and records of measurements, etc.) within the scope of the supply and the works according to this Inventory SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.14	Sodelovanje na operativnih sestankih na gradbišču DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Participation in operational meetings on site SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
5.0.15	Stroški transporta, souporabe pomožnih objektov, napeljav in zavarovanja na gradbišču DOBAVITELJ TEHNIKE IN OPREME ZAKLONIŠČA	Costs of transport, sharing of ancillary facilities, installations and on-site insurance SUPPLIER OF SHELTER EQUIPMENT	kpl	1,0	Že zajeto v cenah 1.0 do 4.0	
	VGRADNJA NAPRAV, NAPELJAV IN OPREME TER OSTALE DEJAVNOSTI	INSTALLATION OF PLANT, FIXTURES AND FITTINGS AND OTHER ACTIVITIES			Skupni znesek pozicij te točke mora biti zajet v	

DGNB quality classes of materials, components and equipment installed

ID	Line	Category	Relevant building elements / Building materials / Surfaces	Scope	Substances / Aspects concerned	Reference standard	Quality class QS1	Quality class QS2	Quality class QS3	Quality class QS4	Type of documentation	Scope and verification	Notes on definitions / explanations / footnotes
			Where is this particularly true?	Product type	Explanatory note	Definition	CLP limit value 10	Reference value 50 CLP (Verification via construction catalogue; possible alternative verification based on craftsmanship)	Intermediate target 75 CLP (Verification via construction catalogue)	Target value 100 CLP (Verification via construction catalogue)	Requirement for verification of specific aspects	The requirement applies to the following components	
18001	1	Coatings on non-mineral substrates inside and outside	Coatings on non-mineral substrates: metals, wood, plastics	Decorative liquid coatings are foreseen: varnishes / lacquers with primers. Effect coatings (e.g. metallic paints) are excluded.	VOC	VOC-Directive 2004/42/EG	< 300 g/l - category D under Directive 2004/42/EC	In accordance with the requirements for water-soluble (Wb) products of the current Decopaint Guidelines (Appendix II) (Cat. D according to Directive 1004/42/EG) <130 g/L	< 100 g/l or RAL-UZ 12a	RAL-UZ 12a	TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	All relevant building elements and products	Remark: Factory coatings
18002	2	Coatings of mineral substrates inside	Coatings on predominantly mineral substrates in interiors, but also on wallpaper, fleece, plasterboard, etc. Floors with specific resistance requirements (such as OS systems) and traffic routes such as underground garages and driveways are not considered.	It applies to decorative paints, primers, decorative levelling compounds (including levelling according to grades 1-4), as well as deep primers, floor coatings without special resistance requirements, concrete glazes.	VOC / SVOC	VOC-Directive 2004/42/EG	In accordance with the requirements for water-soluble (Wb) products of the current Decopaint Guidelines (Appendix II)	< 30 g/l	Solvent-free and plasticizer-free according to VdL-RL01 or RAL-UZ 102 (SVOC)	Solvent-free and plasticizer-free according to VdL-RL01 or RAL-UZ 102 (SVOC)	TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	All relevant building elements and products. No proof required for up to 5 % BGF(R) according to DIN 277	-
18003	3	Coatings of mineral substrates inside	Coatings on predominantly mineral substrates in interior spaces such as concrete, masonry, mortar and levelling (e.g. levelling compounds for concrete). It does not apply to floors with special resistance requirements (such as OS systems) and traffic routes such as underground garages, driveways and exposed and decorative flooring.	Applied to dust-bonding coatings, primers, e.g. concrete primers, pre-coatings for highly absorbent substrates.	VOC	VOC-Directive 2004/42/EG	< 30 g/l	< 30 g/l	< 10 g/l	< 5 g/l	TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	All relevant building elements and products. No proof required for up to 5 % BGF(R) according to DIN 277	-
18004	4	Wallpaper adhesives	Wall and ceiling coverings	Wallpaper adhesives	VOC	VdL-criteria 01	Powdered or dispersion adhesives without solvents	Powdered or dispersion adhesives without solvents	Powdered or dispersion adhesives without solvents	Powdered products or solvent-free dispersion adhesives according to VdL-RL01	TL and/or VL	All relevant building elements and products	-
18005	5	Coatings of mineral substrates outside	Coating materials for external mineral surfaces such as concrete, masonry, mineral mortar and levelling compound, plaster, ETICS, wallpaper (facade wallpaper), plasterboard, etc.	Currently, decorative paints and dispersion adhesives for insulation materials are considered.	VOC	VOC-Directive 2004/42/EG	< 40 g/l	< 40 g/l	< 40 g/l	< 40 g/l	TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	All relevant building elements and products	-
18006	6	Floor coverings	Floor coverings (factory)	Textile floor coverings	VOC / hazardous substances	GUT, RAL-UZ 128	GUT- quality mark or RAL-UZ 128	GUT- quality mark or RAL-UZ 128	GUT- quality mark or RAL-UZ 128	GUT- quality mark or RAL-UZ 128	TL and/or Ecolabel (Blue Angel)	All floor coverings	-
18007	7	Floor coverings	Floor coverings (factory)	Resilient floor coverings	VOC / SVOC / hazardous substances	AgBB or equivalent emission proof (chlorinated paraffins, see footnote)	Proof of emissions	Proof of emissions and < 0,1 % chlorinated paraffins	Proof of emissions and < 0,1 % of chlorinated paraffins and < 0,1 % phthalates toxic to reproduction (= SVHC)	Emissions after 28 days ≤ RAL-UZ 120 and < 0,1 % of chlorinated paraffins and < 0,1 % phthalates toxic to reproduction (= SVHC)	TL and/or manufacturer's declaration and additionally for QS4: an emission certificate in accordance with EN ISO 16000-9 / EN 16516	All floor coverings	Proof of emissions Chlorinated paraffins
18008	8	Laying aids	Primers, pre-coatings, levelling compounds and adhesives under wall and floor coverings (e.g. tiles, carpets, parquet, resilient floor coverings - except wallpaper).	All installation materials, auxiliary materials for tiling surfaces (walls and floors).	VOC	GEV-EMICODE, GISCODE and RAL-UZ	GISCODE D1, RU0,5, RU1, RE1 oder RS10	and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R	GISCODE D1, RU0,5, RU1, RE1 or RS10 and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R or RAL-UZ 113	GISCODE D1, RU0,5, RU1, RE1 or RS10 and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R or RAL-UZ 113	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products	-
18009	9	Laying aids	Barrier coatings, screed resins, waterproofing under tiles	Laying aids	VOC	GEV-EMICODE, GISCODE	GISCODE D1, ZP1, RE0, RE1, RU0,5 or RU1	GISCODE D1, ZP1, RE0, RE1, RU0,5 or RU1	GISCODE D1, ZP1, RE0, RE1, RU0,5 or RU 1 and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R	GISCODE D1, ZP1, RE0, RE1, RU0,5 or RU 1 and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products. No proof required for up to 5 % BGF(R) according to DIN 277	-
18010	10	Impregnations for natural stone inside	Natural stone flooring	Non-film-forming interior impregnations (e.g. impregnations for natural stone, surface hardeners (sandstone))	VOC	VOC-Directive 2004/42/EG	Aroma-free (GH10)	Aroma-free (GH10)	Aroma-free (GH10)	Solvent content < 5 %, no labelling requirement	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration - in special cases (type of natural stone) a technical exception may be claimed	All relevant building elements and products	-
18011	11	Sealants and adhesives	Low-wall trims (mouldings), door mouldings, adhesives for fixing supports (raised or hollow floors); The glazing, façade and fire protection areas are not taken into account.	Sealants, gaskets, adhesives for point and line bonding of interior components. This refers to PU adhesives and silane-modified polymers (SMP).	VOC	GISCODE (PU, RS)	GISCODE PU20	GISCODE PU20	GISCODE PU20 and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R	GISCODE PU20 and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products	GISCODE PU10 GISCODE RS10
18012	12	Sealants and adhesives	Reduced bonding of mechanically stressed joints; The glazing, façade and fire protection areas are not taken into account.	Sealants, gaskets, adhesives for point and line bonding of components in interior and ventilation ducts in building interiors. Acrylate sealants/adhesives, silicone sealants and SMP (hybrid sealants) are considered.	Chlorinated paraffins, solvents, plasticizers based on hydrocarbons	Chlorinated paraffins/solvents (according to TRGS 610), hydrocarbon-based plasticizers	-	No chlorinated paraffins declared in the VL (safety data sheet)	Chlorinated paraffins < 0,1 %	Chlorinated paraffins < 0,1 %, Solvents < 1 % and Hydrocarbon-based plasticizers (KWS-Weichmacher) < 0,1 %	TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	All relevant components and construction products in common use for joint/joint sealing (tiles, natural stone), jointing (dry construction, painting, doors) and HVAC sealants	Chlorinated paraffins
18013	13	Sealants and adhesives	Prefabricated adhesives and sealants on façades, windows and external doors (on site).	Adhesive to ensure airtightness on the façade inside and outside: e.g. PU, PU hybrid, MS polymer, SMP or similar.	Halogenated exhaust gases, chlorinated paraffins and emissions	Chlorine paraffins / EMICODE	< 0,1 % halogenated propellants	< 0,1 % halogenated propellants	Chlorinated paraffins and halogenated propellants < 0,1 %, and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R or VOC < 1 %	Chlorinated paraffins and halogenated propellants < 0,1 %, and EMICODE EC1, EC1PLUS, EC1-R or EC1PLUS-R or VOC < 1 %	TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	All relevant building elements and products	Chlorinated paraffins
18014	14	Sheathing oils	Means for separating concrete	Formwork oils and release agents for concreting	VOC	GISCODE	GISCODE BTM5, BTM10, BTM15 or BTM20	GISCODE BTM5, BTM10 or BTM15	GISCODE BTM5 or BTM10	GISCODE BTM5	TL and/or VL and/or GISBAU - classification	All relevant building elements and products	-
18015	15	Fire-resistant coatings for metals inside	Supporting and non-supporting metal components for interior use with > 50 m² of coated surface (on-site and factory)	Fire-resistant coating for metal components as part of building control approval or on the basis of a CE-marked European technical assessment.	VOCs, emissions and halogens	VOCs - Directive 2004/42/EG (VOC-content) ISO 11890-2 and DIBt - Principles for health assessment of indoor construction products (VOC emissions)	Construction product with emission values according to the DIBt principles for "Reactive fire protection systems on steel components" or German Building Control Authority General Permit (abZ)	Halogen-free and VOC < 50 g/l	Halogen-free and VOC < 25 g/l	Halogen-free and VOC < 1 g/l	abZ / TL / VL / Test Certificate / AgBB-proof	Factory or on site	DIBt-principles Explanation: Optional use of abZ compliant coatings VOC < 60 g/m
18016	16	Corrosion protection for metals	Supporting metal parts (wall thickness > 3 mm) with > 500 m² of coated surface in a building, such as atrium structure, bridges, etc. (on-site and factory)	Coatings to protect against corrosion of internal components (highest corrosivity category C2 high).	VOC	VOC - Directive 2004/42/EC	< 300 g/l	Water-soluble product < 140 g/l (Cat A/i or A/j according to the Decopaint guideline)	Water-soluble product < 140 g/l (Cat A/i or A/j according to the Decopaint guideline)	Water-soluble product < 100 g/l or use of a C3 coating system of Class 4 (see next row)	Note: The requirements in the field of corrosion protection for load-bearing components are to be understood as a single criterion with respect to the exceptions (quality levels QS3 and QS4)	Factory or on site	-

DGNB quality classes of materials, components and equipment installed

ID	Line	Category	Relevant building elements / Building materials / Surfaces	Scope	Substances / Aspects concerned	Reference standard	Quality class QS1	Quality class QS2	Quality class QS3	Quality class QS4	Type of documentation	Scope and verification	Notes on definitions / explanations / footnotes
			Where is this particularly true?	Product type	Explanatory note	Definition	CLP limit value 10	Reference value 50 CLP (Verification via construction catalogue; possible alternative verification based on craftsmanship)	Intermediate target 75 CLP (Verification via construction catalogue)	Target value 100 CLP (Verification via construction catalogue)	Requirement for verification of specific aspects	The requirement applies to the following components	
18017	17	Corrosion protection for metals	Supporting metal parts (wall thickness > 3 mm) with > 500 m² of coated surface in a building, such as atrium structure, bridges, etc. (on-site and factory)	Corrosion protection coatings for components (max. corrosivity category C3 high)	VOC	VOC - Directive 2004/42/EC	Coating system with VOC < 120 g/m²	Coating system with VOC < 90 g/m²	Coating system with VOC < 60 g/m²	Coating system with VOC < 30 g/m² or or the use of a coating system from C4 onwards, (see next row)	Manufacturer's declaration Note: The requirements in the field of corrosion protection for load-bearing components are to be understood as a single criterion with respect to the exceptions (quality levels QS3 and QS4)	Factory or on site	-
18018	18	Corrosion protection for metals	Supporting metal parts (wall thickness > 3 mm) with > 500 m² of coated surface in a building, such as atrium structure, bridges, etc. (on-site and factory)	Corrosion protection coatings for components (corrosivity category greater than C3).	VOC	VOC - Directive 2004/42/EC	Coating system with VOC < 150 g/m²	Coating system with VOC < 120 g/m²	Coating system with VOC < 90 g/m²	Coating system with VOC < 60 g/m²	Manufacturer's declaration Note: The requirements in the field of corrosion protection for load-bearing components are to be understood as a single criterion with respect to the exceptions (quality levels QS3 and QS4)	Factory or on site	-
18019	19	Corrosion protection for metals	Non-load-bearing metal components such as fences, metal substructures, steel frames, metal doors, façade elements, heat and cold transfer surfaces, cooling pipes (on-site and factory).	Corrosion protection coatings and decorative coatings (e.g. metallic paints).	VOC	VOC - Directive 2004/42/EC	< 300 g/l Category A/d according to Directive 2004/42/EC	< 300 g/l Category A/d according to Directive 2004/42/EC	Water-soluble products < 140 g/l Exception: varnishes with metallic effect < 300 g/l - category A/d according to Directive 2004/42/EC (Decopaint - guideline)	Water-soluble products < 140 g/l Exception: varnishes with metallic effect < 300 g/l - category A/d according to Directive 2004/42/EC (Decopaint - guideline)	TL and/or VL	Factory or on site	-
18020	20	Coatings with increased resistance	Reactive PU products for coating mineral surfaces of floors, ceilings and walls - even in system constructions without special requirements.	Finishes, 2K-PU lacquers, PU floor self-polishes - except OS systems for parking garages, etc.	VOCs, hazardous substances	GISCODE	GISCODE PU40	GISCODE PU40	GISCODE PU40 and Evidence of emissions under the AgBB process as a single product or in a system	GISCODE PU40 and Evidence of emissions under the AgBB process as a single product or in a system	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products. No proof required for up to 5 % BGF(R) according to DIN 277	GISCODE PU10 Proof of emissions as an individual product or in a system AgBB Test Certificate
18021	21	Coatings for wood inside	Coatings for wooden surfaces such as parquet, stairs and wood panelling	Surface coating products	VOC	GISCODE	GISCODE W1, W2+, W3, W3+, W1/DD, W2/DD+, W3/DD or W3/DD+	GISCODE W1, W2+, W3, W3+, W1/DD, W2/DD+, W3/DD or W3/DD+	GISCODE W1, W2+, W1/DD or W2/DD+	GISCODE W1, W2+, W1/DD or W2/DD+	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products	-
18022	22	Coatings with increased resistance	PMMA and PMMA/epoxy coatings for floor and wall surfaces (e.g. plinth) with special requirements and liquid plastics	Industrial floors, car parks and underground car parks, with the exception of signage (not regulated) and liquid plastic for sealing risers or kitchens.	VOC	GISCODE	-	-	RMA10 or RMA15	RMA10 or RMA15	TL and/or VL	All relevant building elements and products	-
18023	23	Coatings with increased resistance	Epoxy products for application to mineral surfaces on floors, ceilings and walls - even in system constructions without special requirements.	Surface finishes, 2K epoxy lacquers, epoxy floor coatings - OS systems for car parks are exempted, etc..	VOCs, hazardous substances	GISCODE	GISCODE RE0, RE1 or RE2	GISCODE RE0 or RE1	GISCODE RE0 or RE1 and Evidence of emissions under the AgBB process as a single product or in a system	Nonylphenol <0.1%, Dodecylphenol <0.1%, Bisphenol A <0.1% p-tert-butylphenol <0,1% and GISCODE RE0 or RE1 and Evidence of emissions under the AgBB process as a single product or in a system	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products. No proof required for up to 5 % BGF(R) according to DIN 277	Proof of emissions as an individual product or in a system AgBB Test Certificate
18024	24	Coatings with increased resistance	Epoxy/PU - pre-coatings (including cast asphalt screeds) and coatings for floor and wall surfaces (e.g. wall cladding (cokel)) with special requirements.	Industrial pavements, parking areas in garages (OS 8 and 11) with the exception of signage (not regulated)	PU- and epoxy-based reaction resins	GISCODE	GISCODE PU10, PU20, PU40, PU60, RE0, RE1 or RE2	GISCODE PU10, PU20, PU40, PU60, RE0, RE1 or RE2	GISCODE PU10, PU40, PU60, RE0 or RE1	GISCODE PU10, PU40, PU60, RE0 or RE1	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products	GISCODE PU10
18025	25	Bituminous waterproofing	Roof waterproofing, ground/water/moisture proofing, thick bitumen coating and fixing of insulation material.	Cold-working coating materials (e.g. primers) and ancillary cladding materials (e.g. adhesives, finishes).	Bitumen	Solvents: boiling point 135-250°C GISCODE	GISCODE BBP10 or BBP20	GISCODE BBP10 or BBP20	GISCODE BBP10	GISCODE BBP10	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products	-
18026	26	Bituminous waterproofing	Bituminous waterproofing (composite) for inverted roofs	Bituminous pre-coating	Bitumen	GISCODE	GISCODE BBP10, BBP20 or BBP30	GISCODE BBP10, BBP20 or BBP30	GISCODE BBP10, BBP20 or BBP30	GISCODE BBP10, BBP20 or BBP30	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products	-
18027	27	Wood coatings, inside	Coatings for wooden surfaces such as parquet, stairs and decking	Wood coating products	Oils and waxes	GISCODE	GISCODE Ö10, Ö20 or Ö40	GISCODE Ö10 or Ö20	GISCODE Ö10	GISCODE Ö10	TL and/or VL and/or GISBAU - classification and/or manufacturer's declaration and/or Test Certificate	All relevant building elements and products	-
18028	28	Biocide	Supporting timber interior and cantilevered exterior (on-site and factory).	Chemical protection of wood according to DIN 68800-3 - GK = use class (formerly hazard class)	Wood preservatives (product type 8 according to 528/2012 / EG)	528/2012/EG	GK 0: Only structural wood protection according to DIN 68800-2 GK 1-3: Biciald preparations eligible for marketing according to 528/2012/EG	GK 0: Only structural wood protection according to DIN 68800-2 GK 1-3: Biciald preparations eligible for marketing according to 528/2012/EG	Only structural wood protection according to DIN 68800-2 or natural durability according to DIN EN 350-2	Only structural wood protection according to DIN 68800-2 or natural durability according to DIN EN 350-2	Design, TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	All relevant building elements and products	Wood protection according to DIN 68800-2 or natural durability according to DIN EN 350-2
18029	29	Biocide	External load-bearing timber elements (on-site and factory)	Chemical protection of wood according to DIN 68800-3 - GK = use class (formerly hazard class)	Wood preservatives (product type 8 according to 528/2012 / EG)	528/2012/EG	GK 2-4: Biciald preparations eligible for marketing according to 528/2012/EG	GK 2: Only structural wood protection according to DIN 68800-2 GK 3 and 4: Biciald preparations eligible for marketing according to 528/2012/EG	GK 2: Only structural wood protection according to DIN 68800-2 GK 3 and 4: Biciald preparations eligible for marketing according to 528/2012/EG	Only structural wood protection according to DIN EN 350-2 or natural durability according to DIN EN 350-2	Design, TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	All relevant building elements and products	Wood protection according to DIN 68800-2 or natural durability according to DIN EN 350-2
18030	30	Biocide	Wooden windows and non-load-bearing wooden building elements inside and outside (e.g. façade and terrace) (on-site and factory)	Chemical impregnation of non-load bearing building components	Wood preservatives (product type 8 according to 528/2012 / EG)	528/2012/EG	Interior: without chemical wood preservative Outside: authorised products with marketable biocidal products according to 528/2012/EG	Interior: without chemical wood preservative Outside: authorised products with marketable biocidal products according to 528/2012/EG	No chemical protection of wood inside and outside Exception: window only with marketable biocidal products according to 528/2012/EG	No chemical protection of wood inside and outside Exception: window only with marketable biocidal products according to 528/2012/EG	TL and/or VL and/or Manufacturer's Declaration and/or Test Certificate	Inside: all relevant building elements Outside: all relevant building elements and products. No proof required for up to 5 % BGF(R) according to DIN 277	-
18031	31	Biocide	Film-preserved products and products treated with biocides	Exterior plasters, facade coatings, wool/natural fibre floor coverings, film-protected wood stains.	Biocides (product types 7 and 9 according to 528/2012/EC: Protectants for building materials), e.g. algacides, fungicides, mothicides	528/2012/EG	-	-	Marketable commodities and/or authorised active substances according to 528/2012/EG	Marketable commodities and/or authorised active substances according to 528/2012/EG For system variant NWO15, the following applies: No use of biocidal active substances inside, except preservatives in containers	Manufacturer's declaration	All relevant building elements and products	Authorised active assets in accordance with 528/2012/EG Biocides Regulation
18032	32	Heavy metals	All aluminium and stainless steel building envelope components with a total area > 5m². Sun protection louvres, roller shutter boxes and stainless steel fencing (factory made) are excluded.	Products for passivating aluminium and stainless steel.	Chromium VI	-	-	-	Chromium-VI-free sandblasting agents	Chromium-VI-free sandblasting agents	Manufacturer's declaration	All relevant components of the building envelope, such as e.g. façade profiles, cladding, attic sheeting	-

DGNB quality classes of materials, components and equipment installed

ID	Line	Category	Relevant building elements / Building materials / Surfaces	Scope	Substances / Aspects concerned	Reference standard	Quality class QS1	Quality class QS2	Quality class QS3	Quality class QS4	Type of documentation	Scope and verification	Notes on definitions / explanations / footnotes
			Where is this particularly true?	Product type	Explanatory note	Definition	CLP limit value 10	Reference value 50 CLP (Verification via construction catalogue; possible alternative verification based on craftsmanship)	Intermediate target 75 CLP (Verification via construction catalogue)	Target value 100 CLP (Verification via construction catalogue)	Requirement for verification of specific aspects	The requirement applies to the following components	
18033	33	Heavy metals	Coated or coated metal building components: façade elements, doors, heating elements, heating/cooling ceiling elements. Hot-dip galvanising is not considered as coating for the purpose of this criterion. (on-site and factory)	Primers and finishes (e.g. paints, varnishes, powder varnishes).	Lead, cadmium, chromium-VI	-	Free of lead, cadmium and chromium-VI compounds	Free of lead, cadmium and chromium-VI compounds	Free of lead, cadmium and chromium-VI compounds	Free of lead, cadmium and chromium-VI compounds	VL and/or Manufacturer's declaration	Components with a factory-finished surface area > 100 m² depending on the type (e.g. steel doors) in a building	-
18034	34	Heavy metals	Roof coverings, gutters, downpipes	Roof water-bearing elements and rainwater drainage.	Lead, copper and zinc	-	-	-	Heavy metal filter if the area is > 10% of the roof floor area	Heavy metal filter if the area is > 10% of the roof floor area	Design and/or Manufacturer's Declaration and/or Proof in accordance with UBA-Calibration 17/05	All relevant building elements and products	-
18035	35	Heavy metals	Plastics for surface finishes (floors and walls) and building envelope components (factory made)	Resilient floor coverings (e.g. PVC, rubber), wall coverings, skylights and domes, plastic windows, sound insulation inserts (e.g. façade louver).	Lead and tin organic compounds	-	Lead content < 0,1 % and tin < 0,1 %	Lead content < 0,1 % and tin < 0,1 %	Lead content < 0,1 % and tin < 0,1 %	Lead content < 0,1 % and tin < 0,1 %	Manufacturer's declaration	All relevant components with an area > 100 m² per building element type in the building; the total projected area is relevant	Remark: Use of recyclates
18036	36	Heavy metals	Plastic sheeting on the roof and at the base (factory)	Plastic sheeting for sealing on the roof and external walls of the basement is considered.	Lead and tin organic compounds	-	Lead content < 0,1 % and tin < 0,1 %	Lead content < 0,1 % and tin < 0,1 %	Lead content < 0,1 % and tin < 0,1 %	Lead content < 0,1 % and tin < 0,1 %	Manufacturer's declaration	All relevant building elements > 100 m²	Remark: Use of recyclates
18037	37	Refrigerants	Cooling systems / TGA - Technical equipment of the building / split units (factory)	Refrigerant	Halogenated refrigerants	-	Additional assessment point: No halogenated/partially halogenated refrigerants	Additional assessment point: No halogenated/partially halogenated refrigerants	Additional assessment point: No halogenated/partially halogenated refrigerants	Additional assessment point: No halogenated/partially halogenated refrigerants	Building services design and/or Declaration of manufactures	All relevant building elements and products	-
18038	38	Mounting foams	B2 or E assembly foams for insulation and assembly functions (except for bonding insulation materials).	Prefabricated foams for the installation of exterior doors, exterior windows and interior elements such as door frames.	Halogenated and other propellants, solvents, plasticizers, flame retardants.	REACH, SVHC	Emicode EC1PLUS and without the use of halogenated propellants, chlorinated paraffins and TCEP	Emicode EC1PLUS and without the use of halogenated propellants, chlorinated paraffins and TCEP	Emicode EC1PLUS and without the use of halogenated propellants, chlorinated paraffins and TCEP, plasticizers and halogenated flame retardants	Emicode EC1PLUS and without the use of halogenated propellants, chlorinated paraffins and TCEP, plasticizers and halogenated flame retardants	TL and/or VL and/or Manufacturer's Declaration and/or EC1PLUS - Proof (certificate or TL)	All relevant building elements and products	Push means REACH - Candidate List
18039	39	Mounting foams	Prefabricated foams for insulation materials.	Prefabricated foams for e.g. bonding ETICS insulation materials, perimeter (cavity) insulation, unheated space (basement) ceiling insulation and flat roof insulation.	Halogenated and other propellants.	REACH, SVHC	No use of mounting foams Exception: Halogen-free propellant-free assembly foams may only be used in the joints of ETICS insulation panels	No use of mounting foams Exception: Halogen-free propellant-free assembly foams may only be used in the joints of ETICS insulation panels	Without the use of assembly foams (except for AbZ joints)	Without the use of assembly foams (except for AbZ joints)	AbZ (German Building Control Authority General Permit) and proof of mineral adhesives, grouting foam without halogenated propellants (TL and/or VL)	All relevant building elements and products	-
18040	40	Plastic foam insulating materials	Plastic insulation materials for buildings and building services	PS / XPS / PUR - insulation materials, flexible insulation for home appliances (rubber (rubber) and PE)	Halogenated propellants.	REACH	No use of halogenated propellants	No use of halogenated propellants	No use of halogenated propellants	No use of halogenated propellants	TL and/or Manufacturer's declaration	All building components and building products relevant to the Eup (PURES), as well as the main building technical equipment assemblies	-
18042	42	Refractoriness	Building materials (mixtures) equipped with fire retardants.	Technical fire protection, interior bonding or sealing, PU adhesives for installation: coatings or levelling for fire walls, fire-resistant coatings for cables, fire-resistant silicones, PU adhesives for insulation materials (EPS, XPS, PUR).	Chlorinated paraffins (see definition) and SVHCs	REACH Candidate List POP-VO and SVHC restrictions and long-chain chlorinated paraffins	-	-	CPs < 0,1 % and SVHC < 0,1 %	CPs < 0,1 % and SVHC < 0,1 %	TL and/or current VL compliant with 1907/2006/EG (in VL substances to be declared) and Manufacturer's Declaration "Free of chlorinated paraffins and free of SVHC > 0.1%"	All relevant building elements and products	Corroded paraffins POP-VO REACH - Candidate List
18043	43	Refractoriness	Building materials (products) equipped with fire retardants	Building insulation materials and wall coverings (fibreglass wallpaper, painting fleece, decorative fleece, etc.)	Chlorinated paraffins (see definition), polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) and SVHCs.	REACH Candidate List POP-VO and SVHC restrictions and long-chain chlorinated paraffins	-	-	CPs < 0.1%, PBB< 0,1 %, PBDE< 0,1 %, and SVHC < 0,1 % Exception: long-chain CP (LCCP) insulation materials are permitted in Class B1 building materials	CPs < 0.1%, PBB< 0,1 %, PBDE< 0,1 %, and SVHC < 0,1 %	TL and/or Manufacturer's declaration "Free of chlorinated paraffins, free of polybrominated biphenyls, free of polybrominated diphenyl ethers and free of SVHC > 0,1 %"	All relevant building elements and products	Corroded paraffins POP-VO REACH - Candidate List
18044	44	Hazardous substances in plastics	Plastic articles (factory made)	External sealing of walls and roofs, wall cladding, windows, electrical cables: plastic sheeting, wall cladding, wallpaper, plastic windows, cable cladding.	SVHC phthalates (plasticizers)	SVHCs from REACH Candidate List (all); Partial inclusion in Annex XIV of REACH.	-	-	SVHC < 0,1 %	SVHC < 0,1 %	TL and/or Manufacturer's declaration "SVHC-free > 0,1%"	All relevant building elements and products	REACH - Candidate List
18045	45	Boron compounds	Building products (products) with biocides and fire retardants: wood preservatives, wood-based materials, insulation materials (on-site and factory-made)	Timber structures, softwood fibreboard, insulation materials, including blowing products, fillers or fillers: wood preservatives, wood-based materials, organic insulation materials (cellulose, wood fibreboard, wood wool, sheeps wool, etc.)	Boron compounds as ingredients in recipes	SVHCs from REACH Candidate List (all); Partial inclusion in Annex XIV of REACH.	-	-	Boron compounds < 0,1 %	Boron compounds < 0,1 %	TL and/or Manufacturer's declaration "Boron free > 0,1 %"	All relevant building elements and products	-
18046	46	Sealants and adhesives	PU-system adhesives	Co-structural PU adhesives for dry screeds, hollow floors, drywall	Solvents	REACH	-	GISCODE RU1 (solvent-free)	GISCODE RU1 (solvent-free)	GISCODE RU1 (solvent-free)	TL + VL	All relevant building elements and products	-
18047a	47a	Formaldehyde in wood materials	Industrially manufactured products, series products / finished products made of interior wood materials, e.g. particleboard, OSB, MDF (factory made)	Interior doors made of wood-based materials, acoustic room elements, room-within-a-room systems, wall and ceiling paneling, multi-layer parquet (with wood components) and laminate flooring.	Formaldehyde	ChemVerbotsV - Chemical Ban Ordinance, Emission values according to DIN EN 717-1 / EN ISO 16000-9 / EN 16516	Formaldehyde ≤ 0,10 ppm (= 0,120 mg/m³) in the test chamber	Formaldehyde ≤ 0,10 ppm (= 0,120 mg/m³) in the test chamber	Formaldehyde < 0,065ppm (= 0,08mg/m³) in the test chamber	Formaldehyde < 0,05 ppm (= 0,062 mg/m³) in the test chamber	TL or Test Certificate according to DIN EN 717-1	All relevant building elements and products	For measurements according to EN ISO 16000-9 or EN 16516, the values have to be converted according to the WKI calculation model (mathematical model for the calculation of the spatial concentration of formaldehyde)
18047b	47b	Formaldehyde in wood materials	Coated and uncoated wood-based materials: particleboard, jointerboard, veneered panels, fibreboard (on-site and factory-made)	Joinery products for handmade built-in elements: wall and ceiling paneling, washbasins	Formaldehyde	Perforator values according to DIN EN ISO 12460-5	Formaldehyde ≤ 0,1 ppm (≤ 0,120 mg/m³) in a test chamber, or uncoated panel ≤ 8,0 mg HCHO/100g	Formaldehyde ≤ 0,1 ppm (≤ 0,120 mg/m³) in a test chamber, or uncoated panel ≤ 8,0 mg HCHO/100g	Plate ≤ 4 mg HCHO/100g	Plate ≤ 3 mg HCHO/100g	TL or Test Certificate according to DIN EN ISO 12460-5	All relevant building elements and products	-
18048	48	Formaldehyde in wood materials	Timber construction and prefabricated timber houses: wood-based materials in the construction of timber structures (e.g. reinforcement) such as chipboard, OSB, etc. (on-site and factory-made).	Reinforcing timber panels on walls, floors and ceilings in timber houses/wooden constructions.	Formaldehyde	ChemVerbotsV - Chemical Ban Ordinance, Emission values according to DIN EN 717-1 / EN ISO 16000-9 / EN 16516 or perforator values according to DIN EN ISO 12460-5	Formaldehyde ≤ 0,10 ppm (≤ 0,120 mg/m3) in the test chamber or panel ≤ 8,0 mg HCHO/100g	Formaldehyde ≤ 0,10 ppm (≤ 0,120 mg/m3) in the test chamber or panel ≤ 8,0 mg HCHO/100g	Formaldehyde < 0,05 ppm (= 0,062 mg/m³) in the test chamber or plate ≤ 4 mg HCHO/100g	Formaldehyde < 0,03 ppm (= 0,036 mg/m³) in the test chamber (= QDF requirements) or plate ≤ 8 mg HCHO/100g	TL or Test Certificate according to DIN EN 717-1 / DIN ISO 12460-5 or equivalent proof of emissions as explained in the explanatory memorandum (WKI calculation model)	For measurements according to EN ISO 16000-9 or EN 16516, the values have to be converted according to the WKI calculation model. Perforator check only for uncoated particleboard, MDF, OSB.	-
18049	49	Products with asbestos fibres	External and internal walls, floor and ceiling coverings, fillers and adhesives under wall and floor coverings Windows / Doors / Construction joints Building installations	Facade and wall coverings, insulation, lightweight and fire protection elements, wall and ceiling penetrating sealants, ceiling coverings (such as fibreboard), tile adhesives, plastic coverings (e.g. asbestos vinyl laminate), castings and fillers, industrial screeds, pipes and insulation (heating and ventilation systems).	Asbestos	Regulation (EC) No 850/2004 of 29 April 2004 on persistent organic pollutants and amendment to Directive 79/117/EEC	Asbestos-free or CE marked	Asbestos-free or CE marked	Asbestos-free or CE marked	Asbestos-free or CE marked	TL and/or VL and/or Manufacturer's Declaration and/or SVHC-free > 0,1 % certificate'	All relevant building elements and products	POPs regulation (Persistent Organic Pollutants - POPs Regulation) REACH Candidate List

DGNB quality classes of materials, components and equipment installed

ID	Line	Category	Relevant building elements / Building materials / Surfaces	Scope	Substances / Aspects concerned	Reference standard	Quality class QS1	Quality class QS2	Quality class QS3	Quality class QS4	Type of documentation	Scope and verification	Notes on definitions / explanations / footnotes
			Where is this particularly true?	Product type	Explanatory note	Definition	CLP limit value 10	Reference value 50 CLP (Verification via construction catalogue; possible alternative verification based on craftsmanship)	Intermediate target 75 CLP (Verification via construction catalogue)	Target value 100 CLP (Verification via construction catalogue)	Requirement for verification of specific aspects	The requirement applies to the following components	
18050	50	Artificial mineral fibres	Insulating materials of man-made mineral fibres for buildings and building installations	Thermal and acoustic insulation of buildings Pipeline insulation	Artificial mineral fibres	Regulation (EC) No 850/2004 of 29 April 2004 on persistent organic pollutants and amendment to Directive 79/117/EEC	No use of artificial mineral fibres ≤ 3 µm or CE marking	No use of artificial mineral fibres ≤ 3 µm or CE marking	No use of artificial mineral fibres ≤ 3 µm or CE marking	No use of artificial mineral fibres ≤ 3 µm or CE marking	TL and/or VL and/or Manufacturer's Declaration and/or SVHC-free > 0,1 % certificate'	All relevant building elements and products	POPs regulation (Persistent Organic Pollutants - POPs Regulation)
18000	99	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT	-	-	-

NOTES:

Note: Colour-coded rows (column "Row"): In addition, the explanatory notes in Chapter III Method ("The following are the requirements of this criterion; To view, display and take into account the materials/products/materials supplied to the site.") should be taken into account

Note: The colour-coded rows (column " Row"): 47 and 48 are considered as "optional" and serve for data sampling purposes, i.e. they have no impact on the evaluation of the criterion in this version of the release.

In view of the above, the following areas should be taken into account:

- basement structures, including foundations
- external wall constructions
- interior wall constructions
- floor and ceiling constructions
- roof structures
- underground garages (to be treated separately)

For the prefabricated building materials/products listed below, the following requirements for this criterion shall be considered, verified and fulfilled:

- Coatings used in the factory for windows, facade elements, doors, frames, radiators, partitions, ceiling systems, cooling pipes, etc.: In accordance with the objective (prevention of VOC emissions to the environment), compliance with the product limits in the criteria matrix is considered a valid form of proof. Compliance with the objective can also be ensured by the coating contractor/operator of the exhaust air after-treatment systems by demonstrating compliance with the legal limit values in accordance with Directive 1999/13/EU on the basis of valid, officially accepted monitoring logs.
- Coatings used on site: In line with the objective of preventing the emission of VOCs into the environment, only compliance with the product limits in the criteria matrix shall be considered as a valid form of evidence.
- Synthetic insulation materials with respect to halogenated propellants
- Aluminium and stainless steel components according to Cr(VI) treatment
- Refrigerants in cooling systems
- Plastic windows, floor and wall coverings with regard to stabilisers for lead, cadmium and tin
- Plastics, insulation materials, functional coatings, sealants, rubber products, etc. in terms of substances of very high concern (SVHC under the European Chemicals Regulation (REACH)).
- Floor coverings with regard to hazardous substances and emissions
- Wood load-bearing elements, such as glulam beams, columns/trusses in support structures and window frames, with respect to biocidal substances.
- Coatings applied in the factory to load-bearing and non-load-bearing structural members of a wooden structure, such as varnishes, lacquers, oils and waxes, with respect to volatile organic compounds.
- Coatings applied in the factory to wood and wood-based materials such as façade and acoustic elements, doors, ceiling, floor and wall coverings, parquet, staircases and window sills, etc. with respect to VOCs. Compliance with the objective can also be ensured by the coating contractor/operator of the exhaust air after-treatment systems by demonstrating compliance with the legal limit values in accordance with Directive 1999/13/EU on the basis of ongoing, officially accepted monitoring logs.

It should be noted that the criteria matrix (Appendix 1) only lists requirements that go beyond the material standards set out in the legislation. Compliance with any national specific legal requirements will always be considered as a prerequisite for any construction project that requires compliance with this document, e.g. compliance with the European Chemicals Regulation (REACH) by EU Member State manufacturers. Legally valid evidence (see General Information: 1): Legally valid evidence is a document signed by a responsible or duly authorised person or a clear statement in the manufacturer's declaration that it is signed by a person competent and knowledgeable in composition.

Chlorinated paraffins:
Chlorinated paraffins are mixtures of substances containing chlorinated alkanes with a chain length of 10 to 30 carbon atoms and a degree of chlorination of 10 to 70 wt.% (= SCCP (short-chain CP), MCCP (medium-chain CP) and LCCP (long-chain CP)).

List of POP-VO and REACH candidates:
Both the POP EO and the REACH Candidate List currently regulate short-chain chlorinated paraffins. However, medium- and long-chain chlorinated paraffins are also relevant as a precautionary measure.

AgBB Test certificate (report):
AgBB test certification can only be achieved with low VOC formulations << 100g/l emission

GISCODE PU10 and PU20 respectively:
Due to the stricter labelling of all isocyanates as sensitisers, products previously classified in GISCODES PU10 or PU20 need to be reclassified in GISCODES PU40 and PU50. Until GISCODES are adjusted, we accept substances with GISCODES PU40 (instead of PU10) and PU50 (instead of PU20).

GISCODE RS10:
GISCODE RS10 does not apply to sealants

Wood protection according to 68800-2 or natural durability according to DIN EN 350-2: The classification used to be according to DIN 68364 (11-1979). The new DIN 68800 of 2011 no longer speaks of typical durability, but refers to natural durability in the sense of DIN EN 350-2 in its explanations.

Authorised active substances according to 528/2012/EG:
In the case of products manufactured in the EU, compliance with these requirements can be presumed due to legal requirements (no additional proof is required).

Biocide - Regulation:
More information on active substances approved under the Biocides Ordinance is available at: <http://www.reach-clpbiozid-helpdesk.de/de/Biozide/Wirkstoffe/Genehmigte-Wirkstoffe/Genehmigte-Wirkstoffe.html>
Proof of emissions:
Certification (not older than 5 years) from an ISO 17025 accredited laboratory that the product or system meets the AgBB criteria (except sensory properties) in an emissions test according to ISO 16000-9, prEN 16516 or EN 16402.

Evidence of emissions as an individual product or in a system:
In lieu of proof of emissions, a certificate of compliance with DIN V 18026: 2006-6 together with proof of compliance with the AgBB emission requirements by a test body recognised by the DIBt shall be accepted.

Hydrocarbon softeners (KWS):
Hydrocarbon-based plasticizers are aliphatic hydrocarbons in the boiling range between 200 and 400 degrees Celsius.

Note - factory coatings/applications:
The VOC requirements of row 1 at the highest quality level (QS) can be met at the factory with QS3 coating materials (<100 g VOC/l).

Note - use of recyclates:
For products made from recycled plastics, the manufacturer's declaration must provide proof that they are free of lead, cadmium and organotin compounds.

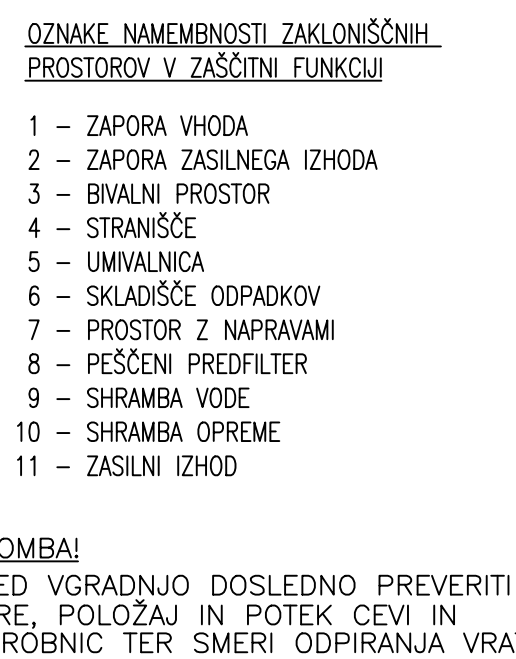
Note - DIBt - Principles:
DIBt - Principles for the health assessment of indoor construction products: including information on the working area "Reactive fire protection systems on steel structural members (DIBt Paper II4 and III4, Status: April 2014).

Notes, explanations and annotations to the text "Performance of substances/aspects taken into account in the different life phases of the building":
'Halogenated refrigerants or propellants' in lines 13, 37, 38 and 39: Avoidance of halogenated refrigerants or propellants unless they or their degradation products have been shown not to accumulate in the environment or to contain persistent degradation products that contaminate or adversely affect natural sinks (= enrichment).

Status: 20180703
Translator's note: The translation is made in the best faith. The translator is not an expert in the field of chemistry and therefore certain terms may deviate from established professional terms. In case of ambiguity, it is recommended to consult a DGNB authorised person.
 This translation is made to help users in Slovenia. It is recommended to use the official version in German and/or English.

TECHNICAL DRAWINGS

INVESTOR		
INVESTOR 1		
name and surname or company name		UNIVERZA V LJUBLJANI
address ali poslovni address družbe		Kongresni trg 12, 1000 LJUBLJANA
CONSTRUCTION DATA		
name of construction		Faculty of Mechanical Engineering
DESIGN DOCUMENTATION DATA		
design documentation type		Detailed Design (PZI)
project No.		362-19
documentation expertise area	4	DOCUMENTATION IN THE FIELD OF MECHANICAL ENGINEERING
documentation title	4/1	Shelter
documentation No.		JULFS--7S/01P



Sprejemba: Opis spremembe: Investitor: Univerza v Ljubljani Fakulteta za strojništvo Alerterova ulica 6, 1000 Ljubljana		Objekt: Fakulteta za strojništvo		Datum spr.: Podpis:	
Projektant: IBE, d.d., svetovanje, projektiranje in inženiring Ljubljana, Slovenija		Del objekta/sistema: Zaklonsiše			
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Ime in priimek: Boštjan Vuga, univ. dipl. inž. arh. Merilo Lubej, univ. dipl. inž. str.		Ident. št.: AA ZAPSA 000305 S-0739		Vsebina risbe/dokumentacije: TLORS - VGRADNI DELI IN ZAPIRALNA	
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Datum: 1. 10. 2023 Datum: 1. 10. 2023		Merilo: 1 : 50			



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 regulirajući vrti za odvod zraka DN 150
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LEGENDA MATERIAL C

ZNAMENITOSTI ZAKLONIH

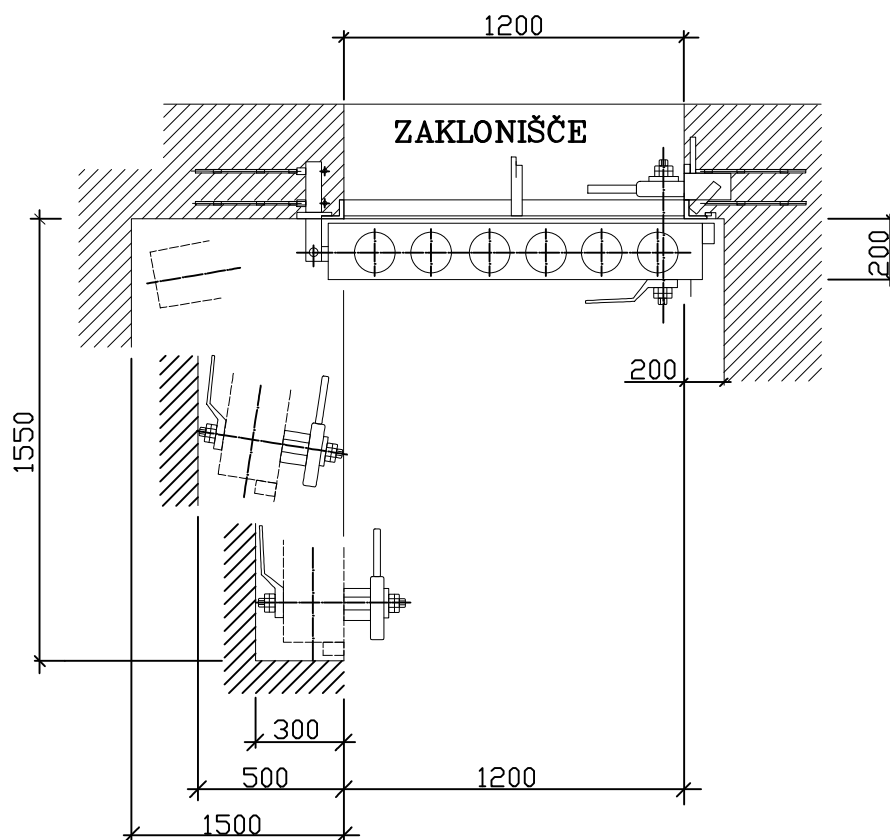
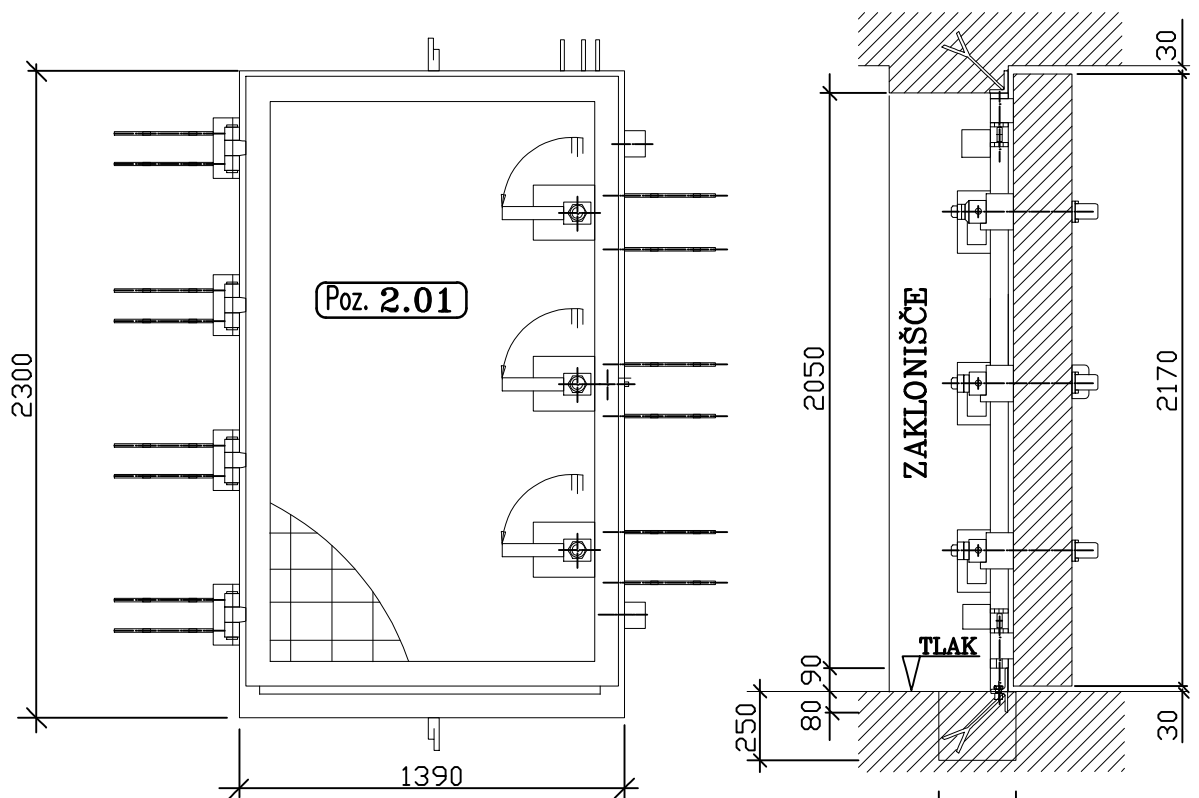
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2 – ZAPORA ZASILNEGA IZHODA
3 – BIVALNI PROSTOR
4 – STRANIŠČE
5 – UMIVALNICA
6 – SKLADIŠČE ODPADKOV
7 – PROSTOR Z NAPRAVAMI
8 – PEŠČENI PREDTELIT
9 – ŠIRAVKA VODE
10 – ŠIRAVKA OPREME |
| | PORC | ZASILNAI (TVP) |
| | PODL | |

OPOMBA!
PRED VGRADNJO DOSLEDNO PREVERITI
MERE, POLOŽAJ IN POTEK CEVI IZ
PRIROBNIC TER SMERI ODPIRANJA

[illegible]

Sprememba:		Opis spremembe:		Datum spr.:		Podpis:	
Investitor:		Univerza v Ljubljani Fakulteta za strojništvo Aškerčeva ulica 6, 1000 Ljubljana		Objekt: Fakulteta za strojništvo			
Projektant:		IBE, d.d., svetovanje, projektiranje in inženiring Ljubljana, Slovenija		Del objekta/sistema: Zaklonišče			
 VAREN d.o.o., Dogoška cesta 35, 2000 Maribor		DRUŽBA ZA INŽENIRING, STORITVE, TRGOVINO IN PROIZVODNJO d.o.o. MARIBOR		Vrsta dokumentacije: 4 NAČRT S PODROČJA STROJNIŠTVA 4/1 Načrt zaklonišč v zaščitni funkciji			
		Ime in priimek:		Ident. št.:		Vsebina risbe(dokumenta): Detajli zapiralnih sredstev, prezračevalnih naprav in tesnenja kablov	
Vodja projekta:		Boštjan Vuga, univ. dipl. inž. arh.		AA ZAPS 0035A			
Pooblaščen inženir :		Marko Lubej, univ.dipl.inž.str.		IZS S-0739			
Izdela:				Številka projekta:		362-19	
				Številka načrta:		JULFS--7S/01	
Datum izdelave:		Oktober 2023		Merilo:		1 : 50	
				Identifikac. oznaka:		JULFS--7S0106	
						Vrsta projekta: PZI	
						Stran/strani: 22	
						Spr.:	

**ARMIRANOBETONSKA PROTIUDARNA VRATA
PLINOTESNA IN POŽARNA (EI-90), ZA NADTLAK 300 kPa
svetla mera: 1200/2050 mm
oznaka : DT- B 1200/2050**



- KOVINSKI MONTAŽNI PRAG
JE PRI TEJ IZVEDBI NA
ZUNANJI STRANI VISOK 90 mm

- SHEMA VELJA ZA DESNO
IN LEVO SMER ODPIRANJA
- UPOŠTEVATI NAVODILA
ZA VGRADNJO
- MARKA BETONA: 40 Mpa
- KOT ODPIRANJA: 180°
- TESNILO PRI PLESKANJU
DEMONTIRATI
- MERE: V MILIMETRIH
- SLIKA NI V MERILU !
- VRATA SO PRIKAZANA
SHEMATSKO !



IDENTIFIKACIJSKA ŠT. PODJETJA : 0213

DRUŽBA ZA INŽENIRING,
STORITVE, TRGOVINO IN
PROIZVODNJO d.o.o.
MARIBOR

objekt:

FAKULTETA ZA STROJNIŠTVO

id. oznaka:

JULFS--7S0106

datum

Oktober 2023

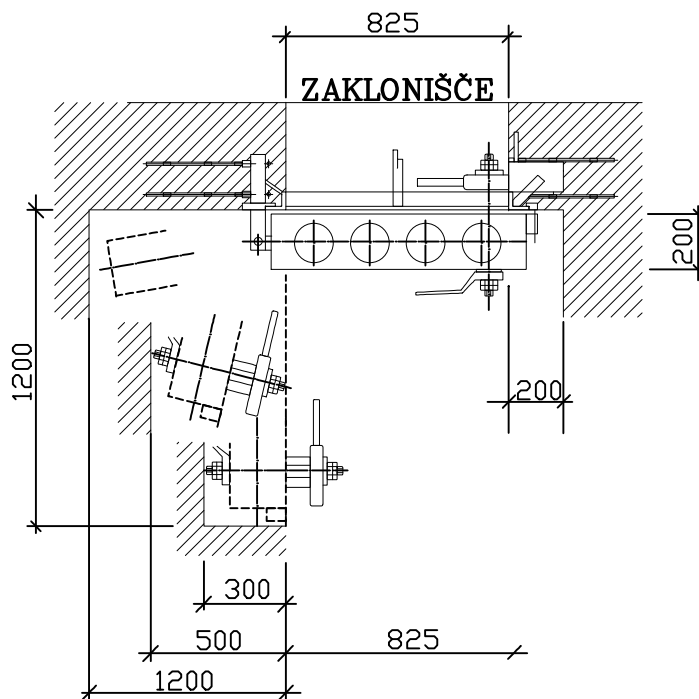
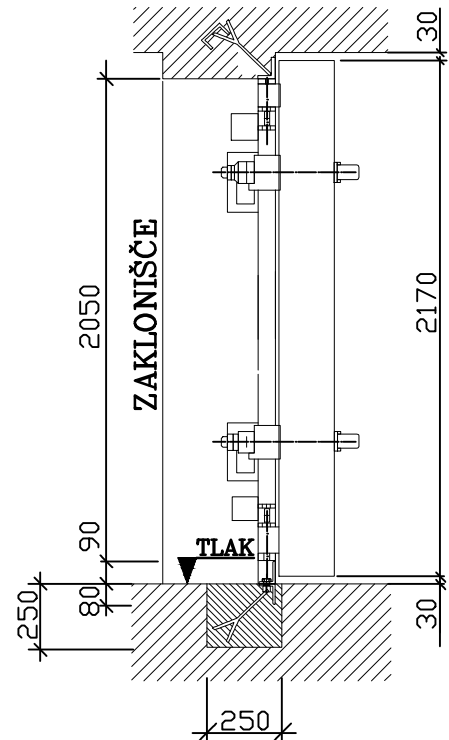
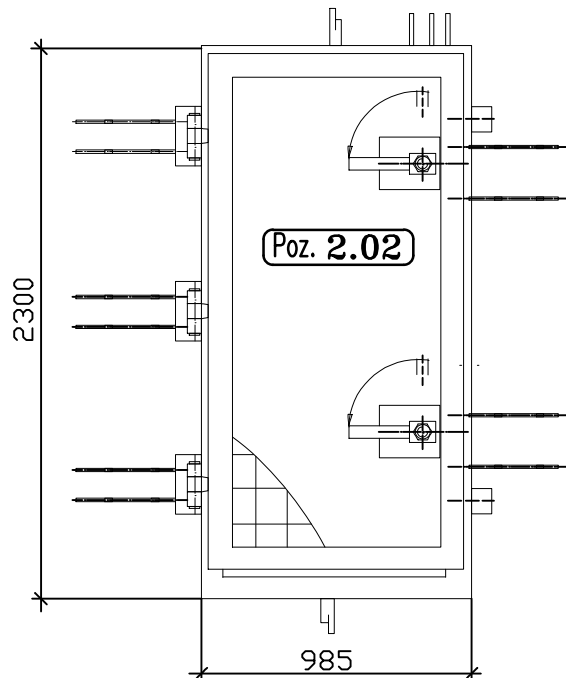
št. načrta:

JULFS--7S/01

list št./stran

1/22

**ARMIRANOBETONSKA PROTIUDARNA VRATA
PLINOTESNA IN POŽARNA (EI-90), ZA NADTLAK 300 kPa,
S PRIBOROM ZA ODPIRANJE IN ODMIK RUŠEVIN
svetla mera: 825/2050mm
oznaka: DT-B 825/2050**



- KOVINSKI MONTAŽNI PRAG
JE PRI TEJ IZVEDBI NA
ZUNANJI STRANI VISOK 90 mm

- UPOŠTEVATI NAVODILA
ZA VGRADNJO
- MARKA BETONA: 40 Mpa
- KOT ODPIRANJA: 180°
- TESNILO PRI PLESKANJU
DEMONTIRATI
- MERE: V MILIMETRIH
- SLIKA NI V MERILU !
- VRATA SO PRIKAZANA
SHEMATSKO !
- SHEMA VELJA ZA DESNO
IN LEVO STRAN ODPIRANJA



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MARIBOR

objekt:

FAKULTETA ZA STROJNIŠTVO

id. oznaka:

JULFS--7S0103

datum

Oktober 2023

št. načrta:

JULFS--7S/01

list št./stran

2/22

ARMIRANOBETONSKA PROTIUDARNA VRATA, PLINOTESNA IN

POŽARNA EI-90, ZA NADTLAK 300kPa

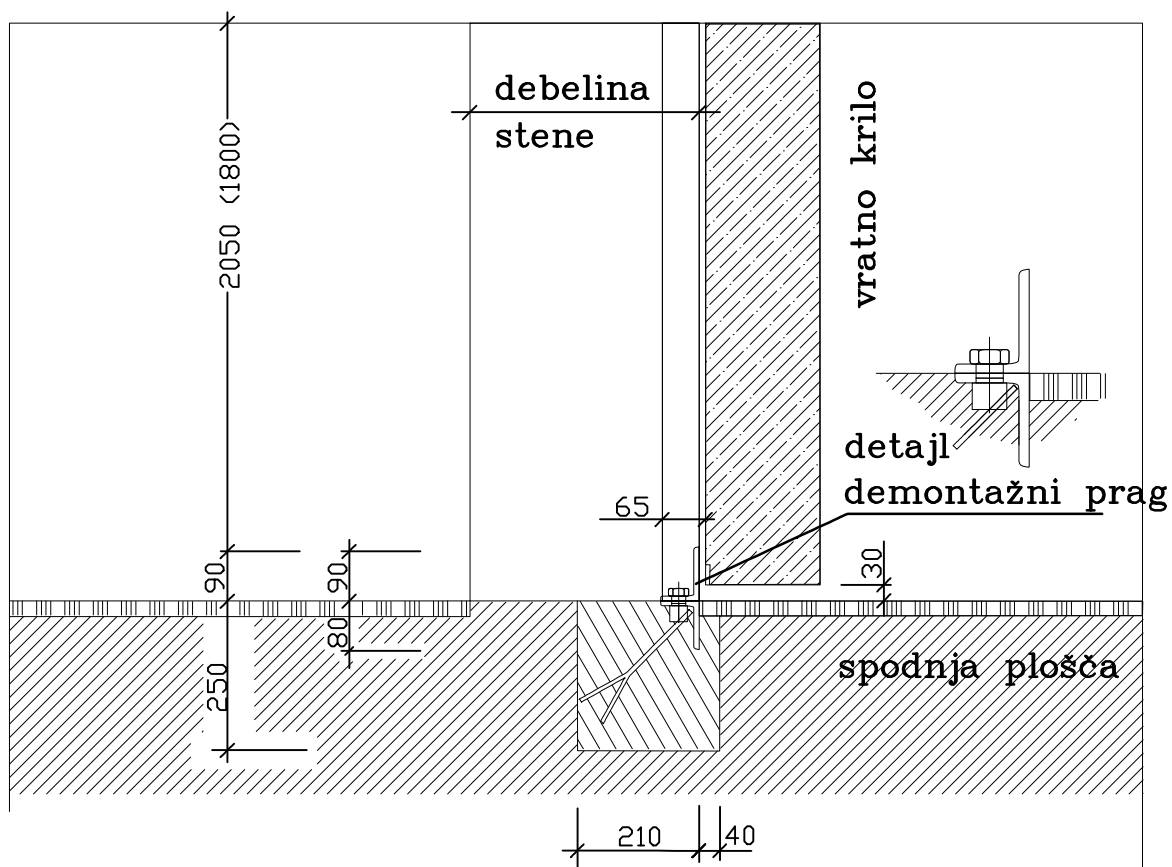
tip GT-B

- detajl vgradnje vrat z demontažnim pragom -
- velja za pozicije 2.01, 2.02.

Namen in uporabnost: ta tip vrat je predviden za vgradnjo v zunanje armiranobetonske stene zaklonišč; prednost izvedbe z demontažnim pragom je neoviran prehod in transport materiala v mirnodobnem času, ko se zaklonišče uporablja v druge namene.

Napotki za projektiranje: vrata morajo biti zaščitena pred neposrednim mehanskim, toplotnim in radiacijskim učinkom z zalomi vhodne ali izhodne konstrukcije; velikost vrat mora biti skladna s predpisom, ki določa velikost vratne odprtine glede na velikost zaklonišča; spodnja skica prikazuje mere za pravilno projektiranje višine vgradnje in določanje potrebne armature betonskih pragov; pri tem tipu vrat morajo biti pragovi izvedeni hkrati z izvedbo plošče, kar mora biti upoštevano tudi v armaturnih načrtih talnih plošč zaklonišč; pri novih zakloniščih se morajo vrata vgrajevati hkrati z izvedbo sten, poznejša vgradnja se sme izvesti le pri obstoječih zakloniščih.

Napotki za vgradnjo: pred betoniranjem armiranobetonskih elementov oz. konstrukcij je potrebno vstaviti vsa sidra oz. okvirje za vratna zapirala in sidra za izvedbo demontažnih pragov; v skici je v okvirju z drugo smerjo šrafitiranja označena potrebna odprtina v talni plošči zaklonišča, kadar se v zunanjo steno vgrajuje ta tip vrat pozneje - ko so stene že zabetonirane.



LEGENDA

- estrih
- spodnja betonska plošča
- jašek za sidro
- betonsko vratno krilo

- MERE: V MILIMETRIH
- SLIKA NI V MERILU !



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

JULFS--7S0106

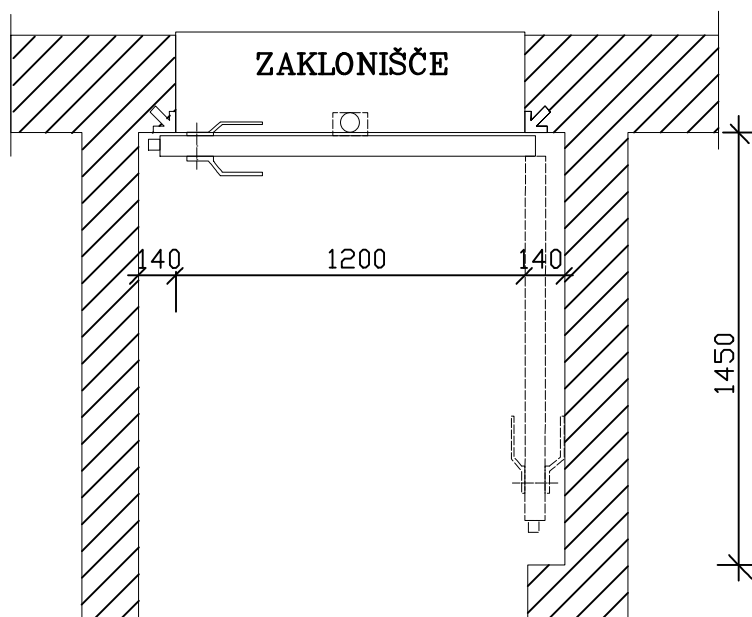
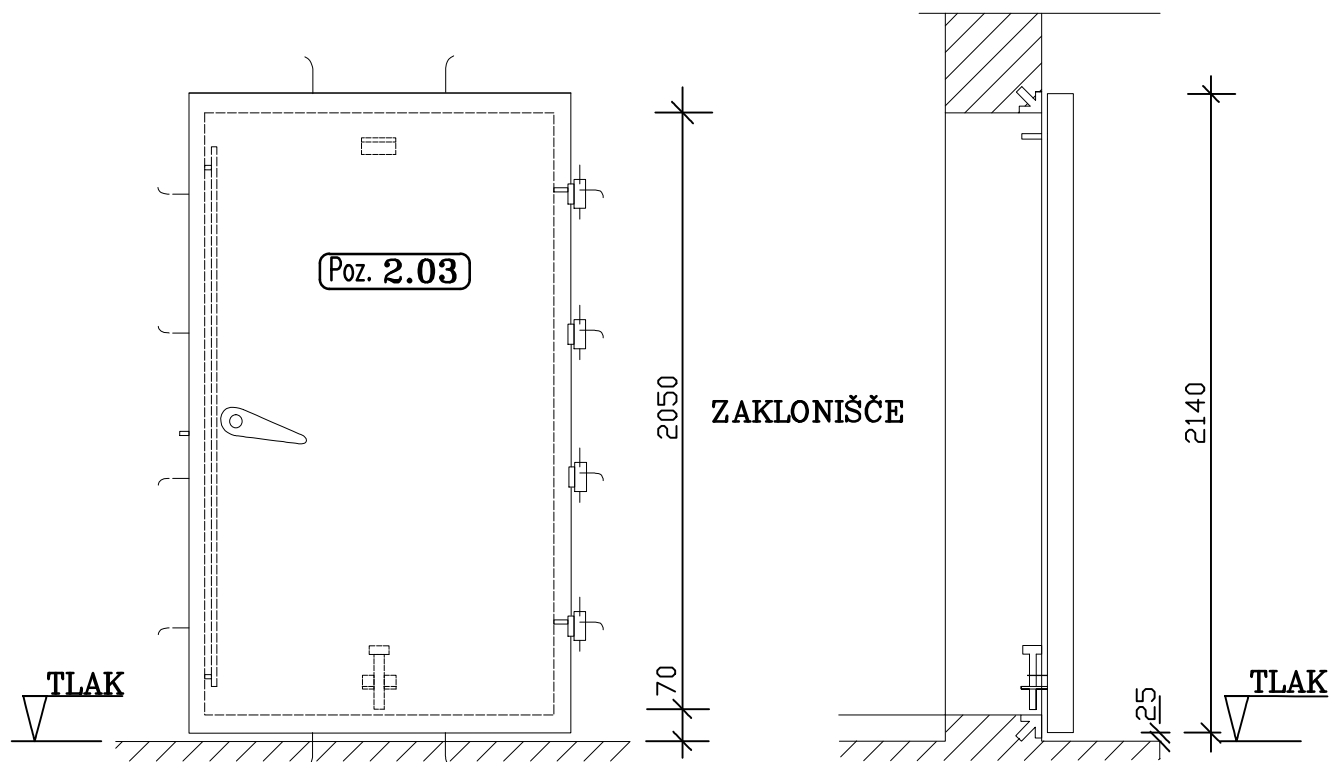
datum

Oktober 2023

list št./stran

3/22

KOVINSKA, PLINOTESNA IN POŽARNA
VRATA (EI-90) ZA NADTLAK 10 kPa
svetla mera: 1200/2050 mm
oznaka : GT-90 II 1200/2050



- SHEMA VELJA ZA DESNO IN LEVO SMER ODPIRANJA
- UPORABNA LEVO ALI DESNO
- OPAŽNA VGRADNJA
- KOT ODPIRANJA : 180°
- TESNILO PRI PLESKANJU DEMONTIRATI
- VRATNO KRILO IN OKVIR POCINKANA
- PRAGVI SO DOKONČNO DEFINIRANI PRI VGRADNJI
- MERE: V MILIMETRIH
- SLIKA NI V MERILU !
- VRATA SO PRIKAZANA SHEMATSKO!



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objekt:

FAKULTETA ZA STROJNIŠTVO

id. oznaka:

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datum

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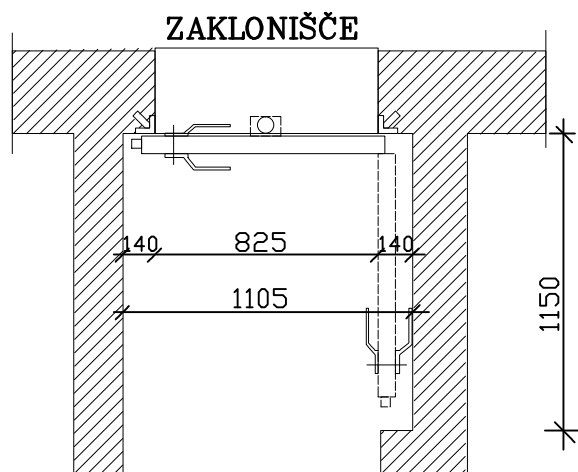
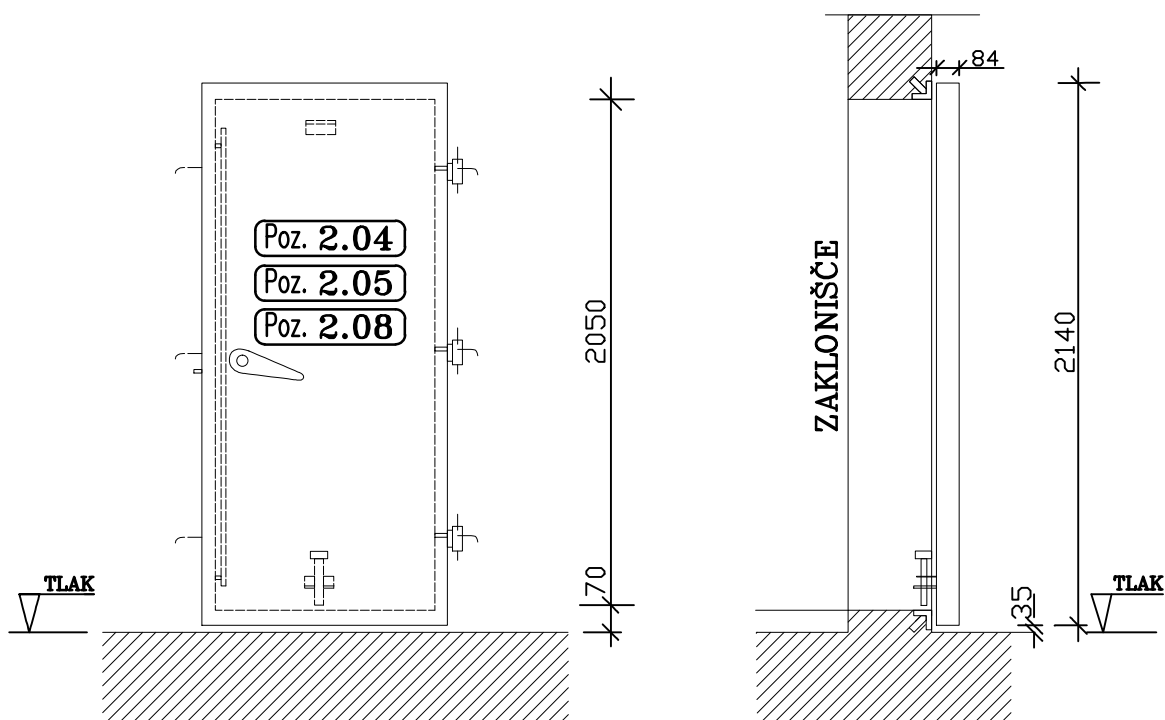
št. načrta:

JULFS--7S/01

list št./stran

4/22

JEKLENA, PLINOTESNA IN POŽARNA (EI-90) VRATA
ZA NADTLAK 10 kPa
svetla mera: 825/2050 mm
oznaka: GT-90 825/2050



- UPOŠTEVATI NAVODILA ZA VGRADNJO
- MARKA BETONA: 40 Mpa
- KOT ODPIRANJA: 180°
- TESNILO PRI PLESKANJU DEMONTIRATI
- MERE: V MILIMETRIH
- SLIKA NI V MERILU !
- VRATA SO PRIKAZANA SHEMATSKO!
- SHEMA VELJA ZA DESNO IN LEVO STRAN ODPIRANJA



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

JULFS--7S0106

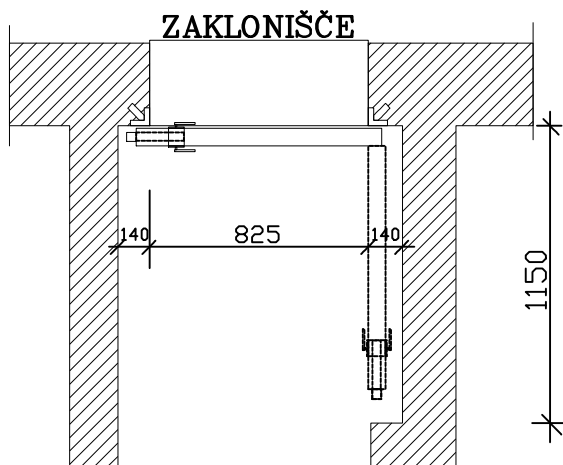
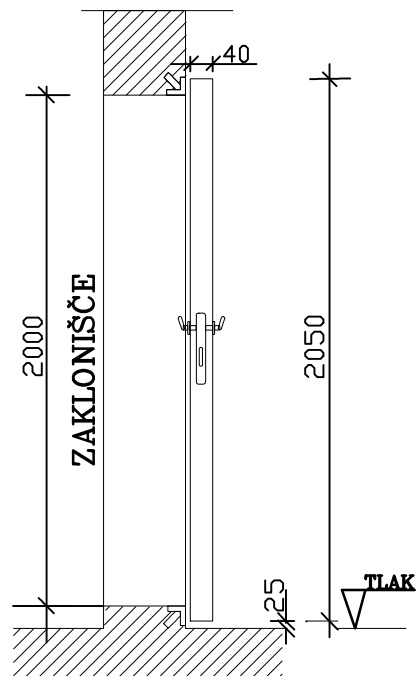
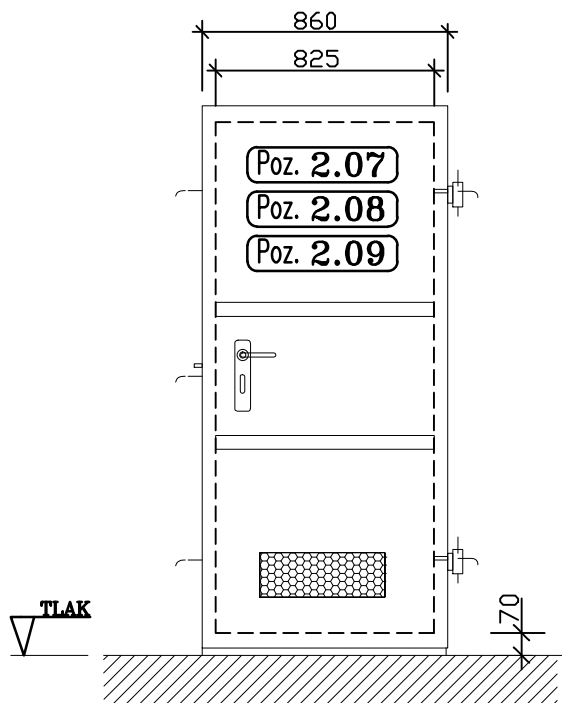
datum

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list št./stran

5/22

KOVINSKA, NOTRANJA NAVADNA VRATA
ODPORNA NA TRESLJAJE
svetla mera: 825/2050 mm
oznaka: IT 825/2050



- UPORABNA LEVO ALI DESNO
- OPAŽNA VGRADNJA
- KOT ODPIRANJA: 90°
- VRATNO KRILO IN OKVIR POCINKANA
- VRATNO KRILO NA VHODU V SANITARIJE IMA SAMOZAPIRALO
- PRAGovi SO DOKONČNO DEFINIRANI PRI VGRADNJI
- MERE: V MILIMETRIH
- SLIKA NI V MERILU
- VRATA SO PRIKAZANA SHEMATSKO !



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

JULFS--7S0106

datum

Oktober 2023

list št./stran

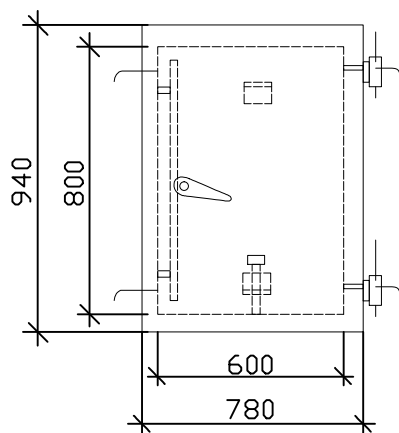
6/22

KOVINSKA, PLINOTESNA IN POŽARNA (EI-90) VRATCA

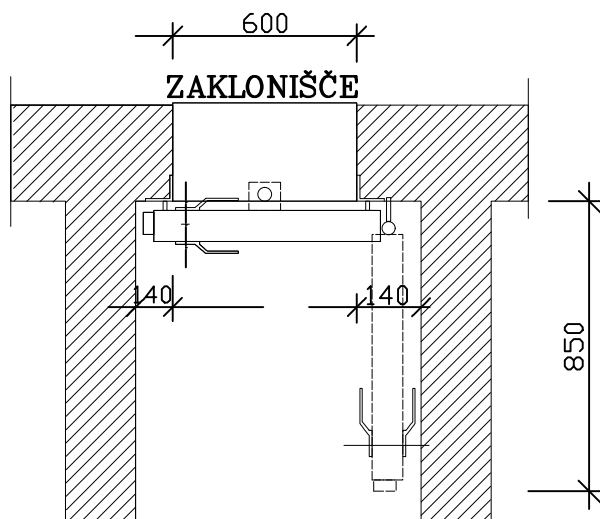
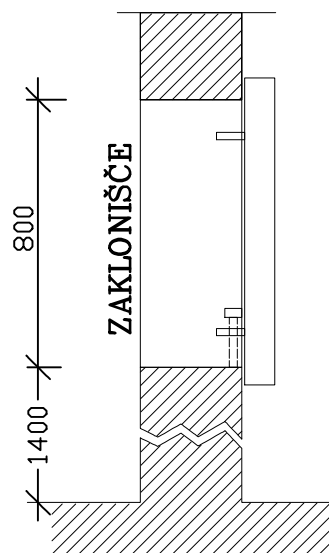
ZA NADTLAK 10 kPa

svetla mera: 600/800 mm

oznaka: GKL-90 600/800



Poz. 2.06



- SHEMA VELJA ZA DESNO IN LEVO SMER ODPIRANJA
- UPOŠTEVATI NAVODILA ZA VGRADNJO
- MARKA BETONA: 40 Mpa
- KOT ODPIRANJA: 180°
- TESNILO PRI PLESKANJU DEMONTIRATI
- MERE: V MILIMETRIH
- SLIKA NI V MERILU !
- VRATA SO PRIKAZANA SHEMATSKO!



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objekt:

FAKULTETA ZA STROJNIŠTVO

id. oznaka:

JULFS--7S0106

datum

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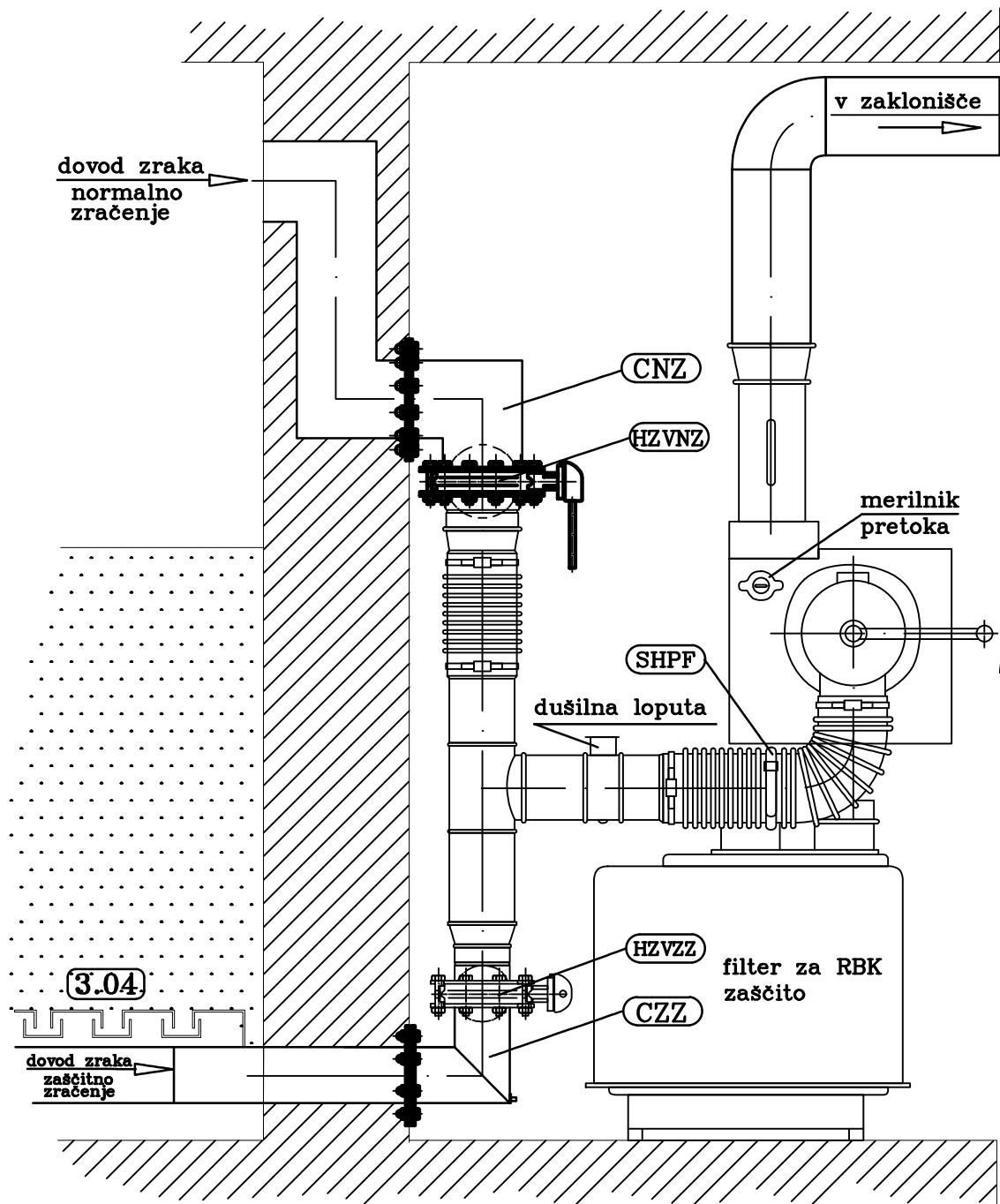
št. načrta:

JULFS--7S/01

list št./stran

7/22

SHEMA DOVODA ZRAKA PREZRAČEVALNE NAPRAVE - ZA NORMALNI NAČIN ZRAČENJA - 1. NAČIN



- (CNZ)** — ZALOMLJENA CEV ZA DOVOD ZRAKA PRI NORMALNEM NAČINU ZRAČENJA
(HZVNZ) — HITROZAPIRALNI VENTIL NORMALNEGA NAČINA ZRAČENJA
(CZZ) — ZALOMLJENA CEV ZA DOVOD ZRAKA PRI ZAŠČITNEM NAČINU ZRAČENJA
(HZVZZ) — HITROZAPIRALNI VENTIL ZAŠČITNEGA NAČINA ZRAČENJA
(SHPF) — SKLOPKA ZA HITRI PRIKLOP FILTRA ZA RBK ZAŠČITO

LEGENDA

- Beton
 Pesek



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

JULFS--7S0106

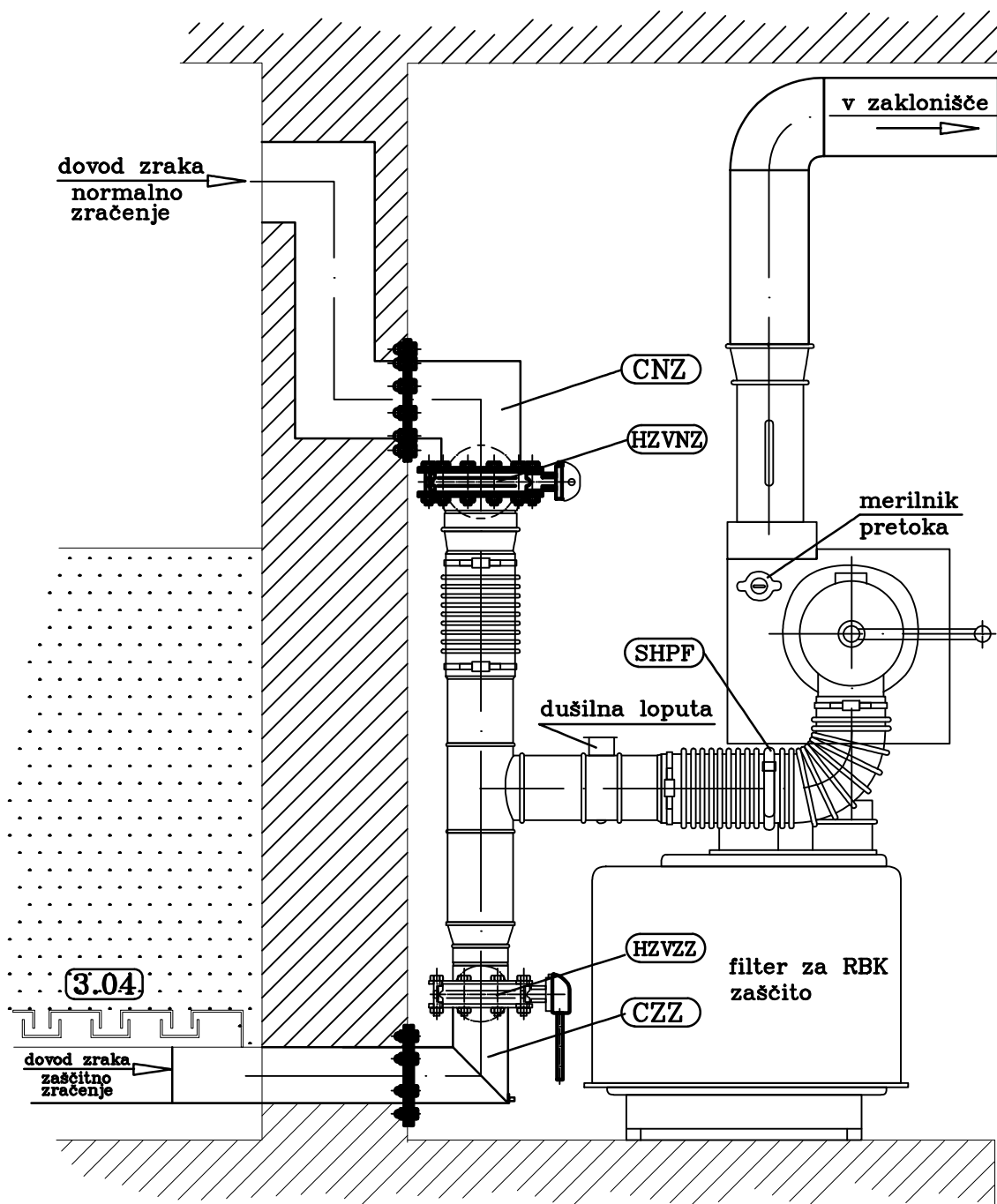
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list št./stran

8/22

**HEMA DOVODA ZRAKA
PREZRAČEVALNE NAPRAVE
– ZA ZAŠČITNI NAČIN ZRAČENJA – SAMO HLAJENJE ZRAKA – 2. NAČIN**



- (CNZ) — ZALOMLJENA CEV ZA DOVOD ZRAKA PRI NORMALNEM NAČINU ZRAČENJA
 (HZVNZ) — HITROZAPIRALNI VENTIL NORMALNEGA NAČINA ZRAČENJA
 (CZZ) — ZALOMLJENA CEV ZA DOVOD ZRAKA PRI ZAŠČITNEM NAČINU ZRAČENJA
 (HZVZZ) — HITROZAPIRALNI VENTIL ZAŠČITNEGA NAČINA ZRAČENJA
 (SHPF) — SKLOPKA ZA HITRI PRIKLOP FILTRA ZA RBK ZAŠČITO

LEGENDA

Beton
 Pesek



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MARIBOR

objekt:

FAKULTETA ZA STROJNIŠTVO

id. oznaka:

JULFS--7S0106

datum

Oktober 2023

št. načrta:

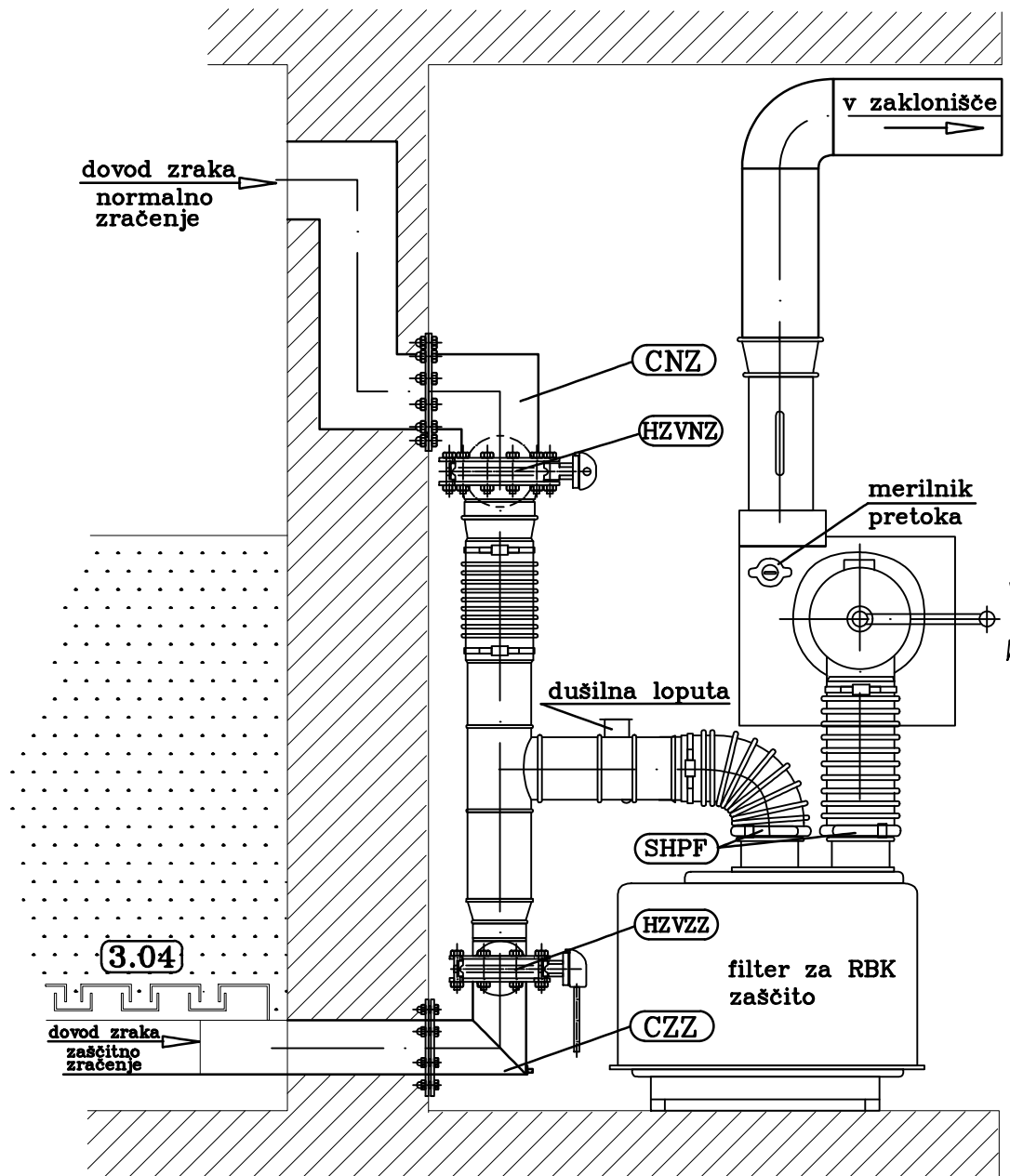
JULFS--7S/01

list št./stran

9/22

SHEMA DOVODA ZRAKA PREZRAČEVALNE NAPRAVE

– ZA ZAŠČITNI NAČIN ZRAČENJA – RBK FILTRIRANJE – 3. NAČIN



- (CNZ)** — ZALOMLJENA CEV ZA DOVOD ZRAKA PRI NORMALNEM NAČINU ZRAČENJA
(HZVNZ) — HITROZAPIRALNI VENTIL NORMALNEGA NAČINA ZRAČENJA
(CZZ) — ZALOMLJENA CEV ZA DOVOD ZRAKA PRI ZAŠČITNEM NAČINU ZRAČENJA
(HZVZZ) — HITROZAPIRALNI VENTIL ZAŠČITNEGA NAČINA ZRAČENJA
(SHPF) — SKLOPKA ZA HITRI PRIKLOP FILTRA ZA RBK ZAŠČITO

LEGENDA

- Beton
 Pesek



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MARIBOR

objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

JULFS--7S0106

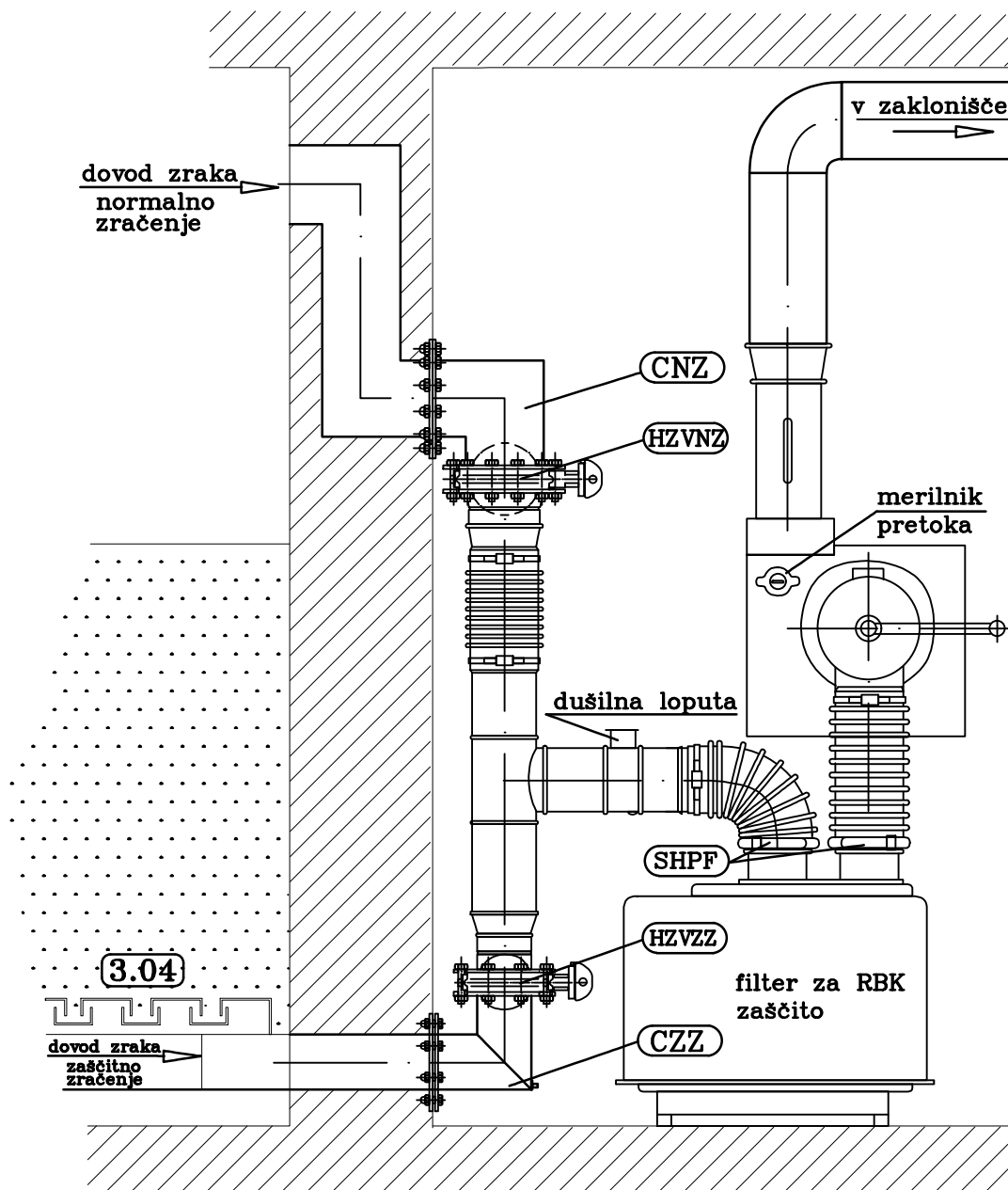
datum

Oktober 2023

list št./stran

10/22

SHEMA DOVODA ZRAKA PREZRAČEVALNE NAPRAVE – ZA STANJE IZOLACIJE ZAKLONIŠČA



- (CNZ)** — ZALOMLJENA CEV ZA DOVOD ZRAKA PRI NORMALNEM NAČINU ZRAČENJA
- (HZVNZ)** — HITROZAPIRALNI VENTIL NORMALNEGA NAČINA ZRAČENJA
- (CZZ)** — ZALOMLJENA CEV ZA DOVOD ZRAKA PRI ZAŠČITNEM NAČINU ZRAČENJA
- (HZVZZ)** — HITROZAPIRALNI VENTIL ZAŠČITNEGA NAČINA ZRAČENJA
- (SHPF)** — SKLOPKA ZA HITRI PRIKLOP FILTRA ZA RBK ZAŠČITO

LEGENDA

- Beton
- Pesek



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MARIBOR

objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

JULFS--7S0106

datum

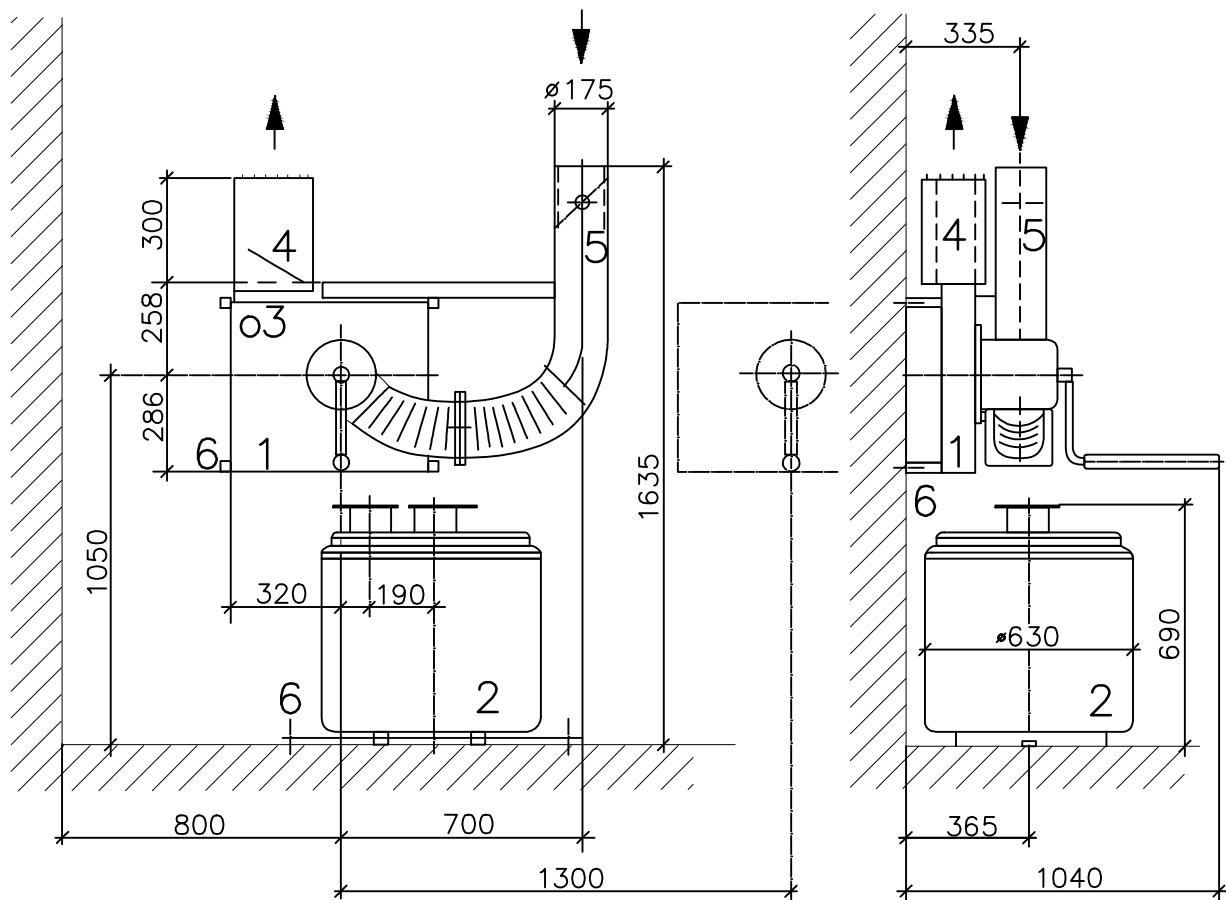
Oktober 2023

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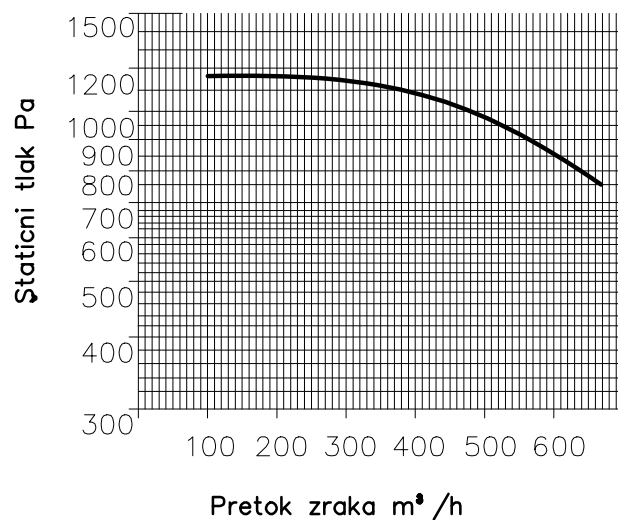
11/22

**PREZRAČEVALNA NAPRAVA
ZA SISTEM ZA ZRAČENJE ZAKLONIŠČA
V ZAŠČITNI FUNKCIJI**

pretok zraka: 600³m/h
oznaka: VA 300



- 1 Ventilator
- 2 Plinski filter
- 3 Merilnik pretoka
- 4 Protipovratna loputa
- 5 Dušilna loputa
- 6 Pritrdilni vijak



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

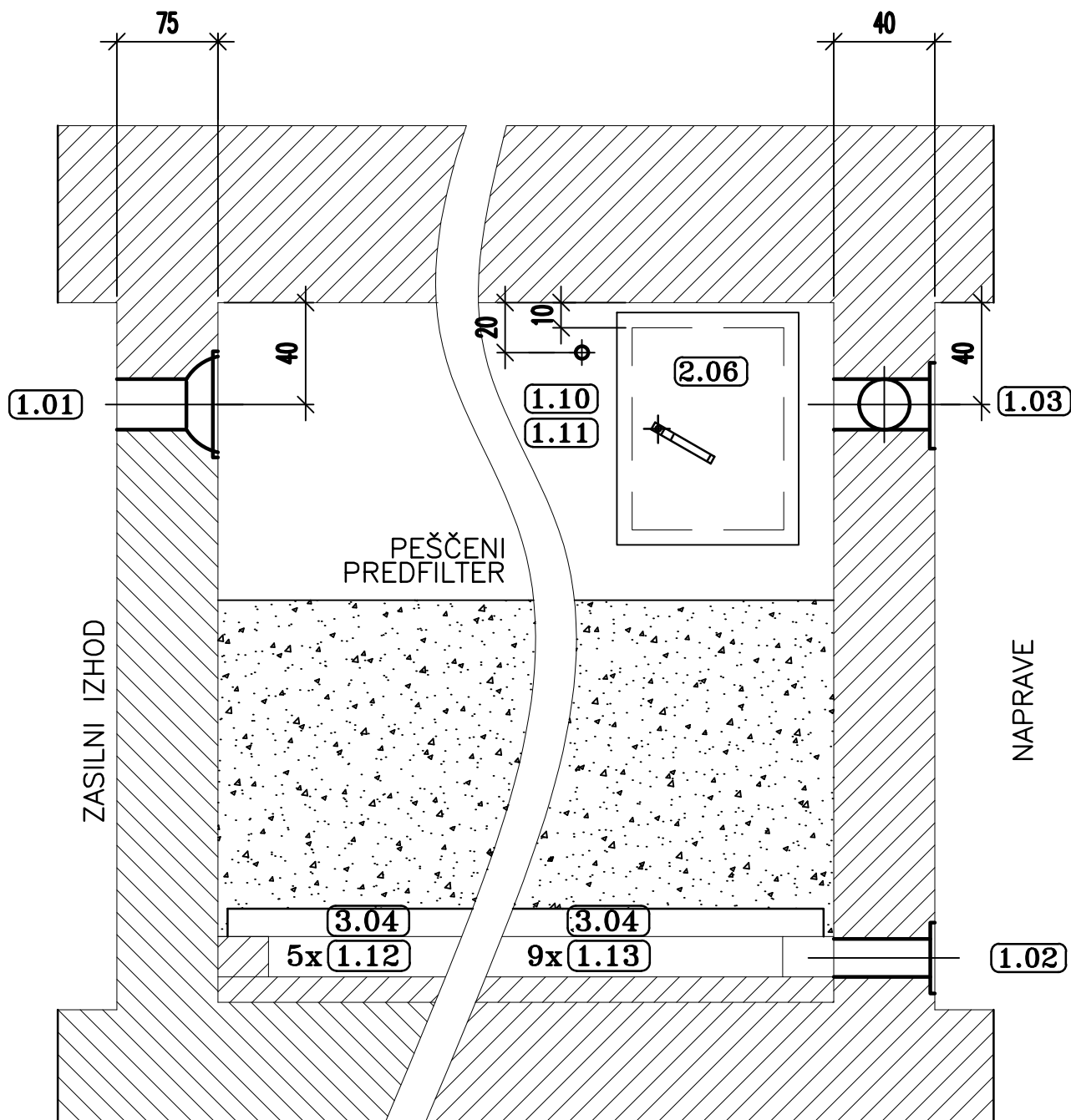
JULFS--7S0106

datum

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list št./stran

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- Poz.: **1.01** Cev protiudarnega ventila DN 200 – vel. 4
L = 750 mm
- Poz.: **1.02** Zaščitno zračenje – cev za dovod zraka DN150
L = 400 mm
- Poz.: **1.03** Normalno zračenje – cev za dovod zraka DN200
200 / 800 / 200
- Poz.: **1.10** Cev za tesnjenje kablov DN100
1.11 L = 400 mm
- Poz.: **2.06** Plinotesna vratca



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

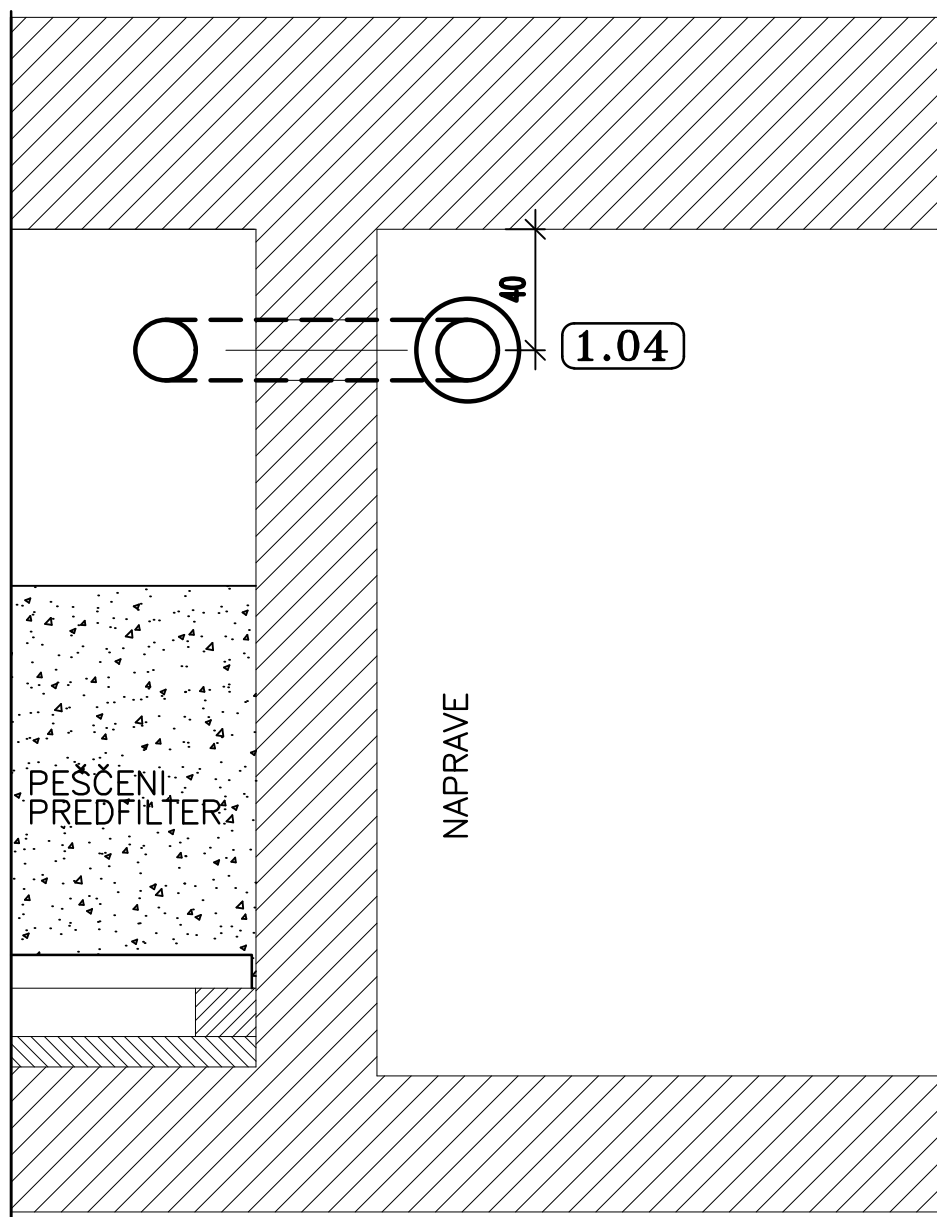
JULFS--7S0106

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Poz.: **1.04** Normalno zračenje – cev za dovod zraka DN 200
200 / 1000 / 200



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objekt:

FAKULTETA ZA STROJNIŠTVO

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JULFS--7S/01

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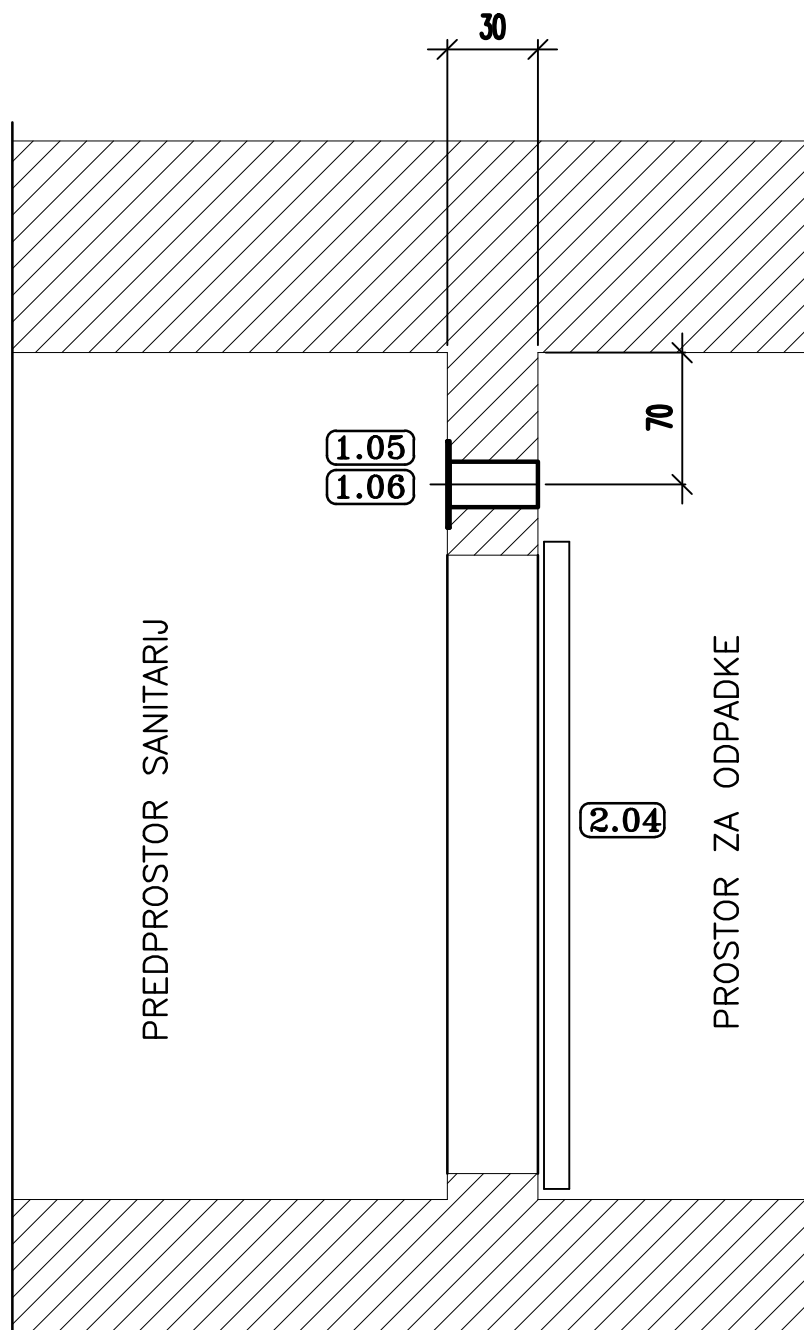
JULFS--7S0106

datum

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list št./stran

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Poz.:

- 2.04** Plinotesna vrata
- 1.05** Normalno zračenje – cev za odvod zraka DN 150
- 1.06** L = 300 mm



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

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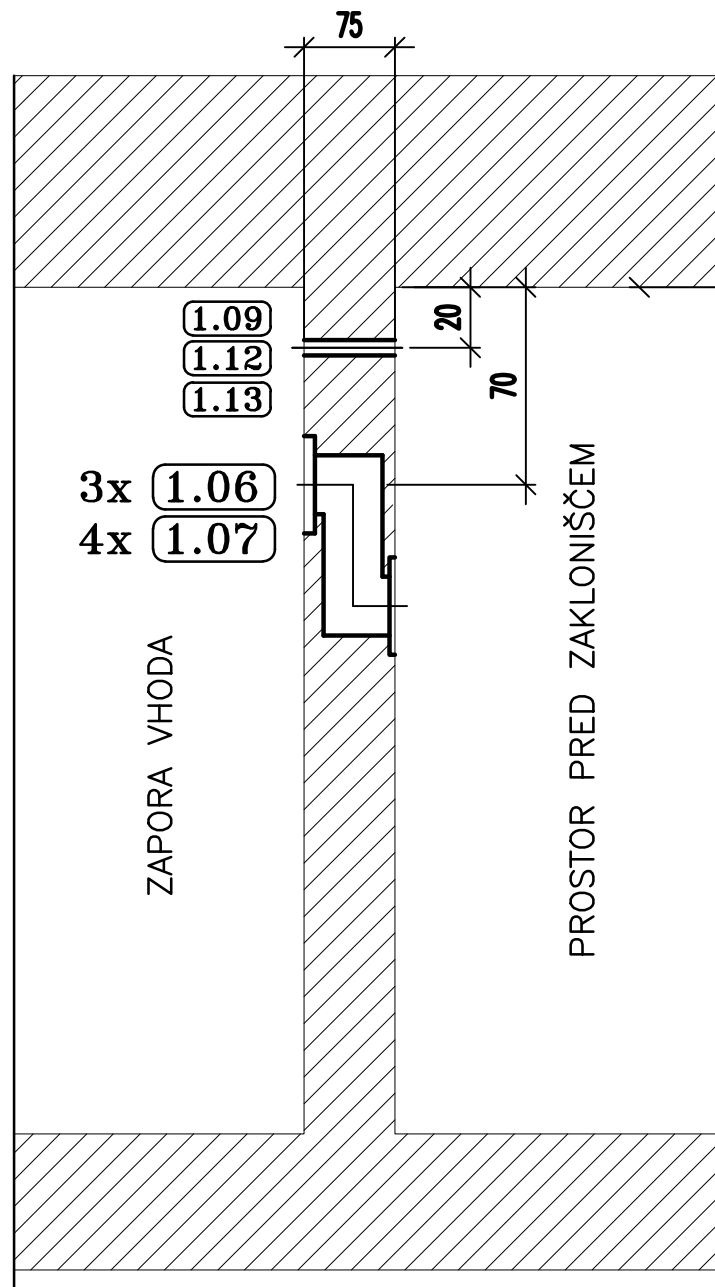
JULFS--7S0106

datum

Oktober 2023

list št./stran

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- Poz.:
- 1.06** Zaščitno zračenje – cev za odvod zraka DN 150
 - 1.07** L = 750 mm
 - 1.09** Cev za tesnjenje kablov DN 100
 - 1.12** L = 750 mm
 - 1.13** Prehod vodovodne cevi DN 25
 - L = 750 mm



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

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id. oznaka:

JULFS--7S0106

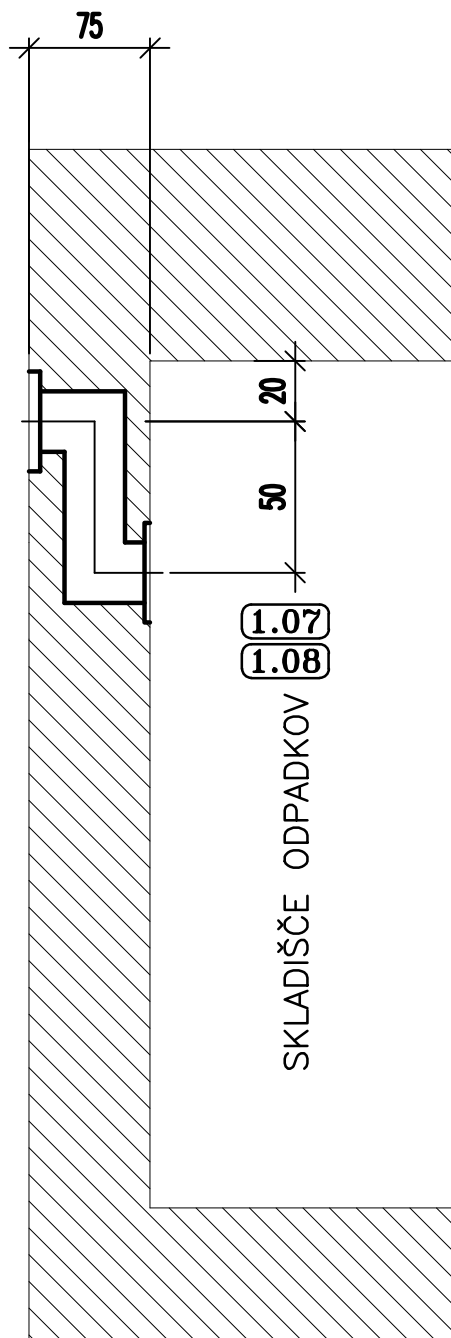
datum

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list št./stran

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ZUNANJOST



Poz.: **1.07** Zaščitno zračenje – cev za odvod zraka DN 150
1.08



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

JULFS--7S/01

id. oznaka:

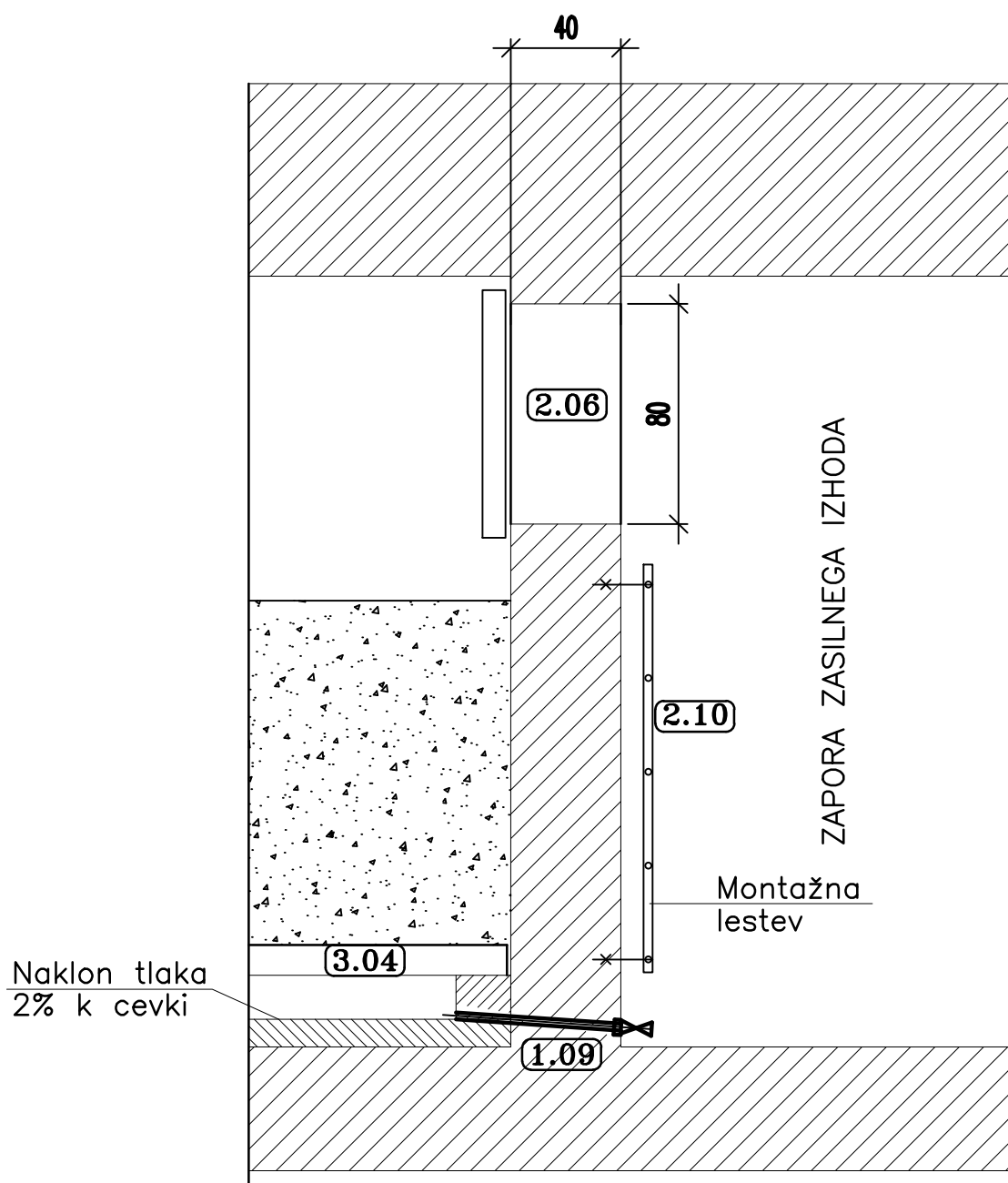
JULFS--7S0106

datum

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18/22



- Poz.: **2.06** Plinotesna vratca
- 2.10** Lestev za vstop v peščen filter
- 1.09** Cev za odvod kondenzne vode DN25
- 3.04** Vroče cinkana rešetka za peščen filter



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objekt:

FAKULTETA ZA STROJNIŠTVO

št. načrta:

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TESNENJE PREHODOV KABLOV V ZAKLONIŠČIH

- po sistemu RGP -

Pomen te priloge:

Po tem sistemu je predvideno tudi tesnjenje prehodov vseh električnih kablov in cevke za merilnik nadtlaka skozi stene z zahtevo plinotesnosti v zaklonišču v - prikaz detajlov.

Namen in uporabnost:

Tesnjenje kablov po sistemu RGP je namenjeno prehodu kablov, vodovodnih in toplovodnih napeljav skozi stene, ki morajo izpolnjevati zahteve plinotesnosti, vodotesnosti in požarne odpornosti (EI-90). Te zahteve morajo izpolnjevati stene in prehodi naštetih inštalacijskih vodov tudi pri zakloniščih. To tesnjenje je primerno tudi za hladilnice, plinske postaje, vodne pregrade in podobno. Prednost tega sistema tesnjenja je ta, da je pozneje zamenjava obstoječih ali dodajanje novih kablov možno brez dodatnih vrtanj v stene.

Izbira dimenzije cevi in tesnilne prirobnice - napotki za projektiranje:

Dolžino cevi je potrebno prilagoditi debelini stene na točki prehoda kablov skozi steno za vsak prehod posebej. **Premjer cevi** se določi po številu in premeru kablov, ki morajo prehajati skozi steno na določeni točki. S tem je določena dimenzija prirobnice, število polj, modul posameznega polja, premeri in dolžine tesnilnih in polnilnih kosov in moduli polnilnih kosov za prosta mesta, skozi katera je možno naknadno napeljati dodatne kable brez dodatnih vrtanj (tabela). Priporočljiva je izbira prirobnice, ki ima na razpolago dodatna prosta polja za poznejše zamenjave ali dodatne kable.

Tip prirobnice	Notranji premer cevi - mm -			Prosta odprtina prirobnice - mm			
				A	B		
RGP - 50	50 - 51,5			30	30		
RGP - 70	70 - 73			40	40		
RGP - 100	100 - 105			60	60		
RGP - 150	150 - 160			90	90		
RGP - 200	200 - 210			120	120		
Modul - mm	15	20	30	40	60	90	120
Premjer kabla - mm	4 - 9	4 - 16	12 - 24	22 - 34	32 - 54	50 - 70	75 - 110
Velikost prirobnice	Možno število kablov v posamezni prirobnici						
RGP - 50	4	1	1	-	-	-	-
RGP - 70	4	4	1	1	-	-	-
RGP - 100	16	9	4	1	1	-	-
RGP - 150	36	16	9	4	1	1	-
RGP - 200	64	36	16	9	4	1	1

Določitev potrebnega števila prirobnic za tesnjenje kablov: v popisu materiala mora projektant upoštevati zahtevo, da morajo biti prehodi kablov skozi stene zunanje cone plinotesnosti zaklonišča tesnjeni obojestransko, skozi stene notranje cone plinotesnosti pa enostransko - na notranji strani.

V popisu te projektne mape so zajeti vgradni deli (cevi) v pozicijah: 1.09, 1.10, 1.11, 1.12
V popisu te projektne mape so zajete tesnilne prirobnice v poziciji: 3.27
Prehodi so vrisani tudi v obeh priloženih načrtih.



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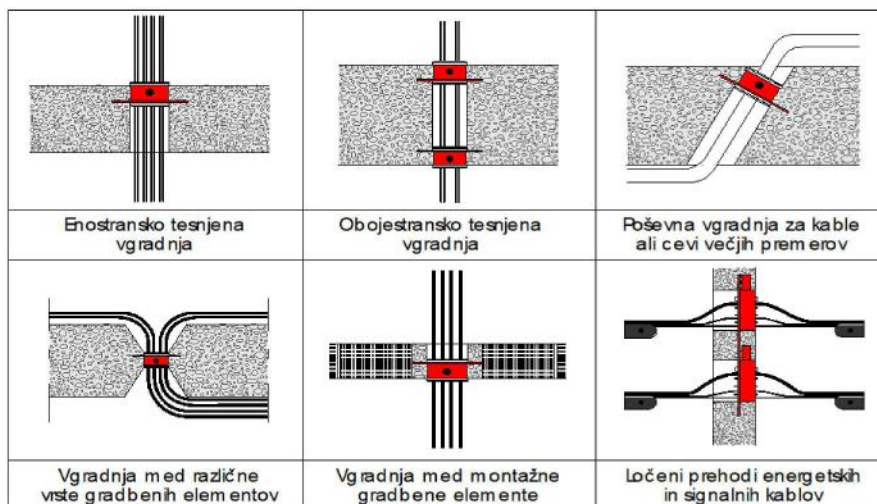
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Primeri izvedbe tesnjenja kablov skozi stene po sistemu RGP:

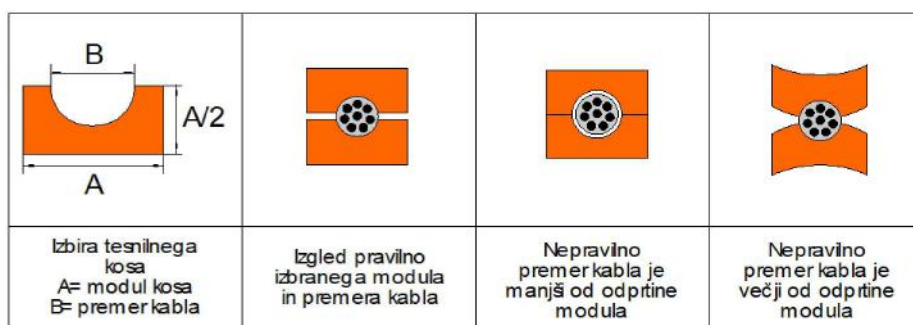
Podatki za projektiranje so navedeni v tabeli za okrogli tip prirobnic s premeri od 50 do 200 mm, kar so pri zakloniščih najbolj pogoste dimenzije. Možne so kombinacije različnih modulov pri posamezni prirobnici, kar je smiselno pri večjih premerih in večjem številu kablov. Na razpolago so tudi pravokotne izvedbe tesnilnih prirobnic ter izvedbe za blokado prenosa frekvenčnih ali visokonapetostnih vplivov oz. motenj. Cevni vodi se tesnijo posamezno - le po ena cev skozi posamezno prirobnico.



Projektant običajno natančno ne more predvideti premerov posameznih kablov, določi le tip, število žil in število kablov, zato mora izvajalec tesnjenja po napeljavi vseh kablov in še pred vstavljanjem tesnilnih in polnilnih kosov sam natančno izmeriti premere kablov in uporabiti le takšne kose, ki zagotavljajo dobro in pravilno tesnjenje.

Izbira tesnilnih kosov:

Tesnilni kosi morajo biti izbrani dosledno šele po napeljavi vseh predvidenih kablov.



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Napotki za vgradnjo tesnilnih uvodnic po sistemu RGP:

Med opažni steni se pred betoniranjem vstavi in pritrdi cev potrebne dimenzije. Cevi naj bodo jeklene, standardnih dimenzij, vroče pocinkane, z nastavki za pritrditev na opažne stene, da ne pride do zamika med betoniranjem. Cevi po dolžini ne smejo biti sestavljene iz več kosov. Uporabljene cevi, tesnilne prirobnice, tesnilni in polnilni kosi naj bodo nepoškodovani.

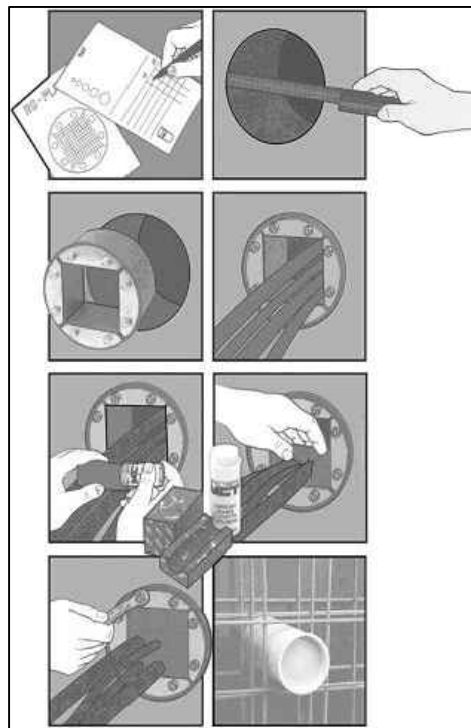
Kable je potrebno napeljati v nezategnjenem stanju, da bo omogočeno kasnejše tesnjenje s tesnilnimi in polnilnimi kosi, prilagojenimi številu in premerom kablov.

Narišemo si načrt
razporeditve
kablov; debelejši
kabli naj bodo
spodaj

V odprtino
vstavimo
obod
tesnilne uvodnice
in rahlo
privijemo vse
matice

Po napeljavi
vseh kablov
pripravimo tesnilne
in polnilne kose in
jih namažemo

Poravnamo
kose in vse matice
na obodu
tesnilne prirobnice
močno privijemo



Kontroliramo
premer prehodne
odprtine,
ki mora biti
v mejah tolerance
iz tabele

Napeljemo
kable
v nezategnjenem
poteku in
v primernem loku
na obeh straneh
prehoda

Vstavimo
tesnilne in polnilne
kose v obod
tesnilne prirobnice;
polnimo s spodnje
strani

Izgled
pravilno
vstavljene cevi za
prehod kablov,
kar se izvede pred
betoniranjem

Opozorilo:

Po vstavitvi in poravnavi vseh tesnilnih in polnilnih kosov je potrebno močno zategniti vse vijake na obodu tesnilne prirobnice (za 10 - 12 mm), ki se s tem napne, trdno pričvrsti in zatesni prehod.

Pri tesnjenju je dopustno uporabiti le originalno mazalno sredstvo, ki olajša namestitve tesnilnih in polnilnih kosov.



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