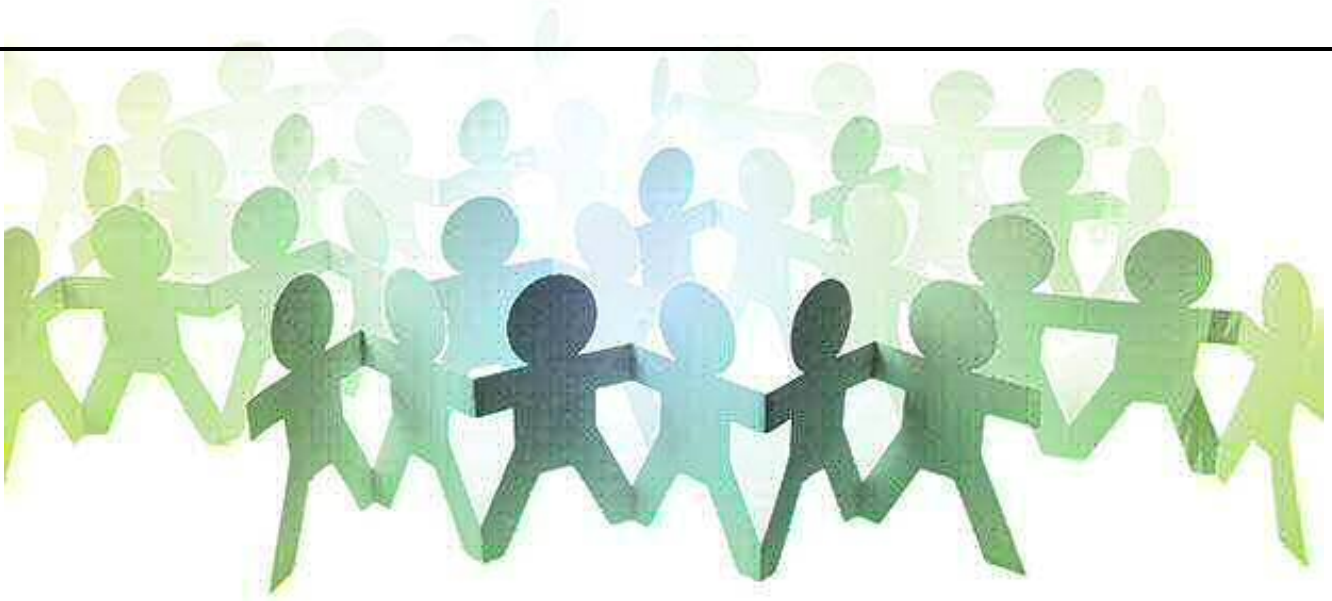


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Construction of
Touristic Center for Cultural and Sport Activities
in Lupsa de Jos village, Brosteni commune



D.Th / DDE

[Technical project and execution details]

December 2017

Beneficiary: **Brosteni commune**, Mehedinti county

Designer: S.C. **IN-OVO** S.R.L.

VOLUME **1 2 3 4**



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Head Page

Project Name: ***Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune***

Location: ***Lupsa de Jos village; Brosteni commune, Mehedinti county***

Beneficiary: **Brosteni commune, Mehedinti county**

General designer: **S.C. IN-OVO S.R.L.**

Project no: **13/2017**

Date: **December 2017**

Design phase: **D.Th/DDE. – Technical project and execution details**



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SUMMARY

Written part:

- END SHEET
- SUMMARY
- PERMITS
- VERIFICATION REPORT
- PROPERTY DOCUMENTS
- GEOTECHNICAL STUDY
- GENERAL REPORT
- TECHNICAL REPORT – ARCHITECTURE
- TECHNICAL REPORT - RESISTANCE
- TECHNICAL REPORT - INSTALLATIONS
- SPECIFICATIONS

DRAWINGS:

Architecture

- A01 - Village framing plan
- A02 - Area framing plan
- RT – Topographic survey
- A03 – Site plan - existing
- A04 – Site plan - proposal
- GA01 – Plotting plan
- OS - Building Site Arrangement
- A05 – Ground floor plan
- A06 – Attic plan
- A07 – Roof plan
- A08 – Section A-A'
- A09 – Section B-B'
- A10 – Section C-C'
- A11 – North facade
- A12 – South facade
- A13 – West facade
- A14 – East facade
- A15 – Fire wooden barn
- A16 – Joinery List doors
- A17 – Joinery List Windows
- A18 – Exhibition Boards
- A19 – Furniture
- A20 West fence, sport court West fence
- A21 – South fence, sport court South fence



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Structure

- R1 - Exhibition center - foundation plan
- R2 - Exhibition center - Foundation details
- R3 - Exhibition center - Foundation details
- R4 - Exhibition center - Foundation details
- R5 - Exhibition center - Foundation details
- R6 - Exhibition center - Foundation details
- R7 - Exhibition center - Foundation details
- R8 - Exhibition center - floor plan over the ground floor
- R9 - Exhibition center - reinforcement plan over the ground floor
- R10 - Exhibition center- plan for superior elevations poles and belts
- R11 - Exhibition center - metal roof structure
- R12 - Exhibition center - metallic floor f1
- R13 - Exhibition Center - reinforcement beams and belts
- R14 - Exhibition Center - reinforcement beams
- R15 - Exhibition Center - reinforcement Pillars
- R16 - Exhibition center – stairs reinforcement
- R17 - Wood warehouse - foundation plan
- R18 - Wood warehouse - foundation details
- R19 - Retention basin - sections
- R20 - Retention basin - plan and plate reinforcement

Installations

- IE01 - Ground floor plan Internal electrical instalations
- IE02 – Attic floor plan Internal electrical instalations
- IE03 - Electrical table tect Internal electrical installations
- IE04 - Tablou electric tes Internal electrical installations
- IE05 - Electrical table teg Internal electrical installations
- IS01 - Floor plan Internal sanitary installations
- IS02 - Scheme of columns Internal sanitary installations
- IS03 - Scheme of columns Internal sanitary installations
- IT01 - Floor plan Internal thermal installations
- IT02 - Scheme of columns I1 and I2 Internal thermal installations
- IT03 - Scheme of columns I3 and I4 Internal thermal installations
- IT04 - Functional central heating scheme Internal thermal installations
- ID01 - Ground floor plan Detection and fire signaling installations
- ID02 - Attic plan Detection and fire signaling installations
- ID03 - Block diagram Detection and fire signaling installations
- RTE01 - Situation plan for public technical networks

Drafted by,
Arch. Dan Boruga



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A. WRITTEN PART

I. GENERAL TECHNICAL REPORT regarding the execution of the works to achieve the objective

1. General objective information:

- 1.1 Denomination of the investment objective:** This documentation is being prepared for the purpose of carrying out the works „*Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*” from Mehedinti county
- 1.2 Location:** Brosteni commune, Mehedinti county
- 1.3 Administrative act approving the feasibility study:** Decision of the Local Council no. 27 of 20.12.2016
- 1.4 Principal Authorizing Officer:** Mayor of Brosteni commune
- 1.5 Investor:** Brosteni commune
- 1.6 Beneficiary:** Brosteni commune
- 1.7 Designer:** SC IN-OVO SRL

2. Presentation of the scenario:

The objective of the project is to build an ensemble consisting of a building with the function of a tourist center for cultural events and the setting up of a sports platform for amateur football.

The tourist center responds to the necessities of providing technical and organizational physical support in the organized tourism, by providing the necessary infrastructure for hosting artistic cultural events.

The sports field is an extension of the main function offered by the building by supporting the sports activities proposed by the project, activities to offer a wider range of options for the tourist development of the area.

The use of this objective is not limiting, since it can benefit of a wide range of tourists:

- Very flexible age groups
- various nationalities - the attractions offered by this center are of interest to both Romanian tourists who want to take in close contact with the specifics of this area, but also for the foreigners who want to discover our national specificity
- groups organized by various themes: arts, traditions, folk culture, religion, etc
- groups of specialists (ethnography, architecture, music, dances, etc.)

The infrastructure that will be created through the implementation of the project will have a continuous use and involves hosting permanent activities such as exhibitions, sports competitions, festivities with a regular character but also organized according to market demand - organized groups or solitary tourists.

In the context of the initiation of a zonal branding process, with the involvement of public entities in the South-West of Oltenia and Serbia, there is a need to set up a center to ensure the development of the proposed tourism activities.

Tourism is one of the sustainable development options of the area, which is based on a valuable potential sustained by favorable geographical positioning - the confluence between the plain and the sub-mountain area, located in the middle of a very rich area of folkloric content, with valuable traditions



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through consistency and variety, with a popular art very present in the architectural, handicrafts, traditional port, but also in the community manifestations - dances, songs, etc.

The project proposes actions to support tourism development based on an organized framework. Thus, it is intended to sustain, promote and capitalize cultural assets through the intermediary of specialized entities in the field - travel agencies, tour operators with operations in the area, partner institutions which, through their own needs, can potentiate tourism activity in the area - museums, schools, etc. After studying the specific requirements of the activity, it was emphasized the necessity of building a center that could meet the demands of this type of tourism, without being limited to it.

The main indicators of the Feasibility Study carried out in January 2016 on which this document was based have been respected, as follows:

- the maximum value of the works and main lines of the overall estimate has not been exceeded
- all the elements initially foreseen were treated in this project, respecting the main technical and dimensional characteristics
- the facilities and equipment provided by the study were provided, and certain adjustments were made in order to improve and improve the final solution, simultaneously with the reduction of the execution costs.

In this sense, by the beneficiary's care, a public drinking water supply network will be built in the area, which will also cover the studied area, respectively the tourist center location, which will connect to this utility until the final reception. Considering this opportunity, the execution of a drilling hole in the premises for the water supply of the building was dropped. At the same time, the pumping and generating group initially provided as a support for the hydrant network is now being renounced, which is now being fed directly from the public network. In this way, the initial bends could be reduced by renouncing these investments in the form of bridging works - much lower costs compared to the initial installations.

By 2020, a public sewerage network is also planned and the technical project has been adapted to provide a link to this utility. Meanwhile, domestic water will be collected in a watertight basin that will be periodically vacuumed. When the public sewerage network is put into operation, this basin will change its initial function and can be used to keep rainwater and use it for irrigation. The cost for the basin was initially foreseen in the feasibility study, which has the role of keeping the treated water from the compact wastewater treatment plant abandoned (it is not necessary in the new situation). By giving up the sewage treatment plant there will also be an additional cost saving.

2.1 Location features:

a) Description of the location:

The land, belonging to the public domain of the village Lupsa de Jos, Brosteni commune with an area of 3,855 sqm, with the cadastral number 50918 is located in the village of Lupsa de Jos, Brosteni commune. The parcel is unstructured, it is located in the city and falls into the category of yards, constructions in the classification of land use categories.

The land, with a 6-sided polygonal shape, is adjacent to the DC60 communal road, with an opening of about 33 meters.

The neighbours of the land are:

- North: DC 60 communal road
- East: property Vilcu Vasile
- west: Lupsa de Jos Kindergarten, property Pescaru Gheorghe, property Geambasu Dumitru
- south: property Trusconiu Ersilia, property Gherghe Constantin

b) Topography

Situated in the northeastern part of Mehedinți County, in the Piedmont area of Motrului, Brosteni commune is a well-personalized and old-fashioned administrative-territorial unit, having an existence



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linked to Motru river, being located around the meeting place of DN 67 Turnu Severin -Tirgu-Jiu-Petrosani with DN 67A Brosteni- Strehaia.

The village Lupsa de Jos is situated between the villages Capatanesti and Luncsoara. From DN 67A to the left in the direction of walking from Brosteni to Strehaia there is DC 60 that crosses the village of Lupsa de Jos and is situated perpendicular to Motru River, on its right side, between two hills, on the bank of a parau.

The studied lot is characterized by a general slope in the direction of NW-SE; At present, access is through a relatively sudden break of approx. 1m after which the gradient is linear, more attenuated.

The location of the proposed constructions and the systematization of the land must be made in such a way as to counteract the negative effects of this slope from the exterior of the property towards the objective, currently the outflow of the meteoric waters in the northern area is made uncontrolled by the studied field.

c) Climate

The study area, located in the southern extremity of the country, is predominantly under the influence of barricial centers of the Mediterranean Sea, characterized by higher temperatures, with annual averages greater than 10C (at Tr.Severin the annual average is 11.70C).

In this part of the country the autumns are long and warm.

The average temperature of October at Tr.Severin is 12.50C.

Polar air invasions are more rare compared to neighboring areas, which is reflected by registering minimum values 7-100C higher than those recorded in the Moldavian Plateau and the Transylvanian Plateau.

Precipitation falls in most of the year in liquid form. Winter is recorded on average for 20 days with snow, and the snow layer does not last longer than 15 days.

The second maximum precipitation approaching quantitative first of May-June is here now reflected in water quantities of 71mm Tr.Severin fallen in May, 79mm in June, 68mm in November and 75mm in December.

The occurrence of short-term secondary climatic events, more marked by their effects, like rainfall and sudden melting of snow, leaves visible traces on the surface of the relief through the morphogenetic processes it generates.

d) Geology

The grounds of the site are located on the upper terrace of the Motru River.

According to P100-1 / 2013, the construction is located in the seismic hazard zone $a_g = 0.15g$ and the control period (corner) $T_c = 0.7s$.

The maximum freezing depth is 0.70 m.

The grounds of the site are located on a terraced relief - the upper terrace of the Motru River, with low relief energy that ensures stability.

Geologically, the area is composed of quaternary deposits consisting of cohesive earths - clays. At the base of these deposits there are older warehouses of the neogene period consisting of marjoram.

On the site the underground water meets at a depth of 4 - 6 m without affecting the foundation ground.

On-site surveys have identified stratification:

- 0.00-0.50m fillings
- 0.50-4.00m dusty clay.

The basement ground is clay with high plasticity, state of consistency - vartos, degree of humidity - wet, medium compressibility. The foundation ground is in the category of good foundation ground.

The foundation ground allows direct foundation.

Minimum foundation depth: $D_{minf} = 0.80m$ from T.N.



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Conventional base pressure: $P_{conv} = 280\text{KPa}$ ($B = 1.0\text{m}$, $D_f = 2.0\text{m}$).

e) Degraded and protected utilities:

-not applicable

f) Water, electricity, gas, telephone and the like for permanent and temporary work

- water supply - network under execution
- power supply - connection to the area network
- Other networks or utilities are not present in the vicinity of the site

g) Permanent access ways, communication ways and the other similar elementsw:

Access to the site is through the DC60 communal road.

h) Temporary access ways

-not applicable

i) Real estate cultural heritage goods

-not applicable

2.2 Technical solution

a) Technical characteristics and specific parameters

Built on a free field with a polygonal shape, the proposed investment is part of a program that includes a number of facilities, as follows:

- pedestrian and road access ways, parking area
- green grasshoppers
- synthetic grass field
- wood store
- fencing, technical equipment

Main building

The designed building will be located on the ground according to the layout, at approx. 8m above the northern boundary of the land (street front), parallel to it and 2m to the nearest point to the eastern border of the property. To the west, the smallest distance from the property limit will be 7.80m, and to the south the minimum distance will be 21.8m.

At approx. 10, in the west of the proposed building there is an existing building with the kindergarten function, in the east of the tourist center for cultural and sports activities being another building with the function of dwelling, located also at a similar distance of 9-10m.

In terms of use, the building is designed to serve multiple purposes:

- center for permanent cultural and artistic activities
- Exhibition center and presentations that can be used on occasions occasioned by different calendar milestones - Local, zonal or organized itinerant
- competitive sports activities
- Performances with the public

The sizing capacity of the building is 120, but on some occasions the maximum number of building users can reach 180 people.



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The height regime is downstairs; the building has an area with reinforced concrete slab that delimits the ground floor by a partial bridge - the bridge is easily accessible and can occasionally be used for the storage of heavy fuel materials during the course of events.

The land on which the works will be carried out is located inside the town and at this moment it is free from any construction.

Land area $S = 3,855$ sqm

Built area $S_c = 656.20$ sqm

Surface developed $S_d = 656.20$ sqm

Building volume $V = 3.735$ mc

Land occupancy (P.O.T.):

- P.O.T. : 17.02%.

Land use coefficient (C.U.T.):

- C.U.T. : 0.170

The functional design allows for the good activities of the project to be carried out and meets the requirements related to safety in operation, access for people with locomotive disabilities, hygiene, fire safety, natural resource economy.

The designed building is the destination of a tourist center for cultural and sports activities. The capacity of the building was determined both by the present situation of the commune and by the prospect of the arrival of the young people in the area and in Serbia, in this sense the size of the building was requested for about 3 coaches with tourists, about 120 people and administrative staff. On the occasion of large-scale events, the capacity of the building can allow for a maximum of 180 people.

Sizing, air volume, glazing, room sunshine were calculated according to the current rationale. The building will be built in the ground floor. The land on which the building will be built on a slight slope, the project will be adapted to the land.

The main entrance to the building is located on the northern facade. The access will be through a portico that will allow access to the other spaces of the building, these being:

- foyer;
- multifunctional hall;
- disabled person toilet;
- men's toilet;
- women's toilet;
- cleaning office;
- buffet with office;
- hallway;
- 2 wardrobes for artists with related sanitary groups
- office;
- staircase.

From the porch on the northern facade is the entrance through two doors in the foyer. This will allow access to the multifunctional hall (front) as well as to the sanitary groups and the office for cleaning materials (left). The multifunctional hall can be temporarily divided into two by removable panels, with functions of the exhibition hall and the projection and showroom. In the vicinity of the multifunctional hall is a buffet with a counter that opens to the foyer. There is also a hall leading to the artists' wardrobes, to the office, to the staircase leading to the bridge and to an exit to the south end of the building. A double door opens to the aisle to evacuate spectators from the showroom, as well as an access door to the stage.

The cafeteria and the office will be equipped with two refrigerators, furniture, and a microwave oven to which you can heat up prepared sandwiches in a specialized location and brought here for serving.

The wardrobes of the artists will have cupboards, benches and tables with mirrors for makeup. Each wardrobe will have a bathroom with peacocks, showers and toilet.



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The multifunctional room has a direct exhaust door on the west side of the building. The stage of the showroom will be demountable. The hall can be divided into two demountable panels, with functions of the exhibition hall and the projection and showroom. The 60 seats that hold the sailboat are tight to make room for actions that do not require their use.

The office will be used by the administrative staff serving the center.

Also on the ground floor, in the south-east of the building, with access from the outside is the room of the thermal power plant.

All rooms will have large windows with PVC windows with double glazing. At the bridge there will also be Velux mansard windows. The exterior doors will be made of PVC, and the PVC interior with wood look.

The rooms will have the walls and ceilings plastered and covered with washable paint in pale colours. The floor in the multifunctional hall will be covered with traffic-resistant parquet and in a non-slip floor. This will also be found on the foyer floor, stairs, hallways, wardrobes and sanitary groups. The floor of the office will be covered with wear resistant laminate flooring.

The bathrooms will have tiled walls up to a height of 2.10 m and in the buffet will be installed the tile on the two opposite walls, with sinks, up to a height of 1.50 m.

Access to the attic will be done on a staircase reinforced with metallic balustrade.

The ceiling of the showroom and the ceiling of the stair house will be made of gypsum board system on fire resistant metallic structure 60 minutes.

In the southern part of the land allocated to the Tourist Center will be arranged a sports field covered with synthetic turf. Its surface will be 684 square meters. It will be enclosed by a mesh fence and will be 4 meters high on the sides and 6 meters behind the gates. The field between the lawn and the fence will be covered with gravel.

In the northern part of the sports ground there will be a parking lot for 11 cars.

In the south - eastern part of the land will be built a warehouse for firewood.

The land has a slope that requires its modeling; in this sense, vertical systematization works will be carried out with the purpose of organizing exterior spaces, green areas, alleys, meteoric discharge.

Walkways, sidewalks and pedestrian platforms will be asphalted and parking will be covered with broken stone.

The green spaces in the courtyard of the center will be planted with grass. Trees and shrubs will be planted on the slopes green.

A ribbon will be arranged in the entire north-eastern part of the land that will drain the meteoric waters off the field.

The proposed partitioning is an optimal one for the studied function and takes into account the specific regulations in the fields involved.

The utilities for the cultural center will be provided in the following way:

- Water supply: connection to the network in progress in the area.
- Drainage: empty basin.
- Power supply: connection to the area network.
- Thermal power supply: own thermal plant.

Pedestrian access building land: from DC60.

Auto Access Land Construction: DC60.

Indoor installations

Indoor and outdoor electrical installations

Designed indoor electrical installations for the investment objective solve interior lighting, strong current outlets, panic lighting, evacuation lighting and intervening lighting.



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Lighting lamps will be of the type of application equipped with LED type sources for general lighting, such as LED panels with accumulator for panic lighting and luminaire for exhaust lighting in case of need of users.

The landing socket for the investment objective will be made on the outside of the building and will be made up of electrodes made of Dn 2 "galvanized steel pipe and 40 x 4 galvanized steel plate.

The lens will be protected by an air discharge protection device mounted on the roof of the building, which will have two drops to the ground.

The grounding resistance will not equal the value of 1 Ohm.

The general exterior lighting will be made with independent luminaires equipped with battery and solar panel, and lighting of the sports ground will be done with lighting lamps connected to the electricity network proposed within the project.

All buildings on the outside of the building will be equipped with LED lamps.

Interior and exterior sanitary installations

The interior sanitary installations solve the cold water supply, hot water, hot water recirculation, hot water during the summer and winter as well as the discharge of domestic water from the use of the object.

The cold drinking water will be provided by the public water supply network of the locality under construction.

Domestic hot water will be produced by a bivalent boiler to be installed in the boiler. The boiler will be serviced during the summer by solar panels mounted on the roof of the building and in winter will be served by the thermal plant.

Recirculation of hot water is necessary to limit unnecessary water consumption during the drinking period.

The manned water will be discharged into a 20 mc vacuum pool that will cover user needs for a period of about a month.

The pluvial waters will be taken "by the drop" and by the configuration of the land will be guided as in the existing situation of the land to the water in the studied area.

The indoor hot water and recirculation water installations will be made of polypropylene pipe and the indoor and outdoor sewers will be made of PVC.

The outdoor water installations will be made of a high density polyethylene pipe.

Indoor and outdoor thermal installations

The thermal indoor installations solve the technical comfort during the development of the activity within the center.

Hot water for heating will be prepared during the winter with the gas-fired thermal power plant that will work with gasification. The power of the thermal power plant is 50 kW, which provides the necessary heating and domestic hot water.

Hot water will be prepared during summer with the help of solar panels mounted on the roof.

The indoor thermal installations will be made with a copper pipe mounted in the equalizing screed.

The distribution will be buried with collecting manifolds.

Radiators will be made of steel mounted on metal brackets.

Fire detection and fire alarm systems

Indoor Fire detection and fire alarm system_solve within the technical project the provision of any valuable objects that may be at a given moment in the building during the period of the activity.

Designed installations comply with current regulations.



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The fire detection and fire alarm system is composed of a fire detection and fire alarm system, addressable smoke sensors, addressable buttons, sirens and indoor flashlights and conventional outdoor sirens.

These equipments are judiciously located throughout the building, thus ensuring the protection of potential goods by shortening the intervention time to an unpleasant event.

Facilities of the building

In order to ensure the development of the current activities and those scheduled in the cultural, tourist and sports activities it is not necessary to equip the spaces accordingly, as follows:

- visitor chairs with a backrest required for viewers and participants in courses, presentations, etc
- Ergonomic office chairs - necessary for staff
- Wall hanger - required for staff
- work desks - necessary for staff
- toilet tables with mirror - for wardrobe artists, one in each cabin
- Changing locks
- lockers with 3 doors - 3 each in each cabin / cloakroom
- document cabinets with 5 shelves - necessary for administrative and organizational activities
- Buffet shelves
- buffet counter
- bodies with a countertop buffet
- suspended bodies. buffet
- 2-sided splitting panels. display - multiple use: temporary visual compilation and support for informational items
- Microwave - Buffet
- Refrigerators - Buffet
- Stage modules - assembled will be the stage platform; can be stored separately or used on various occasions for outdoor activities
- video projector
- projection screen
- portable computer for projector
- expo frames - are part of the quality inventory that can be made available to exhibitors on various occasions
- TV LCD - fast slide shows
- info kiosk - fixed equipment as informative support of the institution's activity, tourism

The Wood warehouse

In order to keep the solid fuel (wood, pellets, briquettes, etc.), a special annex was placed in the southern part of the plot, on the eastern side.

The built and deployed surface is $S = 36.00\text{mp}$

Interior installations – considering the way of use of the building, namely wood warehouse, no installations are proposed for it.

Exterior facilities

A very important component of the proposed program consists of the works and facilities proposed externally.

General systematization of the land for the configuration of flat surfaces, with easy access and maintenance slopes allowing to drain pluvial waters is proposed. Mechanized soil mobilization works are required to remove the plant layer and keep it temporarily on site; land evacuation resulting from the foundations of buildings, alleys and platforms.



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The green space will be planted by planting grass seeds; it is proposed to plant medium-sized fruit trees, decorative shrubs (thuja). The grasshopper placed between the communal road and the site will be arranged by the beneficiary, respectively Brosteni City Hall, in the form of a simple inclined plan, at its expense, until the construction date. The meteoric waters will flow naturally from the north to the south of the land.

On the eastern side, a ribbon will be executed in order to allow drainage of the water.

The parking platform and the inland road traffic will be arranged so as to allow the stationing of 10-12 small cars, but also the access of the off-road vehicle to the wastewater basin located in the southern terrain. The delineation of the alleyways and platforms ballasted by adjacent green spaces will be made with prefabricated concrete strips.

The building will be protected with concrete protection pavements; At the same time, to allow people to access the entire inner area of the property, pedestrian platforms and concrete paved alleys were provided and light armored with welded steel mesh.

The stairs and the external ramps will be made of cast concrete and covered with anti-skid granite, including the staircase that connects the communal road to the access platform in the building.

Sports field

For sports activities it is proposed to create a flat platform with a play area $S = 684.00\text{mp}$.

The surface will be constructed after the levelling of the ground by preliminary levelling. The playground will be made up of a slightly reinforced concrete platform on which a synthetic multisport carpet with fine sand will be mounted. The terrain can be used for the most popular team sport - football and other sports events.

Outside of the lower space, a safety area has been provided, which also has the role of taking over the differences in the level between the sports surface and the perimeter and of draining the meteoric waters. This free zone will be made of ballast.

The fencing of the sports field will be made of a wired galvanized wire mesh mounted on the pillars made of rectangular metallic profile having a height of 4m on the long sides and 6m on the short sides behind the gates. For the fixing of the pillars in the ground there are provided concrete bases.

The south and west sides coincide with the property limit, and no other form of enclosure is necessary.

The metallic painting will be painted with alkyd enamel, after applying a pre-applied primer to the pre-assembly of the net.

The lighting installation for the sports field is a goal within the project, which is provided with only night lighting during the course of eventual sports events. Lighting is made with high-fit LEDs.

The outdoor lighting installation of the enclosure was designed to ensure the safety of the interior for both the maintenance staff and the visitors. It is proposed to mount lighting fixtures mounted on medium height poles equipped with photovoltaic panel and LED lamps that do not require electricity supply from the power supply network so that they have lighting throughout the night without consumption of electricity from the grid .

The perimeter fencing, provided on all sides of the plot studied less on the adjacent side of the southern road, will be made of metallic poles with the section 50x30x3mm and the same type of woven mesh used for the sports field. The mesh will have a width of 2.00m and will be fastened with a stretching wire provided at the top, at the base and at the half height, along the entire length of the fence. In order to secure the chasms, they should be laid at a distance of 15 m from each other.

At the top of each column, 1.5-2mm thick sheet metal welded caps should be mounted to prevent water infiltration.

Metallic painting will be painted with alkyd enamel, after applying a primer primer before grinding the net.

- Technical and municipal equipment
- In order to use the objective, the following utilities and installations are provided:
- - the drinking water supply will be made by connecting to the public water network that is under construction; until the moment of commissioning of the designed object, the beneficiary will ensure the realization of the public network and its access to the public network.
- - power supply to the enclosure will be done by linking to the existing network in the area
- - Indoor water network for water distribution in the studied building
- - indoor electrical network of the objective and the external electric network related to the sports field
- - Indoor sewerage network and emptying basin
- - In-house networks, connections to utilities

Category and class of construction importance

Category of importance : C

Class of importance III.

b) Constructive importance

The main building has the following structural features:

- continuous concrete foundations
- superstructure - mixed structure reinforced concrete frames and bearing brickwork
- framing - fireproof wood; Partly proposes a metal structure for a multifunctional hall; the room will be covered with a plasterboard 30; it will be attached to a system of metal farms that support the cover on that area. The metallic structure will be protected with special heat-shrinkage paint to provide a fire protection of 60 minutes.

The construction structure of the **wood warehouse** is the following:

- concrete perimeter foundation; weak reinforced concrete plate cast on ballast
- wood structure and closures from OSB; the building will have a simple wooden door and two windows with plain glass mounted in the wooden frame.
- ceramic tile covers mounted on wooden structure; for water drainage a pre-painted metal trough and trunks will be installed.

For exterior fittings the following constructive variants will be used:

- building protection sidewalks: Compact ballast 10cm, 10cm concrete
- pedestrian walkways: compact 10cm ballast, low reinforcement 15cm
- sports ground (playing area): compact 15cm ballast, low-arm concrete 15cm, synthetic carpet
- car parks, roads: 20cm compacted ballast, 15cm crushed stone
- Sports platform outside the playing area: Compact ballast 15-20cm
- perimeter fencing: steel poles 50x30x3, wicker mesh, isolated foundations, molded beads 20x20cm; the height of the fence is approx. 2m (2m net and exposed bead about 10cm)
- fencing sports field: steel pole 50x50x3, braid web, isolated foundation, 20x20cm concrete beaded edges on sides N and E, 20cm wide and variable height on sides S and W; the proposed height of the fencing is 4m on the sides, 6m behind the gates

The technical project includes the construction of a sewage tank to take away the wastewater of the main building. This basin will be buried, made of reinforced concrete.



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The connection to the power network will be achieved for a total installed power of 36.18 kW and a maximum absorbed power output of 28 kW.

The electrical connection will be made of CyCbY 5 x 10 mmp cable which will be buried or air-assisted by the power supplier's solution.

The water supply will be carried out by the beneficiary's care until the investment is completed.

The water connection will be made of a polyethylene pipe with DN 40 mm diameter.

The internal drainage will discharge into a watertight tank with a capacity of 20 cubic meters of concrete underground that will be covered by a vegetable layer of grassland.

The connection to the drainage basin will be made of a 125 mm diameter PVC pipe that will be buried below the freezing limit.

The heating of the objective will be done with a gas-fired power plant that will be installed in the specific room for it.

The power of the boiler will be 100 kW, with a power output of about 90 kW and the power absorbed by the bivalent boiler that is around 10 kW.

Utility consumption

Consumption for power supply

$36 \text{ kW} / \text{h} \times 2 \text{ h} / \text{zi} \times 22 \text{ days} / \text{month} = 1584 \text{ kW} / \text{month}$

$1584 \text{ kW} / \text{month} \times 12 \text{ months} / \text{year} = 19008 \text{ kW} / \text{year}$

Consumption for cold water

$80 \text{ persons} \times 10 \text{ l} / \text{person} / \text{day} \times 22 \text{ days} / \text{month} = 17600 \text{ liters} = 17,6 \text{ cms} / \text{month}$

Sewage Consumption

$0,8 \times Q \text{ consumption of cold water} = 14,08 \text{ cms} / \text{month}$

Thermal energy consumption (for heating and domestic hot water preparation during winter)

$100 \text{ kW} \times 16 \text{ hours} / \text{day} \times 22 \text{ days} / \text{month} \times 6 \text{ months} / \text{year} = 1.267200 \text{ kW} / \text{year}$

c) Works tracing

Given that the land is not a flat one will perform a preliminary verification of the level proposed by the project for the possible inconsistency - the terrain has small unevenness that can lead to measurement errors, so that the level quotas will be checked, avoiding the punctual accidents (mounds, pits, ditches).

The local coordinate system will be referenced to the existing fixed elements: the outer walls of the western kindergarten, the corners of the parcel, the road axis in the north of the site.

For easy tracing, the information in electronic format accompanying this documentation will be used. For check before execution, check for retractions to boundaries and vertical elevation differences over pavement.

d) Protection of the works and site materials

During the works, all measures will be taken to mark and secure the intervention perimeter, including the temporary banning of access to areas at risk of injury.

The builder will organize its supply of building materials as required immediately. However, to the extent they are stored, they will be covered with insured tarpaulins and a warning mark.



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e) Site organisation

The supply of the necessary materials for the implementation of the project will be made according to their consumption, within the parcel there will be organized a special platform with adequate dimensions for the handling and processing of the primary materials.

It is proposed to set up a fence of removable panels on the west side of the land to ensure the safety of the materials, the tools, but also the logistics of the construction activities; within the boundary area will be located the required barriers: the work desk, the tool and equipment store, the locker room.

Two portable ecological toilets and a wash basin with its own clean water tank and a waste water recovery system will be installed on the premises.

Planning the platform by minimizing and minimizing a ballast is done only after the coarse leveling of the respective area takes into account the final quotas imposed by the vertical system design.

Drafted by,
Arch. Dan Boruga





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II Technical Report - ARCHITECTURE

regarding the execution of the works to achieve the objective **„Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune ”** from Mehedinti county

Beneficiary: Brosteni commune
Designer: SC IN-OVO SRL
Drafting date: Decembrie 2017
Phase: Technical project and execution details

This documentation is being prepared with the purpose of carrying out the construction works for the aforementioned objective.

The land, belonging to the public domain of the village Lupsa de Jos, Brosteni commune with an area of 3855 sqm, with the cadastral number 50918 is located in the village of Lupsa de Jos, Brosteni commune. The plot is unstructured, it is located in the city and falls into the category of yards, constructions in the classification of land use categories.

The objective of the project is to build an ensemble consisting of a building with the function of a tourist center for cultural events and the setting up of a sports platform for amateur football.

The tourist center responds to the necessities of providing technical and organizational physical support in the organized tourism, by providing the necessary infrastructure for hosting artistic cultural events.

The sports field is an extension of the main function offered by the building by supporting the sports activities proposed by the project, activities to offer a wider range of options for the tourist development of the area.

Main building

Functions

The pre-entry porch is a colonnade that protects people's access to the building. The area covered is 33.70 sqm.

Foyer - entrance hall and receptions, with an area $S = 100.80$ sqm, is a space for access to the building, which has the same connection with the buffet where you can serve refreshments, coffee in the reception for events or pauses to performances.

Multifunctional space is a hall with an area $S = 242.20$ sqm that can be divided into two rooms: one for exhibitions and another for projections and performances. Typically, the showroom has a capacity of 50 seats. Depending on the demands, any of them can be increased by removing or removing the wall from removable panels.

The space can be used simultaneously for various activities, and can be temporarily partitioned or used as a single room. In this sense the room is equipped with a system of removable panels with its own support, which can also be used for exhibiting materials specific to the activities undertaken. At the same time, a modular stage will be placed on the southern wall, which will be installed during the performances; in order to increase the surface of the hall, in situations where this surface is not required, but also for organizing outdoor performances, the elements that make up the podium can be disassembled and transported outdoors for use at cultural shows on which the center will integrate them into its program of activities.



The ceiling of the hall is tall, in the form of a vault with planar surfaces that follow the form of the metal roofing farm, having a maximum height of approx. 6.50m.

Separate sanitary groups, including one for people with disabilities. The sanitary group for men, with a surface $S = 19.35\text{mp}$, has 3 WC cabinets made of phenolic resin based panels. The women's health care team, with a surface $S = 16.65\text{ sqm}$, is provided with 4 cabins. From the bathroom washbasin area you can access the Cleaning Office, a room with a $S = 2.60\text{mp}$ surface where the building cleaning materials are stored and a sink with a bucket filling valve is installed.

The sanitary group for persons with locomotor disabilities, with a surface $S = 6.45\text{mp}$ has the capacity of one person and is equipped with accessories and special furniture for use - low sink, supporting bars, etc. the finishes are of the ceramic type - tiles and faience.

All sanitary groups will have low-floor tile floors and tile floors up to a height of 2.10m.

To serve snacks and soft drinks to the audience, artists, people invited on various occasions, there was a space for Buffet. It is properly furnished to ensure that platters are ported and assembled on dishes, prepared in specialized units - tables with easy to maintain countertops, refrigerators, sinks, utensils racks, etc. The reception of these products is done in the previous room, with the Office function, where it is discharged and washed the dishes. The total area of these two spaces is $S = 32.49\text{ sqm}$. The proposed finishes are easy to clean and sanitize - floor tiles for all floor and tile surfaces in work areas up to a height of 1.5m.

The ECS room (fire detection and fire alarm) is a small room with a surface $S = 1.30\text{mp}$, easily accessible from the main lobby through a fire resistant door, according to the norm. This point is the main node of the fire detection and signaling system where the main equipment (heating plant) is installed.

In the semi-private area of the building was designed a Hall of distribution to the rest of the functions, with a $S = 1.60\text{mp}$. From here, access to the area of the scene is made through a concrete staircase with a metallic railing and to the rest of the rooms. Wardrobes for artists - two distinct spaces of 23.90 sqm each, one for men, one for women are located at the perimeter of the building on the eastern side. These rooms contain specific furniture (toilets, chairs, cabinets) and are also serviced by a bathroom with showers. Wardrobes can also be used as a dressing room for planned sports events on the proposed pitch on the premises. The distribution hall also connects with the outer space in the south of the building, namely the sports ground and the annexes, through a thermostatic metal door.

The office located in the south of the building is an administrative area with a surface $S = 16.80\text{mp}$. Two workstations can work here.

Access to the attic is made through the proposed Staircase House in the same lobby area. With an area $S = 15.40\text{mp}$, this allows the occasional connection to the bridge by means of a concrete staircase. The staircase is delimited at the top of the wooden rope closure; it is envisaged to clad the proposed structure with a simple gypsum board system, later painted with washable paint.

For the installation of the equipment needed for the heating of the building was provided a space with distinct access, directly from the outside – heating plant. Its surface is $S = 15.00$ square meters. For the exterior relationship, an insulating metal door with external opening will be installed.

The attic is a space that results over approx. a quarter of the building surface, with $S = 160.29\text{mp}$. For hygiene and maintenance of attic windows, which will enhance both natural illumination and occasional ventilation and access to the roof for interventions. The bridge is plated with OSB plywood. The floor of the bridge is finished by scaling the cement after casting. The delimitation of the multifunctional hall on the ground floor is made with masonry from ceramic blocks up to the intermediate belt, then continues vertically with a plasterboard wall on both sides where a glass-wool insulation layer is closed.

Materials for perimeter closings, interior walls, carpentry

- efficient brick masonry
- ceramic tile covers; prefabricated panel accessories - gutters, gutters, parapets



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- PVC exterior carpentry with wood trim and wood-based glass; for the protection will be assembled glazing of pre-painted sheet, brown coat assorted with the basic shade of the carpentry
- PVC interior carpentry with decorative wood panel and double glazing; fire resistant doors at the detection room and access to the staircase at the ground floor, the metal door to the thermal boiler, the metal door to the access to the yard. The main access is provided with an ample glazing made of aluminum with thermal barrier and thermopan glass. All windows with parapet will be provided with PVC window sills similar to those of the respective windows.
- the partitions in the sanitary groups will be made with panels based on phenol resins executed on the order, where they will install moisture resistant accessories - legs, bearing elements, locks.
- at the staircase, the walls of the ceramic blocks will be constructed to provide a fire resistance of 120min. The stair railing will be made up of a rectangular steel profile of 40x40x2.5mm, with two longitudinal bars and pillars every 4 steps, and a 60x40x2.5mm dock will be used for the current hand.
- For the ventilation of the bridge and the provision of natural lighting, there are wooden windows in the attic, with a manually opened door.
- In the exhibition hall and in the showroom, there is a ceiling made of gypsum board installed in a 30-minute fire-resistant system (multilayer, two-way structure, according to the manufacturer's specifications that will grant approval after commissioning).
- The cover of the terrace roof will be made with the PVC membrane with polyester reinforcement mechanically fixed over the thermo-insulating layer; the sealing of the material is done by fusion, with the help of a blow of high-powered hot air. The classical layers specific to the terrace are provided: vapor barrier, diffusion layer, air vents. The membrane will return to the attic, where it will be fastened to aluminum cassette tapes with PVC by thermal welding. The membrane will have ultraviolet radiation protection. On the perimeter of the terrace there will be mounted a sort of drip tray made of pre-painted sheet and mechanically fastened by means of special clips. A similar type of glaph will also be mounted on the tilted surfaces of the eaves - the walls that exceed the roof height

Finishing

The façade will be finished with decorative plaster applied on a layer of high density basalt mineral wool. The thermosystem consists of mineral wool with a thickness of 10cm and decorative plaster with small-medium size grained plaster. The colour of the proposed finish is pastel, in poorly saturated minerals (gray-beige).

In the columns at the portico will be used profiles of finished plaster.

The base will be finished with a special plaster based on natural stone resins and granules applied on a layer of extruded polystyrene of 5 cm thick.

Ceilings in the concrete - the slab will be finished with the usual plaster, plaster based plaster, white washable paint.

Cold flooring will be installed in wet, stairway, mountain and foyer - traffic tiles; in the multifunctional hall, in the office and in the two wardrobes will be installed high-quality laminated flooring, high quality with click type and minimum thickness of 12mm, with embossed wood texture. The tiles and tiles will be tinted in the basic colour of the finish.

The colour of the material will be united, discreet, in open mineral shades. Install a 8-10 cm height protection pad made of the same material as the floor; the edges of the cut plates should be avoided.

All interior floors will be made after the 5cm thermal insulation layer made of extruded polystyrene.

The walls and the ceiling are finished with ordinary plaster and plaster, over which it is proposed painting with white washable painting.



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The attic stair railing staircase will be painted with alkyd email.

On the access platform and the outer ramps, granite should be mounted with anti-skidding finishing.

When deciding colours, materials, textures, polystyrene profiles for columns, consult the designer; it will pick from pallet and sample with a sufficient number of landmarks to ensure a wide range made available by the builder.

Wood warehouse

In order to keep the solid fuel (wood, pellets, briquettes, etc.), a special annex was placed in the southern part of the parcel, on the eastern side.

The construction with wooden structure will have a functional character with discreet plastic. The walls, made of whitewood poles, will be treated against the pests; on the outside will be applied a plating with hydrophobic OSB panels. The building will be covered with the same ceramic tile pattern as the main building.

The carpentry will be a simple, wooden one-sided glazing. The windows will be fixed.

The trough and the tubs will be pre-painted, purchased in finite form.

The built and deployed surface is $S = 36.00\text{mp}$

Exterior facilities

General systematization of the land for the configuration of flat surfaces, with easy access and maintenance slopes allowing to drain pluvial waters is proposed. Mechanized soil mobilization works are required to remove the plant layer and keep it temporarily on site; land evacuation resulting from the foundations of buildings, alleys and platforms. Approximately 10% of the land resulting from digging will be re-used to configure the new surfaces; after the completion of the construction works, the restoration layer will be restored - the green space will be planted by planting the lawn and 30 medium-sized fruit trees (5 quinces, 5 pears, 10 apples, 5 cherries, 5 vines) with phyto-sanitary certificate and 10 decorative shrubs (thuja). The grasshopper placed between the communal road and the site will be arranged by the beneficiary, respectively Brosteni City Hall, in the form of a simple inclined plan, at its expense, until the construction date. The meteoric waters will flow naturally from the north to the south of the land.

On the eastern side, a ribbon will be executed in order to allow drainage of the water. The ruler will be machined and mechanized to provide a 20-40cm section from the base to the top, and an average depth of 20-40cm. Grassing will be done by planting drought resistant grass seeds.

The parking platform and the inland road traffic will be arranged so as to allow the stationing of 10-12 small cars, but also the access of the off-road vehicle to the wastewater basin located in the southern terrain. It proposes a road system made up of 20cm ballast and 15cm broken stone both for the parking area and for the platforms and inner carriageways. The proposed surface area for the road system is $S = 790.00\text{ sq. M}$. Its delimitation of adjacent green spaces will be made with prefabricated concrete curbs with the section 12x25cm laid on mortar bed.

The building will be protected with concrete protection pavements; At the same time, to allow people to access the entire inner area of the property, pedestrian platforms and concrete paved alleys were provided and light armored with welded steel mesh.

The stairs and the external ramps will be covered with anti-skid granite, including the staircase that connects the communal road to the access platform in the building; the visible sides of the rails, stairs, will be treated with the special siding plaster.

Sports field

For sports activities it is proposed to create a flat platform with the dimensions of the playing space of 38x18m, having an area $S = 684.00\text{mp}$.



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The surface will be constructed after the leveling of the ground by preliminary leveling. The playground will be made up of a slightly reinforced concrete platform, 15 cm thick, poured on a 15 cm compacted ballast layer. A synthetic multisport carpet with a 25-30 mm yarn height, sanded with fine sand, will be mounted over the plate. The terrain can be used both for football and for other types of competitions and sports events.

Outside of the lower space, a safety area has been provided, which also has the role of taking over the differences in the level between the sports surface and the perimeter and of draining the meteoric waters. This free zone will be made of uniform ballast, washed and compacted with a thickness of approx. 15-20cm.

The perimeter fence will be made of woven galvanized mesh with 50x50mm mesh and 2.7mm wire thickness mounted on metal poles with the 50x30x3mm section; the pillars will be embedded in isolated concrete foundations, with a depth of 70cm and the excavation gauge of 45x45cm. Between the poles will be rolled 20x20cm concrete curbs with construction reinforcement (4 bars of 10mm and 6mm stirrups in 20cm step); the edges will be embedded in the soil around 10cm and will follow the slope of the ground but they will have a flatness suitable for the installation in good conditions of the wire mesh - avoid deviations from the plane larger than 2cm to 10m. At the top and at the bottom, but also at the half height, longitudinally installed galvanized wire with a diameter of 2.7 mm with stretching every 15m. The poles will be provided with min. 1.5mm welded so as to prevent water penetration.

The fence at the sports ground is similar to the perimeter as a material; the fencing will be done with a woven galvanized wired wire mesh of 2.7mm diameter and 50x50mm mesh. The ground poles will be made of rectangular metallic profile with the 50x50x3 section, having a height of 4m on the long sides and 6m on the short sides behind the gates. For the fixing of the pillars in the ground there are isolated concrete foundations in which a min.50cm of the metal posts will be secured.

The ends of the posts will be joined along the entire perimeter with a metal profile in the rectangular pipe with a smaller section of 50x30x3mm; the same type of profile will be mounted horizontally, creating yet another link of stiffening and fixing of the net at + 4.05m share of the share of the playing surface. Wire mesh should be ordered at appropriate mounting widths, ie 1.5m, 1.8m and 2m. The connection between the nets will be made through galvanized wire mesh and party over the support pipes; at the bottom, at + 1.70m elevation and 2.60m elevation 2.70m galvanized mesh wires will be installed. The lower part of the net will be secured to the sill by means of the tensile wire with 50 cm stepped gussets / dowels.

On the south and west sides of the terrain it is necessary to cast a parapet to take the level dive so that the base of the fencing net is horizontal and the parapet is sufficiently embedded in the field to ensure stability. The parapet will have a structural armour with longitudinal bars PC52 with diam. 10mm and 6mm stirrups in 20cm increments. On the other two sides of the field a 20x20cm concrete bead will be poured into the ground with the same type of reinforcement.

The metallic painting will be painted with alkyd enamel, after applying a pre-applied primer to the pre-assembly of the net. Thus, the piles of fencing (parcel, sports field) and other metallic elements, except for the net and wire wires that are galvanized, will be painted with alchidic vernile colour.

Physical characteristics of the spaces; finishing

Space code, level	Denomination of the area	Useful surface	Perimeter	Plinth height	Ceilings	Walls		Floors			Plinths		
					Washable paint	Washable paint	tile	Floor tile	parquet	Dapper cement	Floor tile	parquet	
		[sm]	[ml]	[m]	sm	[sm]	[sm]	[sm]	[sm]	[sm]	[ml]	[sm]	[ml]
total		707,00	405,55		565,60	1.396,25	132,50	249,80	304,90	175,40	208,35	20,84	134,80
Ground floor		547,00	334,75		565,60	1.148,45	132,50	249,80	304,90	15,40	208,35	20,84	134,80
	Foyer	100,80	48,60	0,10	100,80	170,10		100,80	0,00	0,00	48,60	4,86	0,00
	Multifunctional space	242,20	64,80		259,80	314,28		0,00	242,20	0,00	0,00	0,00	64,80
	hall	31,60	28,80	0,10	31,60	100,80		31,60	0,00	0,00	28,80	2,88	0,00
	Office	15,40	16,80		15,40	58,80		0,00	15,40	0,00	0,00	0,00	16,80
	Staircase	15,40	16,80	0,10	15,40	84,00		38,50	0,00	0,00	42,00	4,20	0,00
	Wardrobe artists	23,65	26,60	0,10	24,15	93,10		0,00	23,65	0,00	0,00	0,00	26,60
	Wardrobe artists	23,65	26,60	0,10	24,15	93,10		0,00	23,65	0,00	0,00	0,00	26,60
	Buffet	32,50	22,80	0,10	32,50	62,70	17,1	32,50	0,00	0,00	22,80	2,28	0,00
	Cleaning office	2,60	6,50	0,10	2,60	22,75		2,60	0,00	0,00	6,50	0,65	0,00
	Heating plant fire detection room	1,30	4,70	0,10	1,30	16,45		1,30	0,00	0,00	4,70	0,47	0,00
	Women's toilet	16,65	22,15	0,10	16,65	31,01	46,52	16,65	0,00	0,00	22,15	2,22	0,00
	Men's toilet	19,35	23,40	0,10	19,35	32,76	49,14	19,35	0,00	0,00	23,40	2,34	0,00
	Disabled persons' toilet	6,50	9,40	0,10	6,50	13,16	19,74	6,50	0,00	0,00	9,40	0,94	0,00
	Heating plant	15,40	16,80		15,40	55,44		0,00	0,00	15,40	0,00	0,00	0,00
Attic		160,00	70,80	0,00	0,00	247,80	0,00	0,00	0,00	160,00	0,00	0,00	0,00
	Attic	160,00	70,80		0,00	247,80		0,00	0,00	160,00	0,00	0,00	0,00

Internal circulation, accessibility; access, pedestrian and road traffic

Circulation inside the building has been designed to provide easy access and distribution of people to functions and an easier evacuation. Access and evacuation are possible on two opposite faces, south or north.

People with locomotor disabilities have access to most of the functions proposed by the project.

The pedestrian access to the premises is made by the north of the site, from the public domain - county road. For the sports area the access is strengthened both from the inner yard and directly from the building, on the south door.

Access to the car is designed to allow for maintenance work - sewage disposal (vidanja), municipal tractor (cleaning and maintenance of green spaces, snow removal); parking is for administrative staff, artists, presenters and guests who expose in the center's premises to the various public figures involved in events.

In order to extinguish any fire, the access to the facades of the building is possible from the communal road, from the west side of the building and partly from the south.

Wood supply can be done with vans through the inner courtyard.

Occupational safety and security measures and fire prevention and extinguishing

In the execution of the works and in operation, all the norms of the work safety technique shall be strictly observed in accordance with:



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- Law 90/96 of Labor Protection and Methodological Norms of Application.
- The specific work safety norms specific to the works carried out by the Ministry of Labor and Social Protection, namely:

- Specific Safety Standards for Thermal Insulation, Waterproofing and Corrosion Protection.
- Specific Safety Standards for welding and cutting metals
- Specific Work Safety Standards for sanitary and heating installation work.

Compliance with these rules does not exclude the provision and enforcement of work safety measures appropriate to the particular conditions of the activity.

When executing the works, the contractor will have to take all necessary measures to prevent and extinguish fires, in accordance with the provisions of fire prevention and extinguishing regulations during the execution of construction works and related installations, C300-94, as well as other provisions in force.

Observance of the essential quality requirements of Law no. 10/1995:

Requirement "A" resistance and stability requirement - proposed materials and systems have characteristics that are appropriate to the purpose; the design of the resist structure took into account the loads and details specific to the architectural project.

Requirement "B" safety requirement - the materials provided do not allow separation under normal conditions of use; no materials are used to cause people to slip. Parapets and balustrades have the heights conforming to the rules that apply to these types of function

Requirement "C" on fire safety - architectural solutions have been studied and proposed that prevent the initiation and propagation of fire inside the building and the persons can easily be evacuated in the event of a fire. Outside the building, in an easily accessible area, a fully equipped PSI picket will be installed.

Requirement "D" related to hygiene, health and the environment - was aimed at observing the lighting and natural ventilation conditions in the spaces intended for people. Solutions have been provided that do not produce harmful effects for the environment or the population.

Requirement "E" for thermal insulation, water repellency and energy saving - the project proposed modern, energy-efficient materials for which natural resources were used rationally. The degree of thermal insulation is superior, and the energy loss through the tire is minimal.

Requirement "F" regarding noise protection - is self-fulfilling, since the work inside the building is not a generating noise or vibration, the wall thickness being sufficient to prevent such a noise source from being built up.

Fire prevention and extinguishing measures

The technical solutions have been chosen so as not to favour the onset or spread of fires. Thus, the provisions of the normative acts in force were observed, in order to ensure a good functioning of the installations, a satisfactory degree of protection of the resistance structure and the use of some hard combustible solutions and systems.

Phases imposed in the control program

The execution of the construction and fitting works will be performed according to the control program.

General dispositions

1. Tasks for the contractor

For the good development and good execution of all the works subject to this investment, the performer will carry out the following activities:

- studying the written and drawn parts of the documentation as well as the legislation, standards and technical instructions referred to, so that until the start of the execution can be clarified all the works to be executed.

- to notify the designer, within the legal term, of the possible inconsistencies between the graphic and digital elements in order to solve and reconcile them.

Also during execution:

- ensure the rhythmical supply of the materials, devices and equipment included in the documentation;

- will be aware of the designer in the case of the impossibility of purchasing materials or apparatus provided in the documentation, while presenting an offer of another material with similar technical and economic characteristics;

- strictly adhere to the working technology.

- more attention will be paid to people during the execution of the works and at the time of execution will be placed pleasant warning signs indicating the place of work.

The Executor is obliged to keep on site all the documentation on the basis of which the respective works are executed, including the site provisions and the technical notes given on the site during the execution of the works and the taking of the samples.

This documentation together with the hidden works records, CTC documents attesting to the quality of the materials, other documents attesting to the proper execution or the changes stipulated by the designer following the field trips will be made available to the guidance and control bodies (the State Inspection of Construction).

Changes to technical documentation will only be made with the written designer's approval.

The changes recorded in the notebook shall be stipulated in the drawn part of the documentation, in order for the beneficiary to know when putting into operation the main, real elements in the field. Otherwise, the performer becomes responsible for any adverse consequences caused by non-compliance with the documentation.

2. Tasks for the beneficiary

The beneficiary, through his / her supervisor, will systematically follow the execution of the works according to his / her tasks, controlling the quality of the works and confirming the execution of the works and the quantities of works performed by the contractor at each stage of the execution.

Ranking in class and category of importance

Category and class of construction importance

Category of importance C

Class of importance III.

III Comprehension calculations

- the values were estimated based on the digital simulations found in the technical documentation.

IV Specifications

- attached to this documentation

Drafted by,
Arch. Dan Boruga





Technical report – RESISTANCE STRUCTURE

regarding the execution of the works to achieve the objective **„Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune ”** from Mehedinti county

This documentation is prepared with the purpose of carrying out the construction works for the above mentioned objective and treats the resistance structure of the proposed constructions.

1. General information

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county
Beneficiary: Brosteni commune
General designer: S.C. „IN - OVO” S.R.L., Căzănești, Mehedinți county
Structure designer: Eng. Diana MARIN
Drafting date: December 2017
Phase: Technical project and execution details

2. Basics of design

The project is based on:

- a. Situation plan
- b. the architectural parts
- c. cadastral plans of the objective
- d. seismic design code for buildings Part I - P100-1 / 2016
- e. CR-0-2012-the basics of construction design
- f. CR1-1-1-3-3-2012- snow loads
- g. Normative for designing the foundation NP 112-2013
- h. STAS 10107 / 0-90

3. Structure description

This documentation is prepared for the purpose of the investment: **„Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune”,** which consists of constructing a building that will function as a Tourist Center for cultural and sports activities and in the perimeter affected by this work will be built a sports field, a annex with the destination of firewood storage and a empty basin.

Geological data:

The grounds of the site are located on the upper terrace of Motru River.

According to P100-1 / 2013, the construction is located in the seismic hazard area $a_g = 0.15g$ and control period (colt) $T_c = 0.7s$.

The maximum freezing depth is 0.70 m.



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The grounds of the site are located on a terraced relief - the upper terrace of the Motru River, with low relief energy that ensures stability.

The geological area is composed of quaternary deposits consisting of cohesive earths - clays. At the base of these deposits there are older warehouses of the neogene period consisting of marjoram.

On the site the underground water meets at a depth of 4 - 6 m without affecting the foundation ground.

On-site surveys have identified stratification:

- 0.00-0.50m fillings
- 0.50-4.00m dusty clay.

The basement ground is clay with high plasticity, state of consistency - vartos, degree of humidity - wet, medium compressibility. The foundation ground is in the category of good foundation ground.

The foundation ground allows direct foundation.

Minimum foundation depth: $D_{minf} = 0.80m$ from T.N.

Conventional base pressure: $P_{conv} = 280KPa$ ($B = 1.0m$, $D_f = 2.0m$).

Earthquakes: moderate risk.

Land slip: not applicable.

Flood: not applicable.

In order to create the appropriate conditions for the future activities, it is proposed to carry out the following works:

- 1). Construction of a building with the destination of Touristic center for cultural and sports activities with an area of 656.20 sqm, located on the ground according to the attached situation plan.
- 2). Setting up a sports ground on the premises.
- 3). Construction of an annex for the purpose of the wood store.
- 4). Construction of a drainage basin for domestic wastewater collection.

The building structure of the main building will be made of a mixed system of frames (reinforced concrete pillars and beams) and brick brickwork of 30 cm to the outer walls and 30 cm to the interior dividing walls according to the plan. The foundations are continuously underneath the walls (consisting of a simple concrete block B200 - C12 / 15, width 70 and 80 cm and reinforced concrete elevation B250-C16 / 20 30 cm wide) and isolated under the columns with simple concrete foundation block and reinforced concrete box. The main pillars of the multifunctional hall (50x30cm plan) have rigid, rigid foundations made up of C12 / 15 single block and C16 / 20 reinforced concrete cladding, the foundation dimensions are 1,10x1,00m. Due to the rather high slope of the terrain, it is necessary to achieve foundation steps, resulting in a foundation depth varying from 0.90-1.00m.

Masonry will be anchored to the poles according to the details of the planes.

In the multifunctional hall the ceiling will be supported by steel farms fixed to concrete poles by means of metal plates embedded in concrete at the top of the pillars. The profiles used for the construction of the farms are: rectangular profile 100x60x6,3 and square profile 60x60x5. All joints will be welded according to the specifications on the planes. In the longitudinal plane the farms will be counterbalanced by ties and secondary farms, according to the plans being structured. The farms will be protected with thermal sparkling paint. The ceiling will be 60-minute fire resistant cardboard, on the double metallic structure. The height of the showroom will be 6.55 m, the distance between the axes of the trawls will be 3.00 m.

The floor plan over the other rooms of the center is made of reinforced concrete 15 cm thick, reinforced with bars independent of OB37 and Pc52. The free height to their ceiling is 3.63 m.

The bridge will have exterior walls and partitions made of brick. The structure of the bridge will be made of softwood fireproof. Between the rafters will be insulated with 15 cm mineral wool.

The stairway at the bridge will be reinforced in two ramps and will have a false ceiling made of gypsum board, suspended on the metal structure.



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The roof will be of firewood type fireproof firewood, in two waters, with ceramic tile cover and with sheet parapets.

The firewood stowage attachment is a structure with wood carved and fireproof structure and 15mm OSB closures. The foundations of the building are continuously under the exterior walls, with widths of 45 cm and consist of a simple concrete block C12 / 15 and reinforced concrete elevation 25x30cm -16 / 20. The foundation depth is 90 cm. The roof is made of wood, the ceramic tile cover.

The emptying basin is totally buried in the ground. The plan dimensions are 5.60x3.10m and the depth is 2.10m. It is entirely made of reinforced concrete C20 / 25 with degree of waterproofing P8 / 10. The cutter, the walls and the opening are reinforced with 2 welded meshes o4 / 100xo4 / 100. At the top and bottom of the walls, a steel concrete belt is mounted. The 20 cm plate is reinforced with Pc52-dependent bars.

4. Labour protection measures

For all work inside or outside the building, all measures of work safety in force must be observed throughout the execution of the work.

The following norms will be observed:

- General Labor Protection Norms Title 2/2002, Law 90/1996 - Methodological Norms for Application.
- Government Ordinance no.60 / 97 of the Government of Romania regarding fire protection (M.O. no.225 / 30.08.1997)
- Fire safety standard for construction P118-99

During the execution of the works, all work phases will be coordinated, prepared and supervised by technical staff with attributions and the specifics of labor protection.

The provisions of the Regulation on Labor Protection in Construction shall be observed:

- Earthworks and excavations
- Preparation and transport of concrete
- Formwork and scaffolding
- Manufacture and fitting of reinforcements
- Execution of plaster works.

The constructor has the obligation to complete the work safety training for the more particular work phases that occur during the execution.

The protective measures are not limitative, the builder and the beneficiary may take additional measures that the situation imposes, in order to avoid labor accidents, especially in the case of high-traffic work.

The quality of the works will be in accordance with the Norm NE 012/99.

All the works will be executed by a specialized company, with qualified personnel and under the permanent technical supervision of some specialists, checked by certified personnel in the field of execution of the works.

The works will also be supervised by an authorized site inspector.

For any inconsistencies between the details of the project and the situation on the ground, the designer will be urgently advised to take the necessary measures.

The building is a building framed in:

- Importance category: **C**,
- Class of importance: III,

As measures to prevent and extinguish fires, the building will be equipped with the means provided by the norms in force.

The structure design is verified at A1.



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5. Conclusions

The works carried out in accordance with this technical documentation and with the observance of the quality requirements imposed by the updated Law 10/1995 ensure the requirement of resistance, stability and safety in operation and do not negatively influence the strength and stability of the existing structure or the neighboring buildings.

The execution of all the works will be done with certified and approved quality materials by a construction unit specialized in such works and with the permanent supervision of the designer.

The Beneficiary has the obligation to ensure the supervision of the execution through a suitably qualified and certified MLPAT person prior to the commencement of the works. Throughout the execution of the works, the performer will take all measures of labor protection and fire protection.

All documents related to the execution of the works (project, execution details, minutes, authorizations, mammals etc.) will be included through the beneficiary's care in the technical book of the construction. In carrying out the works, the provisions of Law 10 on the quality of constructions shall be observed.

Drafted by,
Eng. Diana **MARIN**



CONTROL PROGRAM

Regarding the quality of the works and the execution phases - structure & architecture

In accordance with the provisions of Law no. 10/1995, the Regulation on State Quality Control in Constructions (GD 272/1994) and the State Control Procedure in Execution Stages Designed for Building Strength and Strength (MLPAT Order No. 31 / N / 1995), the following control program for the investment is established: **Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune**

Beneficiary: BROSTENI Commune, MEHEDINTI COUNTY.

Participants at the reception of works will be notified 10 days before reaching the scheduled execution stage, through the contractor's care.

NO.	The denomination of the works to be controlled, verified, received qualitatively or in the decisive execution phase	Concluded written document: PV –Record , PVRC –Qualitative record P.V.C.F.D. – Record of works control in determinant phase	The person realizing and signing the document: I – Inspection in Construction D – Designer B – Beneficiary P – Performer	No. and date of executed document
	1	2	3	4
1	Digging foundations	P.V.R.C.	B,P	
2	Nature of foundation land	P.V.R.C.	B,P,D	
3	Elevation reinforcement	P.V.R.C.	B,P, D	
4	Concrete casting in foundations and elevations	P.V.R.C.	B,P	
5	Reinforce the pillars	P.V.R.C.	B,P	
6	Forming styles	P.V.R.C.	B,P	
7	Casting concrete in the pillars	P.V.R.C.	B,P	
8	Concrete appearance after stripping	P.V.R.C.	B,P	
9	Reinforcement and formwork of slabs and beams	P.V.R.C.	B,P, D	
10	Concrete casting in slabs and beams	P.V.R.C.	B,P	
11	Concrete appearance after stripping	P.V.R.C.	B,P	
12	Metal structure mounting	P.V.R.C.	B,P,D	
13	Blanket Molding	P.V.R.C.	B,P	
14	Plate tile	P.V.R.C.	B,P	
15	Framing	P.V.R.C.	B,P,D	
16	Covers reception	P.V.R.C.	B,P,D	
17	Reception chamfers and gutters	P.V.R.C.	B,P	
18	Reception non-circulating terrace	P.V.R.C.	B,P,D	
19	Thermosystem reception	P.V.R.C.	B,P	
20	Field picking for trees	P.V.	B,P	
21	Casting sports ground	P.V.R.C.	B,P	
22	Application of sports carpet	P.V.R.C.	B,P,D	
23	Mounting wire mesh netting and fence	P.V.R.C.	B,P	

BENEFICIARY,

DESIGNER, SC IN-OVO SRL
 Arch. Dan Boruga Eng. Diana Florina Marin

PERFORMER,

STATE INSPECTION IN CONSTRUCTION,



TECHNICAL REPORT **ELECTRICAL INSTALLATIONS**

1. GENERAL INFORMATION

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county

Beneficiary: Brosteni commune

Project phase: Technical project

The design theme provided by the beneficiary as well as the current norms in force were at the basis of the elaboration of the documentation.

The provisions of the "Norms for design, execution and operation of electrical installations related to buildings, indicative I7 - 2011" and of the technical legislation in force (norms, technical prescriptions, standards) have been observed.

The performer, in agreement with the beneficiary, will put into operation only fire-fighting equipment which performs the same functions and have the same technical characteristics as those indicated in the project, are approved and technically approved according to updated HG 10/1995 regarding the quality in construction and the law of safety and health in work 319/2006.

2. PROPOSED SOLUTION

Power supply

The electrical characteristics of the lens:

The overall electrical panel of the facility will be powered by the National Energy System (NPS) through the electrical wiring proposed in the project.

Within the project, the following types of indoor electrical installations are provided:

- Indoor lighting fixtures and sockets
- Indoor lighting installations against panic
- interior lighting fittings for evacuation
- Indoor lighting for interventions

General TEG Overview (General Electric Panel):

- Proposed installed power: $P_i = 36,182 \text{ kW}$
- Maximum absorbed power: $P_s = 28,305 \text{ kW}$
- Operating voltage: $U_n = 3 \times 380 \text{ V.c.a.} / 1 \times 240 \text{ V.c.a.}$
- Frequency of power supply: $F_u = 50 \pm 0.2 \text{ Hz}$

The power thus calculated will be distributed on TES and TECT secondary panels that will have power of 17.8 kW and 2.07 kW.

The power supply of the objective will be achieved through a three phase switching which will be fed from the existing network in the area that ensures the necessary requirements for the objective, the power supply being established by CEZ SA Drobeta Turnu Severin Branch.

The maximum duration of the power interruption from the external power supply system is according to the characteristics of the consumer and the solution obtained through the connection notice or the supply contract.

It has been provided as follows:

- Exhaust fuse lighting with 5-second start-up time and 2-hour running time.



- Safety light for further operation at the fire detection, fire alarm and fire alarm system room with 5 second commissioning time and 2 hours operation time.

- Lighting for interventions at the boiler with commissioning time of 5 seconds and operating time of 2 hours.

According to the technical project, the emergency and exhaust fuse units will have accumulators and inverter mode to ensure normal operating times after power failure.

On the outside of the building it is necessary to make the grounding of the studied object, which will be made from the payment OL Zn 40 x 4 which will be connected to the building's separation parts.

All the cables inside the building necessary for the supply of the proposed circuits to be made within the project will be buried in the building elements as aesthetic.

In order to ensure the supply of electricity to consumers that require this, batteries will be used which will be properly purchased for normal operating times according to the technical documentation.

The electrical installations have been designed and will be made with equipment suitable for the external influences categories and classes and with a performance declaration according to the law.

The general electrical panel will be located in the Foyer room, on the one hand it will not affect the structure of the building and on the other hand will protect it against the action of the chemical or environmental agents as it results from the drawing of the project.

The TES and TECT side panels will be powered from the general electrical panel, which will be located in the Hall and Thermal Power Plant.

The distribution of the electrical energy thus achieved permits an intervention during the easier and lighter operation for

The circuits and the electrical columns on the one hand will not affect the structure of the building and on the other hand they will not determine their demand for the differential compaction of the building or the land, as it results from the drawing of the project.

The grounding socket will be common with the grounding socket and thus it will have $R_p < 1 \text{ Ohm}$.

Lighting system, socket circuit, power

In accordance with the essential energy saving requirement, light sources will be of the economic type as shown by the drawing of the project.

The choice of the lighting fixtures and their supplier remains at the discretion of the beneficiary, subject to compliance with the types, powers and degrees of protection provided in the technical design.

Lighting circuits will be protected in the electrical switchboard with automatic switches.

The proposed indoor lighting circuits should be made with copper cable type CYY-F 1.5 mmp, buried in the construction elements, protected in protective tubes and masked accordingly.

Avoid installing the lighting circuits on warm surfaces.

Security lighting

A safety lighting has been adopted according to the types listed above.

Exhaust safety luminaires are selected from the market-type CISA with an 8W LED battery type with battery.

CISA type cabinets are provided on the escape routes and above the escape doors.

Depending on the location, they will be engraved with specific stickers.

Continuous work safety luminaires are selected from the industry-standard panel type with 40W LED battery type battery.

The safety luminaires for interventions in the risk areas are chosen from the approved IP 55 market.

Panic safety luminaires are selected from the market-type LED panel type with a 40W LED battery source with battery.

The safety luminaires for interventions in the risk areas are chosen from the approved IP 55 market.

Lighting fixture for safety lighting will be made of fireproofing class B material, according to I7 / 2011.



Check the earthing plug after execution and if it does not correspond to the normed values, measures will be taken in agreement with the designer to bring it to the norm.

The electrical installations have been designed and will be made with equipment suitable for the external influences categories and classes and with performance declarations, according to the law.

The electrical panels will be located in spaces and positions which, on the one hand, will not affect the resistance structure of the building and, on the other hand, will protect them against the action of chemical or environmental agents as shown in the drawing of the project.

The circuits and the electrical columns on the one hand will not affect the structure of the building and on the other hand they will not determine their demand for the differential compaction of the building or the land, as it results from the planes.

The short circuit protection of the circuits will be achieved with automatic circuit breakers with differential protection.

For socket circuits and lighting circuits, protection against residual fault currents with high sensitivity differential protection, $I = 30\text{mA}$, has been provided.

The project provided equipment for automated dashboards with 30 mA high sensitivity differential devices.

Their features are mentioned in the electrical diagrams.

The conductors of the circuits and the electrical circuit boards will either be placed in tubes or made with cables suitable for normal, fire hazard or explosion-hazardous areas. These features are presented on plans and on the electrical schemes.

An Iniflash parachuting installation with a radius of coverage according to the project will be installed on the roof of the building and will have two lowering to the grounding socket according to the drawings.

QUALITY EXIGENCIES

The prepared documentation ensures the fulfillment of the essential quality requirements in accordance with updated Law 10/95, namely:

- a) mechanical resistance and stability;
- b) fire safety;
- c) hygiene, health and the environment;
- d) safety in operation;
- e) protection against noise;
- f) energy saving and thermal insulation, in the form appropriate to the characteristics of the object, presented above;
- g) the sustainable use of natural resources.

Solution solutions to the requirements of the design theme, in accordance with the essential requirements, specific to the importance category of the objective:

Mechanical resistance and stability

The electrical installations have been conceived and will be made with equipment suitable for the external influences categories and classes and with a certificate of conformity, according to the law.

The electrical panels will be located in spaces and positions which, on the one hand, will not affect the structure of the building and, on the other hand, will protect them against the action of chemical or environmental agents, as shown in the planes.

Routes of electric circuits and columns, on the one hand, will not affect the structure of the building's resistance and, on the other hand, will not determine their demand for the different design of the construction or the terrain as it results from the planes.

Fire safety

In order to ensure this requirement, according to the category of importance of the building and according to the technical regulations, the following facilities were provided:

Avoiding the risk of a fire triggering an explosion.



Adapting the electrical installation to the degree of fire resistance of the building elements.

Because the components of the electrical installations do not cause a fire hazard, they will not be mounted on combustible substrates.

In cases where this can not be assured, the following measures have been taken:

- plaster coat;
- cables with increased resistance to fire propagation;
- heavy-duty cables.

In order to limit the internal fires of the electrical installations, short circuit protection for each circuit and column has been provided, with protective devices with adequate breaking capacity.

The breaking capacity of the automatic circuit breakers is higher than the maximum short-circuit currents that you will need to disconnect.

Hygiene, health and the environment

For spaces where correct color rendering was required, sources with a color index appropriate to the activity being carried out in the studied building will be used.

Lighting systems in rooms where a certain type of light distribution is required are and will be suitably mounted.

Safety in exploitation

In order to ensure this requirement, according to the category of importance of the building and according to the technical regulations, the following facilities were provided:

In order to limit the area affected by an eventual fault, the thermal overload protection system was created due to overload and short-circuit currents.

This was done with automatic switches, dimensioned according to NP-17 / 2011 and for which selective actuation is ensured.

The short circuit protection of the circuits will be achieved with automatic circuit breakers with differential protection.

For socket circuits, protection against residual currents with high sensitivity differential protection devices, $I = 30 \text{ mA}$ has been provided.

Energy saving and thermal insulation

Under the Energy Saving Essential Requirement, light sources will be, in all cases where other requirements do not accept them, LED type.

Protection against noise

The electrical appliances to be used for the electrical installations shall be so chosen that the equivalent noise level due to the noise sources in the electrical installations shall not exceed by more than 5 dB the equivalent sound level in the room when these installations are not in operation.

The gripping solutions of the electrical devices on the construction elements will dampen the noises and vibrations.

Sustainable use of natural resources

Sustainable use of natural resources is achieved by making the electrical installation consuming renewable resources.

Measures and instructions for fire safety and fire extinction

The present project was carried out in compliance with the provisions of the FSE legislation, the normal and the republican and departmental norms in force.

In the execution of the works and in operation, ordinance no.163 / 2007 - General norms of prevention and fire fighting shall be observed.

Adopted solutions ensure that hazardous installation overheads can be avoided by choosing the proper section of the current paths and adjustments.

All cables installed inside the constructions are "flame propagation delay", according to NTE007 / 08 - 2000.



The cable outlet of the TEG array in the cable duct as well as the cable streams in the false ceiling provided suitable seals.

In operation, periodic maintenance works and prophylactic tests will ensure the functional and constructive integrity of the projected electrical installations.

Operating electricians will be trained on fire prevention measures under the specific conditions of the workplace.

In the event of a fire at the electrical installations, the affected parts of the installations will be disconnected immediately and the location and fire will be switched. Simultaneously, fire alarm will be given.

INDICATIONS FOR RECEPTION AND COMMISSIONING

Reception and commissioning will be done only after the following:

- the achievement of the measures for protection of the work and of the security and fire damages, according to the provisions of the project
- the choice of measures that correspond to the working conditions and those stipulated in the normative acts in force at the date of commissioning. Any changes to the design will be made only with the designer's agreement.

The reception of the works will be carried out according to the provisions of the norms C 56-02 and HG 766 and in the Regulations for the reception of the construction works and related installations, approved with HGR 273/94, as well as the provision of the stages of confirmation of quality stipulated in the program for the quality control of the execution of the installation works, as indicated in C56-02 norm.

List of the Technical Regulations in accordance with the provisions of which the electrical installations were designed and on the basis of which the essential quality requirements established by the updated Law 10/95 were ensured.

Law 10/95 On quality in construction

STAS 234-79 Electrical connections. Electric columns.

I7 / 2011 Norm for the design and execution of electrical installations

PE136-88 Norm for the rational use of electrical energy in artificial lighting.

PE 119 Work safety standard for electrical installations.

P 118/99 Fire safety norm for constructions

C 56-2002 Norm for quality control of construction works and related installations

STAS 6616-87 Electrical installations up to and including 100V - null protection devices.
prescriptions

STAS6119-83 Electrical insulations up to and including 1000V - earthing and protection devices.

STAS 3184 / 1-85 Sockets, plugs and couplings for electrical installations up to 380V alternating current and 250V DC and up to 25 A. Technical conditions quality genres.

STAS 3185-87 Switches for domestic and similar electrical installations. General technical quality requirements

STAS 6646/1 Artificial lighting. General conditions for lighting in construction.

STAS234-79 Electrical connections. Electric columns.

STAS 6646/3 Artificial lighting. Special conditions for lighting in civil buildings.

STAS 10709 Corrugated flexible tubes of plastics. Forms and dimensions

STAS 6824 Tubular fluorescent lamps for general lighting. General technical quality assurance.

STAS 6865 Pipes with PVC insulation for fixed electrical installations.

STAS 8114/2 - 1 General purpose fixed lighting fixtures. General technical conditions.

STAS 11360 - 90 Tubes for electric. General technical tests.

STAS 11160 / 2-78 IPY and IPEY insulated pipe joints. Straight and curved junctions at 90.
Dimensions.

STAS 551 - 89 Tube fastening parts for electrical installations. Metal bracelets. Dimensions.



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STAS 552-89 Dosing and branch boxes for electrical installations. Dimensions.

STAS 553 / 4-80 Switching devices up to 1000 V alternating current. Rules and verification methods.

STAS 6115 / 3-85 Electrical filament lamps for general lighting. Quality technical conditions.

SR CEI 598-2-22 Lighting fixtures. Lighting fixtures. Special technical conditions.

Drafted by
Eng. Dan Cristian Dragut

A handwritten signature in blue ink, appearing to read "Dan Cristian Dragut", written over the printed name.

TECHNICAL REPORT
FIRE DETECTION, FIRE SIGNALING AND ALARM SYSTEMS

1. GENERAL INFORMATION

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county

Beneficiary: Brosteni commune

Project phase: Technical project

When choosing solutions, the following were considered:

- building characteristics of the building;
- climatic conditions specific to the area in which the target is located;
- the destination of the construction;
- the standards in force;
- the need to create the right climate for the building's destination;
- the need to achieve a normal ambient during both the cold and hot seasons.

Preamble:

The building will be equipped with fire detection, signaling and fire alarm systems.

According to the specific norms at the time of the project's elaboration, it is not necessary to make such a facility for the studied objective, but given the importance of the objective, such an installation has been provided for the studied objective.

2. FUNCTIONAL DESCRIPTION

Design basis and subject of the project:

1. Fire detection, signaling and alarm system

The basis of this present project was:

- Site planes (by levels) of the lens;
- discussions with the beneficiary;
- technical books of the equipment;
- P118 / 3-2015 Norms on Fire Safety of Buildings, Part III - Detection, Signaling, Warning
- Law no. 10/1995 - regarding quality in updated constructions;
- Law no. 307/2006 - on fire protection;
- SR EN 54 - Detention and fire alarm systems;
- Law 333/2003 - regarding the guarding of objectives, goods, values and protection of persons;
- Decision no. 1010/2004 for the approval of the methodological norms and documents provided by art. 69 of the Law no. 333/2003;
- NTE 007/08 - 2000 Norm for the design and execution of electrical cable networks;
- Law 319/2006 on safety and health at work.

2. Content of the project

This documentation shall include details of the execution of the fire detection, alarm and fire alarm system.

The characteristics of the existing fire detection and fire alarm system are as follows:

a) Type and specific functional parameters:

- Type I - General fire alarm system according to art. 4.2.2. of the norm P118 / 3-15, provided with standard elements SR EN 54;
- signaling center with stand-by, fire alarm, de-activation and test alarm;
- Automatic smoke detectors;

manual breakers;

- optical and acoustic alarm devices;

- power supply equipment.

- type-type coverage 1, total coverage by fire detectors and manual triggers;

b) Alarm time: 10 sec.

c) Protected areas: total coverage.

d) Main characteristics of the installation:

- degree of coverage - total.

- Fire detection and fire alarm zones - 1 zone (on each projected space).

- Detector type - Optical smoke - Addressable multicriteria.

- manual triggers - addressable buttons.

- alarm devices and specific functional parameters - addressable indoor sirens, addressable flashing lights, conventional siren with conventional flash.

2.1 Fire Detection Networks

2.1.1 Description of the system. Overview

The equipment of the fire detection, fire alarm and alarm system will be performed in order to assure the fire safety requirements of the objects that can be found in the studied building, to prevent fire and to intervene in a timely manner, in the event of their occurrence according to the provisions, and not only the norm P118 / 3-2015 and the family of European standards EN 54.

According to the aforementioned normative, it is not mandatory to make such an installation.

To quickly detect a fire start it is necessary to detect one of its manifestations with a high degree of accuracy and, as far as possible, that form of manifestation can not have another cause. Practically this can be done with automatic detection elements.

The objectives will be equipped with optical smoke sensors, specific to each room, connected to the fire detection and fire alarm system at the beginning of the fire, thus ensuring the protection of people's lives, the protection of the material goods, preventing the interruption of the activity, with the possibility to detect with great accuracy the cause of the danger.

Fire detection and fire alarm systems for the studied object will cover all spaces in total and are intended to capture and signal in the early stages of any fire start, regardless of the cause or timing of the fire.

The building will be equipped with optical smoke detectors, with fire buttons, indoor sirens, short-circuit insulators and communications infrastructure based on a 4-wire fire wire and 2 wires, more economically placed on the structural elements of the building.

Optical smoke detectors are meant to sense any insignificant air pollution with smoke particles, which may be an indication of the initiation and possible uncontrolled development of a fire in the surveillance zone of the detector / detectors concerned.

As an additional alert in case of fire start reporting, manual addressable alarm buttons will be provided. Buttons will be located in areas of intense movement and evacuation of staff and values in the main traffic and exit areas of the building.

To alert staff from disaster areas, multi-zone sirens for audible warning will be installed at important locations.

Ordering these sirens, as well as determining the sound to be emitted, can be scheduled to be triggered automatically by the fire control panel.

Wiring will be done by buried cable, using PVC or metal copex tubes for mechanical / physical protection of the cable.

The fire control panel will be designed to operate via a 220 VAC supply, but in the event of a mains power supply failure, operation will be ensured by automatically switching to the power supply via 12Vdc / 12Ah batteries for the transient period up to the start of the existing genset.

The boiler accumulators have been dimensioned to operate the normal time period even though the fire detection, fire alarm and signaling system is connected to the TEG (general electrical switchboard). For the IDSAI room, it is proposed to be protected from the rest of the 180-minute RF walls, with a fire resistance of 60 minutes and a fire-resistant door 30 minutes.

2.1.2 Structure of the system

The Fire Detection, Signaling and Alarm System was implemented in the following structure:

- addressable fire detection, signaling and alarm system;
- optical multi-criteria smoke detectors - addressable;
- manual addressable alarm buttons;
- Indoor sirens for acoustic and visual signaling of possible events;
- outdoor siren;
- power supplies and buffer batteries.

The fire detection, fire alarm and alarm system will be located in the room designed for this purpose.

The location of the equipment in the rooms is made taking into account:

- the fire detectors are mounted at a distance of at least 0.5 m from the walls, in a symmetrical arrangement and at a distance of at least 0.5 m from the luminaires;
- the fire signposts should be placed in easily accessible places, preferably near the door. The manual signaling buttons from which fire signals can be initiated are clearly marked, visible to the recipient in order to be distinguished from other devices and will not be obstructed by other existing elements of the owner.

2.1.3 Wiring

The wiring of the system is executed on circuits according to the drawings.

Wiring will be done for 1 loop needed for the system.

A special JYsTy fire cable (shielded 2x2X1 mm, external red insulation) is used to wiring the system.

The supply of security systems is from two distinct sources:

- the vital circuit board of the lens to be protected or in front of the general circuit breaker;
- accumulator battery for fire detection, signaling and alarm system

2.1.4 Energy calculation of the system

For the fire alarm system it will be ensured in the event of a basic interruption, a minimum of 48 hours of standby time, plus a minimum of 30 minutes in alarm condition

$$C = 1,25 \times (C_{48} + C_{1/2})$$

Where:

C = the total required capacity

C₄₈ - battery capacity for 48 hour standby

C_{1/2} - battery capacity for 30-minute alarm status

Consumer	Quantity	Stand by consumption (mA)	Alarm consumption (mA)	Total stand by consumption (mA)	Total alarm consumption (mA)
Fire Station	1	130	330	130	330
Smoke detectors	28	0.07	12	1.96	336
Addressable fire button	8	0.25	38	2	304
Siren with internal flash	5	0.25	3.5	1.25	17.5
Outdoor siren	1	0	45	0	45
Total consumption (mA)				135.21	1032.5



It calculates the standby battery capacity for 48 hours and the battery capacity for 1/2 hour, as follows:

$$C_{48} = 48 \times I_{\text{standby}} = 48 \times 0.135 = 6.52 \text{ Ah}$$

$$C_{1/2} = 1/2 \times I_{\text{alarma}} = 1/2 \times 1.032 = 0.516 \text{ Ah}$$

It results in the total capacity of the battery, required for the condition of autonomy:

$$C = 1.25 \times (6.52 \text{ Ah} + 0.516 \text{ Ah}) = 8.79 \text{ Ah}$$

To ensure the required autonomy, the system will be equipped with 2 12 Vcc batteries with a minimum capacity of 12 Ah.

Meeting the essential quality requirements

The de-signing and signaling system at the beginning of a fire related to the construction will be designed and executed in accordance with the legislation in force, ensuring the technical performances by which the essential quality requirements are achieved as follows:

Resistance and stability

Conceiving installations according to resistance requirements.

Conceiving installations to ensure resistance to external agents.

Conceiving installations to ensure that the condition is not destroyed or deformed.

Mechanical resistance of installations to shocks and action maneuvers.

Safety in operation takes into consideration

Safety of users by providing adequate artificial and safe artificial lighting, in accordance with current regulations and protective measures against:

- electric shock by touch (direct or indirect) by connecting it to the protective null and then to earth plugs;
- contact with elements that could be accidentally switched on under voltage by providing protection against residual currents of defect;
- mechanical accidents (cuts, bumps, etc.);

Intrinsic security of the facility by providing:

- protection against abnormal operation (overload, short circuit, isolation faults, etc.) in the component parts;
- protection against atmospheric overvoltages;
- fire protection;
- Ensuring resistance and stability.

Hygiene, human health, restoration and environmental protection

In normal operation, the materials and equipment provided do not emit any noxious and / or odorous substances.

Thermal protection, waterproofing and energy saving

This is ensured by:

- ensuring the continuity of the systems operation;
- Metering of energy consumption;
- ensuring the sealing and protection of electrical equipment against corrosion.

Protection against noise

This is ensured by:

- the location of low voltage equipment and installations so as to limit the noise transmitted from them;
- the choice of electrical appliances and equipment is such as to reduce the noise level when in use.

FINAL PROVISIONS

Installation of the appliance will be done at the end of the installation to avoid damage. Use of the installation requires proper training.



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In order not to lose the warranty of the equipment and the installation, and to ensure safe and long-term use, it is advisable to avoid any unskilled interventions or improvisations of any kind.

NORMS AND REGULATIONS

Specific rules and regulations

The following norms and standards have been consulted in the preparation of the project and will be considered during execution:

P118 / 3-2015 Norms on Fire Safety of Buildings, Part III - Detection, Signaling, Warning

PE 119/82 Work safety rules for electrical installations

PE 127/78 Instructions for coordinating the coexistence of electrical installations with communication lines

STAS 1590 Electrotechnics and Electroenergetics. Conventional signs.

STAS 1842-73 Electrical installation work in buildings. Conventional signs.

STAS 6755-81 Automatic. Conventional signs and letter symbols.

STAS 9638-74 Marking of isolated conductors for the identification of electrical circuits.

STAS 8275-78 Protection against electric shock. Terminology.

STAS 6119-78 Low voltage electrical installations. Earthing earthing devices.

STAS 6616-83 Low voltage electrical equipment. Protective null binders. Prescriptions.

STAS 9637-74 Electrical installation of buildings. Terminology.

STAS 7070-74 Automation installations. Rules for drawing up the technical documentation.

STAS 5325- 79 Normal protection classes secured by carcass. Classification and verification methods.

STAS 1237- 86 Electrical cables and conductors

STAS 6006 - 86 Electrical cables and conductors.

Drafted by,

Dragut Dan Cristian Instal 4D PFA

Eng. Dan Cristian Dragut





TECHNICAL REPORT **SANITARY INSTALLATIONS**

1. GENERAL INFORMATION

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county

Beneficiary: Brosteni commune

Project phase: Technical project

2. TECHNICAL INFORMATION OF THE INVESTMENT

When drafting the project, the provisions of the technical legislation in force - normative, technical prescriptions and standards were observed.

The choice of technical solutions has taken into account the characteristics of the construction, the destination of the building and the rooms and the environmental conditions.

The building site area benefits from water supply from existing springs.

OVERVIEW

According to the design theme, this documentation treats indoor and outdoor sanitary installations, cold water supply and hot water and sanitation, as well as the fitting of sanitary items or specific consumers for the "tourist center" destination.

The project deals with the connection to the drinking water network and the sewerage connection of the objective, but also studies the interior and exterior sanitary installations of the studied object.

The basis of the project was the following:

- Norm I9-2015 - Norms regarding the design, construction and operation of the sanitary installations related to the buildings;
- Instructions and technical prescriptions in force;
- Design theme.
- Plans with related compartments
- Facilities of the sanitary groups;
- Position of street utilities;
- Requirements of the beneficiary;
- Law 10/1995 on quality in upgraded constructions
- The norms in force
- Specific STASs

TECHNICAL INFORMATION

The elaboration of the solutions within the present project complied with the provisions of the updated Law 10/1995 regarding the quality requirements:

A- resistance and stability;

B - safety in operation;

C - fire safety;

D-hygiene, human health, restoration and environmental protection;

Thermal insulation, waterproofing and energy saving;

F- noise protection.

G - Sustainable use of natural resources



WATER SUPPLY

The studied building will benefit from water supply from the proposed network to be made in the locality. The water supply must provide the necessary water for domestic consumption.

The water flow from the source will be about 1.2 l / s.

The connection will be made of 40 mm polyethylene pipe, buried under the specific zone frost.

Drinking water will be measured by means of a water meter mounted in the water meter house at 32 mm diameter.

SEWAGE NETWORK

The studied building benefits from a sewerage network existing inside the building.

The existing sewerage network of the facility is discharged into a self-adhesive sealing basin that is located on the recipient's site at the south of the building under the conditional plan.

The sealing basin will be made of concrete and will have the capacity of 20 cubic meters that will be periodically vacuumed by the beneficiary with the help of a profile company from the locality or from the surrounding area.

INDOOR INSTALLATIONS

The need for drinking water will be ensured as outlined above.

Measure the water consumption with a water meter.

The studied building has a single entrance to the building according to the technical design, namely one in the central heating room area.

Sanitary installations studied within the project solve all the building spaces.

The hot water required for the operation of the studied object will be produced by a bivalent boiler with a capacity of 300 liters that will serve all consumers within the project.

The boiler will operate during summer through the solar panels mounted on the roof of the building on the south side of the building in the area of the thermal power plant.

It will be taken into account that during the summer there will be water consumption so that the solar panel does not get damaged. In case there is no water consumption, the beneficiary will take into account its coverage to prevent a possible malfunction due to overpressure.

The cold water pipes, domestic hot water (DHW) needed to supply sanitary items in bathrooms, sanitary tops will be made of polypropylene pipe and will be mounted apparently or buried. All buried pipes will be insulated.

Connections to sanitary items will be provided with check valves to ensure their isolation in case of necessity.

Cold water and domestic hot water (DHW) pipes and necessary for the supply of sanitary items in toilets, sanitary groups will be made of polypropylene pipe with certificate of conformity and warranty and will be buried.

All pipes will be insulated with Armaflex insulation.

The rainwater on the construction site will be taken over by the burners and from them the land configuration will be directed to the beneficiary's property limit to the outside of the building.

All materials to be put into operation will have technical approvals for Romania and will have technical approval.

The internal sewerage installation will be made of PVC-G or PVC-U pipe of various sizes and is presented in the plans attached to this documentation.

Sanitary items will be used in white sanitary porcelain.

Sanitary drain pipes will be made of PVC-G with the following diameters:

- closet Dn 110 mm;
- washbasin Dn 40 mm;
- siphon Dn 50 mm;
- shower cubicle Dn 50 mm;

- bath tub 50 mm.

The accidental water resulting in the sanitary groups will be taken over by the floor siphons.

These pipes will be connected to the sewer columns or floor siphons. Their quest will be buried.

Sewage columns will be provided with cleaning parts where the situation requires.

The sanitary objects to be put into operation will adapt to the destination of the studied building.

All external excavations larger than 1.5 meters will be supported by procedures specific to such types of works.

Sewage pipes must have technical approvals as well as quality certificates for the Romanian market.

For all external works to be executed, the manufacturer's conditions as well as the STASs in force at the execution date must be observed.

Any modifications to this project may only be made with or under the guidance of the design engineer.

The execution of these categories of works shall be carried out by specialized personnel observing the technical norms and norms in force as well as the norms of labour protection and fire prevention and extinguishing.

Any verification for the project is the responsibility of the beneficiary.

The way the essential quality requirements contained in the updated Law no.10 / 1995 are observed:

Requirement "A" resistance and stability - is resolved by the fact that sanitary circuits have been calculated and dimensioned to cover the demand for running water and wastewater discharge for the projected lens. Resistance of sanitary installations is given by the materials used in the construction of this plant.

Requirement "B" on exploitation safety - is resolved by the fact that all water supply columns are safe in operation, the materials used with technical approval and being checked over time.

Requirement "C" on fire safety - is resolved by the fact that all pipes are not exposed to temperatures and are not located near sources of fire, and they cannot burst into fire.

Requirement "D" related to hygiene, health and the environment - is met in the sense that the projected installations are not polluting, are sealed and do not harm the environment. The materials proposed for use in sanitary facilities are environmentally sound. Also, the installations proposed by the technical sheets require order and cleaning.

Requirement "E" for thermal insulation, waterproofing and energy saving - is achieved by the fact that the sanitary facilities will be located inside the lens and are not energy-consuming.

Requirement "F" for noise protection - is done on its own, with the sanitary installation having no noise or vibration generating components.

Requirement "G" linked to the sustainable use of natural resources is made by itself, the drinking water being rendered to the natural circuit.

1. Safety measures for work and fire prevention and extinguishing

In the execution of the works and in operation, all the norms of the work safety technique shall be strictly observed in accordance with:

- Labour Law 90/96 and Methodological Norms for Application.



- The specific safety standards for the work performed by the Ministry of Labor and Social Protection, namely:
- Specific Safety Standards for Thermal Insulation, Waterproofing and Corrosion Protection
- Specific Safety Standards for Metal Welding and Cutting
- Specific Work Safety Standards for sanitary and heating installations

Compliance with these rules does not exclude the provision and enforcement of work safety measures appropriate to the particular conditions of the activity.

At the execution of the works, the contractor will have to take all necessary measures to prevent and increase fires, in accordance with the provisions of fire prevention and extinguishing legislation during the execution of construction works and related installations, C300-94, as well as other provisions in force.

SPECIFIC NORMS AND STANDARDS

I 9/2013 Norm for the design and execution of sanitary installations

I 6/98 Norm for the design and execution of technical and sanitary installations

C 56/2002 Norm for quality control and acceptance of construction works and related installations

SR 1629 -2/96 Water supply

P 118/2 - 2013 Norms on fire safety of buildings

PROTECTION, SAFETY AND HEALTH IN WORK

In execution and exploitation, the law 319/2006 and the safety and health norms of construction work shall be observed.

The manager of the work place has the obligation to accomplish mainly:

- personal training at the phases and intervals established by legislation, drawing up and signing with the trained staff of the supporting documents;
- verifying knowledge about health and safety rules and measures;
- endowment with individual protective and working equipment;
- provision of protective food and hygiene-sanitary materials for the prevention of some professional illnesses;
- Checking the condition of the tools and tools that work and removing those who are malfunctioning.

TESTS, VERIFICATIONS

Execution control will have to follow the quality of the materials, the execution of the prefabricated buildings and the installations according to the technical standards and regulations in force.

Prior to installation, all equipment is subject to visual inspection to prevent malfunctions. The mounting position must comply with the standards and installation standards.

Verification is executed during execution and completion of the job.

METHODOLOGICAL GUIDE FOR VERIFICATION, SAMPLING AND RECEPTION PROGRAM

Obligations of the parties

The contractor must execute the works according to the present project in accordance with the technical regulations in force.

The Contractor must notify the Beneficiary during the execution of any modification (waiver or completion) that is necessary in the realization of the project and is obliged to ask for a written agreement. Any change is made only after getting the site decision.

When the necessity of the works stipulated in the project, the inconsistency between the situation on the project site, the lack of details and other deficiencies of the project, the entrepreneur must



communicate to the beneficiary and the designer and to prepare the NCS. If the 7-day interment does not solve the problems, the designer will prepare the layout on the basis of the NCS.

The designer is obliged during the execution to follow the project compliance, to check the quality of the materials and the appearance of the works, without interfering with the execution activity.

The findings and provisions will be noted in the workshop layout and site communications.

In case of serious deviations from the project, the designer is obliged to notify the beneficiary accordingly.

Reception, check. General Provisions.

The works executed are put into operation only after the main works have been executed, namely:

- training with technically trained personnel in operating mode;
- drawing up and / or displaying operating instructions at the workplace;
- providing the technical documentation of the installations that contain the reality of the execution.

The commissioning is done in accordance with the specifications in the regulation of the technical operation of the hydrant installations.

Checks and attempts are made at the beginning of the paper, during the work and at the end of the paper.

The main technical - economic characteristics at the project level are verified by guarantee evidence.

Materials that do not qualitatively match will be rejected and will not be put into execution.

Verification of the correctness of execution will be performed in accordance with the technical regulations in force.

Only materials and apparatus complying with the current Thnc prescriptions, regardless of their origin (domestic or importing companies) may be used.

In the case of imported materials and equipment it is necessary to have certificates of conformity and quality and, if they do not come from the EU, there must be certificates of approval of the competent authorities. It is also necessary to carry out all the tests and verifications required by the legislation in force, and they will be certified by verbal processes.

Execution details will be given during the execution of the works as required.

The project is not environmental impact.

The Executor will present to the Beneficiary at the beginning of the work the evaluation of the risk factors for each job according to the Law 319/2006 - Law on Safety and Health at Work.

Drafted by,
Eng. Dan Cristian Dragut



TECHNICAL REPORT **THERMAL INSTALLATIONS**

1. GENERAL INFORMATION

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county

Beneficiary: Brosteni commune

Project phase: Technical project

OBJECT OF THE PROJECT

This documentation treats the solution adapted to the design of the indoor thermal installation related to the "Tourist Center" objective in the village of Lupsa de Jos, Commune Brosteni, Jud. Mehedinți.

DESIGN BASES

This technical documentation was prepared based on:

- Order of the beneficiary
- Standards and STASs in force
- The need to ensure quality requirements in line with the requirements of updated 10/95

PROPOSED SOLUTION

The heating of the building within the building will be centralized by an internal thermal installation.

The thermal source is a wood-fired thermal power plant with 100 kW of gasification that is proposed to be realized within the project.

The installation will be with superior distribution and buried distribution.

The heat demand for heating was calculated according to STAS 1907/97.

The distribution is made up of main branches provided with sectors with the possibility of measuring the parameters of the thermal agents.

The dispenser feed columns are apparently mounted on the building elements.

All the linkages from the inside are mounted buried in holes or apparently on the building elements.

Space heating is achieved through a radiator system. Radiators proposed in the project are steel radiators.

The distribution pipes inside the building will be made of copper pipe.

The connections to the radiator bodies will be made of copper pipe apparently mounted on the building elements.

The heating agent is hot water 90 g / 60 g. having as a thermal source the centralized heating system of the building that has the power necessary to achieve the heating.

Heating works will only be carried out with specialist personnel who have the specific arrangements for such works.

Filling the thermal installation with water is done with the water from the proposed network of the lens.

Dilatation compensation is done naturally by route configuration and by providing fixed points.

The ventilation of the installation is done with automatic dehumidifiers located according to the plans.

The heating bodies for the studied object are of the steel radiator type, with the axle distance between 600 mm and 800 mm.

The location of the building elements is according to the manufacturer's recommendation.



Radiators will be equipped with double-turn and return control valves.

The radiator valves on the radiator will be normal valves.

The mounting of the radiators on the construction elements is done with supports and consoles.

On the distribution there were provided separating, draining and connecting pieces for fitting measuring devices.

It will be taken into account that during the winter, the central heating system will also operate at night.

The passage of the pipes through the walls and the planes will be done through the protective tubes provided with a filling system specific to the type of the protected pipe.

The way the essential quality requirements contained in the updated Law no.10 / 1995 are observed

Requirement "A" resistance and stability - is resolved by the fact that the thermal circuits have been calculated and dimensioned to cover the required heat for the projected lens. The resistance of the thermal installations is given by the materials used in the construction of the plant itself.

Requirement "B" on exploitation safety - is resolved by the fact that all the heating columns are safe in operation, the materials used with technical approvals and being checked over time.

Requirement "C" on fire safety - is resolved by the fact that all pipes are not exposed to temperatures and are not located near sources of fire, and they can not fire.

Requirement "D" for hygiene, health and the environment - is met in the sense that the projected installations are not polluting, are leaky and do not harm the environment. Materials proposed for use in sanitary facilities are environmentally sound. Also, the facilities proposed in the technical data sheets require order and cleanliness.

Requirement "E" for thermal insulation, waterproofing and energy saving - is achieved by the fact that thermal installations will be located inside the lens and are not energy-consuming.

Requirement "F" for noise protection - is done by itself, the thermal installation having no noise or vibration generating components.

Requirement "G" related to the sustainable use of natural resources is achieved. This thermal installation works with a thermal agent produced by a gasification plant and the use of fuel is judiciously consumed.

SAFETY MEASURES FOR WORK AND FIRE PREVENTION AND EXTINGUISHING

In the execution of the works and in operation, all the norms of the work safety technique shall be strictly observed in accordance with:

- Law 90/96 of Labor Protection and Methodological Norms of Application.
- The specific work safety norms specific to the works carried out by the Ministry of Labour and Social Protection, namely:
 - Specific Safety Standards for Thermal Insulation, Waterproofing and Corrosion Protection.
 - Specific Safety Standards for welding and cutting metals
 - Specific Work Safety Standards for sanitary and heating installation work.

Compliance with these rules does not exclude the provision and application of labour safety measures appropriate to the particular conditions of the activity.

- When executing the works, the contractor will have to take all the necessary measures to prevent and extinguish fires, in accordance with the provisions of the fire prevention and extinguishing legislation during the execution of the construction works and related installations, C300-94, as well as other provisions in force .

Drafted by
eng. Dragut Dan Cristian



TENDER SPECIFICATIONS: General

1.1 Standards and regulations

- 1 All civil works will comply with Romanian standards in force, as a minimum requirement.
- 2 will be used predominantly Romanian standards or other international standards recognized as necessary typically used for civil works.
- 3 The materials provided and work performed shall comply with these standards and regulations as a minimum requirement. If manufacturers offer other standard materials, they will be at or above the standards specified and shall make available to the Employer full details on the differences between them.

1.2 List of standards and regulations applicable to Romanian

- 1 For the purposes of the above will be considered harmonized standards or European novelistic.
- 2 The list is not exhaustive. All projects, materials and work will be based on national standards, in force at the time of design. If there is no relevant national standards applicable, the Contractor shall use the applicable foreign standards (EU-DIN, BS, etc..) In which case the norm will attach the project documentation, together with the corresponding translation in Romanian.

1.3 Level and benchmarks

- 1 Except where otherwise specified, all levels will be expressed in meters of the Black Sea, to an accuracy of 3 decimal places.
- 2 The Contractor shall establish, build and design the necessary additional benchmarks during the works, which will be checked regularly.
- 3 The Contractor shall be responsible for execution of the Works in accordance with data on levels.
- 4 The Contractor shall keep records of all equity levels. Coordinate system shares the site coordinate system will be used by the Contracting Authority and will be correlated with the level of rates.

1.4 Dimensions

- 1 All dimensions, distances and levels contained in the plans are metric. If the required work plans, the Contractor shall prepare and submit such plans to the metric system.

1.5 Plotting works

- 1 work will be marked and linked into the national coordinator. Temporary terminals and stations will be located outside investigation construction, except where specified otherwise.
- 2 The Contractor shall identify the locations of all sizes with their reporting structures and interpreting the existing work plans.
- 3 locations of structures that will be built as components of work will be identified by reference to stakes beaten steel in concrete or any other means of marking approved, installed by the Contractor, who shall establish and coordinate marking tools and their distance adjacent to existing structures.

1.6 Implementation and workmanship

- 1 The Contractor shall employ supervisors (RTE) highly qualified and experienced.
- 2 investigative tools used by the Contractor will be modern in terms of type and manufacture, proper execution of work and maintained a first class standard.
- 3 The Contractor shall provide skilled and unskilled work force and the necessary materials to facilitate verification and approval by the project supervisor beneficiaries through the levels and alignment markings and location of structures.

1.7 Specifications on standards

- 1 All projects, materials and work will be based on national standards, in force at the time of design. If there is no relevant national standards applicable, the Contractor shall use the applicable foreign standards (EU-DIN, BS, etc..) In which case the norm will attach the project documentation, together with the corresponding translation in Romanian.
- 2 A list of relevant national standards applicable is attached. The list is not exhaustive.

1.8 Standards on site

- 1 The Contractor shall purchase and maintain on site a copy of each Standard, Guide and Manual important or approved by national standards referred to in the Specification. In addition, the Contractor shall purchase and maintain on site a copy of any standard, guideline or national standards apply to materials supplied.

1.9 Issues not covered by the standards

- 1 any material or execution of any work not specified in / or covered by the standards, guidelines and manuals will also be kind and of such quality as to be able to ensure execution of work first class. In such cases, the project supervisor will determine whether all or some of the materials offered or delivered on the site are suitable for use in the works and project supervisor decision in this regard shall be final and unequivocal.

By, Arch. Dan Boruga



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SPECIFICATIONS

DENDROLOGICAL PLANNING

MATERIALS AND EQUIPMENT. QUALITY PLANTS

All plants shall be subject to phytosanitary control.

Plants must be healthy, with no sign of parasites, diseases, muscle, should look "balanced", well shaped and strong.

Each plant will be legibly labeled with the species name.

Trees

All trees proposed will be validated in the nursery or plant store beforehand.

The logs will show any scarring or stroke.

The first branch should be at least h = 180cm.

Trees should be transplanted at least 2 times the production and presence in container.

Delivery

Plants will be packed and covered to ensure adequate protection against damage during transit. Bare roots (if any) of the plants will be protected with wet straw or other suitable material to ensure delivery to the destination with the roots of wetland plants.

When the transport is done with a vehicle covered, it will be ventilated to prevent "over-heating" during transportation.

Plantations

Planting seedlings to be in the shade and watering should depozitații menține to wet roots.

Sun Exposure roots during the planting is prohibited (reduce growth for 3 years or drying the plant).

Contractor shall inform the designer before any plantation, because they can be present at planting and verify the quality of the plants.

The pit will be filled with well rotted manure, a clay soil from the A horizon of soil profiles of local soils. Must have an organic content between 1% and 10%. Will be relatively free from large roots, sticks, weeds, or stones with a diameter greater than 25mm, or other trash and waste. At least 90% must pass through a sieve of 2.00 mm and pH should be between 6.0 and 7.5.

Topsoil must be able to support and encourage germination vegetation.

Fertilizer will be a split of organic waste produced in specialized plants registered. Fertilizers must not contain shards of glass or metal. Any plastic material or other man-made material shall not be less than 4 mm and is less than 1% of the total dry weight of manure. Fertilizers will help vegetation growth and development.

Making holes for planting

Digging is done 40-60 days before planting itself in order to create conditions for aeration of the earth and enable the development of soil microflora.

Land and soil medium size pits are 1x1x0, 7 m, and heavy soils side can reach 1.2 - 1.5 m and 0.8 m depth in pits dug for planting will prepare a "slime" composed of manure, water and earth yellow, stir continuously until you get a paste of medium consistency. This paste will completely immerse the roots of trees shaped.

Result of digging earth sits on both sides of the line, in the form of mounds (it ensures that the pit walls to be vertical).

Surface layer (30-35 cm) is placed on the same side of the row at all pits (ie east) and the lower layer on the other side (to the west).

This alignment of the layers of earth mounds will take into account the partial filling of the pits before planting.

Due to the fact that by digging disappears picket, which marks exactly where the tree is recommended (especially on slopes) as before digging the hole to mark each picket with another two (one side), but the direction of the line, using board "repichetaj" with a cut in the middle and two ends. This paper easier than finding the right place when sitting tree planting.

Partial filling potholes is running 2-3 weeks before planting.

At the bottom of the pit is thrown 15-20 cm soil layer below, then make up to half or two thirds of the surface soil layer. It is intended that the most fertile ground to find the root zone of the tree.

Trimming roots and planting

Trimming roots and their mudding second condition for success in planting. This mud stimulates wound healing and the development of new roots.

By trimming the roots are new cuts made out, operating with scissors, broken or injured roots are shortened, just above the wound, leaving the healthy whole main.

Thin roots under a millimeter in diameter shortened to 1-2 cm and the dry can suppress the base to stimulate new ones.

After trimming package softened to a paste made from a mixture of fresh cattle dung large land and water in equal parts. Add fertilizer consisting of land for planting (surface layer) mixed with 10 to 15 kg (1-2 buckets) of well rotted manure, plus 50-60 g superphosphate and 50-60 g potassium salt.

The correct planting depth is paramount.

It uses the repichetaj plank, sitting between the two pickets guarding the hole, pull the earth mixed with those fertilizers, creating in the middle of the pit, a small hill on which sits the roots of the tree, so the package to is above the upper edge of the plank. Discard then finely ground and wet (in the mixed fertilizers), introducing gently with fingers spread among the roots.



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After roots were covered, gently tap the tree (without being pulled out) for the earth to get good among all roots.

After the ground pulled over roots, stepping settles very insistent. Then pull the whole earth into the pit to the top of it and stepped back. The rest of the land remaining stitches then run (plate) around the tree. In this ice was poured 1-2 buckets of water.

Watering plants is absolutely necessary, because all the grains of soil drains water from the roots, remove air, prevents mold and leave little tree down, "sit", thus returning the package exactly the soil surface, ie just as it was in the nursery.

After the water has penetrated the soil, gather all the land around the tree as a nest. This is to protect tree roots from freezing in winter. Crown or the aerial part of the tree remains rough, this will take place in spring, in late 2, early March.

Protecting trunk

Protecting the trunk of each tree is the last work to be done before the snow fall. For this purpose, around the trunk link sunflower stems or stalks of corn, reeds, thick paper sacks or perforated plastic film.

Trimming trees running with scissors sharpened tree. This is the case both roots and branches of the trunk, if any. Remove by cutting only the dried roots, broken or injured. If the time for planting young trees is presented as a unbranched rod, it will cut above a bud at a height at 1 - 1,25 m This is the design height of the trunk - depending on the options specified size can be higher or lower.

If the tree already has a few lateral branches, then it will apply cutting reductive, which has two main goals: weight reduction plant will be fed into the next growing season by a weakened root by digging operation and secondly , start cutting the tree crown formation.

The first branch to be removed from the ring is bud competitor, if it was not removed in the nursery. Competitor is the first branch shoots increased annual growth just below the peak. If the competitor has a growth bud more convenient than the tip, it will be stopped and will remove the tip.

Body formation Cutting

First cut out of training applies tree nursery that already has a few lateral branches - it must take place immediately before the final planting (planting pruning), or when the tree planted year before the lateral branches increased during the first year of vegetation .

On a tree already growing two years after is known as shoot branching competitor. Allow it or tip.

Branches forming strain angles of 60 degrees provides durability and an extra edge in terms of the ratio rise / fruiting. It is true that the ramifications that occurred under other angles 5 be more developed, but on the whole do not have to give up their right to leave the high angles of about 60 degrees. The angle between branches, must be as close as possible, this tree provides stability, optimal lighting and ventilation.

Cutting length reductive

Length that is shortened by cutting gears, main branches is very important. An excessive shortening of branches atrge by itself an agglomeration of lower order branches around the axle and therefore deficient ventilation and lighting. A slight shortening will lead to a small number of shoots inside the crown, and a large agglomerate on the periphery thereof. This creates the prospect of a hollow crown.

Cutting should ensure proper growth of shoots to the end of branches, and a few side shoots on the remaining length until the shaft. They will have enough distance between them and will be directed horizontally.

Lawn Seeding

Tools required: rake, water hose.

The optimum time for sowing is late 8 - early 9.

Seeding can be done from spring until autumn if the soil is sufficiently warm and humid.

There are many types of grass seed. Choose the type of pitch was done according to soil type climate shadow etc.. We recommend the use of good quality seeds as a misfire mean recovery of all operations almost from scratch.

The seeds will be scattered by hand. Attention! For this exercise choose a day without wind! Immediately after the seeds were scattered, the surface to be raked, so that the seed does not remain on the surface. Then follows topsoil compaction that seed into contact with it. Soil compaction rollers will be made by the rollers of approx. 200 kilograms.

After compaction, is the first watering. It aims to fill the gaps between the clods of earth and ensure good contact between seed and soil. Attention! Watering hose must have a nozzle as a jet of water will wash the seeds.

Once all these operations are high wet for 2 weeks. If it rains, you have made sure that newly seeded soil does not dry completely during this period. On sunny days there will be a lunch and evening watering. After about 2 weeks all viable seeds became sufficiently deep rooting plants so that it can dilute wetting about 2 times a week, depending on the weather.

When grass reaches a height of about 10 cm will make the first cutting.

Tools required - lawnmower, water hose.

Repeated mowing and lawn maintenance requires watering during dry periods.

Mowing the lawn is the most important operation. By pruning stimulates thickening vegetation cover. Also, through repeated mowing grass varieties favoring growth at the expense of thin wire with thick thread. Uncut grass will grow vertically to produce



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well and will turn yellow at the base. By trimming it will expand horizontally, occupying the entire surface of land available. Besides aesthetics, this will hinder the growth of weeds (weed seeds in the soil will get harder and be suffocated by existing grass). Also, by cutting itself is eliminated almost all stemmed weeds. Because these weeds produce seeds only stem tip by trimming we can not multiply.

Ideally, the lawn is clipped when it is completely dry and when, by trimming removes 25-35% of the height. In reality various intervening factors (prolonged rainfall, holidays, lack of time, etc.) that will depart from the ideal parameters. The climate of Romania will have to reserve time for mowing the lawn at least once a week, ideally 2 times a week from spring until fall.

Lawnmowers have a removable basket that can collect grass clippings. If the grass does not grow more than 25-35%, trimming will be faster and will not have to collect grass clippings. This will be scattered on the ground and contribute to fertilization by decomposition. If, however, proceeds to grow more grass to cut will have to mount the basket collector since the grass will be too long to be scattered on the ground evenly and result furrows (like mowing). That, except that the pitch will lose their beauty because the grass will begin to turn yellow at the base.

Having mounted collection box, we made two additional operations during trimming. Bin should be emptied and the resulting grass must be stored somewhere. Ideally it will be in storage bin with compost. Whenever the soil is dried to less than 2-3 fingers in depth, it will need to water the lawn. According to some authors optimum watering time is morning, evening others.

Watering in the morning would not produce heat shock (difference in temperature between the water and the plant) and not favor the occurrence of mold and other diseases. However, the great disadvantage of watering in the morning is that much of the irrigation water is lost through evaporation, as soon as the sun gets stronger. The amount of water to be metered in such a way as to penetrate only to a depth at which the roots of the turf. If we water too little, we will stimulate root development at ground surface and will result in a pitch sensitive to drought. If we water too much, besides the fact that surplus water is wasted, we will foster the emergence of weeds with deep roots.

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SPECIFICATIONS

PROTECTION Pavement (sidewalks)

(20) 00 OVERVIEW

(20) 1110 Specification object

(20) 1111 This chapter contains specifications for the execution of such building sidewalks protection:

- Plain concrete pavements cast in situ;
- Sidewalks of concrete slabs;
- Pavements of asphalt mixtures;
- Curbs.

(20) in 1112 for concrete works shall consult the instructions in Chapter (0) 0000 of these specifications.

(20) 1120 Reference Standard

(20) 1121 Standards:

1. STAS 388-80 - Portland Cement
2. STAS 790-84 - Water for mortar and concrete
3. STAS 1030-85 - ordinary masonry mortars and plasters
4. STAS 1134-71 - Stone Mosaic
5. STAS 1137-68 - concrete paving slabs
6. STAS 1139-87 - Sidewalk curbs
7. STAS 1667-76 - Natural aggregates for mortar and concrete with mineral binders
8. STAS 7064-78 - Bitumen waterproofing material and in construction work
9. STAS 9199-73 - Bitumen for insulation in buildings

(20) 1130 Extent of the project

(20) 1131 Contractor shall submit the detailed design drawings for execution pavements protection with or without borders.

(20) 1140 Samples and tests

(20) 1141 Before ordering and delivery of any materials from the site, will provide the Consultant for approval the following samples:

1. Concrete tile: two samples
2. Precast concrete curbs mosaic: two samples of finish and color specified.
3. Curbs simple: two samples

(20) 1142 By approving samples by means approved cement and Consultant aggregates, and color choice.

All items will be prefabricated mosaic made of approved materials.

(20) 1200 MATERIALS AND PRODUCTS

(20) 1210 Products

(20) 1211 curbstones, concrete mosaic executed (if so specified) with girls finished with a bevelled edge (according to drawings).

1. Borders must be carried by molding and stamping.
2. Will be shaped, with straight or rounded edges as specified in the plan, no defects affecting their appearance or functionality. There will be mounted onboard breaches and cracks.
3. Borders will grind and rub sewing workshop.
4. Production:

- Borders will be made of a plain concrete, part Portland cement to 3 parts gravel granilic.
- Finished layer thickness of about 2 cm 2 faces, as specified in the plan will consist of cement and stone mosaic ratio 1: 2 (on dry weight), with grain size from 0 to 30 mm .
- The amount of water to be added is not more than 20 liters to 45 kg of cement.
- If so specified in the cement layer of finish will add pigment dye.
- Aggregate, stone mosaic will be approved by the Consultant and will be apparent in the aggregate constitute approximately 50% of the total finished.

(20) 1212 paving slabs of concrete pavements made of a layer of hard rock aggregate concrete or of two layers of which at the base of the concrete used. and the wear of hard rock aggregate, sizes and thicknesses according to STAS 1137-68.

1. The plates will be run by mechanical pressing natural color binder or colored as indicated in the project.
2. Plates shall be smooth or grooved upper face printed as shown in the project.
3. Do not mount plates breaches or cracks.

4. Production:

- Plates will be made of hard stone with sizes up to 1/3 of the layer thickness, or crushed rock.
- Cement used shall have minimum compressive strength at 28 days of 4000 N/cm²



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(400 kgf/cm²)

- If so specified in the cement layer finishing will add pigment dye as described in the project

(20) 1213 plain concrete prepared 3,5 Bc brand ballast grit and cement up to 31 mm F 25 according to (20) 0000.

(20) 1214 bituminous asphalt mixtures clothing made hot cast. The mixture is made from bitumen D 80/100 or D 100/120 according to STAS 754-86 (depending on the climate hot or cold) mixed in mixer and filler according to STAS 539-79 plus natural aggregate (natural sand STAS chippings STAS 662-89 and 667-90), the type and dosage mix asphalt layer will wear according to STAS 174-83.

(20) 1220 Materials used in manufacture of products (in addition to (20) 1121)

(20) 1221 mineral dyes, if specified.

(20) 1222 glazed Bitumen for roads, according to STAS 754-86.

(20) 1223 Limestone filler, filler chalk and lime powder, according to STAS 539-79

(20) Natural Aggregates quarry in 1224, according to STAS 662-89.

(20) 1225 Natural aggregates and processed stone roads, according to 667-90.

(20) 1226 Picture layer materials

(20) 1227 Photo mortar as specified in chapter (20) 1000.

(20) 1228 Bc plain concrete with 7.5 as specified in chapter (20) 0000.

(20) 0-7 mm grit 1229 STAS 1667-76.

(20) in 1230 to fill the grout joints on curbs.

(20) 1231 bitumen sealing joints according to STAS 754-86.

(20) 1232 Delivery, Transport, handling

(20) 1233 for mortar and precast units are available specifications (20) and 1160 (20) 1000.

(20) 1300 SIDEWALKS EXECUTION

(20) 1310 Precast concrete curbs

(20) 1311 Bc concrete foundation is running 3.5, as specified in Chapter

(20) 0000 and as detailed in the project.

(20) 1312 Checking the laying surface and apply the mortar layer current picture, in accordance with specifications of (20) 1000.

(20) 1313 borders is posing (20) in 1211 in accordance with the specifications in chapter (20) 1000 mosaic on concrete elements and indications of the project.

(20) 1320 Precast concrete slabs

(20) 1321 topsoil is removed, after which the land will be well beaten natural and earth filling will be placed and well beaten in layers up to 20 cm thick.

(20) 1322 Pour concrete foundation brand Bc 3.5, poured into panels 4 m², with sloping outwards approx. 3%.

(20) 1323 Photo Apply layer of cement 400 kg/m³ according to (20) 1000 thickness of 3cm.

(20) 1324 Place cards by pressing the joints below the two directions, controlling – is the embodiment of 2 m, and taking care to ensure drainage slope about 3% of the building exterior.

(20) 1325 Fill the joints between the tiles with grout for base building and bitumen (asphalt stopper).

(20) 1330 Plain concrete cast in place

(20) 1331 topsoil was removed, after which the natural land will be well beaten, and land filling will be well beaten in layers up to 20 cm thick.

(20) 1332 Aster ballast bed is finely mixed with beaten clay ratio of 1:1 and an average thickness of 10 cm outward slope of approx. 3%.

(20) Pour concrete brand Bc 1333 3.5 () 0000 and worked towards visible role, at about 3.0 m allow expansion joints.

(20) 1334 expansion joints are filled and the gap between the pavement and base bitumen.

(20) 1340 Asphalt mixtures

(20) 1341 topsoil is removed, then naturally it will be well beaten earth and the earth filling will be placed and well beaten in layers up to 20 cm thick.

(20) 1342 Pour the concrete foundation make Bc average thickness of 3.5 to 10 cm in panels 4 m², and with the slope out of approx. 3%.

(20) 1343 Pour 2 cm thick asphalt STAS STAS 174-83 and 175-87.

(20) 1350 admitted deviation

(20) 1351 The settlement curbs and slabs:

1. Flatness: ± 4 mm below the embodiment of 2 m length.

2. Unevenness permitted between two adjacent precast elements is 1 mm.

(20) 1352 The concrete and asphalt:

1. Thickness: 10% for each stratum.

2. Transverse profile grade: ± 5 mm / m

(20) 1360 Acceptance testing



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(20) 1361 Acceptance tests will be done by examining the work surface, the work must comply with the provisions of these specifications.

(20) 1362 checks should be made to:

- Appearance and overall
- Geometry (thickness, flatness)
- Fastening clothes on a backing;
- Joints;
- Corresponding to the project.

(20) 1363 Where prescriptions or project data were not met, or if the appearance not work properly (cracked tiles, chipped edges, joints, etc.), the Consultant 5 decide to replace local or larger areas to work and restore the conditions prescribed in the specifications.

(20) 1400 MEASURING AND PAYMENT

(20) 1410 Unit price of the item for the quantitative bead works, includes photos layer of cement mortar and concrete foundation simple.

Settlement will be made per meter of work according to the design drawings.

(20) 1420 Unit price for precast concrete pavement slabs article includes the quantitative picture papers and layer of cement mortar and plain concrete layer. Settlement is the square of paper, according to the draft floor.

(20) 1421 unit price for asphalt mixture pavement clothing article includes papers and the quantitative picture of plain concrete layer.

The settlement is one square meter of paper, according to the draft floor.

SPECIFICATION

MASONRY

(1) 1000 GENERAL

(1) 1110 Specification subject

(1) 1111 In this chapter include specifications for masonry ceramic bricks and blocks, small blocks of masonry of lightweight aggregates, small blocks and boards BCA.

(1) 1112 Specification for mortar for masonry accessories are contained in Chapters

(1) The 2000, respectively (1) 3000.

(1) 1120 Basic Concepts

- Interior and exterior bearing walls of masonry must resist vertical loads, horizontal loads and other demands resulting from space functions that close.

- Non-bearing interior and exterior walls must withstand their own weight in tasks finishes, wind pressure and other demands resulting from space functions that close.

- Portable and non-bearing walls must ensure thermal protection, noise and sound foundations they go.

(1) in 1121 of the use of masonry walls.

If not specified otherwise, the Contractor will perform masonry in accordance with the regulations in force and STAS sites.

(1) 1130 Reference Standards and regulations

P2-85 Standard on the composition and calculation of masonry structures.

C 17-82 technical instructions concerning the composition and preparation of masonry mortar and plaster.

C 126-75 Standard for composition and execution of masonry ceramic bricks and blocks.

C 14-82 Standard for the use of small blocks of lightweight aggregate concrete to work masonry.

P 104-83 Technical Instructions for the design and execution of walls, floors and roofs of brick elements.

C 190-79 Technical Instructions for the design and execution partitions boards phosphogypsum and expanded clay plaster.

P68-74 Standard on the degree of thermal protection of buildings.

C 125-81 Technical Instructions on noise protection design and execution of buildings.

C 139-79 Technical Instructions for the execution of rough stone masonry.

C 16-79 Standard for cold weather realization of works and associated facilities.

C 56-86 Standard for checking the quality of construction and installations.

C 198-79 Technical Instructions on manufacturing technology and assembly of plates and strips of plaster walls and other local materials.

P 100-91 Labour seismic design of civil, industrial and agricultural buildings.

C 140-79 Standard for the execution of concrete and reinforced concrete.

C 19-79 Technical Instructions for the use of cement in construction.

NP22-77 provisional rules determine the fire resistance category and class



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fire hazard to buildings, installations and deposits.

NP23-77 Provisional Rules on fire safety in the design and implementation construction elements.

STAS-6233/76 cement, mineral admixtures and additives classification and technology.

STAS-902 1/78 Hydrated Lime powder construction.

STAS-39 10/1-76 building limes.

Ipsos STAS-5445/I-75 construction.

STAS-790/73 water for mortar and concrete.

STAS-8036/72 autoclaved aerated concrete. Gas, general technical quality.

STAS-1030/70 regular mortar for masonry and plaster. Classification and specifications.

STAS 10833/76 autoclaved aerated concrete. Reinforced elements.

STAS-6029/74 small blocks of lightweight aggregate concrete.

STAS-1480/63 plates and strips of plaster walls.

STAS-3281/75 Ceramics. Classification.

STAS-2945/73 burnt clay building bricks.

STAS-8560/74 burnt clay building bricks.

Horizontal hollow bricks and blocks.

STAS-457/80 Bricks and vertical hollow ceramic blocks. Technical quality conditions. Shapes and sizes.

STAS 10501 / I, 2/76 fixtures ceramic walls and buildings. Technical quality conditions, shapes and sizes.

STAS-I836/73 of diatomite insulation products.

STAS-10690/76 pressed hollow glass bricks.

Parts STAS-2863/I.2-76 pressed glass construction. General technical construction quality. Shapes and sizes.

STAS-8600/70 construction tolerance, dimensional tolerance system.

STAS-I0104/75 masonry. Principles and methods for calculating sections.

STAS-I0109/0/75 Civil, Industrial and Agricultural. Masonry.

(1) 1140 Details

(1) The Contractor shall execute the 1141 current sketches and details, which will present the method of implementation, coordination modular Doorways and windows, lintels, weaving, etc..

(1) 1142 for reinforced walls will detail current corners and joints.

(1) The 1143 drawings, detail, detail plans prepared by the contractor shall be submitted before execution engineer for approval.

(1) The 1144 also will present scheme of handling, storage, transport, etc for all materials used, so the Engineer to be convinced of the correctness of the execution of these operations.

(1) 1150 Samples and Testing

(1) 1151 Engineer Contractor shall submit manufacturer's specifications and quality certificates for all materials used in masonry.

(1) Certified in 1152

The Contractor shall provide the Engineer:

a) Laboratory Bulletins for each type of mortar (1) 2131.

b) Laboratory Bulletins executed each time it is necessary to change a material supplier.

c) Certificate of quality additions and materials used (cement, sand, fittings, bricks, blocks, etc..).

(1) 1153 Cost of tests

All costs related to testing and ensuring reports and related certificates, whether or specifications required by the Engineer shall be borne by the Contractor, that will be included in the unit prices for masonry work.

(1) 1154 mortar boards

Before starting work, the contractor shall execute a sample fragment of wall-using materials, products, accessories and technology approved.

Sample runs where walls are required by the Engineer. During execution of the work sample walls will not destroy or damage.

(1) 1200 MATERIALS AND PRODUCTS

(1) 1210 Materials and primary products

(1) In 1211 these specifications are considered the main materials and the execution of the current masonry.

(1) 1211 materials and products can be classified according to their role as follows:

a) Base materials - bricks, blocks, tiles

b) Ancillary materials - mortars, fittings

c) Accessories - connecting parts, anchors, etc..



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(1) The 1212 quality of materials used in the preparation of mortar for masonry must meet the following standards:

- Hydrated Lime powder construction STAS 9201/80
- Lime paste STAS 146/70
- Clays for cement mortars STAS 4686/71
- Plaster Construction STAS 545/71
- Cement STAS 1500/77
- Glue mortar STAS 388/80
- Aggregates, natural sand quarry STAS 1667/76
- Water STAS 970/73
- Glue plasticizer Disan STAS 7514/70
- Accelerators for hardening STAS 2703-80
- C17-1978 retarder
- Waterproofing Additive STAS 8573-78

Mortar for masonry can be prepared with fly ash, according to the Technical Instructions C supplements published in Bulletin 17-78 nr.6/1980 Constructions.

(1) 1214 For specifications on masonry mortars, see Chapter (1) (2000)

(1) 1215 bricks, blocks and other masonry materials are solid, they will not crack, cracks and other defects that might affect the appearance and strength masonry.

-They will be clean and will not be allowed when dirty or oiled.

(1) 1216 Masonry Materials () (1211) that shows cracks, deformations, cracks or deviations from the dimensions and tolerances will be sorted and rejected with the approval of the Consultant.

(1) The 1220 delivery, storage, handling

(1) 1221 shall be provided for all types of masonry materials necessary quantities according to the schedule.

(1) 1222 will supply materials to masons for every sort of one and the same producer for the whole amount required.

(1) 1223 will procure materials for masonry and container handling calls them all the way mechanized transport to the jobsite.

(1) 1224 Handling will be cared for carefully to prevent degradation (chipping, breaking, cracking, etc).

(1) 1225 for masonry materials shall be stored ordered in stacks, piles, bins, containers in shady areas and protected.

(1) 1226 shall cover immediately after delivery at site so as to avoid exposure to the elements and ensure proper drying temperature condition during installation.

(1) 1227 Masonry materials shall be kept dry and protected from the action of rain, snow, sun.

(1) 1300 EXECUTION MASONRY

(1) The tolerances 1310

(1) 1311 manufacturing tolerances:

Wall surfaces, interior and exterior corners will execute plumb, level hose, level mount wood (boboboc), wood or metal angle 90 ° large wooden squares with a side of 70 cm, rack 1 -4 / 4 x 15 or 5 x 15, sandblasting or other work tools and devices that ensure proper quality masonry.

(1) The execution of masonry 1312 subject to the following maximum deviation:

1. The dimensions of the walls:

Width up to 10 cm: + / - 4mm;

15 cm-width: +4 or - 6mm;

-Width of 20 cm + 5 or - 7mm;

-Width of 25 cm + 6 or - 8mm;

-Width of 30 cm or more: + 10 or 10 mm;

2. The size of holes:

- Equal to less than 1 m: + / - 10 mm - equal to more than 1 m - 15 mm - 10mm;

3. The plan dimensions of the room:

- Less than 3 m side of + / - 15 mm;

- Side greater than 3 m + / - 20 mm;

4. The size of the joints:

- Vertical + 3 - 2 mm;

- Horizontal: 3, - 2 mm;

5. On flat surfaces:

- 8 mm up to 2.5 m in any direction:

6. At rectiliniaritatea edges:

- 4 mm to 2.5 m or 15 m along its entire length;

7. The verticality of edges and surfaces:



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- 6 mm or 10 mm per meter per floor;

8. Deviations from the horizontal asizelor:

- 3 mm per meter or 15 mm on the whole length of the wall.

(1) 1320 preparatory operations

(1) Inspection 1321:

They will inspect the areas and conditions to be performed masonry.

Do not start work before meeting satisfactory.

(1) 1322 before closing with a space masonry, remove debris and launder area to be closed.

(1) in 1323 before the start of execution, will prepare:

- Clearing the front of it;
- Preparing the area to place the scaffolding;
- Providing access routes for materials and people;
- Providing storage spaces in the front of masonry work and mortar;
- Work with materials supply front, tools, devices and equipment needed;
- Installation of scaffolding, guard rails;
- Commissioning of equipment and lifting equipment;
- Verification and proof mortar pump it;
- Tracing and verifying focusing masonry;
- Checking and correction of vertical and horizontal tying materials masonry structure;
- Positioning of doors and windows, spaleti other goals, and so on;
- Correction of deficiencies in structure;

(1) 1320 joints

- Horizontal joints thickness of 12 mm;
- Vertical joint thickness is 10 mm;
- Filling joints is less than - 1 - The 1.5 cm from the front wall;

(1) Anchors 1330

Anchoring masonry building structure (columns, diaphragms) is concrete with steel whiskers provided the structure and / or masonry, or clips fastened with bolts or drilled shot.

(1) The 1331 bond masonry structure is tightened by applying a cement mortar joint between masonry and structure completely fill with mortar.

(1) 1332 rebars in masonry are correctly positioned sc and joint width of mortar will cover appropriate reinforcing bars.

(1) 1340 Masonry mixed (complex)

- Usually posts armor is made enclosures that are mounted before the execution of masonry;
- Whiskers to touch the masonry joints will travel housings pillars and will anchor the edge needed;
- Horizontal masonry mortar point adjacent side pillar is left unfilled 2 inches;
- The concrete columns in layer height is approx. 1 m after prior wetting of masonry and timber: shoving is done manually with rods.
- Above and below the openings of masonry (first get the empty plates shall be provided horizontal, which will anchor the empty 500 mm:

(1) 1350 Other prescriptions

- Masonry begins at the corners;
 - Keep interruptions in the form of steps;
 - It is not permitted to interrupt Spreading mortar over the last layer of bricks or blocks;
- (1) Vertical Surfaces 1351 will brush during execution and will be kept in a sanitary condition.
- (1) The 1352 space between frames carpentry and masonry (when mounted above) will be well filled with mortar;

(1) 1353 Above holes where indicated in the plan, will provide concrete lintels slab (precast or cast, as detailed previously approved and properly reinforced

Specifications:

(1) 1353 embedded parts shall be provided in masonry requirements specified in the plans and specifications (Ghermele, dowels, embedded metal parts, etc..) Whose drawings have been approved in advance by engineer.

(1) 1360 The cleaning and protection work in

(1) The 1361 works will be executed as far as possible while maintaining an appropriate cleanliness, remove debris from the sides of the mortar before it hardens.

(1) 1362 masonry must be clean, no spots of mortar or grout leakage.



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(1) 1363 masonry surfaces shall be protected during construction works when not working on them. During rain, snow or interruption during lucrănilor, exposed walls will protect the top with polyethylene film.

(1c) 1370 Checks and fixes for reception lucrănilor

(1) Check the entry in 1371 tolerances (1) 1311 (01) 1312.

(1) Indicate how to make 1372 the workmanship required by these specifications.

(1) The 1373 is considered defects which must be remedied by restoring all or part of the work, Depending on how you decide consultant, the following:

- Failure to comply with specifications;
- Improper use of materials;
- Plotting and execution wronged axes;
- Execution of goals, dowels, ghermele tracks imbedded in positions other than those specified in the plans and drawings;

(1) The 1374 Regulations and verification methods:

- Observe work plans and specifications;
- Checks are made during and after completion of work on sectors and areas;
- Material shows doubts on quality and compliance with prescribed quality classes are laboratory will be subject to verification in accordance with prescriptions;
- Checking the wall thickness of the walls is made between two leveling unplastered 1 m placed on girls walls;
- Checks the correct weaving masonry reinforcement, connection corners, anchorages, openings, parts are embedded in the execution of visual:
- Checking the upper surface flatness asizelor embodiment is made with spirit level and 2 m long;
- Checking verticality surfaces and edges is done plumb embodiment bobobocul and 2 m;
- Check the size of the compartments, the openings for doors, windows, niches, etc., Is done by direct measurements with meter and roulette.

(1) 1400 MEASUREMENTS AND SETTLEMENT

(1) 1401 Gauges

Lucrări quantities executed shall be measured at the registered unit of quantities.

(01) 1402 Settlement

Do not settle additional mortar, accessories and materials for sealing, handling, scaffolding, scaffolding, etc.. and any other operations related to the actual execution of masonry.

Specification

(1) 2000 MASONRY MORTAR

(1) 2100 GENERAL

(1) 2110 Subject specification

(1) 2111 This chapter contains specifications for the composition and preparation of mortar for masonry concrete blocks.

(1) Reference standards in 2120

(1) 2121 Where there contraindications between these recommendations and the standards specifications listed below, this specification shall prevail.

(1) 2122 Reference standards:

1. STAS 388-68 Portland cement.
2. STAS 790-73 Water for mortar and concrete.
3. STAS 3910/1-76 building limes
4. STAS 9201-78 hydrated lime powder construction.
5. C 17-18 - Mortars for masonry and plastering.
6. STAS 1667-76 dense natural aggregates for mortars.
7. STAS 2634-70 Test methods for mortars.
8. STAS 1030-70 regular mortar for masonry.

(1) 2130 Samples and Testing

(1) Testing of mortars 2131 will be on each type in accordance with STAS 2634-70, by sampling and testing by a specialized laboratory., At the expense of the contractor, as follows:

- Compressive strength at 28 days;
- Consistency and density of fresh mortar: a test every trade.

(1) 2132 Acceptance conditions the reception of mortar are:

- Compressive strength at 28 days;
- Consistency of fresh mortar;



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- Density of fresh mortar.

They must meet STAS 2634-70.

(1) The 2133 test method and laboratory tests will be subject to the approval of the Consultant.

(1) 2134 It will also test for cement mortar used on 5 kg of each type of cement proposed to be used in the works.

(1) The 2135 will also provide manufacturer's certification that cement and lime delivered to the site shall be as specified in the standards.

(1) 2136 mortar color samples

If the specs require adding color pigments mixed mortar will provide samples of each mortar color to be approved by the architect representative, according to his demands. It will provide the number of samples necessary for this purpose.

(1) 2200 MATERIALS AND PRODUCTS

(1) 2210 Materials

(1) The 2211 Portland cement - cement shall be according to STAS 1500/77 and 380/88 without any air bubbles, the natural color or white, no constituents that stain.

(1) Hydrated Lime 2212 - STAS 920/80.

(1) 2213 Var paste STAS 146/70.

The apparent density of the lime slurry to consistency of 12 cm will be from about 1300 kg/m³.

(1) 2214 aggregates shall be in accordance with STAS 4686/71, natural sand quarry or river. Dredged sand can be partially replaced by crushing.

Natural sand content will be at least 50%.

(1) Water 2215, according to STAS 970/73 shall be clean, potable, uncontaminated oil in harmful quantities, free of soluble salts, acids, organic impurities and other foreign bodies.

Do not use sea water, without respect C 140/87, Annex VII-3.

(1) The 2220 Delivery, storage, handling

(1) 2221 Units:

1. Aggregates shall be transported and stored according to their source and shorts. Aggregates shall be handled so as to avoid loss of separation fineness or ground contamination or other foreign material.

2. If aggregates are separated or mix different varieties, they will again sieved.

3. Do not use aggregates from different sources alternative or special smoothness. Aggregates to be mixed only to obtain new fine gradations.

4. Not transfer panza transport aggregates storage directly at the site if the content is such that dc humidity can affect the accuracy of the concrete mix, in this case, the aggregates shall be stored separately until the moisture disappears.

(1) 2222 silozuni aggregates shall be stored in chests or platforms with hard surfaces clean. In preparing aggregates storage will be taken to prevent foreign material from entering. Aggregates different types and measures should be stored separately. Before using aggregates shall be allowed to dry for 12 hours

(1) Cement 2223:

1. Cement will be delivered at dc mixing original bags sealed, bearing the label have signed weight, manufacturer names, brand and type. Cement will be stored in enclosed buildings, protected from moisture.

2. There will be no supply packages differ by more than 1% from the specified weight.

3. If approved consultant cement delivered in bulk shall ensure cement storage silos and protect it from moisture. Do not mix brands and types of cement silos.

4. Do not use different varieties of cement or the same sort, but from different sources without approval.

(1) 2224 cement, lime and other dusty materials shall be delivered in bags or other suitable containers full packaging approved, which will have a visible label that were part manufacturer's name and lot.

(1) 2225 materials will be delivered and handled so as to avoid penetration of foreign materials and damage by water or breaking contact packaging. Materials will be delivered in time to allow for inspection and testing.

(1) 2226 materials that can damage the packaging and will be stored in their original containers with manufacturer's name and label so as to avoid damage, while allowing their identification.

(1) 2227 perishable materials will be protected and stored in sealed structures on supports about 30 cm taller than the surrounding elements. For short periods of time, the cement can be stored on raised platforms and will be covered with waterproof tarpaulins.

(1) 2228 will be removed from the site which has hardened or unused cement has set.

(1) 2230 Mortar mixes

(1) 2231 Generality

1. Construction materials will be measured so that the proportions of materials specified mortar mix can be strictly controlled and maintained during the progress of works. 2. Unless otherwise specified, the proportions will be determined according to () 1211 () 1213.

3 In these specifications, the weight of the m³ of each material used as an ingredient in mortar is considered as follows:



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<u>Material</u>	<u>weight per cubic meter</u>
Portland cement	1 506 kg
Lime paste (consistent 12 cm)	1 300 kg
Natural sand 0-7 mm humidity 2%	1 350 kg

(1) 2240 Preparation of mortars

(1) 2241 mortar mix well and only in quantities that will be used immediately. The mortar will use the maximum amount of water that ensure satisfactory workability capacity, but will avoid supersaturated water mixture. Mortar will be put in operation within 2 hours after cooking. In this time adding water to mortar permitted to offset the amount of water evaporated, but this is allowed only in containers not place masonry mortar preparation. The mortar is not used during the set will be removed.

(1) Unless otherwise approved in 2242 for small batches preparation will be in mechanical mixer drum, the amount of water can be controlled with precision and uniformity. Stir for at least 5 minutes: two minutes for the mixture of dry and continue mixing for 3 minutes after adding water. Volume mixing of each batch shall not exceed the capacity specified by the manufacturer of the mixer. The drum is emptied completely before adding the next batch.

(1) 2243 mortar used for grouting will be dry enough to have plastic properties that allow its use in sealing joints.

(1) 2250 Transport mortar - it will make the appropriate equipment.

The maximum duration of transport will thus be appreciated that transport and placing of mortar to do:

- Within 10 hours of preparation, for lime mortars;
- To a maximum of 1 hour of preparation for cement mortars and cement-lime, without retarder;
- For up to 16 hours for mortars with întârziator outlet.

(1) The 2400 MEASUREMENT AND SETTLEMENT

For the works in this section are not quantitative settlement separately but are included in the work of masonry, under Articles of quantities.

SPECIFICATION

PLASTER-BOARD DIVISION WALLS

Tender documentation will be accompanied by technical approval for all items bid.

Technical approval according to law no. 10/1995 - the construction quality is the document that establishes the suitability of products, processes and equipment to be used to build buildings.

Technical approval is granted by the Commission for Technical Structures, Ministry of Public Works and Planning, approval based on documentation prepared by accredited for this purpose units, as well as technical files provided by applicants.

Drywall partitions offer a high level of protection for sound and heat that would otherwise be required to obtain classroom wall, massive and heavy.

These walls are acoustically small building, modulating, through an elastic layer which attenuates sound energy incident.

Heat is lost through windows, exterior walls, roof, basement should be replaced. Partitions and drywall ceilings have excellent insulating properties as open space interior contain insulating material,

Wall surface adapts fully to room temperature and therefore is immediately after heating warm and comfortable, especially termoplacile obtained by plating polystyrene or mineral fiber lends itself to easy application. The basic raw material is gypsum plasterboard. Specialized mixers made from gypsum powder a homogeneous fluid paste of gypsum, which is evenly distributed through the device, the sheet of cardboard on the table moves through translation training. Upon layer of gypsum paste obtained on training table apply another sheet of cardboard perfect thus complete clothing of gypsum cardboard core. Gypsum-cardboard still soft – browse for reinforcement, a conveyor belt to the sawing sawing boards. Then they are taken to the dryer, where excess water is removed.

Applications: dry floors, walls, ceilings, fire protection.

Defining walls. Plasterboard walls with single or double frame interior walls are non-bearing partitions are mounted on site. Functions physical strength and frame constructions result from collaboration profiles steel sheet cladding of drywall boards and insulating layers, pictured needed. Additionally, the walls can support and loading objects hanging.

Application. Frame walls can be used in interior design for civil buildings (including wet rooms). You can not use technological spaces humid outdoor livestock buildings in areas with high temperatures above 50 ° C. Achieving permanent walls - installation - operation.

- Measuring and plotting the floor load bearing walls axis, a self-supporting frameworks, doors and other openings
- The same operation on the walls
- The same operation on the ceilings
- Are attached to the support surface contour profiles
- Before mounting profiles for contour, they stick the sealing tape or sealing is achieved with other methods



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- Resistance to uneven floors high will be equalized before mounting profiles for the above
- Mounted vertical profiles contour profiles
- Start installation of tiles on one side of the wall
- The first gypsum board is partially skeleton poses and fixed with vial bubble
- Still on frame snaps with quick mounting screws avoiding tension plate
- Mounted in the same way these boards
- Distance from the skeleton to support the additions of the bulkhead exceed about 52 cm, while in case of the acoustic distance must be less than 50 cm.
- For double plating, Second Place will be screwed by first putting free joints offset through mounting profiles.
- If fitted frames is necessary to install extra profit on both sides of these frames, these profiles are turning resistance on the one hand, by construction of the wall on the other side by the wall height by the size and weight leaf.
- Profiles door-mounted full height of the wall and very tight sets upper and lower contour profile by entering one another, vertical profiles must support a weight of 25 kg of leaf at a height of up to 2.80 m for premises and leaf weights up to 50 kg;
- In the case of higher height of the walls, the stiffening profiles are used at least 2 mm.
- Filling Plasterboard - cardboard can start eating only after all significant stresses such as, for example, the action of moisture or temperature. It involves mounting the enclosure temperature and the construction of at least 5 ° C, humidity of the air inflated (compared to subsequent conditions of use) in spacluirii time and fast drying or heating for drying can lead the formation of cracks.
- Pouring hot asphalt screeds should be performed before filling works.
- Joints gypsum boards have, typically, half round edges and spacluiesc NO EXCESS shredded cover joints.
- The placing of the cover strip from paper or mat joints of Fiberglass is possible and leveling fillers for joints.
- Where there need to be polished Filling must avoid roughness on cardboard (not to scratch cardboard).
- Where connections to other construction elements will be introduced separation bands.
- Support Expansion joints must be carried through the complete construction of the wall with skeleton.
- For special requirements on the surface (eg with gloss varnishing or bright stripes) is indispensable Filling all surfaces.

Surface treatment

- Plaster boards and fire protection boards are compatible with almost all of the usual coating the rooms, such as: dispersion paints and varnishes, implementation of wallpapers, plates, sheets and other textile similar.
- It is not advisable to use dyes or lime silicate.
- For the subsequent application of additional layers of plaster, minerals or artificial resins are necessary preliminary treatments such as application of bridges bonding or application of primers.

WALL GK in metal

General:

- Tasks are taken from plans, to the extent that the work is executed in the corresponding plans. If such plans are not prepared, the task has to be determined by measurement.
- Dimensions and weights are rounded to two decimal places, unless something else prevuzut specifications.
- In the execution of the tasks must be built dimensions (eg, size of building "In Red").

Colturior walls-processing not paid separately.

Specifications:

Wall mounting frame as walls non load bearing construction of C and U profiles galvanized steel sheet, plate thickness - 0.6 mm and punching the putib for electrical home appliances. Inferior and lateral connections are made only using an intermediate layer, very secure. Superior connection to ceilings of any type interlayer very secure. Insulation glued supoti single layer of mineral fibers sealed. The unit price includes all facilities corners with protective materials and all corners and edges Alux-resistant grouting racordurior elastic.



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The execution wall that will be used to mount installations where sinks, toilet bowls and urinals suspended, except manufacturers' universal support. Should take into account the mounting elements recommended by manufacturer for bathrooms and showers.

To isolate the noise of flowing water piping system must be separated from the wall by a layer of rubber, felt or something and have lined pipes. Cold water pipes should be well wrapped for insulation against condensation. Insulated copper pipes should not be in contact with the wall galvanized items.

Holes for outlets and junction boxes must be carried corspunzator plans for electrical installations in accordance with the directions or electrician.

GK Framework Walls, 1 x 12.5, Min 40, d = 100mm

Wall consisting of metal frames:

Simple construction of frame-profile galvanized CW 75/50/06 mm Wheelbase 62.5 cm and profiles UW 75/40/06 mm installation including related connections strongly enhanced with dowel pins and through the use of insulating tape / putty.

-Intermediate space filled with mineral fiber insulating material (material class A 1, weight 40 kg / cm) insulation must be applied so that there is no danger of slipping.

-Padding on each side with plates 1 x 12.5 mm thick;

- Strengthening the bulonuri fast execution; tile joints and screw heads must be covered with putty to form an insulating layer.

Insulation: 40 mm/40 kg / m

Sheathing boards: 1 x 12.5 mm GKF on each side

Wall weight 26 kg / m²

Wall thickness: 100 mm

Traverse cross frame for plasterboard walls, added:

Traverse transversal sections U and C in the framework of plasterboard walls as the building for wardrobes, furniture and healthcare.

Sleepers width: 150 mm

SPECIFICATION

PLASTERS

(3) PLASTERING

1100 GENERAL

(3) 1110 Specification

This chapter contains specifications for interior plastering works

(3) 1111 Classification of plaster

Interior Renderings are classified by:

1. nature of the surface on which it is applied:

- brick
- Concrete
- autoclaved aerated concrete
- Stone
- strips or cane
- RABIT

2. binder used:

- not withstand water and moisture
- moisture resistant

3. the processing of facial Videos:

- common: rough trowel, trowel smooth, polish, plastered
- Special waterproof plastering, waterproofing
- decorative calcio-Vecchio, artificial marble

(3) 1120 Basic Concept

Plaster applied to interior support brick or brick concrete (diaphragms, pillars, ceilings)

From the point of view of face processing seen in this chapter are treated renders ordinary and special decorations.

(3) 1130 Reference Standards and regulations

(3) 1131 Where there is conflict between the provisions of these specifications and recommendations contained in the standards and normative documents listed below, this specification shall prevail.

(3) The 1132 Standards:

1. STAS 146-80 - Lime for Building



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2. SR 388-1995 - hydraulic binder. Portland Cement
3. STAS 545/1-80 - Plaster Construction
4. STAS 790-84 - Water for Concrete
5. STAS 1030-85 - common for masonry mortars and plaster
6. STAS 1500-78 - hydraulic binder. Cements with additives
7. STAS 1667-76 - Heavy natural aggregates for concrete and mortars with mineral binders
8. STAS 2073-75 - calcium chloride technique
9. STAS 2542-82 - braided wire. Nets with hexagonal and trapezoidal sights
10. STAS 2634-80 - mortar for masonry and plaster usual. Test methods
11. STAS 3910/1-76 - Var. Rules for quality
12. STAS 4686-71 - Alumina cement mortar clay
13. STAS 5296-77 - Cements. Rapid Determination of cement brand
14. STAS 7055-87 - white Portland cement
15. STAS 7058-91 - polyvinyl acetate. Aqueous dispersion
16. SR EN 196-7/1995 - Cement. Rules for quality
17. STAS 8626-70 - Technical calcium lignosulfonate
18. STAS 8819-88 - Thermal power plant ash used as filler in concrete and mortar
19. STAS 9201-80 - hydrated lime powder for construction.

(3) Regulations 1133:

1. C 18-83 - Standard for wet performance technologies
2. C 56-85 - Standard for quality checking and acceptance of construction and equipment, the instructions for checking the quality and acceptance of works hidden and amendments thereto.

(3) 1140 Samples and testing

(3) 1141-sample panel

1. Contractor shall perform inside the construction site at the request of the Consultant, a wall panel size of at least 2.00 mx 1.00 m, finished with plaster to all variants proposed by the project, materials, compositions, method of face processing seen, colors and technology specified in the project.
2. Panel made such Consultant will submit for approval and after obtaining approval, it will become board-sample, comparison and verification element similar works mentioned throughout the paper.
3. Panel-sample will be destroyed and no damage until the completion of all work.
4. Approval means approval renders all materials, additives and technologies used by the contractor for execution of works stipulated in the project implementation.
5. Throughout the execution of the works will not only use approved materials and technologies.

(3) 1200 MATERIALS AND PRODUCTS

(3) 1210 Materials

(3) Cement 1211 - According to STAS 1500-78 - will use Portland cement with additives 35N/mmp mark, symbol Pa 35 30N/mmp cement brand symbol metallurgical furnace cement brand M30 or 25 N / mm² symbol F25, as indicated the project.

(3) fly ash in 1212 - according to STAS 8819-88 - will be used as filler or hydraulic cement together with plasticizer added as indicated in the project.

(3) The Sand 1213 - according to STAS 1667-76 - will be used as indicated in the project, natural river sand (round shape) or career (lumpy) with grain 0 ÷ 3 mm or 0 ÷ 7 mm, which should be clean, stable rocks come from (unalterable in air, water or frost), contain granules of different sizes do not come from feldspathic rocks or system.

(3) The 1214 Var Construction - according to STAS 146-80 will use the lime slurry type I min.2 pulp yield, 2 l / kg or type II yield 1.6 min / kg as indicated in the project.

(3) Hydrated Lime 1215 - according to STAS 9201-80 - will use lime slurry type I with apparent density max. 680 g / dmc apparent density or type II max.700 g / dmc as described in the project.

(3) plaster 1216 - STAS 545/1-80 - will use plaster type A or type B as described in the project.

(3) The 1217 Clay - according to STAS 4686-71 - will be used as a slurry having a consistency of 13-15 cm cone determine plaster standard and optimal content of 15-25%.

(3) 1218 Water - STAS 790-84 - drinking water will be clean, free content of salts, acids, fats. Do not use water from other sources (lakes, rivers, springs, etc..) Without first being subjected to analysis.

(3) The 1219 Additions to adjust setting time, plasticizers. Consultant shall be used as approved.

- REPLAST - retarder for cement mortar, cement-lime or similar.
- Calcium chloride - accelerators as solution with concentration 10% or 20% for manual preparation mechanized preparation of mortars.
- L.S.C. (Lignosulfatul calcium) - according to STAS 8626-70 - added plasticizer.



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- DISAN - according to STAS 8625-90 - mixed plasticizer dispersed and coach air (use will be made according to Standard C140-86, Annex V.3.1.)
- (3) 1220 dyes and other additives
 - Dyes mineral - 6632/2/3-91 STAS, STAS 6632/4-83, STAS 9537-85, STAS 2488/86; STAS 2539-79, must not react chemically with water, binders or aggregates from the mortar to spread its weight evenly, do not change color and does not fade in sunlight, have high power dye, do not decrease mechanical strength of the mortar and not be toxic.
 - polyvinyl acetate (glue) - according to STAS 7058-91 - Use varieties DP 25 or DP 50 for adhesive mortars.
 - Apastop P - added waterproof - (use will be subject to Standard C 140-86).
- (3) in 1221 to support wire mesh galvanized coatings on RABIT: network of reinforcing steel rods round 6 ÷ 10 mm square mesh of 15 to 25 cm.
- (3) 1222 netting hexagonal and trapezoidal - according to STAS 2542-82 - RABIT mesh steel wire diameter 0.4 to 1.8 mm.
- (3) 1223 steel round wire monofilament - STAS 889-89, black annealed wire and galvanized steel 0.5 to about 3.00 mm thick reed or RABIT net for catching network of reinforcing steel rods of resistance element.
- (3) The 1224 softwood battens SR 1294-91 - with dimensions of 1.8 x 3.8 cm or 2.8 x 4.8 cm rectangular or trapezoidal be beaten with spacing of 2 ... 4 cm inclined at 45 degrees on the walls and ceiling, perpendicular to the joists.
- (3) 1 230 Mixes
- (3) 1231 For general recommendations refer to the specifications in chapter (3) 2300.
- (3) 1232 mortar for plastering brand as M 4-T (3) in 2314.
- (3) 1233 lime-cement mortar for plastering mark M 10-T according to (3) in 2315.
- (3) 1234 lime-cement mortar for plastering brand M25-T as (3) in 2316.
- (3) 1235 cement-lime mortar for plastering mark M 50-T according to (3) in 2317.
- (3) 1236 cement mortar for plastering brand M 100-T according to (3) in 2318.
- (3) 1237 To see the mortars will be specified in chapter (3) 2300.
- (3) 1238 will be volumetric dosing with tolerances of 2% to 3% binder and aggregate as specified in (3) in 2313.
- (3) 1240 Delivery, storage, handling
- (3) Aggregates 1241
 - 1. Aggregates shall be handled so as to avoid their separation, loss or contamination fineness earth or other foreign material.
 - 2. If separate units or if different varieties are mixed, they will again be sieved before use.
 - 3. Do not use aggregates from different sources alternative or special smoothness. Aggregates to be mixed only to obtain new fine gradations.
 - 4. Aggregates shall not be transferred from the transport vehicle directly at the storage site, if the humidity is such that it can affect the accuracy of the mortar mixture, in this case aggregates shall be stored separately until the moisture disappears.
- (3) 1242 aggregates shall be stored in silos, bins or platforms with hard surfaces clean. In preparing aggregates storage will be taken to prevent foreign material from entering. Aggregates of different sizes and types to be stored separately. Before use, the aggregates shall be allowed to dry for 12 hours.
- (3) Cement 1243
 - 1. Cement shall be delivered to the mixing in original bags sealed, bearing the label that signed up weight, manufacturer names, brand and type. Cement will be stored in enclosed storage, away from moisture.
 - 2. Do not accept packages whose weight differ by more than 1% over the specified weight.
 - 3. If the advisor approves bulk cement delivery, the Contractor shall provide bins for storage and protection of the moisture. Do not mix brands and types of cement in silos.
 - 4. Do not use different varieties of cement or the same sort, but from different sources, without the approval of the Consultant.
- (3) 1244 cement, lime and other materials will be delivered in bags or other suitable containers full packaging approved by the Consultant, who will have a visible label that were part manufacturer's name and lot.
- (3) 1245 materials will be delivered and handled so as to avoid penetration of foreign materials and damage by water or breakage contract packaging. Materials will be delivered in time to allow for inspection and testing.
- (3) 1246 materials that 5 damage will be stored in their original packaging so as to avoid damaging them, they will label maker that will enable their identification.
- (3) 1247 perishable materials will be protected and stored in sealed structures on substrates with approximately 0.30 m taller than the surrounding elements. For short periods of time, the cement will be stored on raised platforms and will be covered with waterproof tarpaulins.
- (3) 1248 unused cement that hardened or has set will be removed from the site.
- (3) 1300 PLASTER EXECUTION
- (3) 1310 Preparatory operations
- (3) 1311 At the start of the works inside, these works will be completed:
 - 1. Masonry partitions must be finished and walls prefabricated wedge is assured, any break and penetrations for pipeline crossings must be made and repaired.
 - 2. Electrical, water, central heating forecast to remain buried under the plaster will be fully implemented and tested.



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3. RABIT nets will be installed in areas specified in the project.
4. Reed sticks to walls and ceilings will be beaten.
5. The surfaces of plaster, must meet the following conditions:
 - a) be rigid so that the plaster will not crack or be coscoveasca.
 - b) be cleaned and roughened to ensure a good adrenta mortar.
 - c) be dried mortar joints shall be in masonry and concrete surfaces are dry, because moisture is not strengthened their joints masonry and concrete surfaces are dry, because moisture does not adversely affect their adhesion coatings .
 - d) be cleaned of dust, dirt, traces of concrete or mortar, grease spots or bitumen, etc..
 - e) brick masonry joints or substitutes to be cleaned about 3-5mm deep.
 - f) be recorded if the maximum flatness deviation allowed, following the larger local projections to be carved and inlets greater than 4.0 cm to be covered with netting nailed RABIT in masonry joints.
 - g) portions of wood or metal that appear on plastered surfaces (ghermele, beams, lintels, etc..) will be covered with roofing felt and RABIT net.
 - h) On the run from autoclaved aerated concrete walls or concrete macro in rooms with high humidity (over 60%) will be applied before plastering plastering surface, a waterproof layer - vapor barrier, according to the project.
 - i) plastering can be executed only after finishing the roof or the terrace, only after executing its waterproofing and leak proof flooding, storm water drainage is provided.

(3) 1320 Drawing surfaces

(3) 1321 Mapping is mandatory finished plaster (the visible layer that is processed) to achieve flat surfaces, vertical, horizontal, angled edges, concave, etc.. with a thickness as low and in accordance with the guidelines of the project.

(3) 1322 Drawing walls - it will take the scoring stage, applying the plaster surface of witnesses inventory in a way that corresponds to the front of their face primer-level, where concrete surfaces inventory controls witnesses will be replaced with mortar, mortar flattened, leveled with plaster thickness to be applied. In Phase II will proceed to fix parts operation that consists in laying of metal parts inventory from planted witnesses on the stand. Levelling mortar screed will be binding metal inventory.

(3) 1323 Drawing ceilings - will be using witnesses and guides strips of mortar.

Scoring and stakeout operations carried out in sequence starting with the application of a central mortar mortar thickness of 1-1.5 cm and containing the application of two other witnesses to the ends of long screed spirit level placed horizontally parallel to the long side of the room, repeating the operations guide strips are made on both directions, with witnesses and screed mortar filling the space between it and the ceiling.

(3) 1324 If walls and ceilings made of strips of cane mapping is done by using special metal parts, inventory.

(3) 1330 Types of interior plaster

(3) The 1331 gross ordinary plasters

It will simply execute without special care, to obtain flat surfaces, giving attention but coverage of all areas of plastering mortar and grout thickness.

Rough plaster consists of a layer of mortar 1-1.5 cm thick, applied to the substrate by mechanical means or manually. Consistency of mortar shall be of 10-12 cm and 9-11 cm mechanized application for manual application.

Mortar will be applied lime mortar brand M 4-T (3) in 2314 in dry and damp locations will apply to a brand cement mortar M10-T (3) in 2315. Before you start applying mortar, plastered surfaces dry will sprinkle water.

Apply mortar on the walls is done bottom-up continuous layer nivelându the then trowel or long slum. After hardening least, it will be paved with trowel.

(3) 1332 Plastering trowel

Plastering operation will be executed only after proper preparation of surfaces for plastering according to (3) in 1310. After plotting and execution strip width (pillars or horizontal strips) shall be applied successively tightened layer, leveling layer of primer and visible layer will float.

(3) 1333 Plastering ordinary trowel on brick masonry.

Plastering operation will start after 2-3 weeks elapsed from execution after proper preparation of masonry and plaster surfaces as (3) 1310

(3) 1334 Plastering ordinary trowel on brick masonry

Plastering operation will be executed only after proper preparation of surfaces for plastering according to (3) in 1310. Ragged edges, indenture, goals dampened with water and pieces of brick repair and lime-cement mortar and glue 1:2:6 by volume. Masonry joints 2-3 inches and deepen the wet plaster surface water.

(3) 1335 Plastering ordinary trowel, concrete and reinforced concrete

Plastering operation will be executed after proper preparation of surfaces for plastering according to (3) in 1310. The surface prepared and fired will apply sprite layer to be smooth and then Tinci layer which in turn will be applied directly on top of the sprit and will be smoothed and polished. Surface finishing concrete formwork made of plywood inventory metla or bachelitizat (tego) can use plaster or paint pasta special (ex.GIPAC).

(3) 1336 Plastering polish



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Since it is used for plastering rooms with high humidity (over 60%), use of cement mortar brand for primer and M 100T visible layer will be processed with grout, smooth with steel trowel. Implementation operation will begin after execution of operations prepared in accordance with (3) 1310 and plotting (3) 1320 shotcretes apply. Over sprit will apply cement mortar layer of soil, and after air drying it (not to harden completely) will apply visible layer of grout-sand (1:1 dosing, consistent 11 to 13 cm).

Priming is made with steel trowel, they will make and smoothing. Surface thus obtained will moisten and rub with steel trowel, adding cement powder until a smooth and glossy (visible layer).

For areas where the surface is masonry, the primer should be applied without sprit.

For areas where the surface is concrete walls (silos), visible layer (0.5 cm thick) will be applied directly to concrete without longer apply primer.

Polish surfaces will protect the wind and sun and will keep moist by spraying with water, at least 7 (seven) days.

(3) 1337 Plaster

Putty will be provided as substrates to achieve high quality finishes (eg paint with oil paint on walls and ceilings).

Type of plaster that will be used (lime, lime plaster, plaster or gypsum-lime) will be determined depending on the substrate under the Project as follows:

- lime putty: any primer fresh lime mortar in composition (not applied directly to concrete surfaces)
- lime putty plaster: any dry mortar primer
- plaster: any dry mortar primer
- -lime plaster: any mortar lime cement primer

Plaster layer is executed by stretching and smoothing the plaster paste with steel on surfaces max.1 m order to achieve smooth paste before hardening.

Plaster thickness $1 \div 3$ mm is obtained by two to 3 coats and leveling successive. Ensure plaster surface flatness using metal screed.

Obtained surface must be perfectly smooth to the touch, any rough edges will be cleaned and smoothed with fine glass paper.

For concrete surfaces smooth results after stripping, plastering plastering can be done through the thick GIPAC.

For wall surfaces executed in blocks or brick, with 2-3 mm thin joints, apply smoothing plaster based glue and sand composition having 1:2:0,5 (glue DP 25; sandy 0 2 mm, water) by volume.

Apply smoothing plaster is made with skim float in layers of 1 mm thickness or using manual or electric machine painted or plastered gun.

Smoothing will be done by hand trowel plaster (skim steel).

(3) 1338 Special Coatings (low permeability)

Renderings will run low permeability usually visible face polish. Prepare cement mortar Pa 35 (or M30 or F25 metallurgical cements) siliceous sands, clean, max. 10% part fine lime added in a proportion of 5-10% by weight of cement and water.

Plastered surface must be properly prepared according to (3) in 1310.

Applying plaster layers will be made as follows:

- Sprit cement-sand mortar (dose 1: 1 and consistent 13-15 cm) sand with grain size between 0-1 mm.
- Primer Brands in plaster project will apply 3-4 layers of thickness 0.5-0.7 cm will be rubbed alternating layers (vertical-horizontal) and applied only after the previous coat has aired .
- The visible layer of grout-sand (1:1 dosing and consistent 11 to 13 cm) should be applied only after the primer moisture ("pulled") and smoothing application will be made using steel trowel.
- Backfilling grout will be made only if indicated in the project.

During entry, the plaster will be protected from the sun and wind and be kept moist for at least seven (7) days by spraying with water.

If the project requires the plaster to have a permeability as low cement mortar will be prepared with the addition of "apastop P", the results will be better if the water pressure infiltration shall not exceed 2 bar (20 m).

Mortar prepared with addition of "apastop P" will be put into operation within 45 minutes of preparation.

Apply mortar to "apastop P" will be made concrete by hand and only reached 50% of branded vertical surfaces first and then horizontal.

Will apply 4 layers of plaster, of which layers 2 and 3, with the addition of "apastop P".

(3) 1339 Plastering plastering

The mortar is prepared in a particular plant mechanical and pneumatic application will be made. Mortars used to prepare cement and sand, the dosages according to the norm

C 130-78.

Use the Portland-max rule. 15% additives, for aggressive environments, the quality of the cement will be indicated in the project.

The sand will be natural for the Crushed prior attempts will be made.

Determining the amount of aggregate required for a m3 of concrete will make depending on cement content adopted, considering a bulk density of about 2100 kg/m3 and water volume of about 200 liters.



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The use of additives, where the case 5 be, shall be indicated in the project.

Gunite surface should be cleaned by sandblasting, then air jet removes dust, washed with water and again apply a jet of compressed air if the project provides support surface is buciardează or sprituiește.

Spraying operation will begin only after removing the surface film of water and air drying.

Spraying will run in at least two layers: the first layer of primer will be composed of cement-sand (1:1 dose) with grain size 0-1 mm

Shotcrete shall be applied by circular movements forward from the bottom up.

If the project requires a thicker layer of 3 cm, the mortar should be applied in layers. Thickness under the project will be achieved through the use of rigid controls.

Usually not to disturb the structure, not plaster plastering is finished. If the project requires their completion, it will apply a layer of fluid grout and

after about 30 minutes it will finish with a metal straightedge.

(3) 1340 Shotcretes application (primer coat)

(3) 1341 sprit mortar layer should be fluid (consistent with standard cone to be between 1:1 and 1:3 cm), contain small amounts of sand to be the same type of soil mortar and ensure very good adhesion to the substrate.

(3) 1342 Before applying grout to sprit, plastered surface will be sprayed with water.

(3) The thickness of the sprit in 1343 will be about 1-2 mm it shall be continuous and shall cover the entire surface.

Surface layer sprit will be rough to ensure a good bond with mortar primer.

(3) Depending on the substrate 1344, the sprit layer will use these types of mortar:

- Concrete or masonry surfaces of stone: grout (cement-water a small amount of sand)

- Masonry b.c.a. (Blocks, plates and strips) cement-lime-sand (up to 1:0,25:3)

- Strips of cane - fat-plaster mortar (cement)

- Masonry: no need coverage tightened layer

- Surfaces covered with mesh RABIT: spritu1 that applies is called "HRMS" and will be the type of lime mortar or lime-cement plaster, consistent with standard cone measured 5-6 cm (mortar strongly) that will so manually apply mortar between good between RABIT mesh net, to cover all and have a rough surface as a primer to ensure the best possible adhesion.

(3) The 1345 application will be either mechanical shotcretes plastering machine in a single layer and a single pass by moving the spray necessarily circular movements from the bottom up in horizontal rows entire Casting sunrafata between strip width (landmarks) or manually by spraying with a short maturity, so that the obtained thickness up to 3 mm.

(3) 1350 Priming

(3) The 1351 primer will have maximum thickness of 1.5 cm, will cover all irregularities in the surface and create the support that will be applied to the visible layer of plaster (tinciul).

(3) 1352 mortars for primer will have a consistently lower respectively when applied 9-12 cm or 7-8 cm mechanical means for their application by manual.

(3) 1353 Application mortar primer can be tightened only after strengthening mortar, but not before 24 hours after its application.

(3) If suprafetelar 1354 concrete which have cast regular shapes without major bumps and no large deviations from vertical or horizontal, will give the primer, applying visible layer directly on top of the sprit paved and fenced.

(3) If masonry brick 1355 (which does not apply Sprite) plastered surfaces shall be sprinkled with water (when they are dry) before proceeding to the application of primer, because masonry does not absorb water necessary strengthening mortar.

(3) The 1356 application will be priming mortar plastering machine mechanically, in a single layer on each crossing between Gaza length, from bottom to top, the final thickness of the plaster will get through several Trecena, after air drying previously applied layer.

(3) If the 1357 mortar primer application will be manually, it will be applied from the bottom up, in one or two rounds, by throwing it on the surface of the plaster. Will lie between Gaza mortar directions, horizontal or vertical (pillars) in a uniform layer and the thickness as indicated by landmarks.

(3) 1358 Regardless of the application, after the primer has reached the thickness indicated in the project's grading will be done manually.

(3) If after leveling primer 1359 is too smooth to be notched trowel depth of 2-3 mm.

(3) 1360 will pay particular attention to corners operations achievement entering or alighting (doors, windows, niches, spaleti, junctions of walls etc.) For their execution will be set at the turn dreptane or spirit level, because they be made straight and vertical, or horizontal.

(3) The 1361 special attention will be paid to the execution of the connections between the ceiling and walls that will be right around the corner (corner alive) or with a simple round soffit, as indicated in the project.

(3) 1370 Application tinciului (visible layer)

(3) 1371 will be visible thickness of 1-4 mm, ranging as unmează:

- Plastering trowel 2-4 mm

- Plaster polish: 1-3 mm



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- Special plasters (waterproof): 2-3 mm

- Renders b.c.a.: 1-3 mm.

(3) 1372 Tinci will prepare mortar sand granules with a maximum diameter of 1 mm and will have consistency of 12-14 cm.

(3) 1373 Tinciul be applied only after the primer is dry from the ceiling and continue with walls.

(3) If the primer is completely dry in 1374 (long passed from the application of) before tinciului application, it will be splashed with water.

(3) The 1375 application will be tinciului small areas will stretch straight edge trowel immediately in regular surfaces and, after air drying, the layer will be applied so smooth with wooden trowel, sprinkled with water to a supnafete obtinenea as smooth and uniform.

(3) The allowable tolerances 1380

(3) 1381 to rough plaster

1. Swelling, pinching (Shooting lime), crevices, cracks up one of up to 3 cm² each square.

2. Coarse (up to max. 3 mm) deep scratches formed blisters and trowel to layer coverage: up to 2 m².

(3) The 1382 La plastering trowel:

1. Surface irregularities in checking dreptanul 2 m length: maximum 2

irregularities in any direction, with the depth or height of up to 2 mm.

2. Deviations from the vertical wall plasters than 1 mm / m and maximum 3 mm throughout room height.

3. Deviations from horizontal plaster ceiling: maximum 1 mm / m and not more than 3 mm from a side to the other.

4. Deviations from the vertical or horizontal inlets, iesinduri, sills, profiles, pilasters, columns, belts, cornices, frames, solbancuri - up to 1 mm / m and a maximum of 3 mm on an item.

5. Deviations from radius curved surfaces: up to 5 mm.

6. Deviations from edges: up to 1 mm / m - single offense.

(3) renders foppish 1383:

1. Irregular surfaces that form when checking with 2 long .. maximum 3 per m² irregularities in any direction with depth and height to 2 mm.

2. Vertical deviations from the plaster walls - not exceeding 1 mm / m and maximum 3 mm throughout room height.

3. Deviations from the horizontal plaster ceilings - up to 1 mm / m and up to 4 mm in total.

4. Deviations from edges. than 3 mm / m - single offense.

5. Deviations from radius curved surfaces up to 5 mm.

(3) 1384 Defects not allowed

1. Swelling, coscoviri, pinching (Shooting lime), stains, efflorescence, cracks, crevices, gaps in glaflurile window to window sills, baseboards, plumbing items.

2. Coarse (up to max. 3 mm) deep scratches formed blisters and trowel on coating.

(3) acceptance testing 1390

(3) The 1391 will be classified as defective work not comply with these specifications and those to which the notice urnătoarele irregularities:

1. Do not follow the rules in the project for thickness, tracing, coverage, smoothness, uniformity (the processing), the connection edges of the walls to the ceiling, window sills, edges of doors or windows, spaleti.

2. Not meet verticality and horizontality surfaces and edges, flat surfaces plastered and respect the permissible deviations according to (3) in 1380.

3. Not specified respected manufacturing technology, which led to the deterioration of the works.

4. There were no indications of respected panel approved the project finishes.

5. The works were not carried out in accordance with panel-sample.

(3) 1392 Consultant 5, depending on the nature and extent of defects found, what remedies should be performed and whether they will be made locally on larger areas or work must be completely rebuilt by scraping plaster and restore them according to specifications.

(3) The provision in 1393 (3) 1392 does not apply if the recipient agrees to accept some work done improperly specifications, but does not affect the appearance and protection during the construction.

(3) The 1394 works that are hidden will end protocol, which will specify which ones and if they performed as described in the project and in these specifications.

(3) 1400 MEASURING AND PAYMENT

(3) The 1410 work executed shall be measured according to the indicators "C" and "PRC" as follows:

(3) 1411 Plastering the walls:

1. Plastering the walls, no matter how visible face processing, developed to measure m², adding and surfaces niches, window sills, spaletilor, etc..



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2. Measurement is performed before applying the plaster. To determine Plaster, Walls will calculate the distance between the front gross floor (no floor or leveling layer) and face unplastered ceiling and the width, the distance between the walls unplastered girls.

3. In areas that remain unplastered, the application of other finishes, take the height distance between unplastered ceiling and line termination indicated in the project, plus 5 cm.

4. Of surfaces calculated minus any surface voids greater than 0,50 m², but adds sills and edges.

5. Gaps with smaller areas of 0.50 m² not deducted from the calculated surface.

6. Door openings shall be measured on the outer windows of plaster and other goals, the contour their unplastered.

7. Edges is measured per meter before plaster.

(3) 1412 Plastering to ceiling

1. The ceilings of concrete, net RABIT, reeds and sticks, plaster surface is measured in m² measured before plastering them.

2. The flat ceilings without visible beams, the surface is measured between unplastered walls of the room.

3. The ceiling beams visible from the surface and side surfaces of the beams add.

4. From the surface thus established, minus any gaps greater than 0.50 m².

(3) 1413 papers will be reimbursed according to articles cantitativele of works by number of square meters of plaster, determine the plans of the project.

SPECIFICATION

PLASTERING MORTAR

GENERAL

(3) 2111 This chapter contains specifications for mortars used in the execution interior plaster.

(3) The 2112 Standards and normative reference

Standards:

1. STAS 146-80 - Lime for construction.
2. SR 388 -1995 - Binders hidraulici. Portland cement.
3. STAS 545/1-80 - Plaster building.
4. STAS 790-84 - Water for Concrete.
5. STAS 1030-85 - common for masonry mortars and plaster.
6. STAS 1667-76 - Heavy natural aggregates for concrete and mortars.
7. STAS 2634-80 - mortar for masonry and plaster usual. Test methods.
8. STAS 3910/1-76- Var. Rules for quality.
9. STAS 5296-77 - Cements. Rapid Determination of cement brand.
10. SREN 196-7:1995 - Cement. Rules for quality.
11. STAS 9201-80 - Hydrated Lime powder for construction.

(3) Regulations 2114:

1. C-17-82 - technical instructions on the composition and preparation of mortars and plaster Zidane, improve and expand them.

(3) Samples and Testing 2120

(3) Testing of mortars 2121 will be made on each type in accordance with STAS 2634-80, by sampling and testing by a specialized laboratory at the expense of the Contractor, as follows:

- Compressive strength at 28 days, one test per 100 m³.
- Consistency and density of fresh mortar, test each shift.

(3) The 2122 Conditions of acceptance reception mortar:

- Compressive strength at 28 days: 50 kg / cm²;
- Consistency of fresh mortar: 5-8 cm;
- Density of fresh mortar: minimum 1950 kg / m³.

(3) Method 2123 laboratory testing and tests will be subject to the Consultant for approval;

(3) 2124 cement mortar will be used to test batch of 5 kg of each type of cement proposed to be used in the works.

(3) 2125 Contractor shall provide the Consultant for verification analysis report of the cement manufacturer, specifying the quality and type according to STAS 388-80 (or 1500-78, 7055-87 if included in the project).



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(3) 2126 mortar color samples: if the specs require adding color pigments mixed mortar, the Contractor shall provide samples of each color of mortar, to be approved by the Consultant in accordance with his request. It will provide the number of samples necessary for this purpose.

(3) 2200 MATERIALS AND PRODUCTS

(3) 2210 Materials

(3) The 2211 Portland Cement: Cement shall conform to STAS 388-80 without bubbles, natural or white color, no constituents that stain.

(3) 2212 Hydrated Lime powder: according to STAS 9201-80 mechanically mixed with about 25 liters dee water to 25 kg of lime. The mixture can be made 16 hours before use.

(3) 2213 Lime slurry of hydrated lime.

(3) in 2214, according to STAS 790-84 water, drinking water will be clean, free content of salts, acids, fats.

(3) 2215 Aggregates sand STAS 1667-76 using natural river sand or career. Dredged sand can be partially replaced by crushing. Natural sand content is at least 50%.

(3) The 2220 delivery, storage, handling

(3) as specified in section 2221 (3) 1240

(3) mix 2230

1. It will prepare materials for construction, so the proportions specified in the mortar mix can be controlled more strictly during the progress of works.

2. The proportions will be determined by volume.

Within these specialty weight of a cubic meter of each material used is according to the standards.

(3) 2300 MORTARS PREPARATION

Will be prepared only in quantities that will be used immediately. The mortars will use the maximum amount of water that ensure satisfactory workability capacity, but will avoid supersaturated water mixture. Mortar will be put in operation within 2 hours after preparation. At this time water 5 be added to mortar to compensate for the amount of water evaporată, but this is allowed only in containers not place masonry mortar preparation. Mortar that is not used during the set will be removed.

(3) 2312 Unless otherwise approved by the Consultant, for small batches mortar shall be done in mechanical mixer drum, the amount of water can be controlled with precision and uniformity. Stir at least 5 minutes: 2 minutes to mix dry materials and mix further 3 minutes after adding water. Volume mixing of each batch shall not exceed the capacity specified by praducatorul mixer. The drum is completely empty before adding the next batch. When stopping mortar preparation for more than 1/2 hour, it is imperative that the drum is washed with water mixed with gravel.

(3) 2313 Preparation of cement mortar and hydrated lime will be made only by mechanical, gravimetric dosing ensuring solid mortar components with tolerances of + / - 2% for binders and + / -3% for aggregates and Care mortar mix to complete homogenisation.

(3) 2314 mortar M4-T brand - according to STAS 1030-85 will be a mortar: lime paste 500 kg sand 0 ÷ 3 mm 1600 kg and 0,310 m3 water per m3 of mortar.

(3) 2315 cement mortar M10-T brand - according to STAS 1030-85. It will be a mortar: lime or hydrated lime slurry 335 kg 155 kg sand 0 ÷ 3 mm 1650 kg, cement F 25 (sacks) 147 kg water 0,210 m3 per m3 of mortar.

(3) 2316 cement mortar M 25-T brand - according to STAS 1030-85 will be a mortar: lime or hydrated lime slurry 267 kg 123 kg sand 0 ÷ 3 mm 1660 kg, cement F 25 (bags) 184 kg and 0,235 m3 water per m3 of mortar.

(3) 2317 cement-lime mortar M 50-T brand - according to STAS 1030-85 will be a mortar: lime paste 113 kg or 53 kg hydrated lime, sand 0 ÷ 3 mm 1660 kg, cement F 25 (bags) 296 kg and water 0,310 m3 per m3 of mortar.

(3) Mortar 2318 M 100-T brand - according to STAS 1030-85 will be a mortar: lime or hydrated lime slurry 60 kg 28 kg sand 0 ± 3 mm 1730 kg, cement M 30 (sacks) 377 kg and 0,310 m3 water per m3 of mortar.

(3) Mortar 2319 M 100-T brand - according to STAS 1030-85 (for coatings resistant to moisture) will be a mortar with cement M 30 (sacks) 391 kg 0-3mm sand and water 1730 kg 0,310 m3 per m3 of concrete.

(3) 2320 Mortar for plastering waterproof: will be a cement 600 kg of cement M 30 (bags), sand 0-3 mm 1730 kg, 0,310 m3 water per m3 and added "apastop P" in a proportion of 3% weight of cement.

(3) 2330 Quality control of mortars

It will STAS 103 0-85 following characteristics:

1. Uniformity: Please check visually if the mixture has a uniform color and contains no lime paste Bulgarian and non-homogenized.

2. Consistency: to be determined - in cm - with standard cone.

3. Bulk density fresh.

4. Segregation tendency: it will establish for mortars to be transported by car or by mijlaace mortar pumps, segregation coefficient for plastering mortars must be less than 40 cm3.

5. Adhesion to the substrate.



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6. Water holding capacity.
7. Compressive strength.
8. Flexural resistance.
9. Bulk density in hardened mortar (at 28 days).
10. Rezistentă freeze-thaw.
- (3) The 2340 Transport mortar
- (3) The 2341 Transport mortar is made with adequate transportation, which must be sealed, cleaned and washed inside and outside, whenever changing nature of the material transported and every break in the carriage of more than two hours and allowing quick and complete draining.
- (3) 2342 download is prohibited mortar directly on the ground, sheets or makeshift tables. (3) The 2343 Duration transportation and placing of mortar to make:
 - In 10 hours of preparation for screeds, cement-lime with or without fly ash and without retarder;
 - A maximum of 16 hours after preparation in the case of mortars with retarder.
- (3) 2400 MEASURING AND PAYMENT
- (3) in 2410 for work in this section will not make separate settlements, which are included in the Articles of plastering in the draft.

SPECIFICATION

EXTERIOR COATINGS

GENERAL

(33110 Specification

(3) 3111 This chapter contains specifications for exterior plastering works.

(3) The 3112 Classification of plaster

Exterior coatings are classified by:

1. nature of the surface on which it is applied:

- Brick
- Concrete
- Concrete
- Autoclavizat Celular
- Stone
- RABITZ

2. binder used:

- Resistant to moisture

3. the processing of facial viewed:

- Common: rough trowel. sprayed;
- Special rubbed, roughened, comb, brush, scraper, spritual, polished, and so on;
- Decorative calcio splashes paint decorative effect, rustic apareiaj or bosses.

(3) 3120 Standards and normative reference

(3) 3121 Where there is conflict between the provisions of these specifications and recommendations contained in the standards and regulations listed below, this specification shall prevail.

(3) The 3122 Standards:

1. STAS 146-80 - Lime for Building
2. SR 388-1995 - hydraulic binder. Portland cement.
3. STAS 790-84 - Water for Concrete
4. STAS 1030-85 - common for masonry mortars and plaster
5. STAS 1134-71 - Stone Maza
6. STAS 1667-76 - Heavy natural aggregates for concrete and mortars with mineral binders
7. STAS 2542-82 - braided wire. Netting hexagonal and trapezoidal
8. STAS 2634-80 - mortar for masonry and plaster usual. Test methods.
9. STAS 39 10/1-76- Var. Rules for quality.
10. STAS 5296-77 - Cements. Rapid Determination of cement brand
11. STAS 7055-87 - white Portland cement.
12. SREN 196-795 - Cement. Rules for quality.
13. STAS 9201-80 - Hydrated Lime powder for construction.

(3) Regulations 3123:

1.C 18-83 Standard for wet performance technologies

(3) 3130 Samples and Testing



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(3) 3131 Observe the same conditions as for interior plasters (see () 1130).

(3) 3200 MATERIALS AND PRODUCTS

(3) 3210 Materials

(3) 3211 cement, sand, lime, hydrated lime, water, additives, dyes, nets support plasters, nets RABIT, see (3) 1210. III. 4.1.2.1.

(3) The 3212 stone mosaic, white limestone, marble or hard rock with granulation 0 to 35.5 mm (As specified in the project) according to STAS 1134-71.

(3) 3220 Mixes

(3) cement mortar 3221 (3) 2316. III.4.1.2.2.

(3) 3222 cement mortar with fine aggregate will be prepared.

Unit will consist of mosaic stone mosaic marble limestone or white (unless otherwise specified):

If not stated otherwise. will add a color pigment approved Consultant.

(3) 3230 Delivery, storage, handling

As specified in section (3) 1240.III.4.1.2.3.

(3) 3300 EXECUTION

(3) 3310 Preparatory operations

(3) At the beginning of 3311 the works of exterior coatings, the following work will be completed:

- Masonry (closures and coatings to concrete diaphragms);

- Installation of electrical and plumbing installations forecast to remain buried under the plaster will be fully implemented and tested;

- RABIT nets will be installed in areas covered by the project;

- Assembly dowels embedded wood and metal parts for fixing other elements of the building;

- Installation of windows and protect them.

(3) The 3312 will not run before completing the exterior coatings and waterproofing roof terraces and its leak proof and storm drainage is not provided.

(3) 3313 Support surfaces for plastering must fulfill the conditions specified in

(3) 1310-5 (a, b, c, d, e, f, g).

(3) 3320 Drawing surfaces

(3) 3321 Drawing will be conform walls (3) 1320. If plastering mm height of vertical surfaces, plastered surfaces tracing can be done in the form of vertical strips (pillars) that can be spotted strips of metal or witnesses and mortar.

(3) The 3322 Purchase aggregates, cement and lime from different sources during the execution of the works shall be made only with the approval of the Consultant.

(3) 3323 The exterior plastering will use the same materials, mortar of the same composition (same cement, same color, same dosage, same units).

(3) 3330 Climatic conditions and protection works

(3) During summer 3331 the execution of exterior coatings will be taken the following safety measures:

1. Spraying them with water for at least 7 days (for replenishment of water lost by evaporation);

2. Covering with mats, plastic sheets or tarpaulins moistened (protect from sunlight and wind).

(3) 3332 The cold weather, when the temperature drops below -5 ° C, it will run with exterior coatings than taking appropriate protective measures.

(3) 3340 Types of exterior coatings

(3) Gross common Plastering 3341 - will run as (3) in 1331 using lime mortar - cement - M25-T score average thickness of 2 cm.

(3) 3342 Plastering trowel usual - will run under (3) 1332.

(3) The 3343 regular Plastering trowel on brick masonry, small blocks of concrete and brick will run according to (3) and 1333 (3) 1334 with cement mortar M 25-T brand average thickness of 2.5 cm.

(3) 3344 Plastering trowel on the walls conventional monolithic concrete or aerated concrete panel will run according to (3) in 1335 with cement mortar M 25-T brand average thickness of 1 cm.

(3) The 3345 regular plaster, sprayed on brick walls in small blocks of concrete or a bc, will run with cement mortar M 25-T score average thickness of 2.5 cm.

(3) Special Coatings 3346 similipiatra (artificial stone) will be executed with cement primer of brand M 100-T with the addition of lime, trowel in thick, the average thickness of 1.5 cm beyond the visible layer to be applied with cement mortar brand M 100-T prepared with limestone mosaic stone grit indicated in the project (which will replace the sand).

Suprafata visible layer will be completed:

- Continuously field scrubbing with higher thickness of 0.5 ... 0.8 cm.

- Roughened or combed continuous field with higher thickness of 1 cm, divided into rows with joints or grooves.

- Spritual continuous field with higher thickness of 3 cm or not split rows with recessed joints.



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(3) Special Coatings 3347 grit stone mosaic indicated in the project - will run with primer of lime-cement mortar brand M 25-T, trowel in thick with an average thickness of 2 cm, which will be applied over the visible layer executed trowel or splashes of lime-cement mortar M 25-T brand stone mosaic made of limestone or marble (stone dust) and will have a thickness of 1 cm.

(3) 3348 special terrace cement plaster, stone, mosaic marble, dolomite or similar in color and gnanulatia indicated in the project - will run with lime mortar primer

M 25-T Cement brand in thickness of 2 cm, above which shall apply thick layer visible
0.8 ... 1.0 cm polished brushed or scraped.

(3) The 3349 Special Coatings sprayed calcio - will run with primer of lime-cement mortar brand M 25-T 2 cm thick, on which will be applied in the visible layer thickness of 1 cm prepared with mortar and addition of cement (the dosage indicated in the project, usually 100 kg per m3), pearl sand and gravel (grain size 3 ... 5 mm).

(3) The 3350 Special Coatings sprayed calcio - will run with primer of lime-cement mortar brand M 25-T 2 cm thick, on which will be applied in the visible layer thickness of 1 cm prepared with mortar and addition of cement (the dosage indicated in the project, usually 200 kg per m3), stone mosaic marble limestone or gravel marganitar (grain size 3 ... 5 mm), completed with porous float (ball head).

(3) Special plasters calcio 3351 STRAP - will run with cement primer of brand M 100-T in thickness of 2 cm, above which shall apply visible layer thickness of 1 cm, stone mosaic marble grain indicated in the project, which will add 450 kg 150 kg cement and white cement per m3 of Mosaic.

(3) 3360 Application shotcretes (primer coat)

It will be as specified in section (3) 1440.

(3) 3370 Priming

(3) 3371 will be as specified in section (3) in 1450.

The thickness of the primer will be consistent with the type of plaster indicated in the project.

(3) 3372 Before applying primer poses according trasajelor grooves performed (as described in the project), sticks of soft wood, polished with section 2x2 cm which is provisionally fixed with nails.

Sticks will be benchmarks for training fields that will apply primer.

(3) The 3373 Primer driscuieste fine and apply limits (fields) for nutuni rods formats, such as stopping work to be completed between rods work areas.

(3) 3380 Application tinciului (visible layer)

(3) 3381 will be as specified in section (3) 1470. Visible thickness will be consistent with the type of plaster indicated in the project.

(3) Before applying tinciului 3382 after the primer has dried, carefully remove wooden rods so that the edges can not be damaged grooves.

(3) 3383 Tinciul apply restricted areas, the limits (fields) formed by grooves, so that cessation of work, only to be executed completely covered areas between grooves.

(3) 3390 The allowable tolerances

(3) The 3391 exterior plastering works will be included in the maximum permissible deviations according to

(3) 1380. Defects that are not allowed are shown in the specification (3) 1384.

(3) 3395 Acceptance testing

(3) 3396 will be classified as defective works, works that do not meet specifications

(3) 3390.

(3) 3400 MEASURING AND PAYMENT

(3) Measure 3410 works will be done as follows:

1. Renderings are measured in m2 area measured plastered masonry unplastered, adding niches, spaletii, etc..

2. Acaperita with plinth area of a wall on the perimeter of balconies and loggias and terraces not measured.

3. Do not fall gaps with smaller surface of 0.50 m2.

4. Gaps with larger surface area of 0.50 m2 is lower, but it adds jambs and spaletilor surfaces.

5. Profiles pulled faade pattern with iesinduri less than 5 cm and 20 cm lățirma not measured separately.

6. Edges is measured per meter, before plastering them.

(3) The 3420 papers will be reimbursed according to the item quantity of exterior coatings, depending on the number of square meters of plaster execute the plans, approved the project. (3) The 3430 execution of works grooves faades, is measured by the number of meters run as planned, approved the project, decontându into the article for plaster exterior.



SPECIFICATION

PAINTINGS AND PAINTS (WALLS AND CEILING)

GENERAL

(4) 1110 Specification object

(4) 1111 This chapter contains specifications for the execution of interior painting of the walls and ceilings.

(4) 1120 Basic concept

(4) The 1121 interior painting watercolors are made with clay, water calcio Vecchio with paint based polyvinyl acetate, applied to walls and ceilings, the grinding and polishing of composites.

(4) 1130 Reference Standards and regulations

(4) 1131 Where there is conflict between the provisions of these specifications and recommendations contained in the standards and regulations listed below these specifications shall prevail.

(4) 1132 standards:

1. STAS 88-90 - bone glue
2. STAS 89-86 - hide glue
3. STAS 146-80 - Lime for Building
4. STAS 189-77 - soap
5. STAS 232/1-76 - Kaolin Washing Arghires
6. SR 388: 1995 - Gray Portland Cement
7. STAS 545/1-80 - Plaster Construction
8. STAS 790-84 - Water for Concrete
9. STAS 1903-85 - Concentrated Bath Iron Graphite
10. STAS 2488-86 - Inorganic Pigments. Chrome yellow
11. STAS 2539-79 - Inorganic Pigments. Iron Blue
12. STAS 2706-86 - Crete Murfatlar Dobrogea. Chalk ground
13. STAS 4888-76 - Kaolin washed Harghita
14. STAS 6632/2-91 - red iron oxide
15. STAS 6632/3-91 - Iron Oxide Yellow
16. STAS 6632/4-83 - Iron Oxide Black
17. STAS 7058-91 - polyvinyl acetate. Aqueous dispersion
18. STAS 7359-89 - based paints aqueous dispersions of poly
19. STAS 9201-80 - Hydrated Lime powder for construction
20. STAS 9537-85 - Chromium Oxide Green

(4) Regulations 1133:

1. C 3-76 - Standard for the execution of painting and painting, with additions future.

(4) 1140 Samples and testing

(4) 1141 Consultant Contractor shall submit for approval the manufacturer's specifications for materials used in painting, and certificate which will certify compliance with specified conditions.

It will also provide instructions for handling, storage and protection of each material.

(4) 1142 control panel

Before starting work, the Contractor shall execute a sample fragment wall using materials, products, colors and technology specified in the project for the entire work. The panel will be executed at site and after approval by the Consultant, – panel will be blank for comparison element composition. Throughout the work will not destroy or damage the blank panel.

(4) 1200 MATERIALS AND PRODUCTS

(4) 1210 Materials

(4) The 1211 Ipsos construction STAS 545/1-80.

(4) Hydrated Lime 1212 STAS 9201-80.

(4) The 1213 Water for Concrete STAS 790-84.

The water will be clean, potable, without salts, traces of oil, acids or other impurities.

(4) 1214 graded quartz sand 0.2 mm or 0 ... 3 mm according to STAS 3844-76.

(4) in 1215 as various pigments (4) (1132).

(4) 1220 Products:

(4) The 1221 paint washable polyvinyl acetate type or another similar series 8204, according to STAS 7359-89.

(4) 1222 Primer of washable paint in water dispersion type (Water washable 1:1), or similar.

(4) 1223 Filler cement mortar with the addition of glue (polyvinyl acetate) in the ratio of 3: 1: ½

- Sand: cement glue. or similar.



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1. Glue will be of DP25 or D50 or another equivalent
2. Sand grain size will be according to the size of recesses in the substrate:
 - Depth 0,5 - 10 mm 0.2 mm sand
 - More than 10 mm sand 0 ... 3 mm.
- (4) 1224 plaster-based glue roller (polyvinyl acetate) of the following composition: 3:1:1 / 2 (by volume) less than 0.2 mm sand: glue DP25: water.
Mechanical application, the proportion 5 be increased up to 3:1:2 by volume of water.
- (4) 1225 cement-lime mortar brand M50 - T to rectify plasters in order to apply with lime depictions.
- (4) 1230 Delivery, storage, handling
- (4) 1231 niateriale for receiving each batch delivered. Contractor shall verify certificate
As the manufacturer.
- (4) 1232 products based on polyvinyl acetate should be stored in its original packaging-bags
cardboard or polyethylene drums p.v.c.
Will check that the cans are sealed to prevent evaporation of water from the dispersion.
- (4) 1233 plaster will deliver paper bags of 35 kg.
- (4) 1234 Bulgarian lime and clay are delivered in bulk.
- (4) 1235 dyes and other chemical compounds are delivered in metal cans.
- (4) 1236 ground animal glues are delivered in polyethylene bags or slabs.
- (4) 1237 materials will be grouped in a sheltered, dry, well ventilated, frost and temperature variations (+7 and +20 ° C) von
materials be stored in categories, with labels visible to avoid confuse content.
- (4) 1238 for materials handling at the workplace will be used packing boxes, cans and buckets with handles and transfer only the
amount needed for a work shift.
- (4) 1300 PAINTING WORKS
- (4) 1310 Preparatory operations
- (4) The work 1311 is only beginning to ambient air temperature of -5 ° C. This regime will maintain at least 8 hours after the
execution of painting.
- (4) The 1312 painting will be executed only after finishing the following operations:
 1. Fitting woodwork
 2. Installation of electrical, water and sewage, heating.
 3. Running cold floors (ceramic tiles, mosaic tiles, etc..) Only their polish.
 4. Plaster repairs works.
 5. Execution of plywood on walls.
- (4) The 1320 Running paintings
- (4) 1321 surface preparation will be done taking into account the nature of the substrate. The new plaster, paint compositions
are applied after setting and drying them, admitting a constant humidity of 8%.
Area will be carefully smoothed to remove roughness and mortar spatter and rub scum to disappear. Remove dust.
- (4) 1322 surface processing will be done at maximum 2-4 hours after completion of preparatory work, comprising the following
operations:
 1. Wetting of the surface water intensive support.
 2. Paciocul priming or until a wet look - shiny surface grun – Duit, without the brush marks or streaks and without roughness.
 3. Filling cracks, joints and recesses, only after drying primer coat.
 4. Sanding and priming sites grouted.
 5. Coating application shall be made only after complete drying primer. Starting with the ceiling and then the walls. Successive
layers are applied only after the previous one is found that is completely dry.
- (4) Surface Processing 1323 will be a maximum of 2-4 hours from completion of the preparation, as follows:
 1. The first primer soapy water applied manually by brush.
 2. Filling cracks with plaster paste.
 3. Polishing grouted places, dusting and grouted priming sites.
 4. Filling surfaces (only for high quality painting) by applying
compositions filled using a brush with a rubber spatula or wooden.
 5. Polishing surface spatula, dusting and applying second coats.
 6. Applying the paint composition. prepared based recipe: 100 kg clay, glue 6 kg 12 kg pigments, water 200 l application will
start with the ceiling and then the walls. Apply successive layers are found only after the previous one is completely dry.
- (4) 1324 Preparation of surfaces:
 1. Clean all surface irregularities with spatula and brush with the brush of straw.
 2. Fill the existing holes with putty mortar substrate () in 1223.
The mortar is smooth with spatula.
Each layer is left to dry at least 16 hours before applying the next layer.



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3. Thus prepared surface will have larger deviations as follows:

- flatness: maximum 5 mm below the embodiment of 2 m;
- no more than 2 mm wavelength as the embodiment of 0,5 m

(4) 1342 plaster surface preparation:

1. Rectified plaster with cement mortar-lime (4) in 1225 after previously were removed burrs and protrusions.
2. Surface is clean of dust, to ensure good adhesion of the finish on the base layer.

(4) 1332 processing surfaces.

1. Priming with (4) 1222 will be made by application by brush and allow to dry for at least 2 hours at -15 ° C and one hour at 25 ° C or higher.

2. If after priming is observed uncorrected initial surface irregularities will do with putty mortar grouting (4) in 1223 and then a local grinding.

3. Smoothing plaster runs where specified with plaster (4) 1224.

- Putty is applied first on an area of approx. 1 m² and smooth with a rubber spatula after full smoothing, operation continues on the remaining surface.

- Avoid leakage of material to the bottom.

- will apply plaster thickness of 1 mm that is 1200 to 1400 g/m².

- plaster layer will let to dry at least 16 hours before applying dye.

(4) The 1333 Running dye.

1. Painting will be done with paint type Vinarom (4) 1221 diluted in water in proportion 4:1 (volu – metric). Will apply 2 coats approx. 150 g/m² per coat.

2. Before application. paint strain through a sieve with 900 stitches/cm², and mix with the water needed to be perfectly clean.

(4) 1340 Protection and maintenance work

(4) 1341 floor area in rooms where painting is executed, it will protect paper or polyethylene.

(4) In 1342 the neighboring areas: carpentry, plywood. paint, etc.. PFL will apply rough boards or cardboard to avoid splashing spray from gun.

(4) 1343 To prevent drying and peeling depictions sudden, avoid applying them on surfaces exposed to sunlight.

(4) The 1344 painting with lime and clay shall be maintained by cleaning dust brush with long tail.

(4) finished 1345 with Vinarom surfaces can be washed with a cloth soaked in water and squeezed. It is forbidden to wash a painting with a length less than 30 days.

(4) 1350 Acceptance testing works

(4) The terms of the quality of work in 1351

1. Area painters must have uniform color tone, have no stains, spills, splashes, peeling, hair. Not allowed corrections or local touches that fit with the overall tone even at distances less than 1 m on sprayed surfaces requires that drops to flex evenly.

2. Painting and painting must be uniform without let them see through the substrate.

3. Painting and painting should be sticky and easy to hand scrub should not be taken in hand.

(4) 1352 Fixes:

1. In case of no smoothing plaster, putty to repair the local area and manually apply layers of paint or paint required.

2. If visible damage last layer will be applied by hand one or two layers of paint or paint diluted with water in the same proportion to the original.

3. If the shade repaired area is not identical to the rest of the surface, the repair will last layer over the entire surface of the panel respectively.

(4) In 1353 out of the defects listed in () 1351 counting the defects are the following:

1. Failure to comply with these specifications.

2. Lack of correspondence and consistency between the work performed and the provisions and requirements of the project site.

3. Failure to implement technology specified in the norm C 3-76 () 1133 and additions.

4. Failure dosages, number of layers and materialelor specified.

(4) in 1354 at the request of the Consultant, the Contractor shall remedy such defects be run by local remedies, either by restoration work on larger areas, as appropriate.

(4) 1400 MEASURING AND PAYMENT

(4) Measure 1410 works (according to the article in the quantitative share of work) will be in square meter pictured or painted on the project plans.

(4) In 1420 the unit price per item from the quantitative works on painting and painting works are included (where specified) rectification of the support surface and smoothing plaster.



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SPECIFICATION WALLS PAINTING

(4) 2100 GENERAL

(4) 2110 Specification object

(4) 2111 This chapter contains specifications for the execution of paint on the walls.

(4) 2120 Basic Concept

(4) The 2121 application only body paint on oil is expected to be made in humid (bathrooms, kitchens, toilets, laundries, etc..) on walls where there were provided with ceramic tiles or ceramic tiles. In other areas can apply paint with enamels based on alkyd resin or epoxy resin.

(4) 2130 Reference Standards and regulations

(4) Where there are contradictions between 2131 prevedenile these specificatii and recommendations contained in the standards and regulations listed below, this specification shall prevail.

(4) 2132 standards:

1. STAS 16-80 - Drying oils.
2. SR 18: 1994 - Oil in technical.
3. STAS 545/1-80 - Plaster building.
4. STAS 2706-86 - Chalk ground.
5. STAS 790-84 - Water for Concrete.
6. STAS 2710-70 - Technical sunflower oil.
7. SR 2993: 1993 - Paints and varnishes. Rules for verificarea quality packaging, marking, storage and transportation.
8. STAS 3097-80 - oil-based primers.
9. STAS 3123-85 - thinner for alkyd resin based products.
10. STAS 3124-75 - 104 Thinner for oil based products.
11. STAS 3509-83 - oil paints. Paint Khaki 1003.
12. STAS 3706-69 - oil based varnishes. 1060 lacquer.
13. STAS 3744-69 - oil based paints. 1000 gray paint.
14. STAS 5192-79 - Primers for clogged pores
15. STAS 6592-80 - Oil grouts.
16. STAS 7058-91 - polyvinyl acetate. Aqueous dispersions.
17. STAS 8308-69 - Resin Romalchid R60.
18. STAS 8311 -87 - Paintwork. Colours and shades.
19. STAS 8512/1-79 - epoxy type 040 and 040T.

(4) Regulations 2133:

- 1.C3-76 - Standard for the execution of painting and painting.

(4) 2140 Samples and Testing

(4) 2141 Consultant Contractor shall submit for approval, manufacturer's specifications for materials used in the paint and quality certificates which attest to compliance with specified conditions.

(4) 2142 will be provided by the manufacturer, instructions for handling, storage and protection of each material.

(4) The 2143 Billboard - witness

Before starting work, the Contractor shall execute a sample fragment wall using materials, products, and technology color specified for the entire work.

The panel will be executed at site and after approval by the Consultant, the panel will be blank for comparison element composition.

Throughout the work will not destroy or damage the blank panel.

(4) 2200 MATERIALS AND PRODUCTS

(4) 2210 Materials (in addition to (4) 2132)

(4) 2211 oil based paint type Linoxyn Under NI90-61 MICH. or similar.

(4) 2212 enamel paint on Alkyd resin (type E HEXOL 105-1; E405-I0) or similar.

(4) 2213 Solution bone glue STAS 88-90.

(4) 2230 Products

(4) The 2231 primer-binding or oil based alkyd resin:

1. The primer will be of G001 or G005-2-5 STAS 3097-80 or similar.
2. The primer can be prepared on site with the following composition:
 - Drying - 3,00 kg.
 - Mounting pigment - 0.05 kg.
 - white spirit - 5-10%.



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(4) 2232 Spray Putty

1. The grout will be of STAS 6592-80 or similar.
2. Grout can be prepared on site with the following composition:

- Drying - 3.00 kg
- drying naphthalene - 0.15 kg
- solvent (turpentine) - 0.60 kg
- 10% glue solution - 0.30 kg
- laundry soap - 0.05 kg
- chalk about 5, 90 kg

(4) 2233 putty knife based on plaster.

1. The grout will be of the type according STAS 6592-80 or similar.
2. Grout can be prepared on site with the following composition:

- Plaster-1.00 kg
- Ground chalk or clay - 2.00 kg
- Solutions of gum 2% - by working consistency.

(4) 2234 oil-based putty.

1. The grout will be of the type according STAS 6592-80 or similar.
2. Grout can be prepared on site with the composition:

- Drying - 1,00 kg.
- 10% glue solution - 0.10 kg.
- chalk - to work consistently.

(4) 2240 Delivery, handling, storage

(4) in 2241 for the reception of each lot of material delivered. Contractor shall verify certificate As the manufacturer.

(4) The 2242 products will be stored in the original packaging, grouped by categories in a space covered, dry, well ventilated, frost and temperature variations (-7 ° C to +20 ° C) with visible labels to not confuse the content.

(4) 2243 for materials handling at the workplace will use cans and cans packaging, pails and will carry only the amount needed for a work shift.

(4) 2300 EXECUTION

(4) 2310 Preparatory operations

(4) The 2311 work to be completed before commencing the body paint:

1. Repairs to plaster and ceramic tiles or tiles.
2. Installation of electrical, water, sewer, gas and heating.
3. Running cold pardoselilon (ceramic tiles, mosaic tiles, marble, etc.). Their exclusive polishing.
4. Apply final coat of paint will be made only after completion of the painting.
5. Protection by covering with paper or polyethylene flooring and sanitary.
6. Clogging the paper and then plaster the openings, the floor drains, etc..
7. Removing doors and casements and storing them in a safe place, or if carpentry is already painted, it will be covered with paper or hardboard plates

(4) 2320 Oil paint performance

(4) 2321 oil painting will be applied on rough plastering. The works will start only at an air temperature of at least +15 ° C and this regime will be maintained throughout the execution and at least 15 days after their execution.

The new plasters will only apply after painting and drying plaster and plaster. admitting a residual moisture of 2-5%. Smoothing to remove roughness must be done carefully so not to scratch the surface friction.

(4) 2322 will be processing surfaces immediately after surface preparation, comprising the following operations:

1. Priming with imbibition (4) 2231 insisting on the right of plaster cracks open. Primer shall be applied by brush and be thin, continuous and without trickle, give or hairs.
2. Local filling putty coating (4) 2234 scratches, cracks, dents, stir – Bits, etc.. Grout should be applied to steel spatula.
3. Polishing job will execute grouted San blade grinding and after grinding the surface must be thoroughly cleaned of dust.
4. Priming grouted places will follow pt.1
5. Filling general I will be using putty knife (4) 2233 or receipt of application by Splash (4) 2232.

Sc putty will dilute the special diluent (D-001-3) or with oil or paint color. Filling generations will be run only top quality paint.

6. Polishing gezogenen I will be wet or dry, using power tools disc brush or abrasive grit felt fine. After dry grinding, surface must be thoroughly cleaned of dust, and after wet sanding rinse with water and wipe.

Polishing generations will be run only after leveling generations.

7. Applying coatings will be mechanized spray gun in 2-3 layers, depending on the provisions of the project.



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Each coat should be applied after complete drying of the previous one and after polishing it. The paint will be applied in layers, the last layer will extend preferably from top to bottom, smoothing it and aim to obtain a glossy and liked the film.

(4) 2350 Reception Conditions

(4) 2351 Painted surfaces will be present as a uniform, continuous, smooth and perfectly covering the lower layers.

(4) 2352 Portions transparent stains, separation, cute, leakage, staple of the film, clusters of pigments, fillers or surface irregularities due to improper traces of brush hairs will not be accepted.

(4) 2353 will be repaired portions of the same color with the rest of the surface.

(4) 2354 will be considered defects in addition to those listed above, the following:

- failure to implement technology specified in the norm C 3-76 (38) 2133;
 - failure to comply with specifications;
 - lack of conespondentă and the consistency of the work performed and draft provisions and the provisions of the contract;
 - failure dosages, number of layers and materials specified.
- (4) The 2355 consultant 5 decide local restoration or large areas of Painting, from case to case, depending on the nature and extent of defects found.

SPECIFICATION

WOOD JOINERY PAINTING

GENERAL

(4) 3110 Specification object

(4) 3111 This chapter contains specifications for the execution of painting the interior and exterior woodwork.

(4) Basic Concept 3120

Paint the interior woodwork will be executed with oil paint. The outside windows will be executed painting with oil based paints, alkyd paints or epoxy resin.

(4) 3130 Standards and normative reference

(4) 3131 Where there is conflict between the provisions of these specifications and requirements contained in the standards and regulations listed below these specifications shall prevail.

(4) 3132 Standards

1. STAS 16-80 - Drying oils.
 2. STAS 18-70 - in technical oil.
 3. STAS 88-90 - bone glue.
 4. STAS 2706-86 - Chalk ground.
 5. SR 2993:1993 - Paints and varnishes. Rules pcntru quality control, packaging, marking,
- Storage and transport
6. STAS 3097-80 - oil-based primers.
 7. STAS 3123-85 - thinner for alkyd resin based products.
 8. STAS 3124-75 - 104 Thinner for oil based products.
 9. STAS 3509-83 - oil based paints. Khaki paint 1003.
 10. STAS 3706-69 - oil based varnishes. 1060 lacquer.
 11. STAS 3744-69 - oil paints. 1000 gray paint.
 12. STAS 6592-80 - Chituni oil based.
 13. STAS 8308-69 - resin. Romalchid R60.
 14. STAS 83 11-87 - Paintwork. Colours and shades.
 15. STAS 8512/1-79 - epoxy resin type 040 and 040T.

(4) Regulations 3133

1. C 376 - Standard for the execution of painting and painting with additions future.

(4) 3140 Samples and Testing

(4) 3141 Consultant Contractor shall submit for approval, manufacturer's specifications for materials used in dyeing wood carpentry and certificates that will certify compliance with specified conditions.

(4) 3142 will be provided by the manufacturer, instruction handling, storage and protection for each material.

(4) The Contractor shall submit with 3143 samples of wood joinery and finishing mode it under the terms of the project (materials, colors, technology).

(4) 3200 **MATERIALS AND PRODUCTS**

(4) 3210 Materials (those referred to in (4) 3132)

(4) 3220 Products

(4) 3221 oil based paint type Linoxyn according NJ 90-61 of M.I.Ch. or similar.



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- (4) 3222 enamel paint based on alkyd resin (type E Hexol 105-1;'s 405-TO) san similar.
- (4) 3223 enamel paint based on cellulose derivatives (type Novoline E 102-1, E 232-1, 532-1 E, ER) or similar.
- (4) 3224 enamel paint or epoxy based simulations.
- (4) The 3225 primer-binding or oil based alkyd resins:
1. The primer will be of STAS 1060 3097-80 or similar.
 2. The primer can be prepared on site with the following composition:
 - Drying: 1,00 kg.
 - Pigments for Tinting: - 0,05 kg.
 - White Spirit - 5-10%.
- (4) 3226 oil based putty.
1. Grout will be the type C 101-2 - according to STAS 6592-80 or similar.
 2. Grout can be prepared on site with the following composition:
 - Drying - 1,00 kg.
 - 10% glue solution - 0.10 kg.
 - Enamel - to the working consistency.
- (4) 3227 oil-based putty trowel glue.
1. Grout will be type STAS 6592-80 or similar.
 2. Grout can be prepared on the următoarea composition ~ ~ Antichrist ie:
 - Drying - 1,2 kg.
 - Solution of glue 6% - 1,2 kg.
 - Ocher - 1.4 kg.
 - Carbon black - 0,2 kg.
 - Chalk approx. 6.0 kg.
- (4) The 3230 shipping, handling, transport, storage
- (4) 3231 for the reception of each lot of material delivered, the Contractor shall verify certificate As the manufacturer.
- (4) The 3232 products will be stored in the original packaging, grouped by categories in a space covered, well-ventilated, frost and temperature variations between (+7 ° C and +20 ° C) with visible labels to not confuse the content.
- (4) 3233 for materials handling at the workplace will use cans and cans packaging, buckets, and transfer only the amount needed for a work shift.
- (4) 3300 EXECUTION
- (4) 3310 Preparatory operations
- (4) 3311 work to be completed before commencing the dye in woodwork.
1. Plaster repairs.
 2. Seal around frames and sealing materials and laying cement (where applicable) sealing rods.
 3. Electrical and plumbing installation.
 4. Execution cold floors (tiles, ceramic mosaic tiles, etc..), Excluding their training.
- (4) 3312 Carpentry shall be permanently mounted to commencing the dye, metallic accessories to be mounted carpentry and good batch operation is venificata except drucarelor and escutcheons which are fixed after painting carpentry.
- (4) 3313 final coat of paint shall be made only after full completion before the end of paints and clothing floors (cleaning, polishing, waxing), taking measures to protect them against dirt.
- (4) 3320 Substrate preparation
- (4) 3321 will be pre-checked carpentry carpenter in terms of best execution and operation, repairing all the defects.
- (4) 3322 There will be remedied in damages during transportation, handling or installation.
- (4) 3323 will be cut knots, pitch pockets or pegs.
- (4) The 3324 will increase by 2-3 mm by hammering nails metal flower heads.
- (4) 3325 will be smooth edges of wood pieces.
- (4) 3326 Wood humidity woodwork before painting should not exceed an average of 16% on the heels carpentry and average of 14% on all other items.
- (4) 3327 metallic carpentry Accesoriile not nickel or lacquered factory will be coated with anti-corrosive primer and paint.
- (4) 3330 Oil painting performance
- (4) 3331 surface processing will be done immediately after their preparation.
- (4) Painting 3332 will not start until the air has a temperature of at least -15 ° C.
- This regime will be maintained throughout the execution and at least 15 days after their execution.
- (4) 3333 The use of paints exceeded the terms of use.



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(4) 3334 Grunduinea and leveling.

1. Primer-binding primer is oil based (4) 3225 and will apply for a manual good adhesion to the substrate.
 2. Woodwork will be delivered to site ready primed with primer-binding.
 3. After priming defects will Chita local oil-based putty (4) 3226 and will sleftui. Wipe dust after dry the.
 4. Unless otherwise specified, will run two complete leveling of the surface after drying followed by sanding and wiping dust.
 5. Filling shall be done in layers, with putty (4) 3227 special diluted with a diluent approved Consultant, or with oil or with colored paint.
- The layer thickness of spăcluiala will be about 0.2-0.5 mm.

(4) 3335 Paint Application

1. Applying paint layers will be in 2-3 as described in the project.
2. Paint will glide through fine sieve with 900 meshes in cm² and be diluted with thinner () 3214 in 5-10%.
3. The paint will be applied in layers, without leaving traces thick and thin paint.
4. Paint will cover up to a good adhesion with the lower layer.
5. Layers of paint will extend the directions perpendicular to each other, the last layer is stretched along the fiber.
6. If necessary after the application layer will be executed grouting chatty and slefiuiri.
7. The last layer is not anew but is specified, the brush tufuieste to achieve a matte surface.
8. Sashes and doors will be painted sheets upright.

(4) 3340 Performance with paint based on alkyd enamels

(4) 3341 Substrate Preparation will follow (4) 3320.

(4) 3342 exterior and interior paint work must be carried out at a temperature of at least + 15 ° C and in conditions of relative humidity less than 60% ..

(4) 3343 The use of paints exceeded the terms of use.

(4) 3344 surface processing will be done by applying rigorous compositions respecting the order of operations shown below:

1. Priming with imbibition () 3225.
2. Local filling with putty () 3226.
3. Polishing bocurilor grouted.
4. Priming sites grouted with oil-based primer () 3225.
5. General leveling putty () 3227.
6. Polishing surface fillers.
7. Leveling layer II.
8. Polishing surface fillers.
9. Leveling layer III (if specified).
10. Polishing surface fillers.

(4) dc coats 3345 coverage will be in compliance with the order and the way operations indicated below:

1. Priming with coverage.
 2. Sanding primer coating film.
 3. Apply first coat of mail under () 3222.
 4. Polishing.
 5. Apply second coat of mail.
 6. Sanding (if specified).
 7. Apply second coat of enamel (the works of particular importance).
- (4) 3346 will stretch successive layers perpendicular directions to each other, and last layer will extend along the wood fibers.
- (4) 3347 email layers will polish with no sanding paper or canvas. 40 or 32, then Remove dust with a soft brush.

(4) 3348 last layer requires no finishing operations.

(4) 3349 The time required for a layer to another layer 5 be applied to e-mail, is 24 hours. Do not apply a new layer before the previous one has dried.

(4) The 3350 performance-based body paint epoxy emails

(4) 3351 Substrate Preparation will follow () 3320.

(4) 3352 Painting interior and exterior will be performed at a minimum temperature 18 ° C and in conditions of relative humidity less than 60% ..



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(4) 3353 surface processing will be done by applying rigorous compositions respecting the order of operations shown below:

1. Grunduina the primer-binding G 005-2 () 3225.
2. Local filling with putty knife according to STAS 6592-80.
3. Polishing grouted places.
4. Priming grouted places.
5. Total Filling putty knife I with STAS 6592-80.
6. Polishing.
7. Filling generation.
8. Polishing.
9. III General Filling (if specified).
10. Polishing.

(4) 3354 by applying the surface coating compositions based resin varnishes

Epoxy shall be in the following order of operations in strict compliance with them:

1. Priming with coatings based on epoxy resins.
 2. Polishing.
 3. E-mail the first layer 106.
 4. Polishing.
 5. Apply second coat of mail.
 6. Finishing acopenire film (only if specified).
- (4) 3355 Before applying the final coat can be sanded easily with no grinding or canvas.
8-4 your water resistant.
(4) 3356 Each coat shall be allowed to dry for 24 hours.

(4) 3357 painted woodwork will not be put into operation only after at least 7 days after application email last layer of epoxy resin.

(4) 3,360 reception conditions

(4) 3361 Painted surfaces will be present as a uniform, continuous, smooth and perfect to cover the lower layers.

(4) 3362 Portions uncovered spots, desprideri, cute, leakage, staple of the film, clusters of pigments, irregularities due to improper filling or sanding traces of brush hairs will not be accepted.

(4) The rectified portions 3363 will have the same color as the rest of the surface.

(4) 3364 will be considered defects in addition to those listed above, the following:

- Failure to implement technology specified in normative C3-76 () 3133;
- Failure to comply with specifications;
- Lack of correspondence between the work performed and the provisions of the project;
- Failure dosages, number of layers and materials specified.

(4) The 3365 consultant 5 decide local restoration or large areas of Painting, from case to case depending on the nature and extent of defects found.

(4) 3400 MEASUREMENT AND PAYMENT

The work described in this chapter shall be settled separately, but are included in the unit price of the item carpentry of wood, the quantitative works.

SPECIFICATION

PAINT ON METAL (STEEL)

GENERAL

(4) 4110 Specification object

(4) 4111 This chapter contains specifications for the execution of painting the elements of metal (steel) or metal joinery rolled steel. stairs, railings, grilles, grates and other metal.

(4) 4112 This chapter also includes specifications on the conditions for corrosion protection of metallic elements and bodywork.

(4) 4120 Basic Concept

(4) 4121 Metal joinery provided on exposed surfaces to be painted with oil-based paints, alkyd paints or epoxy resin, and the girls hidden interior will be coated with anti-corrosive primer.

(4) 4122 All metallic structures. unless specified otherwise, shall be painted with oil based paint and primer coated with corrosion.

(4) The 4123 items will protect bodywork corrosion by hot dip galvanizing.

(4) 4124 metallic constructions in aggressive corrosive sea conditions will be made of stainless steel.

(4) 4130 Standards and normative reference

(4) 4131 Where there is conflict between the provisions of these specifications and recommendations contained in the standards and regulations listed below, this specification shall prevail.



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(4) 4132 Standards

1. STAS 16-80 - Ulei of the Drying.
2. STAS 18-94 - in technical oil.
3. STAS 88-90 - bone glue.
4. STAS 2706-86 - Chalk ground.
5. SR 2993:1993 - Paints and varnishes. Rules for quality, packaging, marking, storage and transportation.
6. STAS 3097-80 - oil-based primers.
7. STAS 3123-85 - Thinner alkyd resin.
8. STAS 3124-75 - 104 Thinner for oil based products.
9. STAS 3421-79 - Lakes nitrocellulose.
10. STAS 3474-80 - Varnishes based on bitumen.
11. STAS 3509-83 - oil paints. Khaki paint 1003.
12. STAS 3706-69 - oil-based varnishes. 1060 lacquer.
13. STAS 3744-69 - oil based paints. 1000 gray paint.
14. STAS 3745-69 - oil-based paints. 1060 black enamel.
15. STAS 4121-75 - Primers nitrocellulose. 2446 gray primer.
16. STAS 4649-80 - Email khaki E 592-I based nitrocelnloză.
17. STAS 6592-80 - Chituni oil based.
18. STAS 8009-80 - Protection of metallic suprafelelor. Paint coatings. Verification methods.
19. STAS 8308-69 - resin. Romalchid R 60.
20. STAS 8311-87 - Paintwork. Colours and shades.
21. STAS 8512/1-79- epoxy type 040 and 040 T.
22. STAS 10128-86 - Corrosion protection of steel constructions above ground. Classification aggressive environments.
23. STAS 10166/1-77 - Corrosion protection of steel structures above ground. Preparation Mechanical surface.
24. STAS 10702/1-83 - Corrosion protection of steel structures above ground. Coatings protective. General technical conditions.
25. STAS 12796-90 - Protection against corrosion. Surface preparation of steel parts painting.

(4) Regulations 4133

- 1.C3-76 - Standard for the execution of painting and painting, with additions.

(4) 4140 Samples and Testing

- (4) 4141 Consultant Contractor shall submit for approval the manufacturer's specifications for materials used in the paint and certificate which will certify compliance with specified conditions.
- (4) 4142 will be with valid by the manufacturer instructions for handling, storage and protection for each material.
- (4) 4143 Contractor shall submit samples along with various metal joinery (Steel) and how to finish them under the specified conditions (materials, colors, technology).

(4) 4200 MATERIALS AND PRODUCTS

(4) 4210 Materials (acc () 4132)

(4) 4220 Products

- (4) 4221 oil based paint type L 001-27 breast Durolac similar.
- (4) 4222 enamel paint based on alkyd resin (type Hexol F 105-1, E 405-10) or similar.
- (4) 4223 enamel paint based on cellulose derivatives (type Novoline E 102-1, 232-1 E, E 532-1; ER or similar).
- (4) 4224 enamel paint on epoxy resin or similar.
- (4) 4225 anticorrosive primer with oil and lead minium.
 1. The primer will be of the type 1000 or 1165 or similar STAS 3097-80.
- (4) 4226 oil-based putty for leveling interior metal surfaces.
 1. Grout will be of 1522 (C 101-2) - according to STAS 6592-80 or similar.
 2. Grout can be prepared on site with the following composition:
 - Drying - 2.00 kg
 - Solution of glue 6% - 0.30 kg
 - Ocher - 1.00 kg
 - Carbon Black - 0.20 kg



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- Chalk approx. 6.50 kg

(4) 4227 oil-based putty for leveling exterior metal surfaces.

1. The grout will be of 1522 - STAS 6592-80 or similar.

2. Grout can be prepared on site with the following composition:

- Drying - 0.55 kg

- Drying neftenic - 0.68 kg

- Lake - 0.45 kg

- Turpentine - 0.57 kg

- Spat hard - 0.60 kg

- Ocher - 0.95 kg

- White Zinc - 0.64 kg

- Minium iron - 0.22 kg

- Carbon Black - 0.20 kg

- Chalk approx. 5.10 kg

(4) The 4230 delivery, handling, storage

(4) 4231 for the reception of each lot of material delivered. Contractor shall verify certificate As the manufacturer.

(4) The 4232 products will be stored in the original packaging, PC categories grouped in a sheltered, dry, well ventilated, frost and temperature variations (+7 ° C and +20 ° C) with visible labels not to confuse the content.

(4) 4233 for the handling and transport to the place of work will be used packing boxes and cans, buckets and will only transport quantities needed for a work shift.

(4) 4300 EXECUTION OF WORKS

(4) 4310 Preparatory operations

(4) The 4311 work to be completed before commencing the vopsitoniei the metal joinery and metallic structures.

1. Plaster repairs

2. Seal around frames and laying cement mortar (where applicable) sealing rods.

3. Execution cold floors (ceramic tiles, mosaic tiles, marble etc..), Excluding their polish.

(4) 4312 Carpentry shall be permanently mounted to the commencement dye, metallic carpentry accessories must be mounted correctly and properly functioning to be checked.

(4) 4313 Mounting the complementary metal confections (handrail on stairs railings, pull handles, etc..) Will be made after the complete execution of dye, taking care that it does not suffer degradation.

(4) 4314 final coat of paint on woodwork shall be made only after full completion before the end of paints and clothing floors (cleaning, polishing, waxing) taking action to protect them against dirt.

(4) 4320 Substrate Preparation

(4) 4321 metal joinery and all garments will be delivered to site with a layer of anti-corrosion primer (4) 4225 over the entire surface, ie inside and closed profiles.

(4) 4322 It will remove all traces of rust, oxides, stains, grease, mud, mortar, etc.. shortly before application of paint, these operations are done in metal workshops or plants.

(4) The 4323 will clean metal priming maximum 2-4 hours after cleaning. Surface ready for painting will clean up to be polished manually by hammering, scraping or brushing, or mechanized tools electric by Perieni with wire brush or abrasive, in special cases will proceed to sanding, flame cleaning, pickling pasta pickling or degreasing solvents.

(4) 4324 On site preparation will perform the following operations:

- Checking in terms of good carpentry funcitonări executions;

- Dust and dirt by brushing;

- Repair of corrosion primer layer, where applicable;

- Local grouting and polishing.

(4) 4330 Oil paint performance

(4) 4331 Substrate Preparation will follow (4) 4320.

(4) Painting 4332 will be carried out at an air temperature of at least - 15 ° C, regime will be maintained throughout the execution and at least 15 days after their execution.

(4) Surface Processing 4333 will be in strict compliance with the order of operations shown below:

1. Priming with anticorrosive oil and Red lead in 1000 or 1165 according to () 4225 applied in a thin trickle continuously and without, streaks or wire brush.

Woodwork and metallic are delivered on site ready primed.

2. Grouting will be done with local oil-based putty according to () 4226 and will cover scratches, cracks, holes. Places deeper than 1 mm cover on several occasions.

3. Polishing grouted places will execute slefiuit canvas, after sanding the surface must be thoroughly cleaned of dust.

4. Priming grouted places will be made according to 1.



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5. Filling general I will be using putty as () 4227; putty diluted with thinner or special (D-001-3) or with oil or paint color.
6. Polishing general I will be using power tools for sanding disc brush, felt or a fine grain sandpaper. It can be wet or dry. After polishing, the surface must be thoroughly cleaned of dust by brushing or blasting with compressed air. After wet sanding, wash the surface with solvent and will be deleted.
- (4) 4334 Paint Application
 1. Application will be mechanized paint spray gun in 3 layers, each layer being applied – CANDU after complete drying of the previous one.
 2. Paint will glide through fine sieve with 900 meshes per cm² and dilute with thinned 5-10%.
 3. The paint will be applied in layers without leaving traces thick and thin paint.
 4. If necessary, it will execute the filling and sanding after each coat of paint.
 5. Layers of paint will extend perpendicular directions to each other.
 6. The last layer will not grind and, unless otherwise specified, will be finished by the end of smoothing shine.
- (4) The 4340 performance with body paint based on alkyd enamels
- (4) 4341 Substrate Preparation will follow (4) 4320.
- (4) 4342 internal and external painting works will be carried out at a temperature of at least - 15 ° C and in conditions of relative humidity less than 60%.
- (4) 4343 surface processing will be done by applying a rigorous compositions order of operations given below and details given in (4) 4333.
 1. Priming with G 355-4 corrosive alkyd resin and Red lead.
 2. Local filling with putty knife, alkyd resin.
 3. Polishing grouted places.
 4. Priming sites grouted under point 1.
 5. Filling gezogonen with putty knife or spray
 6. Polishing surface fillers.
 7. Leveling layer II (if specified).
 8. Polishing surface fillers.
- (4) 4344 Application of coatings will be observing the order of operations and how indicated below:
 1. Priming with the acopenire.
 2. Sanding primer coating film.
 3. Apply first coat of mail under () 4223.
 4. Polishing.
 5. Apply second coat of mail.
 6. Sanding (if specified).
 7. Application of the third layer of enamel.
- (4) 4345 will stretch successive layers perpendicular directions to each other.
- (4) 4346 email layers will polish with polishing cloth no. 40 or 32, then Remove the dust with a soft brush.
- (4) 4347 last layer requires no finishing operations.
- (4) the drying time of a layer 4348, 5 be applied to another layer of enamel is 24 hours.
Do not apply a new layer before the previous one has dried.
- (4) 4360 Reception conditions
 - (4) 4361 Painted surfaces will be present as a uniform, continuous, smooth, and that perfect cover lower layers.
 - (4) 4362 Portions uncovered spots, separation, cute, drains, discontinuities of the film, clusters of pigments, irregularities due to improper filling or sanding traces of brush hairs will not be accepted.
 - (4) The rectified portions 4363 will have the same color as the rest of the surface.
 - (4) 4364 will be considered defects in addition to those listed above, the following:
 - Failure to implement technology specified in normative C3-76 (4) 4133;
 - Failure to comply with specifications;
 - Lack of correlation and concordance between the work performed and the provisions of the draft;
 - Failure dosages, number of layers and materials specified.
 - (4) The 4365 consultant 5 decide local restoration or large areas of works painting, from case to case, depending on Natrun and extent of defects found.
- (4) 4370 Corrosion protection of metal components of bodywork
 - (4) 4371 bodywork elements will be made of galvanized steel sheet on both sides. The zinc layer is 480 g/m² on all sides.
 - (4) The 4372 items will protect corrosion tinker at the edges of the cut results by galvanizing with a zinc spray.
 - (4) 4373 All fasteners to be galvanized tinkers (screws, pins, bracelets, nuts, etc.).
 - (4) 4374 All fasteners to be corrosion-protected metallic confections:



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1. Praznurile, clips, fittings, mounting plates and the underside of the metal frames of doors, windows and cabinets will protect oil based primer and Red lead, or similar.
2. Screws, nuts, washers, bolts shot, plugs expanded metal, self-tapping screws, nails will be hot galvanized.
- (4) 4400 MEASUREMENT AND PAYMANET
- (4) The 4410 works in this chapter shall be settled separately, but are included in the unit price of the quantitative article works properly metallic carpentry, metal or bodywork elements.

SPECIFICATION

CERAMIC PLATES PLATING

GENERAL

(5) 1110 Specification object

(5) 1111 This chapter contains specifications for the plywood interior walls, made with the tiles or ceramic tiles.

(5) 1120 Basic Concept

Tiles or ceramic tiles will be applied in particular to the walls room where wet processes take place, which require maintaining a special hygienic condition, as indicated in the project or where it will be indicated by the Consultant.

(5) 1130 Standande and normative reference

(5) 1131 Where there contraindications between these recommendations and the standards specifications listed below, this specification shall prevail.

(5) The 1132 Standards:

1. STAS 146-80 - Lime for construction.
2. EN 159: 1996 - tile tile.
3. STAS 388-95 - Grey Portland cement.
4. STAS 545/1-80 - Plaster building.
5. STAS 790-84 - Water pentrn concrete and mortar.
6. STAS 1500-78 - Pa35 cement, cement M30.
7. STAS 1667-1676 - silica sand in breast nan canieră, well washed, Grann ~ os
8. STAS 5939-80 - ceramic tiles.
9. STAS 7055-87 - white Portland cement.
10. STAS 7058-91 - DP25 glue or D50.
11. SR EN 159: 1996 - Ceramic CESAROM.
12. STAS 9201-80 - hydrated lime powder.
13. SREN 159: 1996 - majolica plates.

(5) Regulations 1133

1.C 6-86 - Technical Instructions for the execution plywood tile, majolica and glazed tiles CESAROM.

2.C 223-86 - Technical Instructions on the execution of plywood tiles, majolica and glazed tiles applied to walls by gluing thin pasta.

(5) 1140 Samples and testing

(5) 1141 Before Lansana orders, the Contractor shall submit to the Consultant for approval, 3 samples of each type and color of tiles in the project proposed to be used.

(5) 1142 Before delivery each batch of porcelain or ceramic, the Contractor shall submit certified Consultant in triplicate stating physical and chemical composition of boards, quality and compliance with these specifications.

(5) 1143 for premises where the project is provided sanitary ware and ceramic tiles supplier shall submit for approval Consultant sanitane sets of objects with assorted colored tiles or tiles.

(5) 1150 Extra material

The site antreprenonul will ensure a surplus of 2% by weight of the tiles or tiles of each type, size and color used in the works.

(5) 1200 MATERIALS AND PRODUCTS

(5) 1210 Materials (that of () 1132)

(5) 1220 Products:

(5) The 1221 tile tile, square or rectangular in size, color and quality specified in the project and according to EN 159-1996.

(5) 1222 S-type tiles (natural) or F (fine sandstone), square or rectangular, the size, color and quality specified in the project and according to STAS 5939-80.

(5) The 1223 agreement with the Consultant, the site can be delivered plates of different sizes and formats in standard conditions in the two materials (ceramic tiles).

(5) The 1224 Boards shall have the following physico - chemical characteristics:

- Coefficient of water absorption: max. 18% for tiles and max. 2.5% for tiles.



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- The fine cracking resistance tests, samples shall not present any such failure;
- The chemical resistance test, finish (glaze) will remain undamaged.
- (5) The 1225 cards will not show dark spots with an area greater than max. 1.5 mm² max. 2% of the sample, cracks in the glaze, glaze or underserved areas thickening glazed look "frozen" or crystalline and rough areas.
- (5) 1226 admitted deviation from normal size for tile manufacturing:
 - The nominal thickness of 5.5 mm - + / - 10% and thickness of 5 mm - 0 .. 10%
 - The nominal length and width: + / - 0.6%
 - Arrow: max. 0.5% of the length of the major side
- (5) 1227 admitted deviation from nominal dimensions of built stoneware plate:
 - The nominal thickness: + / - 10%
 - The nominal length and width: + / - 2%
 - Arrow: 0.35 mm and 0.5 mm fine tile natural tile diagonally measured the length and larger side.
- (5) 1230 Delivery, storage, handling
- (5) 1231 or ceramic tiles will be stored away from damp, covered, in the original packaging provider on the platform flat surface or shelf.
- (5) The 1232 will not bring to the working dc site than the amount strictly necessary for the performance of plywood and only when necessary, such as boxes or ceramic tile is not stored in inappropriate places.
- (5) The 1233 plates will be handled with care to avoid being hit and not damaged and will shun contact with materials that can stain.
- (5) 1234 or ceramic tiles will be transported in boxes with vehicles covered, clean and dry.
- (5) 1235 In transport stacking boxes will be taking measures to prevent displacement piles during transport, to avoid damaging the package and spreaders plates.
- (5) 1240 Mortars for laying tiles on walls
- (5) The 1241 General:
 1. Mortar components will be well mixed before adding water.
 2. It will add the required amount of water to achieve desired consistency. Avoid excess water.
 3. Amestecul will prepare carefully for full humidification and mixing.
 4. Din time to time, the mixture will be to maintain a consistent reagitat appropriate but will not add ingredients.Mortar has set it can not be used.
- (5) 1242 will be tightened mortar cement-sand (grain size 0 ... 3 mm) in dosage volumetric ratio of 1:2.
- (5) 1243 mortar cement primer will be given dosage of 400 kg cement per m³ sand (Grain 1 ... 3 mm) in volumetric dosing 1:3,5:0,05 (cement: sand: lime paste). Mortar will dry mix, then add enough water to a homogeneous mixture.
- (5) The 1244 Mortar cement, sand (0 ... 1 mm), lime paste in 2:1:1 volumetric dosing.
- (5) 1250 Easter thin adhesive for laying plywood on walls
- (5) 1251 General:
 1. Primer will be a solution of glue DP25 (D50) with water in a 1:3 volumetric dosing.
 2. Plaques paste adhesive is applied to the following: cement: sand 0 ... 1 mm: DP25 glue: water 5:2 volumetric ratio: 1:2 ... 3.
 3. After mixing the dry components (sand and cement) add liquid components (Glue 1.5 ... 2 parts water).
 4. In preparing the composition of the adhesive paste to be used PA35 cement.
- (5) 1300 **PLYWOOD EXECUTION ON SUPPORT**
Unless otherwise specified, plywood installation will be done by tile (5) 1221 or sandstone (5) 1222 mortars according to (5) 1240 San paste adhesive (5) 1250, as specified in (5) 1310 .
- (5) 1310 Preparatory operations
- (5) Prior to the commencement of operations in 1311 plating or ceramic tiles, they will be executed other finishing works as follows:
 1. The roof of the building, the execution spill final solution, so running cladding surfaces to be protected from the action of atmospheric precipitation;
 2. Mounting frames the windows and door frames and linings from the outside sill that will be installed after the execution of plywood.
 3. Plastering ceilings and areas that do not plated, in premises where the tiles will be executed.
 4. Sanitary pipe fitting, electrical, heating, buried under their proof plywood and pressure.
 5. Mounting anchors or devices for fixing sanitary, any subsequent holes will be drill data only.
 6. Running cold floors (mosaic cast mosaic tiles, ceramic tiles, marble, etc..).
 7. Running hot floors (wood, PVC etc..) That degrades at high humidity, will be made only after installing plywood.



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- (5) The 1312 will not start work until the work already performed (floor) will not be protected satisfactorily.
- (5) 1313 before work Plating will make inspection of surfaces to be coated. Do not start work until they have not directed any irregularities (vertical and horizontal deviations and any apparent defects or alterations).
- (5) 1314 Application of the tiles or tiles will make only snrafete dried, prepared in advance and to be entered in deviations from flatness between 3 mm / m vertical and 2 mm / m horizontal.
- Any local irregularities shall not exceed 10 mm (bumps or pits).
- In the case where these deviations are exceeded, the surfaces will be directed by filling with mortar or putty. Mortar thickness should not exceed 1-2 cm.
- (5) in 1315 before work plating will run the following operations:
- Removing any residual mortar, dust, grease stains, etc..
 - Masonry joints (horizontal and vertical) must be cleaned well to a depth of about 1 cm, for fixing the mortar to adhere better to these surfaces.
 - Monolithic poured concrete surfaces or concrete surfaces of large panels will apply a spritzer, to obtain a higher roughness, needed fixing mortar adhesion plaques.
- (5) The 1320 General
- (5) The 1321 will not run plywood in areas where the temperature is below +5 ° C.
- (5) 1322 will take care to avoid rapid evaporation of water from the mortar bed.
- Mortar bed shall not apply well before placing the tiles or ceramic tiles in any case will not apply on dry mortar.
- (5) 1323 Avoid cutting boards if possible, so that by their correct place, the panel will be cut to no more than half of the plate.
- (5) 1324 will grind cut edges of the plate with carborundum stone.
- Unfinished boards will not apply properly, cracked or jagged edges.
- (5) 1325 joints between the plates will be made in continuity, both vertically and horizontally and have the same size - approx. 2 mm - in both directions, as spcifica to (5) 1350.
- (5) 1326 Permissible deviations for finished surfaces will be + / - 2 mm below embodiment of 1.20 m length.
- (5) 1330 Mapping surface coverings
- (5) 1331 Drawing surfaces that are to the plate will be both from and to the vertical onizontala.
- (5) 1332 Drawing will be the embodiment of wood up to 2 m long and with repenelor made of pieces of ceramic tile or plaster mortar provisionally fixed onto the surface of the plaster in the immediate vicinity of the surface is plated.
- (5) Plumb in 1333, left the front line parts should represent plywood surface that is to be executed.
- (5) 1340 Execution of plating
- (5) 1341 After finishing operations can proceed to trace application execution plywood in the following sequence of operations.
- (5) in 1342 for concrete walls (precast or cast monolithic panels):
- Implementation of the spirit of cement-sand mortar (5) 1242 with fluid consistency (10-12 cm) over the height of the wall and ceiling to driscuirea to the line dividing the area to be plated;
 - Priming cement-sand mortar (5) in 1243 with greater consistency (6cm) the area that tackles;
 - The thick adhesive and plywood;
 - Execution fillet connection;
 - Application of plaster on top of the wall;
 - Applying oil paint.
- (5) 1343 The brick walls or concrete blocks:
- Applying Sprite and tinciului primer that remains plastered surface;
 - Shotcretes application of cement-sand (5) 1242 and primer-cement mortar sand (5) surface 1243 to be like:
 - Execution of plywood.
- (5) In 1344 b.c.a. wall elements:
- a) On the planar b.c.a.:
- Application shotcretes cement thickness of 2-3 mm made from cement: sand 0 ... 1 mm, glue 1:3:0,15 DP 25 in dosage and water to the consistency of 12-14 cm;
 - Priming adhesive mortar thickness of 8-10 mm, prepared from 0 ... 1 mm sand, cement, lime paste, glue DP 25, the volumetric dosing and water to the consistency 2:4:2:0,50 of 10-12 cm;
 - Execution of plywood.
- b) on small blocks of masonry b.c.a.:
- Implementation of the spirit of cement thickness of 2-3 mm, made of cement: sand 0 ... 3 mm, glue DP 25, the dosage 1:4:0,3 and water to the consistency of 11-13 cm;
 - Priming plaster fixation plates prepared with the same composition as the sprit, with consistent 7-8 cm and thickness 20 mm;
 - Glue application thickness of 8-10 mm, made of sand 0 ... 1 mm, cement, lime paste, glue DP 25, the dosage 2:4:2:0,50 and water to the consistency of 10-12 cm;



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- Execution of plywood.

"(5) 1345 primer surface should be roughened with hedgehog.

(5) 1346 or ceramic tiles will be cleaned of dust and dirt, will be held in the water for 10-15 minutes before plating and then will drain the water for 5-10 minutes.

Do not use wet sheets cladding.

(5) The 1347 settlement plates will start from the floor, taking care to match the joints in the plywood floor unless otherwise noted and correlated plywood (adjusted perfectly horizontal) with the floor level of which can be tilted.

(5) 1348 Bonding shall be made by application of the mortar trowel on the back plate (5)

1244 or adhesive paste (5) 1251-2, as appropriate and apply the tiles by clicking on the substrate. (5) 1349 After placing each row of tiles will clean the excess grout and will pour into the gaps behind the tiles, grout.

It controls every time the screed.

(5) The 1350 grouting

After approx. 5-6 hours of completion of the plywood joints between boards should be cleaned by rubbing. After this operation, the joints are filled with grout white, unless otherwise specified, a period of 6-8 hours of completion of the entire surface of plywood that room.

â(5) 1360 Protection of work

(5) 1361 spaces that were made of plywood or ceramic tile will be sealed and will keep this until the paper is completely dry.

Plywood shall be protected from damage until the reception of the work.

() 1362 During the warm season, sun-exposed surfaces shall be covered with sackcloth sheets in strips or sheets which will be for 2 days continuously moistened.

(5) 1370 Acceptance tests work

(5) The 1371 Surface plywood will check embodiment of 1.20 m, and will allow no more than a ripple with the arrow up to 2 mm.

(5) 1372 plywood must submit a color uniformity over the entire surface, not allowed tonal differences between panels mounted either in the same panel, not allowed dirt stains, enamel defect visible places, etc..

(5) 1373 rows of tiles must be regular, rectilinear further or alternate joints of uniform width and well filled with white grout.

(5) 1374 will be considered faults that must be addressed locally or all the following:

1. Failure to comply with these specifications.
2. Improper positioning plate to the vertical and horizontal deviations.
3. Failure continuity and size joints in two directions.
4. Application to the edges of walls or pillars normal plates and no special edge tiles glazed as specified.

It will replace these tiles with some matching.

5. The finish does not conform to those specified in the project plans.

6. Damaged plywood resulting from inadequate protection to final acceptance: cracking of the plates, the plates substrate separation, staining, etc..

(5) The extent of repair or replacement in 1375 will be determined by the Consultant. These operations will not result in additional costs being borne entirely by the Contractor.

(5) 1400 MEASUREMENT AND PAYMENT

(5) The 1410 works in this area is measured in square feet of plywood executed.

(5) The 1420 settlement works will be on square meter of plywood executed as planned in the project, based on the unit price of the item in the quantitative papers.

SPECIFICATION

THERMAL INSULATION SISTEM AND OF FASADES FINISHING

GENERAL

(6) 1010 Specification object

(6) 1011 This chapter contains specifications for works that are facade insulation systems.

(6) 1020 Standards and normative references

(6) 1021 Where there is conflict between these specifications and the recommendations of the standards and regulations listed below these specifications shall prevail.

(6) 1022 Standards:

STAS 6472/3-89 Building Physics. Thermodynamics. Calculation of thermo elements of building construction.

STAS 6472/4-89 Building Physics. Heat Engineering. Construction elements diffusion behavior of water vapor.

STAS 5912-89 homogeneous building materials. Determination of thermal conductivity.

STAS 6156-86 building acoustics. Protection against noise in civil and social-cultural. Allowable limits and parameters do soundproofing.



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(6) Regulations 1023

P 118-83 Technical Standards design and realization of buildings on the action of fire protection.

113-94 Standard for the design and execution of heating.

C56-86 Standard for checking the quality of construction and installations.

C107-82 Standard for the design and execution of thermal insulation in buildings (under review do).

P 122-89 Technical Instructions for the design of sound insulation measures in civil buildings socio-cultural, technical and administrative.

Quality in Construction Law Law 10-95

GD. 273/1994 Regulation of construction and reception of their installations.

Nr.728/1994 Government Regulation on quality certification of products used in construction.

Order 9/n/15.03.1993 Protection Regulation and Health in Construction. Normative framework for the granting of personal protective echipamentului.

(6) 1030 Project Details

Consultant Contractor shall submit for approval detailed design company supplying.

Also will present certificates of quality and technical agreements.

All materials of this system must come from a single manufacturer.

It will follow the existing design drawings arrangement of their finishing position of front and grooves.

(6) 1100 MATERIALS AND PRODUCTS

(6) 1110 Materials

1. rails

- Synthetic

- Aluminum

2. Connecting rods

3. Insulation boards

- Polystyrene

- Mineral wool

4. Adhesive for bonding insulating

5. Dowels for fixing insulation boards

6. Glue putty reinforced with glass fiber mesh

7. Miscellaneous supplies

(6) 1120 Tolerances

() 1121 For deviations greater than 1 cm have made a rough equalization.

(6) 1122 outside air temperature and the surface of the material being put in the work must be either +5 degrees C, fully cured.

(6) 1123 can not work in high winds or high temperatures (under the influence of direct sunlight).

In case of unfavorable meteorological conditions, the working surfaces must be protected by suitable materials.

(6) 1130 Delivery, storage, handling

The materials are made, depending on their nature, in plastic buckets, bags, rolls or packages with liners.

Storage, all depending on the material will be in frost and moisture, cool and protected from UV rays (sun), the influence of rainfall and damage mechanics. The bags are stored on pallets or wooden stand, rollers are stored upright. For these products (adhesives, paints) are to avoid prolonged skin contact, in case of splashing into eyes rinse with plenty of water indicate current and needed medical attention. These products are not harmful when hardened.

When purchasing materials will be given special attention by the manufacturer warranty period allowed for storage.

(6) 1200 EXECUTION

(6) 1210 General

The thermal insulation and finishing facades should be selected to match in terms of thermal protection, acoustic, fire and weather.

(6) 1220 Substrate preparation

Must be removed dirt splashes of mortar and other debris. Do shell oil must be removed.

(6) The 1221 Fit horizontal rails above the base, checking with the spirit level horizontality. Between themselves leave a distance of 3 mm. Self secured with pins - by 3 pieces per meter. Self is always fixed on the last hole possible to avoid excessive lengths loose. For buildings under 8 m height using nails and those with more than 8 m height using dowels screwed. Any unevenness can be solved by providing spacers. Self do cut corners properly (oblique) or using rails corner.

(6) 1222 boards which are fixed with glue and dowels. For buildings taller than 8 m using special anchors. The adhesive is spread flat side of a notched trowel and then make indentations using the notched surface. The joints (edges) between boards should be free of adhesive. Bonding the entire surface is used only to smooth surfaces. For other types of surfaces, apply adhesive on a strip of 5 cm around the perimeter of the plate and the 3 points of her (size of the area in the 3 points is about a palm). In applying the above window lintels recommend the use of fixatives to avoid dislodging plaque with adhesive is still wet. The corner areas are recommended disposition woven insulating plates. After drying adhesive protrusions are removed by cutting



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with the cutter. The joints between the tiles are filled with foam or feather insulated. The ends of the boards from the windows, or doors are provided with cover strip joints. Then stick plaster rulers end to the window frames. Protective strap serves to catching foil tape medium which is removed after plastering.

(6) in 1223 with dowel holes are drill and make their introduction tapping or screwing.

Dibluirea be made earlier than two days of bonding adhesive. Anchor length is chosen according to the characteristics of the surface of the spot.

Will be applied at least 5 plugs / m field, and at the edge will be 12 pins / sq. Edge zone width will be specified by the manufacturer. Buildings taller than 20 m further action is taken against rise buildings under 20 m by holding plates with a number of anchors increased the schedule maker.

(6) The 1224 first stage is the application of mass of fillers in the adhesive strip, in order to fix the place of C glass fibers. Nets overlap each other on a width of 10 cm. After it is applied wet on wet spatula until the glue has not dried yet. Fixing putty that must cover the net.

Post no longer have to see. The thickness of this film is approx. 3 mm.

Corners are protected with a special corner post. Putty will apply strong press coverage has not done too thick.

In the area of facade openings (windows, doors) is required for strengthening the corner. The overlap is between the jamb and lintel bracket with a net.

In areas prone to bumps (sockets) armatura usual mesh 5 be reinforced armored, but which no longer overlap.

Apply adhesive putty about 2 mm thick, mounted to place blind. Then apply putty strong press. Follow all over reinforcement fiberglass mesh which is fitted with overlapping and covering it with putty.

(6) The 1225 windows sills are chosen so that the width of the drain edge to be protruding 3-4 cm from the new surface.

(6) 1226 the building expansion joints will highlight the insulating layer by running a uniform ditch about 15 mm. The joint edges and both sides thereof, a distance of approx. 20 cm width, apply a putty. Is inserted into the joint mesh tape is placed corner point with self hardening of PVC bed and trowel putty. Profiles are placed from bottom to top, overlapping at a distance of approx. 2 cm in order to ensure complete removal of water.

Before further processing, putty layer is at least 7 days dry.

(6) 1227 Primer gives the putty dry well. The primer can be applied by brush or trafaletale. You worked evenly and without interruption. The drying time is at least C 24 hours.

(6) 1228 is given after plaster primer. Apply with a stainless steel straightedge. For a brushed plaster, plaster on the wall immediately after the scope will round brush plastic brush, evenly and without flesh.

The thickness of the plaster is 3 mm.

It is recommended to purchase the entire quantity of plaster once to avoid color deviations.

Hue can be guaranteed only within a single batch of plaster.

(6) The 1229 painting is done after drying plaster and plaster only if no command from the start in the desired color. The first coat of paint gives diluted 1:1 with water or by the manufacturer's instructions. Depending on weather, dan least not before noon longer apply one or two coats of paint nesubtiata. As the plaster is recommended coandarea entire amount of paint at a time. Eyes and skin, as well as areas around the areas that apply tinciul, plaster or paint (glass, ceramic, stone Natrun, metal) will be protected. In case of need the sprayed Rinse immediately with plenty of water will not wait for drying.

(6) The 1230 staging will be anchored binding facade and securing devices will remove water, not to dirty the surface facade. At the end of the work holes will cap the color tone of the coating.

(6) 1300 ACCEPTANCE TESTING

(6) The 1310 will check flatness (± 0.5 mm).

(6) Ensure 1320 vertical deviation (± 1 mm / m).

(6) The 1330 will venifica if corresponds in terms of sound insulation, thermal and fire resistance.

(6) 1340 will verify the correspondence between the sample and what is executed.

(6) 1350 will check for quality certificates, instructions for use, date of warranty and technical approvals for materials used.

(6) 1360 If you meet these specifications and approved shop drawings and samples, the consultant 5 decide to replace lucnarilor with others that comply with these requirements.

(6) 1400 MEASURING AND PAYMENT

(6) 1410 Unit price includes all materials and accessories included in the system.

(6) The 1420 settlement is the area in square meters, according to the actual quantities executed.



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SPECIFICATION FLOOR SCREEDS

GENERAL

(15) 1110 Specification object

(15) 1111 This chapter contains specifications for the execution layer mortar screeds support floors.

(15) 1112 This chapter will complete the chapters of specifications for performance following types of flooring:

- Mosaic floor tiles;
- Ceramic tiled floors;
- Concrete slatted floors.

(15) 1120 Reference Standards and regulations

(15) 1121 Where there is conflict between the provisions of these specifications and recommendations standards and regulations listed below, this specification shall prevail.

(15) 1122 Standards

1. STAS 388-80 - Portland Cement
2. STAS 790-84 - Water for mortar and concrete
3. STAS 1030-85 - common for masonry mortars
4. STAS 1667-76 - Natural aggregates heavy mortar and concrete with mineral binders
5. STAS 2634-80 - ordinary masonry mortars and plasters. Test methods.

(15) Regulations 1123

- 1.C17-82 Technical instructions on the composition and preparation of masonry mortar and plaster
- 2.C35-82 Standard for composition and execution floors, amendments and additions thereof.

(15) 1130 Samples and testing

(15) 1131 mortar testing will be done by sampling according to the STAS 2634-80, namely:

- Compressive strength at 28 days: 1 test every 40 m3 mortar.
- Consistency and density of fresh mortar: a test every trade.

(15) 1132 Conditions of acceptance reception mortar:

- Compressive strength at 28 days: 50 kg/cm²;
- Consistency of fresh mortar: 12 cm;
- Density of fresh mortar: min. 1950 kg/m³

(15) 1133 Test method and laboratory test results will be submitted for approval to Consultant.

(15) 1134 It will also test for cement mortar used on 5 kg of each type of cement proposed to be used in the works.

(15) 1135 The Consultant shall provide the manufacturer's certificate attesting that the concrete delivered to the site complies with the specifications.

(15) 1200 MATERIALS AND PRODUCTS

(15) gray Portland cement in 1211, according to STAS 388-80, no bubbles, natural or white color, without constituents to stain.

(15) 1212 Natural aggregates (sand 0-7 mm) STAS 1667 to 1676, having a density in the pile, the loose fill of 1200 kg/m³.

Dredged sand can be partially replaced by crushing.

Natural sand content shall be at least 50%.

(15) 1213 Water STAS 790-84.

Drinking water will be clean, free from grease or other substances that can stain will not contain acids.

(15) 1214 DISAN plasticisers (Romanian product) or other similar close.

(15) 1220 Delivery, storage, handling

(15) 1221 units

1. Agregatele will be transported and stored according to their source and shorts. Aggregates shall be handled so as to avoid their separation, loss or contamination with soil fineness or other foreign material.

2. If separate units or mix different varieties, they will again be sieved before use.

3. Nu be used alternatively aggregated from different sources or special smoothness. Aggregates to be mixed only to obtain new fine gradations.

4. No units will be transferred directly to the means of transport from site storage location where moisture content is such that it can affect the accuracy of the mortar mixture, in which case aggregates shall be stored separately until the moisture disappears.

5. Aggregates shall be stored in silos, bins and platforms rough surfaces clean. When preparing aggregates storage shall take measures to prevent the entry of foreign materials. Aggregates of types and sizes to be stored separately.

Before using the aggregates, it will be left to dry for 12 hours.

(15) 1222 Cement:



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1. Cement shall be delivered to the mixing in original bags, sealed bearing labels that have joined weight, manufacturer's name, brand and type. Cement will be stored in enclosed buildings, away from moisture.
2. Do not deliver packages to differ by more than 1% of the weight specified.
3. If approved consultant cement delivered in bulk shall ensure cement storage silos and protect it from moisture. Do not mix brands and types of cement silos.
4. Do not use different varieties of cement or the same sort, but from different sources, without the approval of the Consultant.
- (15) 1223 materials will be delivered and handled so as to avoid penetration of foreign material, or through contact with water damage or broken packages.
Materials will be delivered in time to allow for inspection and testing.
- (15) 1224 perishable materials will be protected and stored in sealed structures on supports about 30 cm taller than the surrounding elements.
For short periods of time, the cement can be stored on raised platforms and will be covered with waterproof tarpaulins.
- (15) 1225 will be removed from the site which has hardened or unused cement has set.
- (15) 1 230 mixes mortar
- (15) 1231 General
 1. It will measure the material works so specified mortar mix proportions can be strictly controlled and maintained during the progress of works.
 2. Unless specified otherwise, the proportions to be determined by volume.
 3. In these specifications, the weight of each material Fobos m3 of ingredients for mortar is considered as follows:

<u>Material</u>	<u>weight per cubic meter</u>
Portland Cement	1506 kg
Natural sand 0-7 mm 2%	1300 kg wet
- (15) 1232 dosage compositions
 1. Floor screed mortar is a mixture of cement sand ratio of 1:3,5 (about 405 kg m3 cement mortar).
- (15) 1300 EXECUTION
- (15) 1310 Mortar
 - (15) 1311 mortar mix well and only in quantities that will be used immediately. The mortar will use the maximum amount of water that ensure satisfactory workability capacity, but will avoid supersaturated water mixture. Mortar will be put in operation within 2 hours after cooking. In this time adding water to mortar permitted to offset the amount of water evaporated, but this is allowed only in containers not place masonry mortar preparation. The mortar is not used during the set will be removed.
 - (15) Unless otherwise approved in 1312 for small batches preparation will be done in mechanical mixer drum, the amount of water can be controlled with precision and uniformity. Stir for at least 5 minutes: 2 minutes to mix dry materials and mix further 3 minutes after adding water. Volume mixing of each batch shall not exceed the manufacturer's specified capacity mixer. The drum is emptied completely before adding the next batch.
 - (15) 1313 mortar grouting will be used to dry so as to have plastic properties that allow its use in sealing joints.
 - (15) 1314 Transport mortar:
 1. It makes the appropriate equipment.The maximum duration of transport will thus be appreciated that transport and placing of mortar to make:
 - Within 10 hours of preparation, for lime mortars;
 - To a maximum of 1 hour of preparation for cement mortars and cement-lime - without retarder;
 - To a maximum of 2 hours for mortars with retarder.
- (15) 1320 Preparatory operations
 - (15) in 1321 immediately before the screed, concrete strength will be cleaned and all debris will be removed material. The concrete surface shall be cleaned of dust.
 - (15) 1322 Sapele will be cast in one operation and will be trowel; when partially dry brush will be getting a ribbing.
 - (15) 1323 Sapa ciment mortar runs for at least 24 hours and within 24 days of pouring plain or reinforced concrete slab.
 - (15) 1324 Sapa will run in areas that have already run the following finishing operations:
 1. routing partitions;
 2. plastering;
 3. laying of interior door frames;
 4. execution of installations, including verification samples.
 - (15) 1325 check that the concrete floor to have maximum permissible deviation from flatness as follows:
 - Flatness: + / - 4 mm to 2 m;
 - Uneven between two adjacent prefabricated (tiles): + / - 0.5 mm.
- (15) 1330 Running screed
 - (15) 1331 Sapele thickness will be indicated in the plans.
Unless otherwise specified dig will have thickness of 22 mm. irrespective of the layer to be applied (or waterproofing concrete) or of the floor construction which is subsequently applied.



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- (15) in 1332 will also have a special care in execution designs on slopes in wet areas (bathrooms, kitchens, laundries, and so on).
(15) 1333 floor surfaces should be cleaned with wire brush or straw, residue, dirt, dust, debris, Scrape with spatula concrete or mortar drops falling from other processes, sweep and wash with running water, without to flood.
(15) 1334 Drizzle the surface with cement grout.
(15) 1335 Trace levels, based on vagris line.
(15) 1336 mortar is applied to the floor by pumps or other means and leveled with screed, then driscuieste surface.
(15) 1377 Sapele will be brushed to achieve a surface to ensure good adhesion of the surface of the floor.
(15) 1340 Cleaning and protection
(15) 1341 Sapele will be covered to prevent rapid drying.
(15) 1342 After running the screed, the Contractor will cover and protect the means it considers appropriate.
(15) 1350 Allowable defects and fixes
(15) 1351 After execution, dig left in perfect condition, as planned. We have obtained the approval of the Consultant.
(15) 1352 All defective work shall be removed and replaced at the request of the Consultant. The volume of work to be removed and the removal and replacement methods are indicated by the Consultant.
(15) 1353 Contractor shall execute at his own expense all work to remove and replace faulty bits.
Consultant's opinion, are not allowed entry if:
1. Sapa does not comply with the specifications;
2. Subfloor surface is too damaged to be accepted.
3. Levels are not finished as planned in the project.
4. Due to dig premature loading, altered or damaged.
(15) 1400 MEASURING AND PAYMENT
(15) 1411 Sapele will not be paid separately.
(15) 1412 Sapa will settle separately only when compared to the thickness specified in the specifications and details of the plan.
The beneficiary will require a greater thickness of it.

SPECIFICATION TINWARE

GENERAL

- (17) 1110 Specification object
(17) 1111 This chapter contains specifications for tinker work (gutters, downspouts, window sills, aprons, sale, parafrunzare, and so on).
(17) in 1112 are also included specifications for mounting the bodywork elements used to work sealing vertical and horizontal joints.
(17) 1120 Basic concept
(17) 1121 All bodywork elements will be made of hot galvanized (490 g/m2).
(17) 1130 Reference Standards and regulations
(17) 1131 Where there is conflict between these specifications and recommendations contained in the standards listed below these specifications shall prevail.
(17) 1132 Standards:
1. STAS 429-85 - Red lead putty.
2. STAS 500/3-80 - general purpose construction steels, corrosion
3. STAS 889-89 - soft galvanized wire.
4. STAS 908-90 - Hot rolled steel. Band.
5. STAS 2028-80 - galvanized sheet.
6. STAS 2111-90 - Nails with flat head, conical beak.
7. STAS 2274-88 - Downpipes, gutters and accessories joining and fastening.
8. STAS 2389-92 - Gutters and downspouts. Design specifications and composition.
9. STAS 3097-80 - anticorrosive primer - Red lead.
10. STAS 8285-88 - braided wire. Wire cloth for general use.
11. SREN 10143:1994 - galvanized steel continuous hot.
(17) 1133 Standards
1. C 3 7-88 - Standard for composition and performance of the roof construction - Specification I.
General requirements.
(17) 1140 Drawings
(17) 1141 Execution Contractor shall submit drawings for items of bodywork including:
- Details of cutting and trimming of the board;



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- Mounting details of the items.

(17) 1142 approval of architectural details (details Terrace, penetrations, leaking) mean approval and bodywork elements that will not be subject to separate approval by the Consultant.

(17) 1200 MATERIALS AND PRODUCTS

(17) 1210 Materials (in addition to () 1132).

(17) 12 11 Accessories: screws, nuts, washers cadmium plated.

(17) 1212 CA400 roofing felt, according to SR 138-94.

(17) 1213 Bitumen type H80/90 STAS 7064-78.

(17) 1220 List of tinwork

(17) 1221 Leakage of elbows Downpipes and gutters, with circular or rectangular galvanized sheet 0.5 mm thick, according to STAS 2274-88.

(17) 1222 gutter with a semicircular or rectangular section of 0.5 mm thick galvanized according to STAS 2274-88.

(17) 1223 hooks and brackets to mount the gutters and downspouts, according to STAS 2274-88.

(17) 1225 Window sills protection of galvanized steel 0.5 mm thick, with width as detailed in the project.

(17) 1227 gargoyles (drains) of galvanized steel sheet of 0.5 mm thickness, circular or rectangular cross-section as detailed in the project.

(17) 1228 protection cap, baffles the terraces, ventilation pipes of galvanized steel 0.5 mm thick, as detailed in the project.

(17) 1230 Delivery, handling, storage

(17) 1231 galvanized sheets are supplied in connection with the quality certificates issued by the manufacturer.

(17) 1232 Transport links will be by car, stacking them on the platform, being allowed to remain in console connections with sheets.

(17) 1233 On site links to sheets will be stored in stacks placed on platforms, in enclosed spaces, dry, protected from weather and mechanical degradation (hitting, scratching, deformation).

(17) In 1234 Handling will be done in terms of protecting the material so that it does not damage the corrosion protection.

(17) 1235 Do not unwrap the packaging than the clothing shop and tinker.

(17) 1236 manipulation of the bodywork, ready-made, will be careful not to cause their deformation before being put into operation.

(17) 1237 Storage gutter downspouts, hooks and bracelet will be on platforms, ensuring their protection against knocks and damage.

(17) 1300 ASSEMBLY

(17) 1310 Works to be performed before installing tinkers

1. Plastering and corrections.

2. The location of the mounting components (pins, bracelets and fitting them with nails or bolts shot).

3. Sealing vertical and horizontal joints.

4. Laying the decking plumbing items.

(17) 1320 Installation

(17) in 1321 will be in accordance with plans and architectural project approved by the Consultant and prescriptions of STAS 2389-92.

(17) 1322 sills protection will be installed on the windows will be installed on concrete or mortar through a separating layer of roofing felt (17) 1217 bonded with mastic asphalt (17) 1218 and will be provided at the bottom with drip that will exceed face masonry at least 2 cm.

(17) 1330 acceptance testing

(17) 1331 Fixing Barrettes and bracelets must be corrected by the substrate.

(17) 1322 tinker items must be free of mechanical deformation of the surface with zinc damaged or missing.

(17) 1333 Covering the horizontal and vertical joints must be perfect concondanta the requirements and details of the project from the expansion.

(17) 1334 items covering the joints will need to allow for variations in size of the expansion, the joint.

(17) 1335 Soldering should be no interruptions to prevent separation of the elements and water infiltration.

(17) 1336 work sheets, although no great importance in terms of cost are very important in ensuring good behavior in service of construction works (especially insulation), so it will check very carefully how to make sealing the terraces or roof penetrations and fitting gutters and roofing to rainwater downpipes.

(17) 1337 Consultant 5 request the replacement of elements of the bodywork unless they are complied with:

- These specifications;

- The provisions of the approved project and the provisions of the contract;

- Details of the execution of the approved project.

(17) 1400 MEASUREMENT AND PAYMENT

(17) 1410 Measurement of works is done according to the quantitative item of works, depending on the number of pieces of paper or meter.



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(17) 1420 tin works are paid either separately or as part of more complex works (parcel).

SPECIFICATIONS

PVC JOINERY

General

1. constructive solutions, the composition and quality of the woodwork will be included in the project.
- 2 PVC will be stored in a dry, protected from rain and degradation by striking.
- 3 Fitting woodwork to masonry walls is plaster and floors before execution.

4 Before commencement of installation of joinery check flatness walls, voids size openings praznuri number.

5 execution PVC joinery profiles will use white binding, stabilized with UV protection, with five rooms, width of at least 70 mm and metal fittings for reinforcement - reinforcement. The hardware is good quality and will ensure opening windows in the ways specified in joinery panels maximum distance between two points closing less than 80 cm.

6. exterior windows will use compulsory windows (laminated) to 24 mm (4 to 16 - 4) with the float glass Low-e, the heat transfer coefficient $K = 1.4 \text{ W / mpK}$ the space between the panes filled with an inert gas (argon).

7 . All exterior window will run with the appropriate profiles to create the possibility of later installation interior sill.

13.2 Execution Technology

1 PVC wall gap is positioned correctly and secured with wooden wedges.

2 Check the verticality and horizontality with bubble level, then fill the gaps with cement mortar praznurilor right.

3 After strengthening mortar can head feathers and install windows.

4 After glazing is fitted space between the frame and masonry cement and plaster on contour runs scorer and floor, then paints woodwork.

5 Both PVC doors and PVC windows running special order as detailed in the project design phase taught according to the actual size of the voids and the walls.

13.3 Control installation and acceptance of works

1 After completion of the installation will be running the reception doors.

2 Check that:

(A) that the project and the details;

(B) catching carpentry masonry, concrete pillars or her welding praznuri (according to the project);

(C) the method in which staging was performed rubber gasket;

(D) quality dye.

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SPECIFICATIONS

STEEL REINFORCEMENT

Types, quality and storage

Concrete reinforcing steel one will consist of steel bars or steel bars welded mesh concrete, except where indicated otherwise.

Two reinforcing steel bars will consist of profiled bars or / and smooth, as stipulated in the provisions of the applicable national standards and regulations in force.

3 Reinforcement steel wire fabric shall conform to the provisions of the applicable national standards and regulations in force.

5.2 Protection and cleaning

1 Reinforcement will be protected against damage and permanent placement when the structure will be cleaned of mud, clay, rust, paint, oil or other foreign substance.

2 Reinforcement steel will be cleaned carefully hardened or partially hardened concrete, shuttering oil or paint that were made during construction of the adjacent openings.

5.3 Cutting and bending reinforcement

1 Forming bars, reinforced carcass construction and installation shall be in strict accordance with the design.

Two valves which must be clean and trimmed straight. Any contaminants on the surface of the bars must be removed.

3 To avoid corrosion of the steel reinforcement to the rear and concreting within 15 days after trimming.

4 mounting fittings shall take measures to ensure maintaining the position assigned to the project by:

(A) mounting spacers;

(B) the creation of the necessary penetration hoses loose concrete or concrete that is downloaded;

(C) the creation of the necessary penetration vibrator for compaction;

5.3.1 Forming

1 Before trimming reinforcement bars must be clean and straight and to this end will remove earth, traces of oil, paint or other contaminants.

Forming two bars, manufacture and installation of any carcasses or mesh reinforcement, shall be in strict accordance with the project.

3 cut and shaped bars will be stored in packets labeled so as to avoid confusion and to ensure that they retain their shape and their cleanliness until installation.

4 Bending reinforcement is running slow motion without shock.

5 two-speed bending machine bending is allowed bars rolled at high speed machine. Bending radius is minimum inside diameter 1.25 if smooth valves and fittings with two diameters when rolled. Right portion of the end by bending the valve diameter is 3 to 7 diameters from the smooth profile periodically.

5.3.2 Tolerance

1 shaping and fitting valves shall comply with the following tolerances:

Cut length to the length of the design (if the length of the bars is greater than 10 m) ± 25 mm

The length of the bars to party hookups overlay (to the provisions and requirements of the project) ± 3 diameters

Heading hookups (to the project) 50 mm

The distance between the axes of the bars ± 5 mm

The coating thickness ± 3 mm

Cutting and bending of the valve 2 will be in accordance with ISO 4066 and operations will be carried out without the application of heat and at a temperature of not higher than 5 ° C. fold lines will have a substantially constant curvature.

3 Reinforcement is not directed or renewed.

5.3.3 Fixing fittings

1 Valves will be installed at the position mentioned in the project through the details of reinforcement, maintaining position must be ensured throughout the concrete pour.

2 To provide concrete coating provided will be used spacers made of plastic or mortar prisms provided with one wire to be related fittings shall be prohibited the use of reinforced concrete coupons. The installation will provide:

(D) at least 3 spacers / m² of plate or wall;

(E) at least one spacer in each ml of the beam.

3 if not otherwise specified by the project, connecting the plates is made with two threads of the black wire of 1.5 mm diameter (STAS 889-89) as follows:

(A) networks of reinforcing the wall and floor will be linked to binding to all crossings, if the network side is less than 30 cm, if not necessarily be linked to two rows of crosses all around the edge, and the remaining 2 in the two crosses of two-way (check).

4 Reinforcement must be held firmly in position and secured against displacement.

5 non-structural connections for positioning the reinforcement will be made by wire bound or other fasteners. Will be taken to ensure that the ends of ties or clips shall not exceed a concrete cover.

6 cladding will be held in position while the concrete is poured through the use of parts of distancing spacers. Only spacers can be used in permanent works. Before the spacers to be used must be shown their ability to maintain safe position reinforcement during concreting without affecting concrete, compaction, durability.



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7 ties are tightened so that the bars are propped and the inside of the curved parts thereof be in contact with the bars to be connected.

8 concrete has partially adhering to exposed bars during concreting operations shall be removed

5.3.4 concrete coating

1 with concrete coating on the inner considers the casing to the outside of the valve.

Two concrete coating, if the project otherwise specified element will be according to EN 1992-1-1 pct.4.4.1.

5.3.5 Cutting meshes

One reinforcement nets will be cut at right angles.

2 Cut nets will be done in such a way as to limit loss of material.

3 will not be permitted to cut the remaining parts of the Permanent Works.

5.3.6 hookups overlapping bars and nets

One overlapping bars and nets are allowed when necessary or stipulated in the project.

2 Except when otherwise specified, the length of overlapping bars shall comply with the standard, and will be positioned overlapping zigzag.

3 hookups bars will be made by the party in accordance with the project or weld where stated.

5.3.7 Steels for reinforcement

1 for reinforcement of concrete using hot rolled steel bars round concrete OB 37 and PC 52, which must meet the requirements of the technical specification technical effect on steel products used as reinforcements: requirements and performance criteria ST 009/2005 .

2 Supply, storage and quality control valves will be in compliance with the norm NE 012/2-2010.

3 Delivery of concrete and steel meshes will be made according to the provisions in force and must be accompanied by a certificate of quality issued by the manufacturer. If delivery is made by a supply base, it is required to send copies of the appropriate quality they deliver lots.

Four bars of steel-reinforced concrete and nets should be stored separately by type and diameter, aiming at:

(A) avoid conditions favoring corrosion of steel;

(B) prevent their contamination with earth or other material;

(C) providing opportunities for easy identification of each type and diameter.

5.3.8 Quality Control

1 To quantity and diameter stocked verification operation will consist of:

(A) finding that quality certificate;

(B) check the section size;

(C) examining the issue;

(D) verification by cold bending.

5.4 Welding of reinforcement

1 Reinforcement shall not be welded on site except where described or where permitted in the contract documentation.

5.5 Approval before concreting

1 Reinforcement, after fixing the position will be inspected and approved by the project supervisor before the concrete is poured. Failure poured concrete will be removed and replaced with armor by the Contractor at his expense.

SPECIFICATIONS

ROOFING

General

1 This chapter covers the composition and performance of the roof tiles trough (drawn or pressed) in Civil with or without bridge.

10.2 Materials and products.

1 Base materials: tiles and ridges - you have to meet technical requirements of these standards condiitilor shown in Table 12-1.

Shape and material basis

(Shape and size) Auxiliary

(General cond, checks, etc..) Dimensions

Tile scales

- In baked clay

- Glass

515-89

2863 / - 80

514-78

2863/1 - 80

350 x 170



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350 x 170

Gutter tile path

- In baked clay
- The cement mortar

515-89

-

514-78

-

390 x 220

380 x 230

Pressed tile trough

- In baked clay
- Glass

515-89 2863 / 2-80

514-78

2863/1 - 80

480 x 230

390 x 220

Pressed tile roof

- In baked clay

513-74

450 x 180

Ridges pressed

- Baked clay - Large
- Small
- Cement

515-89

515-89

5547-64

514-78

514-78

380 x 250

320 x 206

450 x 220

2. auxiliary materials: lath, cement-lime mortar, nails, galvanized wire galvanized, small soldering equipment, cardboard bituminous or bituminous glass fiber mat must meet standards specified in Table 12-2.

Shape and material basis

(Shape and size) Auxiliary

(General cond, checks, etc..) Dimensions

Wood planks 952-86 1949-1986 24 x 300 x 3000

Fir slats 942-86 1949-1986 28 x 38

24 x 48

Mortar cement - lime marca25 1030-85 2634-80

Dye Red lead or iron 429-85

Nails with flat head for sheet and cardboard 2111-90

Galvanized annealed wire 1-2 mm 889-89

Board 0.40 x 750 x 1500mm 2028-80

Soldering Materials

- Alloy type Lp - 30
- Ammonium chloride (tipirig)
- Tin, lead. 96-87

Technical Ammonia type 20 or 25

- Technical nitric acid
- Cardboard bituminous
- Snuff 448/2 - 84

447-80

138-80

137-78



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11853-83

Gutters and downspouts with
round section

2389-77 \pm 154 mm

L = 750 \pm 2 mm

Elbows 2274-88 \pm 154 mm

R = 385 \pm 2 mm

Hooks 2274-88

Water collection drains on terraces and roofs 2742-86 2583-80

3 tiles and ridges shall be provided with mounting holes.

4 mounting holes diameter should be 1.5 mm minimum 2mm tiles and the ridge is allowed a maximum of 5% of the tiles and ridges do not have mounting holes.

5 Height beaks for catching tiles are recommended to be 20 mm but not more than 15 mm. Depth of side gutter tiles must be at least 5 mm and the other ends troughs must be deep enough to allow entry of tiles interior beaks.

6 The sound of hammering must be clear, nedogit. The structure must be homogeneous, compact, close-grained and without stratifications that influence resistance to frost - thaw.

7 waterproof, load capacity and resistance to frost - thaw according to STAS 515-89 - 2.2. Tiles and ridges form must be adjustable without waves. Allowed deviation from flatness and straightness girls 4 mm tiles edges shaped troughs, corners unevenness up to 4 mm. Breaches at the corners, edges and faces - one at the corners with maximum depth of 5 mm and a maximum length of 20 mm. The edges and sides with a maximum depth of 3 mm and 10 mm total length Crushing on corners allowed a maximum of 1/3 of the height. Not allowed cracks. Burrs are not allowed. Allowed small variations in shading. Glaze should be applied uniformly and not showing flaking.

8 Rules and methods for checking the quality of baked clay tiles and ridges are STAS 514-78.

9 Roof caps have size 1076 x 900 mm, according STAS11853-83. The frame is made from planks lined with galvanized exterior. The cover comes with reinforced windows. Sorts are folding, folds must cracks or cracks. Check the joints, if properly executed sizes to ensure a good seal.

10.3 Delivery, storage and handling.

10.3.1 tiles and ridges

1 Each delivery must be requested quantity besides the ridge tiles and quantity. In the absence of the specification, in order, the number of ridges is 5.

2. tiles and ridges are stored in stacks of the same class products and quality. Edge tiles sits on more than 7 times. Sits between rows slats, straw, wood chips or other materials to ensure the integrity of the storage.

3 ridges sits upright on a maximum of 6 times. Tiles and ridges polarized comes packaged, containerized or loose. Transported in any conveyance.

4 In the case of unpackaged, they are placed in the edge transport in stacks, the maximum 7 times.

5 and discharge must be done with care, being forbidden to throw or roll their transport.

6 Tabacherele comes complete, but no windows, controlling the flatness and attachment to the open position to end cigarette.

7 Red lead is supplied in drums tightly closed, store in a dry, covered, for transport using vehicles covered.

8 nails comes in types, packages and containers tightly closed.

9 Wire is supplied in coils of a single wire without bending, unpacked, transportation is the transportation closed.

10 sheets are delivered in bundles up to 60 kg is fastened with sheet strips about 30 mm wide.

10.3.2 Welding Materials

1 tin of lead rods comes packaged in bundles weighing up to 15 kg.

Ammonia solution comes in two tanks, steel drums and industrial glass flasks under STAS2062-74.

3 nitric acid comes in glass packaging enclosed with glass or ceramic stoppers, sealed with plaster. Transported in metal baskets protected granulated clay or rock wool or glass wool.

4 cardboard bitumen comes in soft black wire scrolls tied with D = 1 m, 5 piece now reads.

5 comes bound with wire bends read 4 pieces to a link (or 10 pieces) packed in boxes.

6 Storage gutters, downspouts and elbows is platform ensures the protection against knocks and damage.

10.4 Execution of works

10.4.1 Preparatory Operations

1 Roof will be performed in accordance with the details of project execution and compliance with the norm for the composition and performance of roof covering C37-83.

2 Before starting the execution of the base, its substrate will be strictly controlled in terms of:

(A) compliance solutions, materials, dimensions;

(B) compliance slopes leaks, planting and alignment of forms, purlins and rafters, according to data from the project;

(C) the execution of all penetrations prior to pimples, ventilation, pipes, cables, etc.



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(D) ensuring water flows where cross skylights or other barriers wider than 500 mm;

(E) corrosion protection for metal parts in the draft;

(F) performing technical specification insulation

3 In the winter time and substrate materials are put in the work will be thoroughly cleaned of snow and ice.

10.5 Description of the groundwork

1. works tinker (joints, valleys, fascia boards, penetrations for. Ventilation, cigarette cases) will precede the actual roofing installation.

2. tiles are placed on two rows of slats and deck, Sipic the second row along the rafters resting on a layer of roofing felt with parties of 10 cm nailing the deck plate.

3 Installing the tiles will start from the ridge lap. Rows of tiles to be offset from each other by half a tile. In field tile roofing will bind trough galvanized wire lath every fourth row.

4 roof ridges will run with high ridges (STAS 515-89) to be spent by 8 cm. They will be fixing lime mortar - cement (according to catalog details ICCPDC, vol I, Group 10).

5 To ridges sloping ridges will be mounting after ridge along the slope will fight two separate slats through cracks up to 1 m distance.

6 Mourning sheet will be attached to the deck by 0.5 mm sheet stitches on minimum 40 cm width, folds ridges are double sheet and tin (detail ICCPDC Catalog - Vol group 10).

7 pipes are attached building with bracelets anchored in masonry. To prevent slipping on vertical gutters will stick bracelets stops triangular pipes that will support the bracelets at about 2 m distance. Draining the pipe bends shall be made by the board placed at 20-25 cm from the ground.

10.6 Requirements, recommendations, standards, norms for execution of detail

SPECIFICATION METALWORKS

GENERAL

(16) 1110 Specification object

(16) 1111 This chapter contains specifications for the execution and installation of metallic (Steel).

(16) 1112 Specifications for the metallic paint work are summarized in chapter (16) 3000.

(16) 1120 Basic concept

(16) 1121 All metallic garments are made of mild steel, protected with anti-corrosive primer and painted with oil based paint, alkyd resin or epoxy.

(16) 1130 Standande and normative reference

(16) 1131 Where there is conflict between the provisions of these specifications and recommendations of standandele and regulations below, this specification shall prevail.

(16) 1132 Standards:

1. STAS 333-87 Steel Round
2. STAS 334-88 Square Steel
3. STAS 395-88 Steel Wide
4. STAS 424-91 Steel equal angle with wings
5. STAS 438/1-89 hot rolled steel concrete
6. STAS 500/2-80 Construction steels for general use. Brands.
7. STAS 500/3-80 general purpose construction steel resistant to atmospheric corrosion.
8. STAS 908-90 steel band.
9. STAS 7657-90 longitudinally welded pipes for construction.
- 794-90 10. STAS square and rectangular steel pipes welded longitudinally.

(16) 1140 Samples and tests

(16) 1141 Consultant Contractor shall submit for approval one or two samples pieces of metal complex, typically comprising materials, fastening systems, assembly (bolts or welding), corrosion protection and finishing due to be adopted system for all metallic structures.

(16) 1142 only after obtaining approval from the Consultant will place orders for the execution and delivery of metallic that will be executed in accordance with approved samples.

(16) 1143 metal pieces will be accompanied by manufacturer's certificates, which attest to the quality of materials used in accordance with approved samples and shop drawings.

(16) 1150 Drawings



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Contractor shall submit along with samples of execution drawings for all metallic garments that will be included in the work, including fixing their systems structure elements.

(16) 1200 MATERIALS AND PRODUCTS

(16) 1201 Materials

(16) 1211 mild steel according to the standards listed above: wide hot rolled steel, hot-drawn pipe, round steel, hot rolled, sheet steel.

1. Hot rolled steel profiles will have a thickness of at least 3 mm.

2. Board will have at least 2.0 mm thick and will be hot galvanized. (490 g / m²)

(16) 1212 Accessories: screws, nuts, washers, anchors Wedge corrosion protection by cadmium (unless otherwise specified).

(16) 1220 Products

(16) 1221 General

1. Metallic constructions will be performed in specialized workshops in strict accordance with the shop drawings and approved samples.

2. In special cases granted with the approval of the Consultant, modify the solutions, gauges and finishes from those initially approved, but not in the (qualitative and quantitative) of the original solution.

3. Maximum deviation in manufacture of metallic:

- Length, width: + / - 2 mm

- Thickness: + 1 mm - 0.5 mm

- Flatness: a corner deviation from the plane formed by the other 3 will be up to 1.5 mm in size up to 1.5 m in length and less than 1% over 1.5 m size

(16) 1222 List of metallic:

1. Rails of interior and exterior stairs.

2. Handrail on stairs, balconies, loggias, galleries, etc..

3. Metal grates protection gaps (doors, windows) and dividing panels for balconies.

4. Intentions and exterior metal stairs, fixed or adjustable.

5. Exterior fire stairs.

6. Metal manhole covers.

7. Ventilation grilles.

8. Grills to delete feet.

9. Other various garments included in the project.

(16) 1223 von metallic constructions as corrosion protection by priming with oil based primer according to STAS 3097-80.

(16) 1240 shipping, handling, transport

(16) 1241 metallic constructions will be packaged specially designed containers and will carry this specially designed storage until the construction site.

(16) 1242 metallic constructions will be stored under cover, protected from weather and corrosive agents and harmful action, rule, 10-15 cm from the floor.

(16) 1243 will be delivered by the manufacturer painted with anticorrosive primer based Red lead in assemblies or subassemblies.

(16) 1244 Storage will be protecting the metallic confections polyethylene tarpaulins or sheets.

(16) 1245 metallic constructions under 100 kg 5 be handled manually and the heavy special devices.

SPECIFICATION

METAL ASSEMBLY

(16) 1310 Preparatory operations

(16) 1311 The starting assembly will be executed the following works:

1. Technological process works wet finish (plaster, plywood, grinding the concrete walls);

2. Waterproofing works, including evidence proving them.

3. Embedded positioning and fixing of metallic mounting (praznuri, ghermele, plates, etc..)

(16) 1312 Carry axes tracing and verifying assembly of metallic fasteners according to the existing or their position - in accordance with the detailed design.

(16) 1313 Check the quality of execution of work previously performed in direct connection and that 5 influence metal garment assembly operations.

(16) 1320 Installation

(16) 1321 Operations Manual:

1. Provisional fixation by haftuirea a few welding points (where fixing is done by Sudu - ra).

2. Correct positioning will check with spirit level and plumb.



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3. Permanent fixing by welding or by bolts (depending on the solution, from case to case).

(16) 1322 Finishing operations

1. Clean surfaces of any traces of mortar or other impurities.

2. The repair corrosion primer.

3. The paintwork execute () 3000

(16) 1330 Acceptance testing

(16) 1331 Ensure vehicle substrate quality, quality execution (welding, sleflui, merge, etc.).

(16) 1332 If you do not meet these specifications and approved shop drawings and samples, the Consultant 5 decide to replace work with others to meet these requirements.

(16) 140 MEASURING AND SETTLEMENT

(16) 1410 Unit price for metallic confections include manufacturing and assembly work including fixing and painting accessories.

(16) 1420 settlement works is based on the number of kg, meters or pieces, Article of the quantitative works as metal excerpts from the project.

SPECIFICATION EARTHWORKS

Fillers

Criteria for selection of one of the materials that are suitable for use in the filling is based on proof of adequate strength, rigidity and permeability after compaction. These criteria take into account the purpose of filling and structural requirements that will be placed on the filling material. When choosing a filler must take into account the following:

(A) Leveling

(B) resistance to collapse

(C) compactibilitatea

(D) the content of organic

(E) chemical aggression

(F) the susceptibility to change the volume (and expanded clay material to be deformed)

(G) the effects of frost

(H) resistance to weather conditions.

2 filling material shall not contain foreign materials as snow, ice or peat, in significant quantities. Compacting criteria will be set for each region or layer of the filling, to the purpose and performance requirements.

3 compacting work will be verified by inspection and testing in order to ensure that the filler material, the water content of the location and compaction procedures are in accordance with the set.

3.2 excavations will be filled with granular material

1 A drainage system to dissipate hydrostatic lift forces will be incorporated into the project watershed. The outside wall excavated basins in order to provide space will be filled with granular material back to drain freely extending to the bottom of the field filled walls.

2 In the case where the working width of the excavation beyond 1.0 m (measured horizontally, perpendicular to the front wall), when only a vertical strip with a width of 1.0 m, adjacent to the wall, to be filled with granular material in place. Filling material in the granular material structure should be clean, free-draining granular rare.

3.3 Compaction of fill material

1 will consist of compacted fill material approved spreader and compacted in approximately horizontal layers with uniform thickness, with a slight slope outward. Compaction shall be carried out in layers not exceeding 20 cm.

Two clods larger than 0.10 m will be crushed before compaction. Soil moisture will be carefully controlled, either by natural drying or by dampening fine particles before filling.

3 compaction will be performed by the use of mechanical, electrical, vibration, vibration compaction discs and other approved equipment in order to obtain a dry matter density of not less than 100% of the maximum density of the dry matter determined in accordance with national standards and regulations in force.

3.4 Excavation inappropriate material

1 If, by excavating foundations structures appear inappropriate material requirements of the project, the Contractor will remove and dispose of them as directed project supervisor.

3.5 Slips, collapses and excessive excavation

1 The Contractor shall take all precautions to prevent slip and fall or other materials excavated land. In the case of sliding and collapsing or when the excavations have been carried out more than the minimum required or practicable for building work, the



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opening thus formed will be filled. Where gaps thus formed will be support for permanent works or structures and related services after filling, these gaps will be filled with plain concrete.

2 In all other cases, the gaps will be filled with selected excavated material or other approved material and compacted fill as approved project supervisor.

3.6 Excavations will be protected against ingress of water

1 The Contractor shall protect against water penetration and excavation waste water, resulting either from groundwater, floods, storms and the like, so that work can be performed in dry soil conditions.

3.7 embankments and slopes

1 The material used to form embankments and the stocks of the earth and filling low-lying areas of the site will be of the usual stuffing or selected. Areas where it will use filling material selected are set out below and shown on the plans.

Two selected fill material will be used to form the basis (where applicable) and under roads.

Filler material for the other 3 will be the usual embankments.

Four filler material will be obtained from excavations or similar material.

5 disc should be used compactors operated manually or electrically operated vibrating compactor.

3.8 Draining

1 Except where otherwise stipulated, the Contractor shall protect from water infiltration trench during construction and where structures are built in groundwater will take the necessary measures to avoid sinking concrete.

3.9 Excavation as alignments and levels

1 Excavations will be carried to the size that will allow appropriate epiement, adequate consolidation margins, raising formwork, concrete, filling, including compaction and other construction operations. Special attention should be paid to not be bothered structural excavation formation level.

3.10 Disposal of surplus excavated material

1 The Contractor shall be responsible for negotiating and securing suitable areas for disposal of surplus excavated material and pay fees and other charges related to the escape.

3.11 Excavation in addition

1 Any excavation in excess of the limits specified or indicated shall be filled by the Contractor at his own expense with plain concrete or other approved material and thoroughly compacted.

3.12 manual compacting platform level

1 Where the trench platform will be covered with concrete or compacted fill, the last 0.15 m of excavation shall be compacted manually.

3.13 Leveling areas

1 The areas around and above structures will be leveled to imposed quotas as they are shown in the plans. Contractor shall take all precautions to prevent damage to structures during smoothing. Leveling areas around structures shall be executed by approved methods. Any component damaged will be replaced or repaired at the expense of the Contractor.

1.14 Restoring green areas

3.14.1 Overview

1 completion unpaved earth, the whole earth will crumble affected area at depth of 300 mm, before replacing the vegetable earth, and cultivate and restore the land as close to its original condition.

Two surfaces that are to be sown with grass would be reduced to a thin layer of arable land and would be cleaned rocks and foreign matter more than 50 mm. The seed will be planted in appropriate seasons, distribution and applied in an amount not less than 10g/m² 6g/m² on smooth and sloping surfaces.

3 Areas to be covered with grass will be prepared for sowing. Approved turf will be placed, spliced, joined and beaten, and the edges will be filled with fine sandy soil. Sloping surface, where there is the possibility of slipping, the lawn will be placed diagonally. Any settlement that occurs must be performed correctly by raising grass, filled with sandy soil and turf relocation as specified above. Any grass that dries will be replaced with a new one.

4 Restore unpaved earth will be performed by the contractor as follows:

(A) and topsoil will be replaced gradually by the finished ground profiles, including provisions for any additional area required.

(B) The stones and other debris will be removed and stored.

5 A general fertilizer will be applied in accordance with manufacturer's recommendations.

6 will be reînsămânța all areas where the seed will not grow quite well.

3.14.2 Trees

1 Planting and maintenance of trees will be done in accordance with ISO 14001:2005.

2 Preparing, planting and providing semi-mature trees will be carried out in accordance with ISO 14001:2005 and subsequent maintenance will be in accordance with SR EN 1991-1-4-2006.

3 measures for the protection and preservation of existing trees to be retained in situ must be taken in accordance with SR EN 1991-1-4-2006.

4 No tree shall be felled or removed from the work area without prior approval from the relevant authorities.



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5 All wood will remain the property of the land owner and will be cut and removed in accordance with its requirements reasonable.

3.14.3 Maintenance repairs

1 Until the expiry of the guarantee period, the Contractor shall inspect regularly and frequently all restorations performed by him in connection with this contract for public safety at any time.

2 Where there is damage or subsidence of the surface, whether it is observed by the Contracting Authority during a routine inspection or is otherwise reported, the Contractor shall immediately remedy the defect in a manner approved by the project supervisor. .

3.14.4 Clearing Area

1 Deforestation area will not start until the venue is surrounded deforestation.

2 The Contractor shall not burn wood or other combustible waste from the bushes on the site only with the consent of the Employer.

4 concrete formwork

SPECIFICATION CONCRETE

1 The Contractor shall put in all concrete work to meet these specifications and associated conditions of this service. These requirements are directed towards achieving sustainability and concrete strength. All concrete shall be designed for severe exposure conditions as indicated in EN 1992-1-1. Water-retaining structures will be designed according to EN 1504. All other concrete shall be designed according to EN 1992-1-1.

Technical conditions

Two concrete classes used in new items will be those set out in the project.

3 In the fresh concrete will meet at the installation, the following conditions:

(A) Consistency will match the S3 class settlement (settlement of 100-150 mm);

(B) Maximum temperature will be 25 ° C.

Concrete composition:

4 Parameters of concrete composition - as NE.012/1-2007.

Preparation of concrete:

5 Station concrete must be certified according to U.S. Code 012/1-2007; contractor is obliged to take measures to achieve this goal.

6 Determination of the component materials of concrete will be gravimetric, admitting the following deviations:

(A) Cement: $\pm 2\%$

(B) Aggregate: $\pm 3\%$

(C) Water: $\pm 1\%$

(D) additives: $\pm 5\%$

7 is to check at least two times a week, and when it is deemed necessary to the proper functioning of the means of dosing, using weights spaced out at least up to 200 kg.

8 Determination of the appropriate dosage is done with the additives, which allows a more accurate measurement of the amount of additive solution in the recipe set concrete. Contractor shall take all measures necessary for the preparation and proper dosing of additives, given that larger deviations more or less than expected may adversely affect the quality of concrete.

9 The order of introduction of the materials into the mixer will be: aggregates, cement, water and additive ago.

10 Length of the mixing of a batch to be at least 1 min / m³ or 5 minutes to an amount less than 5 m³.

11 The contractor will determine the cooking characteristics of fresh concrete with a difference to take account of developments in the length of transport time laying and environmental conditions so as to put in the work to have consistency in the draft, and not exceed the maximum temperature of 25 ° C.

Cooking in cold weather conditions

12 During cold weather, the Contractor shall take the measures necessary for preparing concrete than the required minimum temperature.

13 These measures will include: removal of ice and frozen lumps of aggregate, cover aggregates tilt in heating them with steam or air blown through the registers of pipes, hot water use etc..

14 Aggregates shall not be heated to temperatures higher than 60 ° C.

15 If used in prestressed water temperature is above 40 ° C, avoid direct contact of water with cement contract.

16 In the first case, the water is mixed with the aggregates and only after the temperature of the mixture fell below 40 ° C, is added and the cement.



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Terms of preparation in hot weather

17 During hot weather, the Contractor shall take steps necessary to produce concrete below maximum temperature.

18 These measures will include: spraying cold water aggregate deposits, deposit protection aggregates and water tanks against direct sunlight and hot, dry winds, cold water use in the preparation of concrete, concreting at times lower temperatures of the day or night.

Transport concrete

19 Transport concrete from the concrete plant site commissioning work will be done autoagitatoare or Dump trucks tight.

20 Local transport will be made of concrete with concrete pumps, buckets, troughs, skipuri, bins etc.

21 Each transport concrete shall be accompanied by a transport voucher that will be mentioned at least:

- (A) number and date of the bill;
- (B) for preparing the concrete mixer;
- (C) the type and volume of concrete (Mark);
- (D) the use of concrete;
- (E) time of departure from the station;
- (F) time of arrival on site;
- (G) the time of commencement and completion of unloading.

22 Data for the concrete plant will be completed by the station chief and driver data from the work site. Transport voucher shall be prepared in duplicate, one of which remains on site and the other returns to the concrete plant.

23 Duration of transport, considered from the start of loading to the end of unloading the means of transport shall not exceed:

- (A) 45 minutes at room temperature greater than 30 ° C;
- (B) 60 minutes when the ambient temperature is between 15 ° - 30 ° C;
- (C) 90 minutes when the ambient temperature is lower than 15 ° C.

24 Contractor will ensure that during transport will not alter the quality of concrete (grout loss or segregation, the transport dump, adding water when transporting concrete self-stirrers).

25 Contractor shall provide transport concrete in good condition during execution during cold or warm, taking appropriate protective measures in order to preserve the quality of fresh concrete.

4.2 General provisions applicable to reinforced concrete works

1 To achieve an appropriate level of quality of works cumulatively with the norms 012/1-2007 NE and NE 012/2-2010 have technical conditions provided in this technical specification.

2 This chapter covers concrete work in new items.

3 stages of the implementation of concrete and reinforced concrete works are, mostly, works that are hidden, so their quality control must be recorded in the minutes of reception quality, delegates concluded between the Contracting Authority and the Contractor. Not considered valid protocols concluded only qualitative reception Contractor.

4 Do not allow the transition to a new phase of execution before the end of the protocol on the previous stage if it is to become a work hidden.

5 In the verbal proceses shall specify the actual checks, if one accepts the findings and move to the next execution phase.

6 minutes is mandatory completion of the following phases of execution:

- (A) when the performance of the formwork;
- (B) when the armature assembly;
- (C) prior to concreting;
- (D) during concreting;
- (E) stripping.

7 maximum permissible deviations are:

(A) Formwork

- (I) length within ± 10 mm;
- (II) ± 3 mm section size;
- (III) the inclination to the vertical ± 2 mm / m and 10 mm total.

(B) reinforcing

- (I) the distance between armature ± 5 mm;
- (II) ± 3 mm thick cover layer.

(C) reinforcement lengths (total or partial) expressed:

- (I) less than 1 m bar 5 mm;
- (II) from 1 to 10 m bar 20 mm.

(D) the dimensions of the elements after stripping:

- (I) the size ± 15 mm



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(li) the slope of the vertical surface part ± 3 mm / m

(lii) the total vertical inclination of the surfaces to ± 5 mm

(lv) the slope from the horizontal surface part ± 5 mm / m

(V) the overall horizontal inclination of the surface to ± 10 mm

8 The contractor is obliged, in his own laboratory or other specialized laboratories to perform tests specified in this technical specification and track results.

4.3 Specific provisions achieve concrete elements and component materials

1 This chapter covers concrete work in new items.

2 Chapter contains provisions relating to:

(A) Quality requirements for concrete materials and parts;

(B) the composition of concrete;

(C) conditions of preparation, transportation, laying and subsequent treatment of concrete;

(D) methodology to check the quality of concrete materials and components,

(E) the technical and quality control for concrete and reinforcement.

3 The concrete used will occur and will be delivered by concrete plants operating under certificates of attestation.

4 recipes will determine the correct and final according to preliminary laboratory test results on:

(A) moisture content of aggregates;

(B) granularity of sorts;

(C) bulk density of fresh concrete;

5 The composition of the concrete will be taken continuously adjusted in relation to amounts of water depending on the humidity of the aggregates, so as to comply with the ratio A / C prescribed norm U.S. 012/1-2007. Workability of fresh concrete will be checked both at the concrete plant and at laying.

4.4 Pouring of concrete

4.4.1 General Provisions Concreting

1 Concreting construction elements will be based on project execution and technology execution of the order passed by the performer and the provisions of this specification. Observe the rules of the Code NE 012/2-2010 concrete.

2 Before starting concreting of any item, check:

(A) benchmarks and surface cleanliness formwork or concrete poured in the previous phase;

(B) the correspondence quota formwork both in level and those in the design, formwork plumb the existence of measures to maintain shape, tightness and fixing formwork with support elements;

(C) the supporting strength and stability, proper support and fixing allegations, the existence of feathers and other devices stripping and so on;

(D) Proper arrangement of valves and correspondence with the diameter and number of the project, fittings solidarity between them, the existence of sufficient number of spacers etc.;

(E) the operation of means of preparation, transport and placing of concrete;

(F) sealing formwork to not leak grout;

(G) the existence of a protective material in the fresh concrete;

(H) the existence of the necessary equipment for vibration;

(I) providing technical and organizational conditions in all stages of preparation, transportation, laying and subsequent treatment of concrete, so that the requirement for concrete and concrete.

3 If there is mismatch in the project or not insured considers that all conditions required to start concreting, will take appropriate measures.

4 Following the checks mentioned above and those set out in other documents, shall be completed "Report of inspection fixed point for checking preconditions concreting."

5 Concreting will be led directly to the head of the paper. It will be at the site and will oversee casting action, taking operational measures to remedy any deficiencies, weaknesses and measures being recorded in the "Minutes of concrete" elements you pour.

6 The concrete should be placed in the paper as soon as possible after bringing at hardware, implementation of work being done without interruption between casting joints to the project.

7 Pouring concrete in horizontal layers will be as far as possible uniform thickness max. 30 cm. The height of free fall of the concrete is not greater than 1 m when the pump is poured to 1.5 m when cast by other means.

8 The maximum permissible time between the casting of two layers will be appreciated based on the composition of the concrete, the environmental conditions and the size of the item, so that it is ensured that the new layer of concrete cast may be vibrated together with the layer previously poured out. If the Contractor considers that, for various reasons, can not provide concrete pouring layers of time required to ensure the continuity of elements, then the concrete preparation, in addition to basic additive, use and retardant additive (sodium hexametaphosphate).



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9 If, however, previously poured concrete has hardened layer or due to force majeure, it is impossible to continue concreting, the concrete surface shall be deemed get hardware and will be treated accordingly: wash the loose concrete, laitance will create a rough surface that before resuming concreting will be fine with compressed air and washed.

10 The concrete will comply with U.S. 012/2-2010 and will pursue the following:

(A) made at concrete work will be implementing appropriate quality (within the limits of workability allowed and no segregation);

(B) concrete must be spread evenly in horizontal layers;

(C) shall be completely filled with concrete track sections;

(D) It is intended to maintain the initial position of the molds;

11 The concrete will closely monitor the complete embedding in concrete reinforcement and correct performance of the coating thickness. In areas with dense plates (nodes frame) is completely filled with concrete and compaction will be done with great care, and where appropriate will create opportunities for access to fresh concrete side by spaces and allowing penetration vibrator or shoving metal rods for concrete.

12 Avoid deformation or movement of reinforcements from the position set out in the project prohibiting movement of workers directly on the plates.

13 Compaction of concrete elements will be molded vibrating operation during which the Contractor shall take measures:

(A) staff training regarding technical vibrated and implemented correctly and conscientiously importance of this operation;

(B) to provide trained workers in this respect with appropriate and sufficient vibrators.

(C) the optimum vibration and the thickness of the concrete layer will be determined by test measurements performed in concrete work at the first batch which are compacted.

14 The vibration of concrete shall comply with the following rules:

(A) will be introduced as the vibrator vertically penetrating the lower layer depth of approx. 10 ... 15 cm;

(B) removing the vibrator will be slow as to avoid the formation of gaps at the points of extraction;

(C) the optimal vibration for money range from 5 ... 20 min. depending on the workability of the concrete, the element size and the degree of reinforcement, as well as the type of vibration used.

15 signs after recognizing that vibrate over are:

(A) concrete is no longer settles;

(B) the concrete surface is horizontal and slightly glossy;

(C) stop the air bubbles from the concrete surface and to reduce their diameter;

(D) appears grout or water formwork joints.

4.5 The concrete prepared in the state

1. Bulletin of delivery required for each load of ready-mixed concrete detailing:

1. class or description of concrete;

2. specified workability;

3. minimum cement content;

4. the maximum water / cement;

5. amount of concrete in cubic meters;

6. the time it was produced;

7. type and nominal maximum size of aggregate;

8. type or name, and share any admixture;

9. actual content of cement and PFA or percentage of any Ggbs included;

10. concrete location in the works.

2. All ballots will be kept on site delivery and will be made available for inspection.

3. Requirements for materials and labor quality specified herein, including all sampling, testing and results will apply equally to the site mixed concrete and concrete made from a concrete plant.

4. Do not add water to the concrete mix in a mixer batching plant than it. The mixture is stirred continuously during transport. Transport and placement times will be reviewed and applied strictly in relation to the circumstances of the distance and the risk of delays in traffic.

4.6 Mixtures of evidence

1 If the existing data on the properties of materials and concrete mixtures are not available, perform preliminary laboratory tests to determine which mixtures of existing materials meet specifications.

2 When the sample mixtures are needed on the ground, will create 3 separate doses concrete using typical materials sourcing proposed and, where appropriate, working conditions for large-scale production.

3 Lucrabilitatea, air content and density of each dose of the test will be set, and it will be 3 blocks in each dose tested after 28 days. The average strength after 28 days of the 3 mixtures will be less than the average projected.

4.7 Concrete ciclopian

1 concrete shall contain ciclopian Portland cement and aggregate normal size of 20 mm at a rate of 1:10 with its mass.



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Two concrete will be mixed to achieve a uniform color and consistency adding enough water to cover all units without creating excess grout.

3 concrete shall be mechanically vibrated when molding or excessive work.

4.8 Concrete air entrainment

Where necessary, the concrete 1 by driving the air, it will have an average air containing 5% to 7%, by volume of the fresh concrete at the time of molding, which is measured by using an apparatus for measuring air entrainment.

4.9 chloride content

One or additions of calcium chloride containing calcium chloride will be used in the manufacture of reinforced concrete.

2 The total content of chloride ions estimated, based on the weight of cement reinforced concrete will not exceed the following limits:

Portland cement concrete, or combinations of PFA. 0.3%

Concrete made with sulphate resistant cement. 0.2%

Steam dry concrete and prestressed concrete 0.1%

4.10 Dosing and mixing

1 Cement and aggregates shall be dosed by weight up to $\pm 2\%$ of the target dose masses. Water and additions will be dosed up to $\pm 1\%$ of the target volume dose.

2 Mixing will be done with a drum mixer with horizontal axis. Dosage amounts will be between 30% and 60% of the rated capacity of the mixer.

3 Mixing time will be less than 2 minutes will be sufficient to produce a concrete of uniform color.

4.11 workability

1 Workability of fresh concrete shall be such that concrete can be handled and cast without segregation and after compaction, it can fill the entire mold and can encompass all fittings and pipes.

4.12 Transportation, pouring and compacting

1. concrete shall be transported from the mixer and poured into work as quickly as possible by methods which will prevent segregation or loss of any ingredients that will keep the workability required. It will be stored as close as possible to its final position and all equipment for transporting concrete shall be kept clean.

2. concrete is thoroughly compacted into its final position within 30 minutes after the discharge of the mixer, unless it is specifically manufactured carried on the rocker which operates continuously.

3. used for compacting plant will operate on a continuous basis during the casting of concrete each dose until the release of the exhausted air and in a manner which does not allow segregation of ingredients.

4. as many times as necessary to the application of external vibration, the mold design and arrangement of the vibrator should be such as to ensure efficient compaction and to avoid damage to the surface.

5 casting will not begin until approved fittings and attachment and positioning of the elements to be embedded and surface conditions or formwork.

6 concrete is carried by means which prevents the contamination (dust, rain and so on), and to be transported and poured immediately.

7 concreting height will be determined before.

8 The concrete will be poured directly into its final position without moving armature, recesses and the mold.

9 vibrations will not be applied directly or indirectly held concrete after initial grip, and will not be used to make concrete flow into mold.

Casting between the joints of building 10, in each section will be continued. If concrete is delayed more than 30 minutes due to defects, the Contractor shall install vertical breakpoints and form a sense of construction or will remove already poured concrete pouring and restart after repairing the fault.

11 Casting will take place during storms, heavy rain or snow. If such a condition is likely to occur, the Contractor shall provide protection materials and formwork system for work can continue. If strong winds persist, provide protection against rain and dust.

12 Contractor shall pour concrete formwork progressively and avoid deformation.

4.13 Pouring concrete at low temperatures

1 in conditions where the temperature is less than or equal to $+5^{\circ}\text{C}$ and it is likely that within 24 hours to fall below this limit, it is recommended that the temperature of the concrete to be around the maximum prescribed, taking the necessary steps for Concrete surface cleaning snow and ice.

2 Do not use calcium chloride de-icing agent.

3 If the surface temperature of which is to be covered by concrete of less than 5°C , concreting will not start.

4 Concreting average temperatures below 8°C can be performed only if the following conditions are met:

(A) aggregates and water used in the mix shall be free from snow, ice and frost. If necessary, the steam jets will be used to defrost the stacks of units;



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(B) Prior to pouring concrete, formwork, reinforcement and any surface that comes into contact with fresh concrete will be protected from snow, ice and frost;

(C) Initial temperature of the concrete at the time of casting will be less than 10 ° C. If necessary, water must be used to achieve the heated aggregate value;

(D) The lowest surface temperature of the concrete will be maintained at less than 5 ° C for a period of preîntărire for at least 3 days or until the concrete reaches strength of 5N/mm². It will provide insulating blankets or coverings heated to achieve compliance with this requirement;

(E) concrete surface temperature is measured using a device according to an accuracy of 1 ° C. The temperature for each casting concrete will be measured at regular intervals not exceeding 24 hours.

5 Fencing will be heated adequately ventilated and warm air jets will not directly hit the concrete.

6 The Contractor shall take precautions to minimize thermal stresses due to low air temperatures in cold weather. At the end of the pre-hardening, the concrete will be left to cool gradually. The maximum decrease in surface temperature for any period of 24 hours does not exceed 11 ° C until the surface temperature is in the range of 14 ° C from ambient temperature, at which it can remove the protection.

4.14 Pouring concrete in hot

1 concrete in hot weather, the Contractor shall take steps necessary to comply with the maximum permissible temperature and adequate protection of concrete against making rapid evaporation of water from the concrete.

2 calls concreting at night.

3 Treatment of concrete after casting:

(A) The normal temperature

4 In order to ensure favorable conditions for hardening concrete will be kept wet continuously for at least 7 days, or by continuous spraying or by coating of concrete, sheets, mats, cloths, etc.. maintained continuously wet. During hot weather concrete treatment will be on a minimum of 14 days after casting.

(A) In cold weather conditions

5 Protective measures will be taken during cold weather when the ambient temperature (measured at 8 am) is less than 50 C.

6 Protection of concrete will provide near normal hardening and:

(A) strength of 50 daN / cmp enough to avoid damage by the action of freezing and thawing;

(B) the avoidance of cracks due to shrinkage by quenching the surface layer of concrete.

7 Protection of concrete faces will be free with mats or other insulating material applied over a polyethylene sheet. The removal of protection and progressive demoulding will be based on whether the measured temperature, complete removal being done only when the difference in temperature between the concrete surface and air is less than 110C.

8 The attention of the Contractor regarding the provisions of the applicable national standards and regulations in force. Methods Contractor shall comply with the recommendations contained in that document, with the following amendments. Contractor shall take care to prevent cracking and cracking of concrete under high temperatures. Contractor shall make arrangements that concrete be poured early morning or late evening,

9 The Contractor shall pay particular attention to the requirements specified below on curing.

10 formwork will be protected from direct sun exposure both before pouring concrete, and during his disposition.

11 Contractor shall take appropriate measures to ensure that valve, so that the inner and stands out to be concrete section is maintained at the lowest practicable temperature.

4.15 Pouring concrete in bad weather

1 Concreting shall not be permitted during heavy rains, when the air temperature falls below 2 ° C, or when the concrete temperature exceeds 32 ° C.

2 When the air temperature exceeds 25 ° C, concreting will be allowed only when special precautions are taken in order to prevent early strengthening of the concrete, for example lowering the temperature of water to be used in mixture or by a cooling system, maintaining permanent formwork aggregates and sprayed with water and sun for the construction of the work area.

4.16 Temperature concrete

1 temperature concrete material in any dose point and time of delivery to work, not to exceed 6 ° C temperature prevailing in the shade.

2 Where there is likelihood of fresh concrete temperature to exceed 32 ° C, concreting shall not be permitted unless measures are taken to keep the temperature below that level. Such measures may include, but are not limited to, the following:

(A) cooling the mixed water;

(B) cover material;

(C) spraying water aggregates;

4.17 Treatment of concrete after casting



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1 During the period of treatment, measures are taken to prevent loss of moisture and to minimize thermal stresses caused by the temperature difference between surface and core concrete and concrete mass to support sustained hydration of the concrete. It draws attention to the need for rigorous and continuous treatment, especially if concrete containing PFA and ZGCT.

2 The Contractor shall prepare and submit detailed proposals for the concrete methods and maintain a maintenance regime. The concrete to be treated with water or a water-based membrane for a minimum of 7 days.

3 For membranes based maintenance Water sprays will be applied within one hour of stripping. Application rate will be recommended by the manufacturer. In warm weather, sun, use membrane that reflects light. Treating the membranes by spraying on water will be used for the concrete surface to be sealed or Coated.

4 The Contractor shall take precautions against cracks due to shrinkage of concrete cast in new areas. These precautions include, but are not limited to, the following:

- (A) new surface coating cast;
- (B) the immediate layer of polyethylene to reduce evaporation;
- (C) lifting the shield against the wind.

4.18 Quality control works

1 stages of execution of work of plain concrete and reinforced concrete, most of these works are hidden, so their quality control must be recorded in "processes - verbal 'reception quality. Minutes hidden works will be concluded between the project supervisor. and the Contractor and shall be made available to the designer. Not allowed transition to a new phase of execution before the end of the protocol on the previous phase.

2 The quality of work will be done during the following operations:

- (A) execution of formwork;
- (B) the quality and installation of fittings;
- (C) proper introduction and fixing anchors;
- (D) the quality of the concrete plant concrete delivered;
- (E) the conditions for casting and compacting of concrete;
- (F) demoulding the elements;
- (G) The concrete poured into a quality item is considered appropriate in terms of resistance, whether the criteria in Annex H of the Code 012/2-2010 NE.
- (H) Concrete is considered appropriate in terms of behavior permeability criteria are met in Annex X of the U.S. Code 012/2-2010.
- (I) Contractor's Laboratory will present a clear and up to date test results for each type of concrete in part, so that the concrete can easily identify a corresponding element of samples taken and tested.

4.19 Formwork stripping

1 If the project otherwise specified, minimum stripping time shall be those set out in the Code NE 012/2-2010.

2 If the stripping operation should be followed:

- (A) conducting the operation will be supervised directly by the head of the paper, if it is found defective hardware (goals segregated etc.) That may affect the capacity of the item, demoulding elements will cease to support measures remediation;
- (B) supporting formwork unfold since opening the center of the symmetrical elements and supports continuing;
- (C) establishment of fixing parts (feathers) will be gradual, without shock;
- (D) demoulding will be such as to avoid sudden takeover by the elements is decofrează, broken edges or material degradation concrete formwork and support.

4.20 Compaction of the concrete

1 The Contractor shall look compacting concrete as a fundamentally important operation, whose objective will be to achieve a plain concrete with a strength and maximum density.

2 concrete shall be carefully compacted during the operation of the arrangement and will be processed around reinforcement, recesses and corners of formwork and molds.

3 mechanical vibrators are immersed at a rate such as not less than 6000 vibrations per minute.

4 will be used vibrators sufficient to handle the maximum rate of production of concrete, with a tolerance of 50% for reserve units, throughout the concreting. All operators will be trained in the handling vibrators for their operation.

5 vibrators will be placed in loose concrete, vertical and at regular intervals. Where the concrete is in a loose layer on top of the compacted fresh concrete, will allow the vibrator to break down to about 100 mm in the first layer. Vibrators are easily removed from the mass of concrete to avoid leaving voids. Internal type vibrators shall not be placed in concrete at random or in a dangerous manner, and the concrete will not be moved from side to side to work with vibrators. Vibration shall not apply directly or through armor sections or layers of concrete that has hardened to a degree that the concrete ceases to be plastic vibrating. They will be used to result in the formation of concrete in the formwork flow range so high as to cause separation, and vibrators are not used for transport of the concrete in the mold.

6 Vibration concrete shall conform to the requirements of the general provisions applicable national standards and regulations in force.



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7 Ensure that the reinforcement and formwork attached links are not upset and will not damage the concrete already ordered or internal face of the formwork by using immersion type vibrators. In areas of congested reinforcement may be necessary to use smaller diameter rods and the Contractor shall provide suitable sizes of rods for each component works.

8 Do not be permitted by hammering formwork concrete vibrating hand tools.

9 Duration of vibration will be limited to that required to produce a satisfactory binding without cause separation.

10 will not continue after the occurrence of vibrations at the surface of the water or cement slurry. Concrete will not be disturbed by compaction and placement into final position.

11 concrete that partially settled before final disposition will not be used and will be removed from the site.

4.21 Joints Work

1 joints shall be made on horizontal or vertical. Exact positioning of the joints working, if not indicated in the Plans will be agreed with the project manager and project supervisor before concreting. Joints is generally the plans will be achieved with minimal shear and will be in addition the amount of concrete placed so ordered by a single operation is limited in size and shape to minimize the consequences of contracting and temperature.

2 formwork joints work will be done to ensure a tight connection. The outer edges of construction joints shall be formed by calloused edges wrapped shell secured so as to ensure a perfect finish straight. The ends are securely fastened and tight grout and adjusted the valves and other components fixed. Antreprenorului proposal on ranking, number of joints shall be done before work.

4.22 Pouring concrete on work previously performed

1 Where concrete will be deposited near or over work previously performed, the old concrete surface shall be thoroughly cleaned with a wire brush and clean water and air pressure to expose the unit and remove the milk and grout for the application to be made on a clean surface.

2 In some cases, depending on the category of concrete used in the time between successive operations of the concrete and meteorological conditions since resuming concreting, Engineer Santier.poate old concrete require to be treated separately, including washing and drying techniques, The wire brush, etc..

4.23 Protection and the concrete

1 concrete shall be protected from damage caused by weather conditions (blowing direct sunlight, rain, snow or frost), the flow of water or mechanical damage during curing.

2 minimum and maximum ambient temperatures and humidity will be measured and recorded daily by the Contractor.

3 records will be made available for inspection project supervisor. All exposed surfaces, as a finishing procedure will be covered with a wet board followed by a reflective layer of polyethylene. It will be tied around the edges and supported so as not to damage the surface of the concrete.

4 as soon as possible, and the polyethylene layers of the sheets will be lowered into close contact with concrete and are secured or connected to prevent wind below them. Coating shall be kept wet at all times and shall be inspected at least every 6 hours.

5 All materials, spraying equipment and a significant amount of water will be prepared on site prior to concreting.

4.24 Defective Work

1. Do not allow poor painting work. Dimensional tolerances shall be within the limits stipulated in the provisions of the applicable national standards and regulations in force. Any leaks or cracks will be sealed by injecting resin.

4.25 Concrete equalization

1 A layer of plain concrete, at least 10 cm (base coat) shall be ordered under foundations where indicated on the plans. The base layer will be allowed before the concrete reinforcement strength for the foundation to be poured.

4.26 Loading of concrete structures

1 No external load of any kind will not be applied to any part of concrete structures until the concrete has not cured at least 7 days after confirmation that the cube strength after 7 days was reached. Maximum design load shall be applied until it is confirmed that the specific resistance was reached after 28 days.

2 The Contractor shall not be stuffing around a structure incorporating ground or flooring before getting confirmation that reaching the wall plate and the specific resistance of 28 days.

4.27 remedial treatment of concrete surfaces

1 Any remedial treatment of concrete surfaces will be agreed with the project supervisor as a result of the inspection, immediately after removing formwork and will be performed without delay.

Two concrete whose surface is found to have been treated before the inspection by the project supervisor will be rejected.

3 Any minor surface defect will be repaired in a manner satisfactory to the project supervisor, immediately after completion of curing.

4 Remedial action may include, but are not limited to, the following:

(A) supporting formwork holes left to be cleaned carefully to remove materials dropped and the edges will be roughly where appropriate, to ensure satisfactory adhesion. Then will be filled with dry mortar.

(B) edges, small bubbles, surface discoloration and minor defects will be smoothed with cloth and cement once the formwork is removed.

(C) abrupt and gradual Irregularities can be smoothed with silicon carbide and water after the concrete has fully cured.



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(D) the honeycomb minor defects are small and crushed perpendicular to the concrete surface to a depth of at least 25 mm and filled with dry mortar.

5 All other faults will be treated as too extensive to allow a satisfactory repair and concrete that defects will be broken and replaced.

4.28 dry mortar

One dry mortar to fill the holes and repair of surface defects is made of 3 parts, one part cement and fine aggregate which passes through a sieve of 1 mm and a blowing agent.

2 can be added additives to improve workability. Mortar color will match the surrounding concrete.

3 The mortar is mixed with the amount of water just sufficient to cause the material to adhere at the time of modeling of the hand.

4 dried material will be placed and compacted in layers with a thickness not exceeding 15 mm. The connection is made using a hardwood stick and a hammer and spread over the entire layer, paying particular attention to compaction grout around the edges of the hole. After connection, the surface of each layer shall be roughened prior to deposit other materials available. The holes will not be overloaded and the area will be finished by placing a block of wood filler dry and hitting hard on the block a few times. Do not use tools and steel finish will not add water to facilitate finishing.

4.29 Records of concreting

1 The Contractor shall keep updated records of dates and times on which the concreting and the time and temperature of those moments. Items will be available for inspection project supervisor.

4.30 Classification of concrete structures

1 This classification will apply equally to the components of the structure, where there are several types within a given overall structure. The structures will be divided into two classes, as follows:

(A) Class 1 structures that are not intended for storage, or transmission fluid retention (eg, warehouse type buildings - chlorination station, flag, etc.; Concrete dormitories valves, fire flow, etc.);

(B) Class 2 type pool those concrete structures that are intended for storing liquids, and can be / or not subject to hydrostatic pressure of groundwater from the site.

4.31 Codes and Standards

1 reinforced and prestressed concrete shall be designed in accordance with applicable national standards and regulations (see Annex 1)

2 plain concrete (unreinforced) and massive will be designed according to the provisions of the applicable national standards and regulations (see Annex 1)

3 additional efforts structures induced by seismic (earthquake) will be calculated as P 100_1-2006 - Seismic Design Code - Part I - Design provisions for buildings.

4 In the absolutely mandatory Class 2 structures will be designed in accordance with:

Standard P 73-94 Technical Instructions for the design and implementation of containers for liquids or compressed concrete

CR2-1-1.1-2005 Code for design of building with reinforced concrete structural walls

EN 1998-4 Design of structures for resistance to cutremure_Parte 4. Silos, tanks and pipes

4.32 Materials and Testing - Type of Cement

One type of cement used in each of the many works will be specified at present.

2 cement sulphate resistant to be used only for concrete that will come into contact with raw water or drained and exposed to air or moist atmosphere.

3 for all other work to be used Portland cement concrete.

4 cement resistant to sulphates will comply with applicable national standards and regulations in force.

5 Portland Cement will comply with applicable national standards and regulations in force.

6 Cement will be delivered either in sealed bags marked with the manufacturer's name or shipped bulk.

4.33 Testing of Cement

1 Before the cement to be ordered and delivered on site, the Contractor shall submit project supervisor, free test certificates for each consignment of cement.

2 Each certificate shall indicate that the cement was tested a sample of the shipment by the manufacturer or an approved laboratory and that it conforms to all requirements of the specifications.

3 project supervisor request, the Contractor shall provide samples of cement taken its delivery or during storage on the construction site to be tested for free at a laboratory nominated.

4 If the cement was stored on site for a period longer than 40 days or is of questionable quality, further tests may be required to verify that longer meets the requirements, tests on the Contractor's expense.

4.34 Supply and storage of cement

1 cement will be delivered to the site in sealed paper bags, resistant and permanently marked and or other containers approved.

2 cement will be delivered in sufficient quantities to ensure adequate progress of the Works.



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3 imported cement will be packed in sealed plastic bags and placed in paper bags. During the shipyard cement truck or other vehicle, it will be adequately protected against weather and dust contamination, sand or other organic matter.

4 cement proves to have been exposed to water damage will be rejected on delivery. The entire quantity of cement will be stored in a sealed building (against the action of meteorological conditions, water and air), dedicated exclusively for this purpose.

5 floors of the building will be higher by at least 300 mm above the ground to prevent moisture absorption.

6 Do not store bags at a height greater than 2 meters. If the cement comes loose, it will be stored in a storage designed accordingly.

7 silo will be sealed and properly insulated wall against sunlight. In the case where it is used for storing cement silos, each of them or their compartments are completely separated and provided with a filter or other approved alternative method of dust control.

8 Each filter dust control system will be dimensioned so as to allow the maintenance of the cement delivered in order to prevent excessive emissions of dust and effect on the weighing accuracy by increasing the pressure.

9 Each consignment of cement shall be stored separately to facilitate access for inspection and testing.

10 cement shall be removed from storage unless it will be used immediately.

4.35 Cement measured by weighing

1 cement used in construction will be measured by weighing. Partially filled cement bags or unsealed will not be used.

4.36 Water Quality

1 Water used for any purpose during the execution of the Works will be drinking clean, fresh and without unacceptable amounts of sand, organic matter, alkali, salts and other impurities and shall comply with the requirements of the provisions of the applicable national standards and regulations in force.

2 Water used for mixing concrete and mortar, washing of aggregates and concrete maturation will come from an approved source and shall not contain other harmful materials to affect armor, settling time, strength or durability of concrete or produce effects on the appearance of concrete strengthened by discoloration or flowering.

4.37 Coarse and fine aggregates

One fine aggregates will consist of natural sand unless otherwise approved.

2 Except for the changes set out below, aggregates (coarse and fine) for all concrete shall comply with the applicable national standards and regulations in force.

3 They will be strong, solid and durable and will not contain any harmful materials in such quantity as to affect adversely the strength and durability of concrete or, in the case of reinforced concrete, to attack armor.

4 coarse and fine aggregates shall conform to the following physical requirements:

(A) Percentage of vacuum forming shells in fine aggregates and retained by a 2.36 mm sieve shall not exceed 3%.

(B) The content of clay, sand and dust shall not exceed the following limits:

(C) 1% by weight of coarse aggregates

(D) 3% natural sand.

(E) sealing material (for concrete deck)

(F) Fly ash max. 2% of the cement content

(G) silicon max. 2% of the cement content.

(H) peeling, and the coefficient of expansion of rare aggregates, determined according to applicable national standards and regulations in force shall not exceed 20% and 35%.

(I) Absorption of fine and coarse aggregates, measured according to applicable national standards and regulations shall not exceed 3%.

(J) index of coarse aggregates shock resistance, measured according to applicable national standards and regulations in force shall not exceed 30%.

(K) fine aggregates shall be clean, sharp, coarse sand type formed naturally and will comply with the standards and regulations applicable national regulations.

(L) coarse aggregates will be obtained by mechanical crushing and sieving.

5 coarse and fine aggregates, when tested according to applicable national standards and regulations in force, using Na₂SO₄ solution will indicate a loss not exceeding 10% and 12% by weight. Fine and coarse aggregates shall comply with the following requirements of the chemical nature:

(A) fine and coarse aggregates shall not exceed a concentration of 0.10% and 0.05% Chloride (as NaCl). If any of the materials exceed the limits mentioned above, the material will still be acceptable from this point of view, provided that the total concentration of sodium in the mixture is in accordance with clause "of the concrete mix design".

(B) fine and coarse aggregates will not contain more than 0.40%, acid soluble sulfates (such as SO₃) by weight.

(C) coarse aggregates will be at least 85% by weight of calcium carbonate.

(D) coarse and fine aggregates will react with bases. If this requirement is not met, the Contractor shall insert components into concrete or so that either:



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(E) cement material will contain a reactive base should not exceed a maximum of 0.6% by weight when it is developed and tested according to the method set forth, or

(F) the total weight of the reactive base of the concrete mixture must not exceed 3 kg per m³ of concrete, where it is defined and calculated in accordance with the test method stipulated.

4.38 Sorting aggregates

1 Sorting fine aggregates will be within the limits stipulated in clause "Sorting aggregates". Contractor's attention is drawn to the fact that it may be necessary to combine two or more varieties of fine aggregates, or replacement of parts by hydraulic sorting in order to obtain the sort stipulated.

2 Sorting coarse aggregates will be within the limits stipulated by the provisions of the applicable national standards and regulations in force and the Contractor shall obtain particle size stipulated by combining aggregates of a certain size for the resulting particle size stipulated. The maximum size of the aggregates required will not normally exceed 40 mm.

3 requires at least four sizes of aggregates, as follows: fine aggregates: 8 mm coarse aggregates, nominal: 16 mm coarse aggregates, nominal: 32 mm coarse aggregates, nominal: 40 mm (solid concrete)

4.39 Storage of aggregates

One each size of aggregate shall be stored in separate containers or areas covered with sheet steel, concrete or other hard surface clean, self-draining and protected from contamination by dirt or other harmful materials.

Two fine and coarse aggregates will be stored so as to avoid mixing of the two materials.

4.40 Preliminary tests on units

1. Sampling and testing shall be conducted according to the procedures and provisions of the applicable national standards and regulations in force.

2. The samples will then be tested by the Contractor

4.41 Delivery of Samples

1 Samples of cement, water, fine and coarse aggregates, stipulated under the following clauses will be delivered by the Contractor before the date set for commencement of concrete pouring, so necessary tests on materials and preliminary tests on the cube test of concrete, set the clause "Preliminary Tests of Concrete Mixtures", to be completed before the date set for commencement of works.

4.42 Testing of concrete

1 Testing can be carried out according to any known set of standards provided to ensure continuity of the standards. Acceptance limits are, however, defined here in relation to the required standard.

2 Sampling and testing shall be in accordance with relevant sections of EN 12390-2:2002, ISO following relevant. ISO 1920 - Dimensions, tolerances and applicability of test specimens, ISO 2736-1 - Test specimens, part 1 - sampling fresh concrete, ISO 2736-2 - Test specimens, part 2 - collection and treatment of test specimens for strength tests .

3 As part of quality control, supplier will test the manufactured concrete. Where concrete is mixed on site, or where records are not available from the provider, it will require further testing on site.

4 The Contractor shall be responsible for the procurement, transport, storage, treatment and testing of concrete cubes necessary to ensure compliance mixtures.

4.43 Quality and Testing

1 Sampling for testing shall be in accordance with ISO 2736/1 (on site) and SR EN 12390-2:2002 (laboratory). Specimen collection and handling will be in accordance with ISO 1920 and ISO 2736/2. 150 mm cubes will be tested according to EN 12390-2:2002.

Two cubes will be tested by a laboratory's accreditation for testing the resistance of the concrete.

4.44 Sampling cubes

One concrete sampling rate will be as follows. At least one concrete sample will be taken from every degree and type of structural concrete day.

2 of each sample will be two cubes for testing after 28 days and a 7 day test to control. 28-day test results will be the average of two cubes.

3 Contractor for each cube taken to keep detailed records showing:

(A) the reference number of the cube;

(B) Location and lot from which the sample was taken for the preparation of the cube;

(C) The date of preparation;

(D) Weather conditions at the time of sampling;

(E) Date of test;

(F) Age of concrete at the time of test;

(G) Compressive strength in N/mm².

4.45 The results of cube strength

One concrete Conformity assessment shall be carried out in compliance with the following requirements:

(A) Any resistance will be less than the required strength following:

2.0 N/mm² (resistance required = 7.5 to 15.0 N/mm²)



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3.0 N/mm² (resistance required = 20.0 N/mm² or more) and

(B) a medium of any 2,3 or 4 consecutive test results over the resistance is also required as follows:

2 If the specified characteristic strength was not reached or individual results do not comply with the above conditions, then it can be applied to any of the following:

- (A) Change in the mixture;
- (B) Improvement of quality control;
- (C) Cutting and testing of poured concrete cores;
- (D) Testing structural elements relevant
- (E) Non-destructive testing of concrete poured;
- (F) Removal and replacement of defective concrete.

4.46 Further tests

Compaction factor 1 (EN 12350-5, ISO 4111) compaction (EN 12350-2, ISO 4109), Vebe (EN 12350-3, ISO 4110) or other utility tests will be carried out during concreting permanent works to control the usefulness of the dispensing machine and at the casting. The benefit will be that the sample mixtures.

4.47 Contamination

1 concrete shall be protected from contamination by seawater or brine, oil, fuels and other hazardous materials for a minimum period of 30 days after casting.

4.48 Surface finishing products without casings

1 finish by riglare: concrete will be leveled and worked with manual ruler to produce an even surface and a grooved surface, as appropriate. Do not apply any other work on the surface unless it is a first step for finishing with jointing wood or steel trowel.

Two wooden straightedge finishing: finishing the riglare will be performed by pressing lightly to remove surface irregularities.

3 Finish by smoothing steel trowel: the layer of moisture has disappeared and concrete has hardened sufficiently to prevent laitance be worked into the surface, the surface will be smoothed firm pressure to produce a dense surface smooth, uniform, free The trowel marks.

4 Where no type is specified finish: hidden surfaces will be "finished by riglare" and exposed surfaces shall be finished "by smooth steel trowel."

4.49 Surface finishes formwork products

One rough finish: This finish will be obtained by shuttering or forms established by boards cut and joined closely. The surface shall be free from holes substantial structure "honeycomb" or large defects.

Two smooth finish: This finish is obtained in casings designed to achieve a smooth surface. Only very minor surface defects will be allowed and will not be allowed to staining or discoloration. Any projections will be removed and the area will be repaired.

3 worked smooth finish: This finish is obtained by creating a smooth finish and then filling all surface defects with cement and fine aggregates freshly prepared while the concrete is still fresh wherever possible. After the concrete has been properly treated, the faces are roughened, if necessary, in order to obtain a smooth and uniform. If the area will be exposed in the final work, every effort must be made to match the color of concrete.

4.50 Tolerance for concrete surfaces

1 "very minor surface defects" allowed smooth finish are defined as follows:

Two surface defects must not enter more than 5 mm in concrete. The area of a surface defect is to be isolated not more than 0.01 m².

3 Total area of all defects of the surface of a casting must not be less than 2% of the total area of that casting.

4 Do not perform any work in connection with the repair of new concrete surfaces until the project supervisor did not examine the areas in question and has not consented to the preparation and proposed treatment.

5 All the surfaces to be repaired are carefully prepared to ensure good surface adhesion. This preparatory work may involve, cutting, carving, scrub brush, air blowing and drying treatment to remove membranes, etc..

We will use the following methods:

(A) All repairs of concrete surfaces that retain water are made using epoxy resin according to the manufacturer's instructions.

This material is a package of two parts mortar to be mixed and applied strictly in accordance with manufacturer's instructions.

(B) All of repair concrete surface does not retain water will be carried out with mortar cement / sand and a PVA-based adhesive in accordance with the manufacturer's instructions.

6 position tolerance established structures should be ± 20 mm.

SPECIFICATION

FORMWORK

4.51.1 Overview

1 will include all forms of temporary formwork for concrete modeling with all temporary construction required to support these forms.

2 molds can be made of wood or wood-based products and / or metal, materials used for achieving a proper concrete surfaces.

3 Initially the material that will manufacture formwork and shuttering type that will be used will take into account the type actuators, their size and the technology implementation of the concrete.



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4 molds and their claims will meet the following conditions:

- (C) ensure getting shape and size to the project;
- (D) be stable and resistant to the action of loads that occur in the execution;
- (E) consist of elements which allow a greater number of reuse;
- (F) be provided with assembly parts inventory.

4.51.2 Lubrication formwork

1 To reduce the adhesion between the concrete and formwork, they anoint the faces that come in contact with concrete, before each use with stripping agents. They must not stain concrete, do not damage the mold, easy to apply and to retain the same in the climatic conditions of execution of works.

4.51.3 Storage

1 Deposit formwork shall be made so as to avoid deformation and degradation (wetting, soiling, decay, rust and so on). It is forbidden to store formwork directly on the ground or other material storage piles shuttering panels.

4.51.4 Mounting Conditions

1 When installing formwork will pay particular attention to supporting and binding the mold. Formwork is prohibited binding reinforcement bars.

It will use two ties, metal bars or bolts appropriate.

3 links formwork will not leave holes or uneven areas that require repair of concrete surface and will not lead to its degradation.

4 is recommended that after removal of the mold will not be any metallic element embedded in the concrete at distances of less than 5 mm from the concrete.

5 supporting formwork shall be so mounted as to not allow movement or deformation of the formwork during concrete placement.

6 formwork columns and walls shall be provided at the bottom special windows cleaned before concreting, at intervals not exceeding 2 m in height windows will provide concrete if not pour concrete pump hose or tip.

7 formwork plywood or other wood products, to ensure achievement of rough surfaces (for adhesion to concrete) and have holes for passage connecting whiskers. It will follow watertightness and resistance formwork so as to not allow grout loss and will ensure the loads that occur.

4.51.5 Tolerances

1 formwork and supporting parts or assembly must be made using templates and devices to ensure the accuracy sizes, shapes and positions of parts.

2 Deviations and tolerances formwork will be:

limit deviations in size panels in lengths ± 4 mm the width ± 3 mm limit deviations for concrete ready made light of the tiles, walls or beams ± 10 mm thickness of the walls and tiles ± 2 mm tolerance inclination from the horizontal edges and surfaces pre-fabricated formwork on 1 m linear ± 2 mm the entire surface of ± 10 mm

3 formwork shall be so constructed as to prevent loss of water or cement paste. Special attention will be given to formwork when using rods or valves vibrators to compact concrete.

4.51.6 Materials for formwork

1 formwork can be made from high quality, free of knots, cracks or warped surfaces. Wooden formwork will have a thickness of less than 30 mm, the panel faces and edges in contact with the concrete paneling will be flat and smooth, and the joints are tongued and grooved.

2 or hardboard wainscot shall be resistant to damage by watering and will be fixed and jointed concrete so as to provide a smooth surface finish and equalized.

4.51.7 The construction formwork

1 formwork shall be sufficiently rigid and tight to prevent loss of grout concrete and to maintain the position, shape and dimensions of the finished work. There will also be constructed so as to be able to remove it from the molded concrete without damage.

Two molds are capable of producing high surface quality,

3 Where necessary holes to mount the valves, fasteners or other items embedded precautions are taken to prevent loss of mortar cement bond.

4 molds will allow access to joint surface preparation before the concrete to be reinforced.

5 Method of achieving Contractor will allow support for concrete formwork to remain in place during described.

Six metal links or anchors to the formwork or sleeve will be constructed to allow their complete removal down to a depth of at least one layer of the front cover without damage to the concrete. All fittings for metal ties shall be so constructed that, after removal, the cavities left to be as small as possible. Cavities are caused by partial or complete removal of the links will be strengthened and filled with material.

7 formwork boards will have sharp edges for accurate alignment and joints will be attached either vertically or horizontally. Where necessary edge, joints must be cut to provide a straight line. Joints will not allow leakage of grout or skirts or edges on exposed surfaces. He will be a tolerance for deformation formwork while pouring concrete.



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8 molds shaped panels are made of steel, GRP, plywood or other suitable materials to obtain a final aspect accordingly. Individual panels will be arranged in a uniform pattern.

9 shaped molds are made of sawn boards, sheet metal or other suitable material to prevent unnecessary loss of grout when the concrete is vibrated and ensure concrete surface suitable for application of any coating specified.

10 The Contractor shall take all measures in the selection and use of formwork and formwork removal and subsequent treatment of concrete to prevent rapid changes in concrete temperature.

4.51.8 Cleaning and treatment of formwork

1 interiors of all formwork shall be cleaned thoroughly before any concrete is poured. The faces of formwork in contact with concrete shall be cleaned and treated with a suitable release agents where appropriate.

2 will give notice at least 4 hours prior to inspection and approval of formwork and reinforcement.

3 Where an area is permanently exposed concrete, use one release agents throughout the area. Mould release agents are applied uniformly and avoid contact with other elements embedded reinforcements. Where concrete surface will receive a finishing will take care to ensure compatibility with finishing release agents.

4.51.9 Disassembly formwork

1 formwork will be removed without impact or disruption of the concrete. If possible frost, the mold will not be removed until the concrete monolith has a resistance of 5 N/mm².

Two vertical formwork or mold surfaces sloping concrete supports not against deflection will not be removed until the concrete hardness will not be sufficient to combat the wind force on concrete with high probability to appear at the time the mold is removed, and

(A) strength of concrete monolith (confirmed by tests in conditions representative of cubes treated as cubes or cubes Edge treated at the right temperature) to be achieved 5 N/mm² or

(B) for concrete containing only portland cement in the absence of test results cubic, a minimum period must have elapsed from concrete, equivalent to 8 hours at 20 ° C for formwork plywood uncluttered, or 6 hours at 20 ° C for formwork waterproof.

Periods at other temperatures can be calculated using the specifications in NE 012-99

Concrete shuttering support against deflection will not be removed until:

Strength concrete (test confirmed cubes treated in representative) does not reach the 10N/mm², or twice the voltage that will then be subjected to the concrete.

3 After removal, repair work will not be done until the concrete has not been inspected and approved.

4 Before removing formwork, concrete or application loads, the Contractor shall ensure that the concrete is capable of resisting efforts caused.

4.51.10 downhill casings

1 Formwork shall be provided for slopes above 30 ° or more from horizontal.

1 The roof tiles are simple shapes with sides flat, intersections (valleys and ridges) few blanks leaking eaves, gutters, according to the details of project execution.

2 How trough execution of tiles is simple, two rows of slats and deck, tile second is connecting the line along the rafters on a layer of cardboard 10 cm bituminous parties nailing the deck plate (as detailed Catalog IPCT).

3 slopes admitted acoperiturile STAS 3303/2-88 roof tiles are usually 45cm minimum 50-70 cm / m maximum of 1200 cm / m (under floor coverings).

4 To provide natural illumination of the bridge is Snuff (STAS 11853 -83) and glass tiles clearly defined portion in plant architecture and the implementation details will follow the floor.

5 Trenches and pipes are attached building with masonry bracelets anchored as detailed in the project.

10.7 acceptance testing

1 Preliminary Acceptance tests of the entire object is done by the reception committee by:

(A) examine the existence and content of material quality certificates and inspection records on work stages;

(B) direct examination of the works executed at random (at least one for each section), with reference to all the constructive elements of the base, the specific requirements, aiming especially the envelopes to perform the functions of removing rainwater, and those conditions the waterproof, wind and rain or snow blizzard.

2 roofing underneath examination is allowed to submit interspace through which to see the light outside.

10.7.1 Support roofing

1 Inspection consists of examining the reports concluded at the end of phase at the end phase of works which includes support and measurement - random geometric its elements (slope, flatness, straightness, distance between axles), minimum distance 10 cm between stacks of or combustible smoke and woody parts of the support. Deviations from flatness measured embodiment of 3 m must not exceed 5 mm and 10 mm along the slope perpendicular to it.

2 In all cases must be checked:

(A) works executed consistent with the data and details of the project (like roofing, ramps, connections, businesses, valleys, ridges, penetrations);

(B) the existence and correctness of bodywork for roofing work, as detailed in the project and type catalogs of details, including: aprons, valleys, fascia, clothing bins, flashovers for ventilation, gutters, downspouts.



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3 roof tiles (scales, profiles) and tiles should be checked:

- (A) placing the tiles and ridge lines in the string, the horizontal lines parallel to the lap allowable deviation is 1 cm / m but less than 5 cm for the entire length of the slope;
- (B) offset successive rows of tiles of any kind as to overlapping shingles (double stacked) with a half-tile;
- (C) the scales laid tiles simply the first lap and at least double mane be placed with staggered joints;
- (D) the tile scales simply placed next to a baseboard showing 3 overlapping tiles and battens between two tiles;
- (E) the double stacked tiles scales, all rows to be double in the right rezemării stickers showing four tiles;
- (F) the scales or profiled tiles catching the binding wire galvanized support in the field every fourth row and the eaves and edges and in the field to the slopes that exceed those customary in seismic areas or grade 7-9 each tile;
- (G) the profiled tiles, achieving complete rezemării on four sides;
- (H) the fixing and sealing ridges with cement mortar;
- (I) the ridges placed Continuous protected with a layer of bitumen (cardboard, mat) 4 cm overlap successive rows;
- (J) fixing with cement tile rows and lath boundary (hem, edges, ridges), and if the usual attachment field gradients exceeding 10 times the longitudinal and transverse with conical head nails underneath the tiles and the mortar to the top of the line;
- (K) the correct execution ridges of galvanized steel of 0.5 mm and a maximum of 40 cm length with soldered double rebates.
- (L) tiles, tiles and ridges to be whole, not admitted the broken, cracked or chipped more than 2 cm.

Drafted by, Eng. Diana Marin





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SPECIFICATIONS – POWER SUPPLY

1. GENERAL INFORMATION

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county
Beneficiary: Brosteni commune
Project phase: Technical project

2. CALCULATION OF THE ELECTRICAL INSTALLATION

The lighting installation has been dimensioned on the basis of existing specific calculation programs, based on the room characteristics (dimensions, refraction, high ceilings) and the necessary levels of illumination.

Sizing columns

The dimensioning of low voltage electrical installations involves:

- determination of absorbed and calculated power for circuits and columns
- determination of the calculation current of the electric circuits and columns, which is the basis of the whole calculation
- Determining the short-circuit current at different points of the installation
- choice of section of conductors or electric cables for concrete conditions of use (permanent or intermittent) and mounting (in protective tubes, in the air, in the ground, buried in walls etc.)
- Choice of protection tubes for the electrical circuits of the circuits and columns
- choosing the characteristics of the actuators, protection and measurement devices

Calculation of nominal current I_c (I calculation) for columns in general or secondary panels

The calculation formula applied for each circuit is as follows:

$$I_c = \frac{P_s}{U_i \times \cos \varphi \times \sqrt{3}}$$

Where:

P_s - Simultaneous computing power in the column on the electrical panel

U_i - line tension

$\cos \varphi$ - the power factor equal to 0,8

The nominal current of the general column is calculated

$$I_n = C_s \sum_{k=1}^n I_{n_k} \times \cos \varphi_k$$

Where:

C_s - the coefficient of simultaneity of the entire power plant - is chosen according to normative I7 / 2011

K - any column

m - the number of columns

$\cos \varphi$ - the power factor

Determination of active conductor section

According to the I7 / 2011 norm and according to the nominal current resulting from the annexes, the section of the active conductors

Choice of protection and switching devices

The selection of the fusible is provided in the main panel according to I7 / 2011:

$I_f \geq I_c$

Where:

I_f - represents the maximum value of I_f on a circuit board circuit

I_c - the intensity of the above-mentioned calculation stream

Check for voltage loss

This check is done in the two cases outlined by the normative:

- symmetrical

- unbalanced

When the electric panel is similar to a symmetric receiver we have:

$$\Delta U\% = \frac{100}{\gamma} \times \frac{1}{U_i^2} \times \frac{P_i \times L}{S_f}$$

When the electric panel is similar to an unbalanced receiver we have:

$$\Delta U\% = \frac{2 \times 100}{\gamma} \times \frac{1}{U_i^2} \times \frac{P_i \times L}{S_f}$$



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Where:

Pik - the installed power for the k (W)

lk - the length of any k (m)

SFk - the phase conductor section for the k-section (mm²)

UL - line voltage (V)

- conductivity of conductor material, 57 m / Wmm² to copper and 34 m / Wmm² to aluminum

Loss of maximum allowable voltage for the lighting circuit

A. Electrical installations directly fed through a low voltage grid to the public grid for:

- lighting: <3%

- other uses: <5%

B. Electrical installations fed from a transformer station

- lighting: <8%

- other uses: <10%

The intensities of maximum permissible currents were calculated according to normative I7 / 2011

2. STANDARDS, NORMATIVE AND GENERAL PRESCRIPTIONS TO BE OBSERVED IN THE OVERALL EXECUTION:

Law 10/95 On quality in construction

STAS 234-79 Electrical connections. Electric columns.

I7 / 2011 Norm for the design and execution of electrical installations

PE136-88 Norm for the rational use of electrical energy in artificial lighting.

PE 119 Work safety standard for electrical installations.

P 118/99 Fire safety norm for constructions

C 56-2002 Norm for quality control of construction works and related installations

STAS 6616-87 Electrical installations up to and including 100V - null protection devices. prescriptions

STAS6119-83 Electrical insulations up to and including 1000V - earthing and protection devices.

STAS 3184 / 1-85 Sockets, plugs and couplings for electrical installations up to 380V alternating current and 250V DC and up to 25 A. Technical conditions quality genres.

STAS 3185-87 Switches for domestic and similar electrical installations. General technical quality requirements

STAS 6646/1 Artificial lighting. General conditions for lighting in construction.

STAS234-79 Electrical connections. Electric columns.

STAS 6646/3 Artificial lighting. Special conditions for lighting in civil buildings.

STAS 10709 Corrugated flexible tubes of plastics. Forms and dimensions

STAS 6824 Tubular fluorescent lamps for general lighting. General technical quality assurance.

STAS 6865 Pipes with PVC insulation for fixed electrical installations.

STAS 8114/2 - 1 General purpose fixed lighting fixtures. General technical conditions.

STAS 11360 - 90 Tubes for electric. General technical tests.

STAS 11160 / 2-78 IPY and IPEY insulated pipe joints. Straight and curved junctions at 90. Dimensions.

STAS 551 - 89 Tube fastening parts for electrical installations. Metal bracelets. Dimensions.

STAS 552-89 Dosing and branch boxes for electrical installations. Dimensions.

STAS 553 / 4-80 Switching devices up to 1000 V alternating current. Rules and verification methods.

STAS 6115 / 3-85 Electrical filament lamps for general lighting. Quality technical conditions.

SR CEI 598-2-22 Lighting fixtures. Lighting fixtures. Special technical conditions.

4. VERIFICATION OF MATERIALS, APPLIANCES AND EQUIPMENT:

The provisions of the norm C 56-2002 - "Norms for the verification of the quality of construction works and related installations" shall be observed, as follows:

- all equipment, materials, equipment and prefabricated electrical (electrical panels, niches, etc.) can be experienced only if completed according to the project and are accompanied by certificates of quality and warranty.

At the same time, it will be considered whether during storage, handling or transport, they have not suffered damage.

- Verifications will be scripted, visual, and poll.

- the scriptic verification consists in the analysis of the quality, type and electrical characteristics mentioned in the acquisition or accompanying documents, with those in the project, for compliance.

- Visual inspection is done by examining the exterior appearance of the technical condition.

- Sample verification refers to dimensional measurements at a minimum of 1% of the size dimensions.

Materials, appliances, equipment whose characteristics do not correspond to those in the project or which have technical or quality defects will be rejected, and will be replaced or repaired as appropriate. If any repairs are made, the checks will be repeated before commissioning.



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PVC pipes and pipes must be smooth, with no foreign bodies, cracks or perforations, and with a uniform wall thickness. Gentle curls and black dots are admitted which do not bend or crack at bending. The tubes must be straight, with the circular section and the ends cut perpendicular to the axis of the tubes.

The electrical conductors will be subjected to checks on each coil with the ohmmeter in order to establish the existence of electrical continuity. Devices and connectors, protection, lighting fixtures and electrical panels will be scripted and visually inspected at the installation site after transport.

Electrical installations are designed and executed only with materials, appliances, equipment and electric receivers approved by units approved for this purpose.

The choice of imported materials, appliances, equipment and receivers is made by assimilating their technical characteristics with those of the products manufactured in the country, respectively by fitting them with the normative provisions in force.

It is mandatory to carry out all the tests and verifications required by the legislation in force, and they must be certified by the minutes and specific documents.

5. CONDITIONS FOR DELIVERY, TRANSPORT AND STORAGE OF MATERIALS:

- a) Handling and transporting PVC materials should be done with care to avoid hitting or scratching.
- b) loading, unloading and various handling of PVC materials in the siphon storehouses is done with care, without throwing and without storing any other material on top of them.
- c) the tubes will be stored on assortments and dimensions, being placed only horizontally on continuous and straight surfaces; fitting accessories will be arranged on the shelves; in summer, PVC tubes will be protected against sunlight to avoid warping by heating. The maximum storage temperature will not exceed + 45 ° C, and the space will be clean and located at a distance of more than 2 m from any heat source.

In winter, PVC materials become brittle at temperatures below +5 ° C, so shipment and handling will be done by taking special protection measures against blows

Pipes are individually marked at each end, with the following indications:

- the factory brand;
 - type of pipe (light, medium or heavy);
 - outer diameter - mm;
 - year of manufacture, lot number and STAS;
 - the sign of the Ethnic Quality Control Body (CTC);
 - pipe connections up to 40 mm outer diameter will be labeled with the same specifications.
- d) Adhesives and solvents should be kept wherever possible in cool places, in a sealed container made of galvanized sheets or glass, labeled and sealed with a stopper.
- e) To avoid evaporation, use a smaller capacity receptacle in which the required amount of work is kept; because solvents and adhesives are toxic, their storage containers will be obligatorily provided with colored labels.

6. DESCRIPTION OF INSTALLATION EXECUTION WORKS:

a) Preparatory operations

1. Careful study of the electrical installation project.
2. Studying the coordinate grid plans necessary for the passage of the protective tubes of the electrical installations, which will be operated by means mechanized by:
 - Existing concrete elements
 - masonry brick or b.c.a. It is strictly forbidden for plumbers or ditches to be executed by the installers through the structure's resistance structure; it is allowed to do so only on the basis of a written agreement of the designer of the resistance structure.
3. Supply and storage of necessary materials at the site yard.
4. Preparing your job.
5. Establish, together with the contractor, gaps in reinforced concrete elements in order to avoid damage to reinforcements and concrete.
6. Drawing up the worksheet.
7. Organization of the work team on the site and equipping it with the necessary tools, according to the annex.
8. Check the equipment and equipment on site. Their transport and storage will be subject to specific requirements.
9. Execution of temporary electrical installations in accordance with the rules in force regarding:
 - distribution and power supply of stationary and mobile receivers within the site;
 - protection against electric shocks by direct touch in case of defect.
10. Execution of electrical installations.
11. Checking the electrical installations.

b) Climatic conditions of execution

1. Optimal working temperatures for cutting and fitting PVC tubes both on the site and in the workshop will be within the range of + 10 ° C ... + 30 ° C.



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2. Mechanical processing of tubes which have been stored at temperatures below +5 ° C is not recommended. Under these conditions, the materials shall be kept for at least 24 hours in the rooms referred to in point b.

3. Hot work deformation, gluing, installation on site will be carried out on site and at temperatures below + 5 ° C, giving more attention than normal operating temperatures.

4. When working on site, care must be taken to ensure that PVC tubes are not under long-term exposure to sunlight.

c) successive stages of execution of the works

1. Trace and position the circuits horizontally and vertically.

2. Laying of electrical cables in cable lounges on the hallways.

3. Place the tubes on the floors and protect them with protective tubes.

4. Executing trenches in walls.

5. Execution of straps.

6. Dowels manufacturing and mounting (mechanical drilling).

7. Mount the brackets where applicable (cable bridges).

8. Mounting of tubes through scraps, plaster, etc.

9. Mount the dosages to the level corresponding to each circuit.

10. Making connections between tubes, sockets, curves, etc.

11. Fixing in doses.

12. Visual inspection of the insulation of the electrical pipes.

13. Introduce pipes and tubes.

14. Execution of bindings in batches by clamping or clamping, including milling and sealing.

15. Preparing to install the devices.

16. Marking the gaps for the device dosing, mounting the mounting brackets, installing the unit dosing.

17. Installing appliances in dots or dowels, depending on time - buried or apparent.

18. Running circuits.

19. Drawing the positions of the luminaires.

20. Mounting dowels, hooks, etc. by fixing the luminaires.

21. Assembling and mounting lamps.

22. Run the electrical connections to the corresponding circuits.

23. Drawing the positions of the electrical panels,

24. Mounting of electrical panels.

25. Connection of circuit boards.

26. Attach the panels to the indoor protection installation.

27. Checking and energizing.

28. Executing sample runs.

29. Connect the indoor protective device to earth plugs.

30. Checking the grounding in operating conditions.

d) Execution of electrical installations

When building electrical installations in the building, only materials, appliances, equipment, tools and machines approved and certified by the competent authorities shall be used.

D.1. Protective tubes

D.1.1. Materials:

- PVC type IPY, IPEY or PVC pipes;

- IPY and IPEY sockets and curves;

- Dutch joints for bonding by gluing;

- Codez 100 adhesive;

- dichloroethane solvent;

- PEL type tubes and reinforcements.

D.1.2. Mounting requirements:

- all the tubes in the rooms, columns, stairwells, will be buried in the plaster on concrete, brick or b.c. walls;

- the tracks above the slabs should be mounted and protected by cement mortar;

- Horizontal routes will be located above the water pipes and the vertical ones at least 50 cm from any heat source;

- the diameters will be chosen according to the section, number and type of conductors protected in the tube;

- Tubing will be made using parts and pieces;

- Pre-fabricated curves or workpieces with a minimum curvature radius of at least 4 diameters (outer diameter) shall be used for the directive changes;

- For branches and reductions, only used and reductions will be used;

- when passing through hollows or walls, use the tube tube procedure; when passing through expansion joints, the outer metal tube will be used;



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- the passage of the pipes through walls or basements of the basement will be made by sealing against water infiltration;
- Install the tubes so that they do not allow water to penetrate, and collect condensation inside is not allowed.

d.2. Electrical conductors

D.2.1. Materials:

Only copper conductors with PVC insulation type FY and AFX will be used for fixed installations at rated voltages up to 750 V. The sections of the electric conductors will be the ones mentioned in the projects, and the minimum allowed sections will not be lower than those stipulated in the annex to the Norm 17/98.

The electrical conductors must be continuous, with a constant section. The conductor applied insulation must be adhered and can be removed without damaging the conductor. The surface of the insulation must be uniform, without thickening, inclusions of air and foreign bodies.

Measurement of the insulation resistance of the electric conductors shall be done with a megaohmmeter at the voltage at which the plant is operating, but at least 500 V. The measurement shall be made in turn, both at the conductors of the circuits and the electric columns, determining:

- insulation resistance of the phase conductor to the earth;
- the insulation resistance of the conductors between them.

The insulation resistance value must not be less than 500,000 ohms.

To identify the function that conductors perform, they will be marked by colors as follows:

- green - yellow, for protection pipes;
- light blue for work nipples;
- white or gray for medium or neutral pipes;
- other colors (red, blue, brown) for the phase conductor;
- For telephony use Tcy 0.5 mmp conductor type;
- for receiving and distributing radio and TV signals. a 75 ohm coaxial cable will be used.

D.2.2. Mounting requirements:

- the conductors will be inserted into tubes with a diameter corresponding to the type, section and number of conductors provided by the project;
- Draining the conductors through the tubes will be done only at ambient temperatures ranging from -5 ° C to + 35 ° C and only after the coating covering the tubes has dried.
- the bonding of the conductors for joints and derivations will be done only in doses (chosen according to the diameter of the tube), using three-directional clamping connectors for aluminum conductors and twisting and tumbling for copper conductors; the twists and tweezers must have a minimum of 2 cm and are mowed;
- joints will be protected by covering with insulating tape;
- it is forbidden to make connections or joints inside the protective tubes;
- connecting the conductors to the devices, distribution boards, etc., will be done by screws, using direct bonding for sections of conductors below 10 mmp and slippers or space clamps at sections equal to or greater than 10 mmp.
- the laying of the cables will be done only after all the corresponding metallic constructions have been installed, painted and tied to the ground.
- the cables will be marked with ID tags at the ends, intersections, when switching from one construction to another; Earth-to-ground cables will be traced 10 to 10 m trails; the laying depth shall be at least 0.7 m from the ground level, at the entrances to the constructions or intersections the depth of 0.5 m shall also be admitted;
- cable routes will be horizontal or vertical, exceptions are allowed only if this is not possible. Cable fixing shall be made with secure fasteners in accordance with Norm 17;
- the cables will be fastened by means of clamps and, if placed on the cable bridge.

D.3. Mounting control devices and switches in the unit dose

Electrical appliances must provide a perfect safety against electric springs when driving. The live parts will not be accessible during operation. The lever, the control levers, the buttons and the control organs must be of insulating material.

Devices must have full-size carcasses or plates without cracks or cracks. The sealing gaskets of the devices to be installed in wet environments should not be missed. The operating mechanism must ensure secure contact at closing and firm interruption at opening.

Fixing the switches, switches and sockets in the appliance dosages will be done using the usual tools for the electrician. Run connections to the terminals, taking care of the correct execution; concentrate the electrical conduits and insert the assembly into the dose, then fix into the dose walls by tightening the screws from the clamping claws.

D.4. Lighting fixtures

D.4.2. General mounting requirements:

- drawing with template and execution of mounting holes with rotary drilling machine;
- fixing of plastic dowels;



- partial dismantling of the luminaire to facilitate fixation of the body according to its own fixing holes, after which it is screwed on the dowels;
- the electric conductors are inserted inside the luminaire through the specially provided dock and are connected to its connecting terminals;
- reassemble the constituent elements of the luminaire;
- mount the fluorescent light bulb or tube and fill with body accessories, as appropriate (lampshades, grills, etc.);
- the luminaires shall be so chosen as to withstand, without deformation, a weight equal to 5 times the weight of the respective luminaire but not less than 10 kg; it is forbidden to suspend the luminaires directly from the pipes - water, heating, etc.

D.5. Electric distribution boards

D.5.1. Specification of electrical panels:

The electrical panel is specified by the project, its type, as well as its equipment (apparatus, number of circuits, etc.).

Only calibrated fuses should be used on the electric panel.

The isolation distance between the non-insulated parts of the panel must be at least 50 mm to the construction elements.

Protective, command, separation, connection, tripping and displacement devices are clearly and visibly labeled so that they are easy to identify for maneuvers, repairs, checks. The fuses are marked on labels and nominal currents of fuses. Before integrating circuit boards, the integrity of the assembly, installation of all appliances and equipment, and the integrity of the labels, internal circuits, and devices will be checked.

Verification of internal connections will be done with 24 V low voltage, the panels not being connected to the network. Also, the connection of the electrical connections, the fixing of the devices, the stiffness of the bars, the insulation resistance between the circuits and the hand, the earth connection protection shall be verified. If all the required conditions are not met, remedy the defects and recheck the checks.

D.5.2. Mounting requirements:

- electrical panels will be mounted with dowels in walls in existing or apparent niches; as appropriate, the niches will be readjusted for the new conditions; the mounting position of the electrical panels will be vertical, they must be fixed to avoid vibration or displacement in the event of accidental, short-circuit or earthquake.
- The mounting height will ensure a Hparapet = 2.0 m.

d.6 Electrocutaneous protection devices

D.6.1. The bonding device to the protection null

All protective contact sockets, as well as metallic enclosures that are provided with the null protection terminal, will be provided with a copper FY protection neutral conductor.

The protective null conductor will be mounted in the same tube with the work conductors and will be connected to the protection shield of the electrical switchboard from which the circuit is fed.

D.6.2. Tolerances of execution and assembly

- dimensional and qualitative deviations of the materials, appliances and equipment are admitted within the limits allowed by the respective internal manufacturing standards and norms, in force at the date of execution of the works;
- there are no deviations regarding the quality of the protective works against electric shock by touching the metallic parts that can be accidentally switched on under tension, as well as the lack of quality required works at the electrical installations for fire protection (obturators of holes, seals, etc.).

7. VERIFICATIONS FOR THE RECEPTION OF WORKS:

During the execution of the works, the beneficiary will follow the preliminary checks, as well as the final verification before the commissioning of the installation.

Also, it is necessary to draw up certain documents, according to the provisions of the law and the technical norms in force, regarding: handing over the work front, the drawing of the works, the quality of the work done, the correct positioning of the tubes, the doses, paintings, as well as ongoing on-site checks (possible site layouts).

The final check will include controlling the functionality and quality of the electrical installation, and will refer to:

- the quality of the protective tubes;
- the electrical continuity of the electrical conductors - before assembly in coils, and after assembly, before finishing of the finishing works;
- correctness of electrical connections to joints, derivations, devices, paintings, etc.;
- the insulation resistance of the installation to the earth and between the phases (with the plant disconnected);
- the correctness of the execution and the proper functioning of the protection against electric shock (against the earth and between the phases);
- how to start the electric motors and their protection;
- correct selection and installation of fuses;
- grounding dispersion resistance;
- Prefabricated or fabricated elements of the installation (panels, flanges, etc.);



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- for the works that are hidden, there must be prior checking, the results of which are recorded in the hidden works, which will be attached to the building's book.

Prior to the start of each test, the technical and organizational development conditions will be checked so as to exclude the failure, damage to the facility and injury to the staff.

Checks, tests and tests from the beginning, time and after completion of the assembly are made to determine the quality of the assembly.

These prove that the assembly works are finished and correctly executed, and can be moved to the provisional reception. All the tests are done by the building-assembling company, which checks, tries and proves the material and equipment that will be used for the execution of the installation.

Materials and equipment that do not qualitatively comply with quality certificates or proofs and proofs will be rejected.

The Beneficiary will provide when it is necessary for its own qualified personnel to carry out the tests. The co-ordination and responsibility for the execution of the verifications and the proofs shall be fully paid, as the case may be, to the contractor or supplier.

The temporary reception is made on the condition that the usefulness necessary for the next run-in period and technological samples is ensured. For this purpose the beneficiary will follow up and call in time for the receptive and commissioning committee. The Commission has the task of determining whether the installation can proceed to the next period of commissioning and operation of the samples under installation and personnel security conditions.

At the provisional reception, the performer and the suppliers will have to prove by legal technical documents the quality of the materials used and the correct exception of the hidden works, as well as the results of the samples to be performed before, during and at the end of the work. If facilities were admitted to the receptive and the works are fully completed, a verbal process of receptive work with the builder and the monitor will be completed, specifying the obligations and responsibilities of each.

Through the provisional reception, the builder remains under the obligation of possible completions and remedies established by the verbal process or which may subsequently arise as a result of hidden vices. The provisional reception and takeover by the beneficiary of the installation can be made with parts, if they can work separately.

The tests, tests and tests during the commissioning and exploitation of samples are done in order to achieve the normal working regime, after which the complex technological sample is passed.

The above work is done on the basis of the report of the commission for commissioning and putting into operation together with the contractor, the supplier and the beneficiary, who establish the samples and the program of their deployment. Sample execution is done by the beneficiary, with technical assistance from the designer, the contractor and the supplier.

Responsibility for maneuvers and application of labor safety rules rests with the operating personnel who will take the necessary measures.

The final test will be carried out according to the notions in force and the designer's provisions when the installations are complete. If there are missing parts that can be replaced by provisory and commissioning is imperious the final samples and commissioning for limited time can be done. After the final test is completed the minutes of commissioning signed by the members of the commission are concluded.

With the commissioning of the plant, the operation can be started.

The guarantee samples are made after the installations have been put into operation, for a limited time, in order to check the performance of the project. Samples are performed by the operating organization, alone or with the help of other specialized companies, in the presence of the contractor and, where appropriate, the supplier. If during the warranty period the facility does not achieve the guaranteed performance, the beneficiary has the right to ask for the remedy of defects, damages from the supplier or even the rejection of the equipment.

If warranty claims are past, the contractual acceptance of the equipment and installations shall be carried out, and a report shall be concluded.

If they remain or appear deficient during the warranty period, these will be specified in the minutes, with the manner and the time to resolve them, as well as with the tasks of the parties involved.

If there are no litigations at the end of the warranty period, the minutes of definitive receptions ending with the results of the evidence of guarantee and confirming the remedy of the previously noted deficiencies.

8. MEASUREMENTS AND SETTLEMENTS:

Verification of the quantities of works can be confronted with those provided in the quantities lists provided in the project, while also consulting the electrical installation plans (the drafts of the project).

The settlement of the works will be done on the physical stages, by categories of works, in agreement with the beneficiary.

Designer,
Ing. Dan Cristian Dragut



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INSTRUCTIONS FOR COMMISSIONING, OPERATION AND MAINTENANCE

-internal and exterior electrical installations-

1. GENERAL INFORMATION

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county

Beneficiary: Brosteni commune

Project phase: Technical project

When commissioning the projected interior and exterior electrical installations, proceed as follows:

- Check the continuity of all electrical circuits and grounding conductors (via PE, null in the switchboards), the shutoff contacts, and up to the BMPT;
- Measure the insulation resistance of all electrical circuits with a megohmmeter of 500V or 1000V and its value should not be less than 500 kohms, then check after each repair;
- Check that all metal switchboard cases (if any) from any level or any part of the electrical installation, or the various equipment or household appliances to be assembled or used are galvanically connected to the socket of the earth, either directly or through the contact in the plug. This is then checked periodically by the owners or their representatives;
- Check that all circuits are properly inscribed and that the safety interdiction warning signs (s) are fitted to people - and then checked periodically by the owners on a 6-month basis;
- Check all switchgear (switches, switches, contactors, control knobs, etc.), lamps and equipment fitted for proper operation, and if all socket outlets have galvanically-protected protective contacts corresponding to the protective conductor made of copper minimum 2.5 mm², mandatory - (PE) - The PE conductor of the general column will also be copper, but will have a section of 6 mm².
- Check that all differential and normal circuit breakers in the electrical switchboards are adjusted to the values indicated by the designer, and those that will fail during operation will only be replaced with identical circuit breakers, others will not be installed at random, and increases the power of the receivers used will be replaced, but only after a calculation made by a specialist.

In operation - electrical installations, if operated properly, require minimal troubleshooting. The following shortcomings may occur:

- Do not operate the device for mechanical reasons, leakage - the defective appliance is replaced by a qualified person;
- Pulverization of electrical contacts, loss of electrical elasticity and contact pressure, especially in electrical outlets (due to the use of inappropriate plugs), in which case defective appliances are replaced by specialized personnel;
- Problems arising from improper use of equipment and receivers or equipment malfunction, burner bulbs, tubes during operation, situations where they typically trigger differential breakers (causes: short circuits or overvoltage overload, inappropriate appliances or electrical insulation damage partial or total). - Under these conditions, the cause of the fault is first removed and then the fuses with calibrated fuses are replaced, or the circuit breakers are switched off when qualified personnel is preferred. When the situation is known, the entire power supply is removed and qualified personnel performs the appropriate tests, removes and returns the system under voltage.
- If there is no voltage on the system sections - check the last voltage point then close to close (by the specialized personnel) and after determining the fault area, check it in doses, junction boxes or at various outlets and circuit breakers;
- Condition of connections between conductors, device terminals, conductor integrity on the route - between doses, etc. The continuity is restored and the electrical system switched on.
- In case of non-functioning of the luminaires, the state of the bulbs or fluorescent tubes is first monitored, they are replaced with good ones if they are burned (it does not necessarily require specialized personnel) but the person should be careful not to look at the bulb or tube fluorescent when replacing it, as it may result in adverse situations such as breaking the glass globe, either mechanically damaged or implosion; in some cases the blisters, the inner contacts of the luminaires are damaged, situations where specialized personnel have to intervene;
- Every year, the continuity of the earthing installation and the PE of the protective contacts from all the flue plugs is checked.

Measures to protect users:

- Users are required not to come into contact with uninsulated electrical conductors or electrical appliances that they have found to be defective in some circumstances - require specialist personnel to intervene;
- If it finds by a certain circumstance that a particular machine is running, it will unplug it, disconnect it by a switch (or remove the normal fuses if it exists) or automatically disconnect the automatic circuit-breakers, in order not to come into contact with him / her other unauthorized persons and will require an authorized person who will perform the remedy;

Obs. - In addition to these instructions for general use and protection, the user is bound to strictly observe the manufacturer's safety, technical and protective instructions for use with each appliance or household appliance.

The interventions and works of the distribution boards of any type will be carried out only by authorized electricians of specialized companies.

Designer ,

Eng. Dan Cristian Dragut



SPECIFICATIONS
FIRE DETECTION, FIRE ALARM AND ALARM SYSTEMS

GENERAL INFORMATION

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county
Beneficiary: Brosteni commune
Project phase: Technical project

1. Overview

Object of specifications.

This specification contains the main technical conditions for the installation of the detection, signaling and alarm system in case of fire related to the studied object.

Fire detection, signaling and alarm system

General requirements for installed equipment and materials

The ambient temperature is between 5 and 40 degrees Celsius for equipment inside the building. For equipment located outside the building, the ambient temperature is between -20 and + 50 degrees Celsius. Relative humidity ranges between 20% and 80%.

All connections to the devices are made inside them, in the protective contact (or buried), to ensure maximum safety.

Cable networks and equipment locations will be built according to the plans of the project.

Surface preparation involves installing buried tubing as appropriate, making wall passages or adjusting existing ones and preparing special areas for cable trains.

When performing the drilling, fastening, the general measures of the work safety technique and the rules specific to the place where the work is carried out shall be observed.

In case of inconsistencies between the installation documentation and the on-site situation, design changes will be made, these modifications (accepted only with the written consent of the designer) will be included in the final documentation of the installations.

In order to install the cables, they should first be cut to the required dimensions, taking care to keep a 3-45 cm margin on each end, while marking the cable according to the installation documentation. In the case of cable trains (cable ducts), cables are installed in one pass (no more wires are fed into the same tube in succession) and the maximum force for the pulling force is exceeded.

At the end of cable installation, they should not remain in a tense position. When making the cable groups, the parallel threading of the threads will be attempted, and placing multiple groups on the same support will prevent them from being broken.

A very important thing to place cables on the route is to avoid damage (scratching, bumping, excessive bending, etc.) if one or more cables are damaged, then they must be replaced completely (no bumps are allowed).

Particular attention will be paid to laying / installing the cables in order not to damage the insulation and the shape. High radius curves (over the minimum allowable radius in this case will be at least 10 times the outside diameter). Do not pull on the cables, they will sit on the cable bed, the troughs, if the tubes are being handled carefully, from one end will pull with little force, and from the other end will prepare / sit and push lightly.

When laying the cables, account will be taken of current regulations for weak current installations.

During the execution of the works, the quality checks are carried out by the technical manager with the execution of the works.

All appliances, equipment will be controlled separately to meet the design specifications and functional qualities guaranteed by the manufacturer.

Materials or equipment exhibiting irreparable damage will be changed.

Execution of electrical connections will be performed only:

- after cleaning the oxides at the ends of the conductors or bars;
- with specialized doses mounted on the vertical elements of the building or apparent on the masonry;
- with slippers, printers with special parts for this purpose, or by metallizing and gluing;
- electric or oxyacetylene welding with a cord having a length of at least 3 labels of payload, for earthing protection conductor;
- Fixing the slips or platforms on the bars is done with screws, flat washers and safety washers.

Installation of protection tubes, PVC ducts and cables will only be carried out:

- on vertical or horizontal routes, as appropriate;
- with a 0.5 - 1% slope between doses to the horizontally mounted tubes;
- with shielding devices at the ends of the metal tubes;



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- with threaded joints and sockets for metal tubes;
- fixed on constructional elements, with specialized accessories, at the distances that are covered by norms 17 and PE 107;
- with the use of special prefabricated bent and vertical bends or section modification for PVC grooves and PVC planks.

When passing cables and protective tubes through the walls, floors and foundations of the buildings, proper seals with special material will be made.

The ends of the protective pipes will be formed and will be provided with devices to avoid damaging the insulation of the conductors and the electric cables as a result of the friction.

Both ends of the metal protective tubes are connected to the protective installation.

The electrical interconnections will be made with single-piece cables (without interruption).

Each cable will be marked at both ends. The cables will be lightly mounted with loops at the ends.

For the cable bridge it is required to use zinc prefabricated. Do not accept welded wire bridge.

The position of the routes for the location of the protective tubes, cable bridges, PVC channels as well as the position of the appliances, materializes only:

- on separate routes from other installations which could endanger their integrity or proper functioning;
- with minimum required distances to other installations according to I7 and PE 107 norms.

If there is not enough space, the installation can be arranged on common routes with other installations, provided the minimum safety distances are respected, and the electrical installation shall be disposed over the liquefied water pipelines, sewage and liquefied petroleum gas pipelines and under natural gas pipelines .

General technical specifications for installed equipment

Fire detection, signaling and alarm system

Addressable fire detection system

It is mandatory to observe the area of the fire detectors.

The interconnection network between detector, fire alarm and fire alarm equipment will be made with a fire resistant cable, JYsTY or similar for the detection, command, signaling, and fire alarm side of the central / repeater communication part.

The sirens will be grouped into alarm zones and their power supply will be made from the detection and command center, using the cables of the same loop.

Realization of protection:

The fire detection system has been designed with addressable equipment that efficiently and modernly performs fire safety.

The plant's central unit consists of an addressable detector.

For the detection of a possible fire in the initial phase, for all the rooms together with the annexes, respective horizontal movements (access and traffic lanes, corridors), vertical movements (stairwells and lifts), etc., type detectors were provided: optical smoke.

The fire detection and alarm elements will be located according to the present documentation, for any nonconformity between the projected situation and the site situation, the designer will be notified.

Detection elements will sense smoke at the onset of a fire start and provide a quick signaling, will be apparently located on the ceiling.

The manual fire buttons will be mounted in accordance with the present documentation on all the exits of the building. These will be activated by breaking the glass (no danger of injury). Checking this device is very simple and will be done with a special key. The main advantage is the extreme ease of maneuverability, the hitting can be done at any angle and from the run.

The sirens have the role of sound alert, to alert staff to start the evacuation of the building. They will be located near the traffic areas where people are located, in order to alert clients and staff to the danger that has arisen.

The electrical signaling cables used in the signaling circuits will be protected according to norm Norm P118 / 3-2015 in plastic or metal tubes or planks.

It is forbidden the use of unified wires in the signaling circuits.

The circuits for signaling circuits will, as much as possible, be separated from other electrical or telecommunication circuits.

The multifilament cable used for signaling circuits will not be used for other telecommunication circuits, even if there are pairs of free wires and different colors. It is forbidden to execute the fire signaling circuits with visible and unprotected signaling cables in the tube.

The power supply of the system shall be made of a separate dedicated and protected circuit (having a dedicated protective device to be labeled and accessible only to authorized personnel), buffer batteries shall be provided for the supply voltage so dimensioned to ensure a normal operation of 48 hours with a 30-minute alarm.

The backup source must automatically take over the power supply to the system when the base source falls off or no longer provides normal operating voltage. Switching from one source to another should not lead to changes in the state of the installation (false alarms, loss of information, initiation of operating commands for protective devices, etc.).

Location and installation

For the installation and installation of detector, fire alarm and fire alarm equipment, the order of operations will be:

- Marking of routes and location of detectors, buttons, sirens, etc .;



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- installation of protective tubes and cables;
- mounting of detectors and other equipment;
- making connections.

Before the installation of equipment and appliances is started, it is necessary to check them. Only equipment and apparatus in perfect working condition with appropriate certificates will be installed in the installation.

The equipment is installed according to the location documentation, observing the specific standards and regulations, as well as the installation instructions of the equipment manufacturer.

Connections will only be carried out on equipment (no hooks are allowed), the cables will be written according to the cable log.

Preparation and commissioning of the installation

Verify installation after assembly and before commissioning.

Check the correctness of the connections to the equipment, taking into account the polarities. Improper connection of the power supply may result in damage to the equipment (decommissioning).

After installing the boiler, connect the detection and control loops cable, power the plant.

System programming is running, testing and samples for 72 hours.

Training is done with the user personnel, practical demonstrations of the fire detection, signaling and alarm system will be performed.

Measurements, checks, adjustments and samples

During execution and after execution, the following will be done:

- faulty line checks;
- Checks on meal;
- individual detector simulation verification of each detector;
- local fire alarm simulation;
- checking the automatic switching from the mains supply source to the back-up source and automatically returning to the mains source when reconnecting it;
- verifying the existence of protection by grounding and null protection;
- verification of earthing resistance;
- correct fixing on the support of each component;
- the existence of cable labels corresponding to the cable log;
- cable antislammimg;
- existence of cable shield continuity.

Management and quality assurance

According to the provisions of the Construction Quality Law no. 10/1995 "The management and quality assurance in the constructions and the related installations" is the task of all the factors that participate in their conception, realization and exploitation and implies an adequate strategy and specific measures for guaranteeing their quality.

It is accepted for auction / execution companies whose main activity is the production or installation of fire detection, signaling and alarm installations, closed circuit video surveillance systems and voice / data communication networks, TV.

The systems will be installed by competent personnel, permanently employed by the contractor, agent or installer and who are fully responsible for the correct execution of the installations provided, including locating and repairing defects.

If the participating firm does not cover all specified areas, it will need to list the subcontractors and proof that they cover all the above mentioned areas.

The provider will have a competent ethnic support and will provide on-demand (warranty) intervention within 24 hours (except on Saturdays, Sundays and legal holidays), offering a contact-assistance post-warranty post-warranty. The supplier owns the respective spare parts and the specific diagnostic equipment.

The assembly will be executed in strict accordance with the regulations and the necessary approvals imposed by the Romanian legislation.

Normative and normative reference

This documentation respects the Romanian and European standards and standards regarding electrical installations of weak currents related to the buildings, in terms of plant size, equipment and materials selection, works execution and operation.

Designer,
eng. Dan Cristian Dragut



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SPECIFICATIONS

for the execution of sanitary, sewerage installations and sanitary fittings and specific consumers

CHAPTER I. OVERVIEW

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county

Beneficiary: Brosteni commune

Project phase: Technical project

OBJECT OF THE PRESENT DOCUMENT

The present specialized project covers sanitary, sewage, potable water supply and fitting of sanitary items or specific consumers in the studied location.

The project was elaborated on the basis of the framework conditions of the theme, of the architectural plans and in accordance with the technical norms in force.

The indoor and outdoor sanitary installations for the building represent the work of cold water supply, domestic sewage, as well as the installation of sanitary objects or specific consumers.

The cold water pipes required for the supply of plumbing sanitary items will be made from the PPR pipe mounted buried to specific consumers.

Each column will be sectioned by fitting the valve valves at their coupling point to allow for partial disconnection of the water supply.

Connections to sanitary items will be provided with check valves to ensure their isolation in case of necessity.

The domestic sewerage system will be made of PVC - U pipe.

Drain pipes for sanitary items will be made of PVC - U. These pipes will be connected to the sewer columns or floor drains. Their quest will be buried.

BRIEF DESCRIPTION OF PROJECTED WORKS

The present technical specifications concern the sanitary and sewerage installations of this phase of works, which essentially include the following:

- Execution of potable water pipes for drinking water and execution of domestic waste water discharge pipes;
- Execution of domestic hot water pipes
- installation of sanitary items;

STANDARDS AND TECHNICAL PRESCRIPTIONS FOR EXECUTION AND FITTING

Sanitary and sewerage installations in general must comply with the following rules and regulations:

I 9-2015 Norm for the design and execution of sanitary installations

I 6-98 Norm for the Design and Execution of Natural Gas Supply Systems

P 118 - 99 Technical rules for the design and construction of buildings, regarding the fire protection;

I 30 - 75 Technical Instructions for the Calculation of the Ram and the Measures to Prevent its Negative Effects on Hydraulic Pressure Installations;

C 10 - 84 Norm for the execution of cold works:

Performance degree for civilian sanitary installations.

C 107 - 82 Norm for the design and execution of thermal insulation works on buildings;

PE 924 / E - 35 Requirements for calculation of thermal insulation of installations;

C 56 - 2002 Norm for quality control and acceptance of construction works and related installations;

I 12 - 78 Norm for conducting pressure tests on steel pipes;

273/1994 Regulations for reception of construction works and related installations;

SR-ISO 1167-93 Pipes of plastics for the transport of fluids.

The 1995 Republican Labor Protection Regulations;

Labor Protection Law no. 90/1996 and Methodological norms for application;

General Labor Protection Norms - 1998 edition.

Decree no. 290/1977

Technical rules for the design and construction of constructions, P.118 - 99

Norm I1 / 1978 for the execution of installations with plastic pipes (through assimilation and pipelines in p.p.)



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Normative for preventing and extinguishing fires during the execution of construction works and related installations - C.300-94.

General Norm for Fire Prevention and Extinction by Common Order MI-MLPAT, 1994
STAS 1478-90

Calculations of flow calculations and sizing of installations will be carried out in accordance with the Romanian regulations in force. The design of the sanitary and sewerage installations will take into account the requirements of the site.
In the absence of local regulations, the international rules I.E.C.

BRANDS AND EQUIPMENTS

The quality, characteristics and appearance of the proposed equipment must meet the specifications of the presented material that represent the minimum admissible level.

TESTS-RECEPTION

The tests will be performed after the determinant phase program.

Testing of the plant assembly will be recorded in the standardized result sheets established at the beginning of the site and sent to the beneficiary as the work progresses.

These documents will be compiled and validated by the contractor and / or the beneficiaries and will constitute the installation dossier.

Upon completion of the works, a file in 5 copies, which served at execution, validated by the beneficiary and updated as the site progressed, will constitute the final dossier.

In the technical site, a general plastic scheme of the installations will have to be displayed before the reception operations begin.

1. Cold water and hot water

The cold and hot water pipes will be subjected to the following tests:

- Cold pressure tightness test;
- Trying to work with cold and warm water;
- the tightness and hot resistance test of hot and circulating water pipes.

The cold-water tightness test as well as the tightness and heat resistance test on cold and hot water pipes will be equal to 1.5 times the system pressure (2.2 bar) indicated in the project for the respective power supply installation the water.

The pipes will be kept under pressure, the time required to check all the tracks and joints, but not less than 20 minutes.

No pressure drop is allowed.

The pipeline pressure will be carried out with a hydraulic test pump and read on a pressure gauge mounted on a pump that will be located at the bottom of the pipeline.

The cold and hot water test will be carried out after fitting the fittings to the sanitary items and to the other points of consumption and the pipes under the hydraulic pressure regime.

Verify by successively opening the supply valves if the water reaches the operating pressure at each individual consumption point.

The check will be made by opening the number of consumption taps corresponding to the simultaneity and the flow rate.

The tightness test and the resistance to hot water pipelines, including circulation, shall be carried out by putting the hot water system into operation at the set operating pressure and at a temperature of 55 ... 60 ° C.

The pressure and temperature of the system shall be kept in the installation for the time necessary to check the tightness of joints and of all points of support and fixation of pipelines subjected to dilatations, but not less than 6 hours.

After complete cooling, the cold-water proofing test will be repeated.

To check the operation of the circulation pipes, measure the water temperature in the hot water pipe at the outlet of the cooking appliance and the circulation pipe before connecting to the appliance.

The operation test will be carried out with the equipment in operation according to the provisions of the project (press stations, hot water appliances, pumps, etc.).

2. Sewage pipelines

The sewer pipes will be subjected to the following tests:

- the tightness test;
- attempted operation.

The tightness test will be performed by checking the tightness of the pipeline and the joints. Conduits provided in masking elements will be checked during the work, before they are closed.

The sealing test will be done by filling the pipes with water as follows:

- sewerage pipes for meteoric water throughout the building height;
- sewage pipelines to the discharge level through sanitary ware floor siphons.

The attempt is made by water supplying sanitary items and drainage points at a normal flow rate and checking leakage conditions.



When performing test runs, the pipe slopes, the condition of the supporting and fastening parts, the cleaning parts according to the parts of the project are checked.

3. Removal of malfunctions (in case of water or air loss above the permissible norm) and restoration of samples.
4. Washing clean water inside the water pipes and blowing the gas pipes under pressure.
5. Disinfection of water pipes (as it transports drinking water).
6. Commissioning at regime pressure (Norm Norm I-9-94, Norm Norm 6-98).
7. General reception of installations.

The reception of sanitary works is carried out in accordance with the provisions of the norms and regulations regarding the collection and reception of the construction works and the related installations, namely:

- Law no. 10/1995 on quality in construction;
- Normative for quality check and acceptance of construction works and related installations, indicative C.56;
- Technical Instructions for Testing Hydraulic and Pneumatic on Receptacles, I.25;
- Regulation for the reception of construction works and related installations, no. 273/1994.

In view of the reception, it will be observed whether the execution of the works has been done in accordance with the provisions of the project, the technical regulations regarding the execution of the related works and the installation instructions of the equipment manufacturer.

Particular account shall be taken of the technical conditions concerning:

- equipping with sanitary ware and appropriate appliances;
- using the equipment provided in the project;
- observance of pipeline routes;
- normal operation of the equipment in the pressure lifting station at the specified parameters;
- fitting and proper functioning of sanitary items and their associated water and drainage and auxiliary fittings;
- the rigidity of the fixation of the building elements by the building elements;
- ensuring the free expansion of the pipes;
- the location of the control valves and devices, their measurement and control and their accessibility;
- equipment and proper operation of the fire extinguishing installations according to the provisions of the project and of the equipment manufacturer's indications;
- applying measures to reduce noise and vibration;
- the quality of insulation and dyeing;
- aesthetic appearance of the installations.

In order to reduce the possibility of corrosion and to extend the service life of the installations it will be mandatory to run hot water installations for 60 days, at a temperature of 45 ° C after commissioning of installations and reception of works.

For hidden work, the quality of the materials used and the execution will be verified and the samples will be carried out before isolation and masking and ending the starch processes for hidden works.

CHAPTER II. TECHNICAL SPECIFICATIONS

II.1 CHOOSING THE MATERIALS

The proposed equipment will be in compliance with the Romanian regulations.

The imported material will have to have the type approval certificates of the Romanian authorities.

These will be presented to the beneficiary before installation.

The electrical material used will have a degree of protection against the risks posed by different locations and locations.

All materials will be guaranteed through a compliance record.

In the absence, materials will be proposed:

- Comply with the technical features mentioned in the contract specifications.
- Resistances (the proposed material will be defined by its life span, number of hours of operation, number of operations).
- Easy maintenance (accessibility, spare parts, etc.).
- Having a local representative who has the possibility to ensure:
- Parts whose manufacture is maintained in time to allow maintenance,
- A troubleshooting and maintenance service, knowing the materials and being able to intervene quickly.

The water and sewage waterway routes have been chosen so as to ensure minimum pipe lengths, self-extinguishing dilatations and possibly prefabrication.

Coordination of all installations in the technical spaces was envisaged so as to ensure unhindered access of maintenance and operation staff in case of breakdown and easy dismantling for repairs.

Pipes and connections to functional equipment (pumps, receptacles, etc.) have been chosen so as not to prevent the dismantling of the fittings and fittings.

The execution of the sanitary facilities will be coordinated with the other installations.

This coordination will be tracked throughout the execution, starting with the layout.



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When crossing the slabs or concrete walls, use the openings provided in the project or the passageways. For this purpose, they will be followed by the constructor who has the obligation to do them with the completion of the respective structures.

Only equipment that corresponds technically and qualitatively to the provisions of the project, to the respective standards and to the technical approvals shall be used during the execution of the works.

Prior to putting into operation, all equipment will be subjected to visual inspection to determine whether they have suffered degradation to reduce their technical and qualitative state (deformations or blockages in appliances, thread condition, flanges, valve operation, etc.). We will remedy any malfunctions and replace the equipment that can not be brought back to the proper condition.

Check whether the pressure vessels have been subjected to ISCIR control and that they have the stamp plate and the relevant technical book.

The measuring and control devices will certify the existence of the seal and the verification bulletin issued by the metrology bodies.

The storage of sanitary equipment is done in warehouses or storage spaces organized for this purpose under conditions that ensure their good conservation.

The equipment on which the atmospheric conditions do not have the unfavorable influence during storage (steel pipes, cast iron tubes, etc.) will be stored outdoors on specially designed platforms, observing the specific rules of the work safety technique.

Materials that can be damaged by weathering or direct sunlight, such as plastic pipes, copper pipes, insulation materials are stored under sheds or in warehouses.

Fittings, ceramic sanitary ware, measuring devices, etc. it is kept in closed warehouses.

Handling of the material is done in accordance with the rules of the work safety technique so that it does not deteriorate.

Particular attention will be paid to brittle or slightly deformable materials such as reinforcements, sanitary items, measuring devices, etc.

All appliances that have been provided with manufacturing protection seals will be mounted as they are, keeping the seal intact for reception.

II.2 INSTALLATION OF COLD AND HOT WATER PIPES

Conduits will be mounted after they have been previously drawn. When drawing, the slopes provided in the project shall be strictly observed, so that the pipes are completely ventilated and emptied.

The distribution pipes and columns are fixed to the building elements by bracelets.

Joining polypropylene pipes will be done by polyfusion with fittings.

The joint with the metal parts will be achieved by threaded parts.

The thread of the fittings will be in accordance with STAS 402 and must allow the hand presses to be screwed to at least half of at most three quarters of the thread length.

At threaded joints, the sealing should be done with a pinhole coat soaked with the minimum lead paste or graphite paste and mixed with double boiled oil or other materials homologated for this purpose.

In the case of plastic pipes (PVC, PE, PP, PP-R, PEHD, etc.), it is obligatory for the supplier of the pipe to make available to the contractor all specific technical instructions regarding:

- the way of joining the piping (electrofusion, polyfusion, infiltration, flanges, etc.) as well as the fittings, accessories, special parts and tools and the verification devices required for this operation;
- fastening on construction elements, which will be made with fisci and slides, standardized, supplied with the tubing;
- how to compensate dilators, by directional changes, according to the project or by expansion bolts and / or special expansion parts according to the design and the execution manual;
- how to protect the pipes when installing in various environments (apparently in closed ghee, buried in walls, foundations or in the ground;
- Specific conditions for the performance of the tightness, pressure and functioning.

Dilatations of pipelines will usually be taken over by L-shaped path changes.

In the absence of these, on the straight lines will be provided expansion expansion compensators type U, axial or lenticular, calculated according to the material of the pipeline and technical specifications of the supplier, and Norm I1-2000.

Taking over the dilatation efforts will be done by supporting struts reinforced by adjacent building elements.

The distances between the movable supports will be determined according to the pipeline supplier's indications.

II.3 PLUMBING

The following types of reinforcements are to be provided as necessary: passage, adjustment, retention, drainage, safety, ventilation, etc.

They will be mounted in the positions indicated by the project drawings.



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The provided fittings will correspond to the working pressures required by the project: up to 10 bar pressures will preferably be used with spherical valve made of brass or steel (1/2" - 3") or, failing that, taps valve and seat passage, cast brass body with threaded plugs for assembling with steel or plastic matt pipes.

Drain fittings will be installed at all points required by the project. The drain valves shall be straight with ball valve or with STAS 1602 pin or ball valve with AmT1 cast brass body and threaded plug for steel pipe at one end and Dutch connection for hose port connection at the other end. Through the project, a PP threaded plug with chain for the hose port connection is required. Project size 1/2".

The fittings will be mounted taking into account the following conditions:

- easily accessible
- easily removable

All reinforcements during execution will be mounted in the closed position.

The lever and counterweight safety valves will be mounted so that the stem is vertical.

The fitting installed on pipes with a diameter between 1/2" and 2" shall be with an internal thread.

The internal threaded fitting will be equipped on each side with coupling couplings. The threads will be provided with teflon tape.

The valves' protection devices will only be removed when assembling.

Closing valves (with internal thread and standard crossing)

Type: quarterback, ball

Manufacture:

body in molded brass
chrome plated brass
sealing gaskets and teflon seals
wrought iron maneuver.

Usage limits:

- Temperature from -30 ° C to 60 ° C
- service pressure for a temperature of 60 ° C 10 bar.

Retainer flap

For connecting the threaded holes:

- body in molded brass
- Dash and guide in Delrin
- spring in stainless steel
- Nitrile gasket

Usage limit:

1. temperature: 60 ° C
1. Service pressure: 10 bar

Threaded filters

Type: with sieve

Manufacture:

- a) body in bronze
- b) Removable sieve in stainless steel with 0.5mm eye

Usage limit:

2. temperature: 60 ° C
2. Service pressure: 10 bar

Safety valve

Type: with resort

Manufacture:

- body in bronze

Features of use

calculation pressure control function

II.4 PP TYPE DRAINAGE PIPES

Through the project, the types of pipelines to be used for the construction of the horizontal and vertical sewerage internal networks and the sewerage system are specified, specifying, where appropriate, the working pressure of the respective network.

Drain pipe pipes and springs can be of the type with straight or straight ends, and the joints are made with tightening collars and rubber seals.



Regardless of the type of drainage pipe used, elbows will be used for directional changes, usually 45 grams. and for tees and reductions made.

For some assembly operations, the PP / PEHD caps will be used.

ATTENTION!

It is very important to compensate for the drainage pipe dilatations caused by the variation of the working temperature, which can be done in different ways depending on the pipe material and the recommendations of the supplier, as follows:

- *by choosing through the project paths with steering changes;*
- *In the case of joints with rubber sockets and gaskets (PP, PVC, PEHD) a gap of about 5 mm between the bottom of the muff and the end of the tube will be left;*

When the project does not make these specifications, the following are recommended:

- On the vertical sewer columns, a level compensator will be provided at the domestic columns (bathrooms, sanitary groups, kitchens, offices, etc.) and a compensator at 2-3 levels (but not more than 10 m) on the pluvial columns ;
- Horizontal collectors, irrespective of the nature of the transported water, are provided with compensatory devices at the right of branches and at a distance, on straight paths, not more than 10 m;
- after each compensator a fixed support anchor should be provided;
- between two fixed anchors, support with sliding anchor is provided, the distance between them varying according to material, diameter, wall thickness and fluid temperature;
- at the base of the sewer columns it is mandatory to support the base of the column;
- Tubes with design cleaning parts, steering changes, hard-to-reach branches for cleaning from other places, two columns in two levels, stranded columns mandatory at the first and last level, as well as trails long rectilinear at the distances indicated in the table:
- clean the parts so that the removable cover of the piece is accessible;
- all sewer columns have been extended over the roofing level to ensure primary (direct) ventilation of the sewer system. Ventilation protection against weathering is done with factory ventilation caps;
- if the project also provided for the creation of secondary and auxiliary ventilation columns, the recommendations made by Norm I 9-95, Chapter 6;
- In the case of columns of domestic or pluvial waste water whose height exceeds 45 m, the instructions of Norms I 9-95 art. 6.66, 6.73, 6.85.
- at the directional changes and at the branches of the external sewerage networks there will be drains for control and cleaning. They can be PVC / PEHD - fabricated, or masonry or reinforced concrete, according to STAS 2448.

II.5 GAPS, INCRUSTATIONS, SEALS AND JOINTS

The passage of the pipes through the planes, walls and foundations will be done only through the protective gaps or tubes provided by the resistance design and mentioned in the specialty project.

The gaps and protection tubes will be provided in the structural elements of the molding stage, the contractor of the installation works having the obligation to check the correct positioning of the installation and to notify the designer of any inconsistency.

After the pipes that cross the inner voids of the building, they will be protected by fire-proofing and fire-proofing devices, executed according to IPCT no. 170 or purchased from licensed suppliers. The fire resistance will be the same as the fire resistance of the crossed construction element.

When passing through the walls to rooms and spaces with special destination or dangerous environments, the specific provisions and details will apply.

When drilling through the foundations, protective tubes that will have a diameter of min. 150 mm larger than the diameter of the pipe, to allow the slopes to be built and the spacers (wooden struts) to protect the waterproofing.

When passing through molded walls or through the concrete walls of water storage tanks, type A or Type B passage pieces will be provided as indicated in the design. These will be executed according to IPCT type no. 65/780.

WARNING!

It is not allowed to practice new gaps in the resistance structure executed except with the written approval of the resistance designer.

II.6 PROTECTION TUBES

All crossings of the pipes when crossing the walls or floors will be equipped with rigid metallic protections.

The lower diameter of the protection should be compatible with the outer diameter of the tube that traverses so as not to destroy the displacements driven by its expansion.

If free space between ducts and protectors risks producing a sound communication between two rooms, a filler with non-combustible elastic material will be provided.

The shields of the protection tubes will have to exceed 25 mm walls or floors.



In cases where the crossings of the walls are made from one side to the other of a expansion joint, the protective tube will be divided into two parts along the length and will have an inside diameter large enough to guarantee a free space within joint.

II.7 SUPPORT SYSTEMS

- Fixings on the walls of the thermal insulation facade will be made in the supporting wall with reinforcement in the thickness of the insulation, to avoid crushing it.

The supports used will be industrial, with the advantage of being studied both for fastening and for sounding.

They will need:

- be easily dismantled
- Leave a space for dilatation
- Be in sufficient number to avoid all arrows
- Show the possibility of horizontal and vertical adjustment.

Their structure will be studied according to the task and the efforts they are undergoing.

They will be mounted according to the distance below:

- tube Dn ½" - 3/4" - 2 ml
- tube Dn 1" - 1¼" - 1½" - 3 ml
- tube Dn 2" - 2½" - 3" - 4 ml

h) INSULATIONS

The used materials must:

- not get rot in time
- not damage the heat or humidity
- non-flammable (recreational certificates will be provided).

The thermal insulation of the hydraulic circuits and appliances will be performed after checking and testing the tightness.

- The insulation must not be interrupted by the supports.

The manufacturer will submit other proposed isolation models for approval.

The bracelets and all supporting devices will be galvanized.

The passage through walls and planes, if they are metallic, will be galvanized or will be protected against corrosion by the application of two layers of lead minium.

Pipeline insulation works will be started only if pressure tests have been performed beforehand.

Thermal insulation of pipes and appliances will only be applied after cleaning and protection of surfaces with corrosion coatings.

Thermal insulation applied to pipes will be interrupted at the closure and maneuvering points, support elements and flange joints, as well as through construction joints.

When performing the insulation work, the provisions of the "Technical Instructions for Execution of Thermal Insulations for Installation Elements" shall be observed - C.142.

The thickness of the insulating layer mounted on the pipes shall ensure an efficiency of at least 85%.

Materials used to insulate hot water pipes will be 9 mm thick polyethylene shells

Pipes, tanks, and generally all steel elements are pre-impregnated with a corrosion protection lacquer prior to their isolation.

II.9 DRAINAGE FOR FLOORS

Floor drains for accidental water collection or cleaning at the locations provided in the project are mounted, as follows:

- in bathrooms and toilets, PP, PVC, PEHD, ABS siphons and / or with side and stainless steel or bronze joints;
 - siphons made of enameled iron and stainless steel or bronze grill, in technical premises and according to the project;
- When installing collectors and siphons, the type and instructions of the suppliers must be observed

II.10 SANITARY OBJECTS

All sanitary items will be made of vitrified sanitary porcelain with finishing without imperfections, with dense, glossy, porosity-free, which prevents perfect hygiene.

The fittings that ensure the use of porcelain sanitary ware will be:

- single or double service valves;
- hot and cold water mixers;
- Drain valves and drainage siphons must be robust, easy to use, look-alike, finished, glossy chrome.

It is recommended that within the same room or sanitary group all sanitary items and fittings of use come from the same supplier whose references are to certify the quality of the products supplied.

Enamel cast iron sanitary ware will be continuously enamelled, with no imperfections and porosities that will lead to the appearance of rust in the material.

The kitchens will be fitted with stainless steel washers.



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It will be of good quality and will not exhibit mechanical deformations.

The supplier, range and color of sanitary objects are established by the beneficiary together with the contractor of the work.

Fixing sanitary objects on building elements is done either directly through screws or indirectly via consoles or other supporting devices.

At the exit of the walls of the water and drainage pipes, which serve sanitary ware for the covering of the voids, there are provided nickel or chrome metal rosettes.

The wall fittings of sanitary items as well as metal rosettes will be applied to the finished face of the wall.

In order to avoid deterioration of the sanitary objects during the execution of the finishing works for the buildings, the sanitary objects will be protected until the completion of the respective works.

II.11 MEASURES OF PROTECTION AGAINST NOISES

All measures in I-9-94, against the transmission of noise from sanitary installations and fire will be strictly observed, namely:

- Support bracelets for metal pipes with soundproofing (rubber or waist 0.3 - 0.8mm);
- Elastic connections between the distribution pipes and the hydro-mechanical aggregates;
- the sound insulation of the floating base of the hydro-mechanical aggregates by the rubber pads, by the fixed elements of the construction (floors, concrete sockets, etc.)

II.12 EQUIPMENT ASSEMBLY

Functional equipment and measuring, control and signaling devices will be purchased to meet the technical characteristics of the project.

When delivering the equipment, the integrity of the seals and the presence of the technical books, installation and operating instructions, certificates and warranty conditions, quality certificates issued by suppliers and technical approvals issued by MLPAT, etc., shall be verified.

Until installation of the equipment, they will be stored in specially designed areas, protected from weathering and mechanical blows

The installation of the functional equipment and of the measuring and control devices shall be done in strict compliance with the supplier's installation instructions, so that the product warranty is not lost. It is preferable that, when possible, the installation of the equipment is carried out by the qualified personnel of the supplying company.

Designer,
eng. Dan Cristian Dragut



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SPECIFICATIONS

Heating plants

CHAPTER I. OVERVIEW

Denomination of the objective : *Construction of Touristic Center for Cultural and Sport activities in Lupsa de Jos village, Brosteni commune*

Location: Lupsa de Jos, Brosteni commune, Mehedinți county

Beneficiary: Brosteni commune

Project phase: Technical projec

tl.1 OBJECT OF THE PRESENT DOCUMENT

The present project focuses on the interior heating installations and the connections related to this work.

The project was elaborated on the basis of the framework conditions of the theme, of the architectural plans and in accordance with the technical norms in force.

BRIEF DESCRIPTION OF DESIGNED WORKS

These technical specifications concern heating installations that include, in essence, the following:

Heaters with static bodies for the entire building studied.

Provision of domestic hot water

I.2. STANDARDS AND TECHNICAL PRESCRIPTIONS FOR EXECUTION AND FITTING

Heating installations must comply with the following rules and regulations:

-Normative for the design and execution of heating installations I 13/02.

-Normative on the operation of heating installations I 13/102.

-SR 1907/197 Heating devices. The need for calculation heat. Computational prescriptions.

-SR 1907/297 Heating devices. The need for calculation heat. Conventional internal computing temperatures

-STAS 6472 Thermotechnical design of building elements.

-STAS 6648/182 Calculation of heat from outside

-STAS 6648/282 External Climate Parameters.

-STAS 12025/2 Acoustics in building. Effects of vibrations on buildings or building parts, admissible limits.

-Normal engineering and construction design for fire protection P.11899.

-STAS 11357 Safety measures against fire. Classification of construction materials and elements in terms of fuel efficiency.

General Norms on Fire Prevention and Extinction 1977, 1994

-STAS 8974/1 Reliability, maintainability.

General Norms on Labor Protection MMPM 1996.

Law No. 10/1995 on Quality in Construction

Ord.9 / N / 03.15.93. MLPAT Regulation on the protection and hygiene of construction work.

Normative for quality check and acceptance of construction works and related installations C.5602.

HG 273/1994 - Regulations for the reception of works in constructions and related installations. Annex: Technical building book.

HG 925/1995 Regulation for verification and technical expertise of the quality of the projects, the execution of the works, and the constructions.

HG 392/1994 Regulation on technical approval for new products, processes and equipment in construction.

Catalog details of subassemblies for installations:

Volume I - heating

Volume DC - common details

Technical workshop task

Relative design calculations, heating calculations, flow calculations and plant sizing will be performed in accordance with the Romanian regulations in force.

The design of the heating installations will take into account the requirements of the site.

In the absence of local regulations, the IEC international rules will be respected.

I.3. BRANDS AND EQUIPMENTS

The brands of the manufacturer designated in this description are given for information purposes in Appendix 1.

At the same time, the quality, characteristics and appearance of the proposed equipment must correspond to the specifications in the presented material which represent the minimum admissible level.

I.4. COMPUTING BASES



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LOCATION OF SITE

Lupsa de Jos, Mehedinti county, Romania

CALORIC LOSS

Before performing the calculations, the beneficiary will submit a set of assumptions for approval.

Calorific loss calculations shall be made using the method set out in the Romanian standards, updated on the date of this call for tenders.

RULES AND DATA TO BE OBSERVED IN COMPUTING

Calculation of pipelines

Losses of linear loads do not exceed 25 mm CA / m and pipe speeds will be limited to 1.20 m / s. Excessive dynamic pressure will be absorbed by the adjustment controls.

Pumps

The pumps will never be selected for a maximum rotor diameter, maximum speed of 1450 rpm. Global efficiency at 85%.

1.5. PROGRAM TO BE REALISED

Basic data and treatment principle inside the premises:

-Internal temperature calculations and relative humidity:

Sanitary + 22 ° C

Halls: + 18 ° C

Offices: + 20 °C

Meeting rooms: + 18 °C

1.6. TESTS-RECEPTIONS

The tests will be performed after the determinant phase program.

Testing of the plant assembly will be recorded in the standardized result sheets established at the beginning of the site and sent to the beneficiary as the work progresses.

These documents will be compiled and validated by the contractor and / or the beneficiaries and will constitute the installation dossier.

Upon completion of the works, a file in 2 copies, which have been used for execution, validated by the beneficiary, will constitute the final dossier.

The reception of sanitary works is carried out in accordance with the provisions of the norms and regulations regarding the collection and reception of the construction works and the related installations, namely:

Law no.10 / 1995 on quality in construction;

Normative for quality check and acceptance of construction works and related installations, indicative C.56;

Technical Instructions for Testing Hydraulic and Pneumatic on Receptacles, I.25;

Regulations for the reception of construction works and related installations, no. 273/1994.

In view of the reception, it will be observed whether the execution of the works was done in accordance with the provisions of the project, the technical regulations regarding the execution of the works and the installation instructions of the equipment manufacturer.

Particular account shall be taken of the technical conditions regarding:

equipping with radiators and appropriate appliances;

use of the equipment provided in the project;

compliance with pipeline routes;

normal operation of the equipment in the thermal plant at the stipulated parameters;

fitting and proper operation of the radiators and related fittings;

the rigidity of fixing the building elements to the building elements;

ensuring free pipe expansion;

the location of the valve and control devices, their measurement and control and their accessibility;

applying measures to reduce noise and vibration;

the quality of insulation and dyeing;

the aesthetic appearance of the installations.

For hidden work, the quality of the materials used and the execution will be checked and samples taken before isolation and masking and verbal processes for hidden works will be completed.



CHAPTER II. TECHNICAL SPECIFICATIONS

II.1 CHOOSING MATERIALS

The proposed equipment will be in compliance with the Romanian regulations.

The imported material will have to have the type approval certificates of the Romanian authorities.

These will be presented to the beneficiary before installation.

The electrical material used will have a degree of protection against the risks posed by different locations and locations.

All materials will be guaranteed through a compliance record.

In the absence, materials will be proposed:

- a) Compliance with the technical characteristics mentioned in the contract specifications.
- b) Resistors (the proposed material will be defined by its lifetime, number of hours of operation, number of operations).
- c) Easy maintenance (accessibility, spare parts, etc.).
- d) Having a local representative who has the possibility to ensure:

- spare parts whose manufacture is maintained in time to allow maintenance,

- a troubleshooting and maintenance service, knowing the materials and being able to intervene quickly.

Heating system paths or chosen so as to ensure minimum pipe lengths, self-extinguishing dilatation possibilities and prefabrication.

Coordination of all installations in the technical spaces was considered so as to ensure unhindered access of maintenance and operation staff in case of breakdown and easy dismantling for repairs.

Pipes and connections to functional equipment (pumps, receptacles, etc.) have been chosen so as not to prevent the dismantling of the fittings and fittings.

The execution of the heating systems will be coordinated with the other installations.

This coordinate will be tracked throughout the execution, starting with the drawing.

When crossing the slabs or concrete walls, use the openings provided in the project or the passageways.

For this purpose, they will be followed by the constructor who has the obligation to do them with the completion of the respective structures.

Only equipment that corresponds technically and qualitatively to the provisions of the project, to the respective standards and to the technical approvals shall be used during the execution of the works.

Prior to putting into operation, all equipment will be subjected to visual inspection to determine whether they have suffered degradation to reduce their technical and qualitative state (deformations or blockages in appliances, thread condition, flanges, valve operation, etc.).

We will remedy any malfunctions and replace the equipment that can not be brought back to the proper condition.

Check whether the pressure vessels have been subjected to ISCIR control and that they have the stamp plate and the relevant technical book.

The measuring and control devices will certify the existence of the seal and the verification bulletin issued by the metrology bodies.

Storage of installation equipment is carried out in warehouses or storage spaces organized for this purpose under conditions that ensure their good conservation.

Equipment on which atmospheric conditions have practically no unfavorable influence during storage shall be stored outdoors on specially designed platforms for this purpose, in compliance with specific safety standards.

Materials that can be damaged by weathering or direct sunlight, such as plastic pipes, copper pipes, insulation materials are stored under sheds or in warehouses.

Fittings, ceramic sanitary ware, measuring devices, etc. it is kept in closed warehouses.

Handling of the material is done in accordance with the rules of the work safety technique so that it does not deteriorate.

Particular attention will be paid to brittle or easily deformable materials such as reinforcements, radiators, measuring devices, etc.

All appliances that have been provided with manufacturing protection seals will be mounted as they are, keeping the seal intact for reception.

II.2 PLUMBING

The following types of reinforcements are to be provided as necessary: passage, adjustment, retention, drainage, safety, ventilation, etc.

They will be mounted in the positions indicated by the project drawings.

The provided fittings will correspond to the work pressures required by the project: up to 10 bar pressures will preferably be used with spherical valve made of brass or steel (1/2" - 2 1/2") or, failing that, valve and seat valve valves, cast brass body with threaded plugs for assembling with steel or plastic material pipes.

Drain fittings will be installed at all points required by the project. The drain valves shall be straight with ball valve or with STAS 1602 spigot or ball valve with cast brass body and threaded plug for steel pipe connection at one end and Dutch port for portuguese port connection at the other end.

A chain screw cap is required to protect the porthole connection.



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Project size 1/2 ".

The fittings will be mounted taking into account the following conditions:

- easily accessible
- easily demountable

All reinforcements during execution will be mounted in the closed position.

The lever and counterweight safety valves shall be mounted so that the rod is vertical.

The fitting installed on the tubing with a diameter between 1/2 "and 2 1/2 " will be with an internal thread.

The internal threaded fitting will be equipped on each side with coupling couplings. The threads will be provided with teflon tape.

The valves' protection devices will only be removed when assembling.

Closing valves (with internal thread and standard crossing)

Type: quarterback, ball

Manufacture:

- body in molded brass
- chrome plated brass
- sealing gaskets and teflon seals
- wrought iron maneuver.

Usage limits:

- temperature from 30 ° C to 200 ° C
- pressure service for a temperature of 110 ° C 10 bar.

Retainer flap

For connecting the threaded holes:

in the molded brass

- cloak and guide
- Stainless steel finish
- Nitrile gasket

Usage limit:

- temperature: 110 ° C
- Pressure service: 10 bar

Safety valve

Type: arch

Manufacture:

Bronze body

Features of use

- compression control calculation function

Expansion vessels

For all heating installations there are provided systems for taking up the variations in the volume of water.

Expansion vessels will be of membrane type and gas pillow.

Characteristics

The expansion vessel is connected at the top of the expansion vessel.

The connection will never be less than ¾ ". The connection shall be made in such a way that there is no risk of depositing deposits between the vessel and the installation it serves.

The expansion vessel is equipped with taps with valves that allow pressure control and eventual gas completions.

Use only membrane expansion vessels.

The choice of the expansion vessel is made taking into account the total volume of water resulting from dilatation.

The loading pressure will be sufficient to fill the water with the plant.

Separation membranes will be resistant to maximum operating temperatures.

Accessory

Each expansion vessel will be provided with an automatic vent valve.

The safety valve must also be opened manually.

II.3 PIPES

According to their different applications, their quality and installation will be in accordance with Romanian standards.

No piping will have an inside diameter of less than 16 mm.



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The pipe joints are made by means of special brass sockets with slip resistant sleeve.

The slopes will be built in such a way as to allow for the total emptying and emptying of the installations, ie all the distribution pipes will have a 0.003 slope to the boiler.

Arrows and counterparts are not allowed.

All insulated pipelines or assemblies will be installed at a distance of 50 mm between them.

The minimum distance between water pipes, sewers and electrical cables is 200 mm for parallel tracks and 50 mm for intersections.

If these distances can not be respected, protective measures will be taken by providing protection tubes that will exceed 0.5 m on one side and another protected track section.

The conductors and cables will be placed under the heating pipes.

The high points will be provided with automatic air vents.

Low points will be provided with ¼ turn-off valves.

Dilatation of pipelines will be absorbed either by compensators installed on the road or through the configuration of the route itself.

The piping connections to the devices must be designed in such a way that the removable elements can be mounted without removing the controls, valves and accessories.

These connections will have to be studied so that the maneuver can be done by simply dismounting the sleeves installed between the flanges or between the couplings.

The pipes will be, after installation and before being filled with water, carefully ventilated with compressed air and washed. For this purpose, the installer will have to make samples of water circulating through the pipes before cleaning and clean the filters very well. For this, the performer will have to provide the necessary material to allow the return elements to be connected to the connection of the devices.

All pipes, after installation, will be carefully tested. The sample pressure will be 1.5 of the sum of the highest static and dynamic pressures - according to I13 / 94.

The direct connection of the radiator valves to the wall is achieved by means of special 16 mm - ½ "male thread bends - two pieces for each radiator.

II.4 GAPS, INCRUSTATIONS, SEALS AND JOINTS

The passage of the pipes through the planes, walls and foundations will be done only through the gaps or protection tubes provided by the resistance design and mentioned in the specialty project.

The gaps and protection tubes will be provided in the structural elements, the contractor of the installation works having the obligation to check their correct positioning and to signal any inconsistency to the designer.

After the pipes that cross the inner voids of the building, they will be protected by fire-proofing and fire-proofing devices, executed according to IPCT no. 170 or purchased from licensed suppliers. The fire resistance will be the same as the fire resistance of the crossed construction element.

When passing through the walls to rooms and spaces with special destination or dangerous environments, the specific provisions and details will apply.

II.5 PROTECTION PIPES

All crossings of the pipes when crossing the walls or floors will be equipped with rigid metallic protections.

The lower diameter of the protection should be compatible with the outer diameter of the tube that traverses so as not to destroy the displacements driven by its expansion.

If free space between ducts and protectors risks producing a sound communication between two rooms, a filler with non-combustible elastic material will be provided.

The shields of the protection tubes will have to exceed the walls or floors by 25 mm.

In cases where the crossings of the walls are made from one side to the other of a expansion joint, the protective tube will be divided into two parts, along the length, and will have an inside diameter large enough to guarantee a free space within the joint.

II.6 SUPPORTS

The supports used will be industrial, with the advantage of being studied both for fastening and for sounding.

They will need:

- be easy to dismantle
- to leave room for expansion
- be in sufficient number to avoid all arrows
- to display the possibility of horizontal and vertical adjustment.

Their structure will be studied according to the task and the efforts they are undergoing.

They will be mounted at the distances below:



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tube Dn 1/2" 3/4"	1 ml
tube Dn 1" 1 1/4" 1 1/2"	1,5 2 ml
tube Dn 2" – 2 1/2"	2 2,5 ml

II. 7 INSULATION

The used materials must:

1. not get rot in time
2. not damage the heat or humidity
3. non-flammable (recreational certificates will be provided).

The thermal insulation of the hydraulic circuits and appliances will be performed after checking and testing the tightness.

4. Insulation should not be interrupted by the support.

The bracelets and all supporting devices will be galvanized.

The passage through walls and planes, if they are metallic, will be galvanized or will be protected against corrosion by the application of two layers of lead minium.

Pipe insulation works will be started only if the pressure tests have been carried out in advance or performed.

Thermal insulation of pipes and appliances will only be applied after cleaning and protection of surfaces with corrosion coatings.

Thermal insulation applied to pipes will be interrupted at the closure and maneuvering points, support elements and flange joints, as well as through construction joints.

When performing the insulation work, the provisions of the "Technical Instructions for the Execution of Thermal Insulations for Installation Elements" shall be observed. C.142.

The thickness of the insulating layer mounted on the pipes should ensure an efficiency of at least 85%.

Materials used to insulate hot water pipes will be 9 cm thick cohesive polyethylene coils with the following features:

The λ coefficient will be $<0.04 \text{ W / m } ^\circ \text{C}$.

Vapor permeability ≤ 7000

Use area: 50°C to $+120^\circ \text{C}$.

II. 8 CIRCULATION PUMPS

The pumps will be simple to install directly on the pipes

- Automatic degassing in the rotor chamber
- Motor selected for a speed of 1450 rpm which can absorb the overload of any point on the characteristic curve of the pump
- Whether with a drowning rotor, self-lubricated bearings, direction of rotation and controllable filling through glass sight glasses
- Corp in cast iron
- Stainless Steel Arms
- Graphite casings
- The stainless steel pipe between iron and steel
- Ethylene propylene propylene glands

The equipment of each pump will be the following:

- A set of Dutch grippers
- two butterfly shutter with $\frac{1}{4}$ turn (one on suction, one on discharge)
- a counter-release flap, if necessary

All these valves will necessarily have the same nominal diameter with the pipes.

Pipes do not fit on pumps.

Service pressure = 5 bar

Hot water use temperature = $+2^\circ \text{C} / 140^\circ \text{C}$.

They can be of the single or double type, vertical for pipe fitting (in-line pumps).

II.9 RADIATORS

Radiators will be made of steel.

The radiators should operate at temperatures of 120°C and 6 bar pressures.

It has to have a long life and resistance in high time and a high thermal efficiency.

The fastening will be done with threaded consoles or weight lifters for radiators attached to the wall.

Each radiator will consist of:

- 1 stopper;
- 1 automatic vent valve;
- 2 radiator reductions $\frac{1}{2}$ "x1";
- 1 radiator reduction $\frac{3}{8}$ "x1"
- 4 gaskets.



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CHAPTER III. ANNEX DOCUMENTS

- **ANNEX 1**
- **BRANDS AND PRODUCERS**

BRANDS	PRODUCERS
Boiler	
Pumps	
Radiators	
Pipes and fittings	
insulation	
fittings	
Supports	

Designer,
Ing. Dan Cristian DRAGUT



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PROGRAM FOR CONTROL OF WORK ON SITE - ELECTRICAL INSTALLATIONS

In accordance with the provisions of Law no. 10/95, updated in C56 / 2002 and HG 273/94, the participants who are involved in the execution of the execution control plan so that the works executed comply with the norms in force are:

B = Beneficiary (the project supervisor appointed by him / her)

P = Performer (responsible work, quality controller, technical supervisor)

D = Designer (project manager, specialist designer)

The quality check of all works will be done according to the quality control plan, checks and tests that will be prepared by the Executor (Quality Controller) on the basis of the technical project and according to the provisions of the applicable technical regulations, the executor being responsible for convening the factors that must participate in checks according to the provisions of the technical regulations in force.

The presence of the designer is mandatory whenever objective conditions on the site require modification of the project solutions.

Receptions of works

The reception of the works will be carried out in strict compliance with the provisions of the legislation and the legislation in force.

The stages of reception of the works are:

- reception at work completion
- final acceptance after the expiry of the legal guarantee period

During the execution of the works, the provisions of the execution project, of the standards and norms in force, of the modern execution technologies for the materials not yet assimilated in the Romanian norms - with the precondition that they must have obtained the technical approval in advance - will be observed.

In accordance with the provisions of Law no. 10/1995 regarding the quality in construction, the Norms for the quality check and the acceptance of the construction works and the related installations - C56-2002 and the other specific technical regulations applicable to the works and the provisions of the "State control procedure in the execution stages determining the resistance and stability construction" approved by MLPAT Order no. 31 / N / 1995, the following phases of works subject to control are established.

No.	The name of the work to be verified, received or controlled and for which documents are drawn up	Document	Responsibility	Rhythmicity
1	Electrical elements	P.V.R.C	B+P	x
	Tubing, dosing			
2	Electrical elements	P.V.R.C.	B+P	x
	Cable, apparatus, lighting fixtures			
3	Electrical elements	P.V.R.C.	B+P	x
	Installation of electrical panels			
4	Electrical elements	P.V.R.C.	B+P+D	x
	Checking the grounding socket			

x - whenever necessary

o - once at the end of the work

Notations:

B - Beneficiary, D - Designer, P - Performer, I - Inspectorate in Construction

PVRC - Qualitative reception report

PVLA- Hidden Works Minutes

FD - Minutes of quality control of works in decisive phases

PVRTL - Reception minutes at work completion

Note: The Beneficiary and the Performer will take all measures to carry out their obligations under Law 10/1995 on Quality in Upgraded Construction. A copy of this program and the abovementioned documents as well as the draft will be annexed to the technical building book.

Drafted by,
eng. Dan Cristian Dragut

Acknowledged,

Beneficiary,
Brosteni Commune

Constructor



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PROGRAM OF CONTROL OF WORKS ON SITE - SANITARY INSTALLATIONS

In accordance with the provisions of Law no. 10/95 updated on July 6, 2015 with Law 177/2015, C56 / 2002 and HG 273/94, the participants who are involved in the implementation of the execution tracking control plan so that the works executed comply with the norms in force are :

B = Beneficiary (the project supervisor appointed by him / her)

P = Performer (responsible work, quality controller, technical supervisor)

D = Designer (project manager, specialist designer)

The quality check of all works will be done according to the quality control plan, checks and tests that will be prepared by the Executor (Quality Controller) on the basis of the technical project and according to the provisions of the applicable technical regulations, the executor being responsible for convening the factors that must participate in checks according to the provisions of the technical regulations in force.

According to the provisions of Law no. 10/1995 updated on 6 July 2015 by Law 177/2015, the executor has the obligation to summon the factors participating in the verifications at least 3 days before each phase.

The presence of the designer is mandatory whenever objective conditions on the site require modification of the project solutions.

Reception of works

The reception of the works will be carried out in strict compliance with the provisions of the legislation and the legislation in force.

The stages of reception of the works are:

- reception at work completion
- final acceptance after the expiry of the legal guarantee period

During the execution of the works, the provisions of the execution project, of the standards and norms in force, of the modern execution technologies for the materials not yet assimilated in the Romanian norms - with the precondition that they must have obtained the technical approval in advance - will be observed.

In accordance with the provisions of Law no. 10/1995 updated on July 6, 2015, with the Law 177/2015, regarding the quality in constructions, the Norm for the quality check and the reception of the construction works and the related installations - C56-02 and the other specific technical regulations applicable to the works and provisions of the " in the decisive execution stages for building strength and stability "approved by MLPAT Order no. 31 / N / 1995, the following phases of works subject to control are established:

No.	The name of the work to be verified, received or controlled and for which documents are drawn up	Document	Responsibility	Rhythmicity
1	Interior fittings Installation of internal sewerage pipes	P.V.R.C.	B+P	x
2	Interior fittings Installation of cold water pipes	P.V.R.C.	B+P	x
3	Interior fittings Pressure tightness pipeline traps for cold water	P.V.R.C.	B+P	x
4	Interior fittings Seal pipe sealing pipeline	P.V.R.C.	B+P	x

x - whenever necessary

o - once at the end of the work

Notations:

B - Beneficiary, D - Designer, P- Performer, I – Inspectorate in Construction

PVRC - Qualitative reception report

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PVRTL - Reception minutes at work completion

Note: The Beneficiary and the Performer will take all measures to carry out their obligations under Law 10/1995 on Quality in Upgraded Construction. A copy of this program and the abovementioned documents as well as the draft will be annexed to the technical building book.

Drafted by,
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PROGRAM OF CONTROL OF WORKS ON SITE - THERMAL INSTALLATIONS

In accordance with the provisions of Law no. 10/95, updated in C56 / 2002 and HG 273/94, the participants who are involved in the execution of the execution control plan so that the works executed comply with the norms in force are:

B = Beneficiary (the project supervisor appointed by him / her)

P = Performer (responsible work, quality controller, technical supervisor)

D = Designer (project manager, specialist designer)

The quality check of all works will be done according to the quality control plan, checks and tests that will be prepared by the Executor (Quality Controller) on the basis of the technical project and according to the provisions of the applicable technical regulations, the executor being responsible for convening the factors that must participate in checks according to the provisions of the technical regulations in force.

According to the provisions of Law no. 10/1995 Section 3 art. 23d, the performer has the obligation to summon the factors participating in the verifications at least 3 days before each phase.

The presence of the designer is mandatory whenever objective conditions on the site require modification of the project solutions.

Reception of works

The reception of the works will be carried out in strict compliance with the provisions of the legislation and the legislation in force.

The stages of reception of the works are:

- reception at work completion

- final acceptance after the expiry of the legal guarantee period

During the execution of the works, the provisions of the execution project, of the standards and norms in force, of the modern execution technologies for the materials not yet assimilated in the Romanian norms - with the precondition that they must have obtained the technical approval in advance - will be observed.

In accordance with the provisions of Law no. 10/1995 regarding the quality in construction, the Norms for the quality check and the acceptance of the construction works and the related installations - C56-2002 and the other specific technical regulations applicable to the works and the provisions of the "State control procedure in the execution stages determining the resistance and stability construction" approved by MLPAT Order no. 31 / N / 1995, the following phases of works subject to control are established:

No.	The name of the work to be verified, received or controlled and for which documents are drawn up	Document	Responsibility	Rhythmicity
1	Indoor thermal Piping installation	P.V.R.C.	B+P	x
2	Indoor thermal Installation of pipelines distribution	P.V.R.C.	B+P	x
3	Indoor thermal Mounting of heating bodies	P.V.R.C.	B+P+D	x
4	Indoor thermal Cold test	P.V.R.C.	B+P+D	x
5	Indoor thermal Warm test	P.V.R.C.	B+P	x

x - whenever necessary

o - once at the end of the work

Notations:

B - Beneficiary, D - Designer, P - Performer, I - Inspectorate in Construction

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PVLA- Hidden Works Minutes

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PVRTL - Reception minutes at work completion

Note: The Beneficiary and the Performer will take all measures to carry out their obligations under Law 10/1995 on Quality in Upgraded Construction. A copy of this program and the abovementioned documents as well as the draft will be annexed to the technical building book.

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PROGRAM OF CONTROL OF WORKS ON SITE - FIRE DETECTION AND FIRE ALARM SYSTEMS

In accordance with the provisions of Law no. 10/95, updated in C56 / 2002 and HG 273/94, the participants who are involved in the execution of the execution control plan so that the works executed comply with the norms in force are:

B = Beneficiary (the project supervisor appointed by him / her); P = Performer (responsible work, quality controller, technical supervisor); D = Designer (project manager, specialist designer)

The quality check of all works will be done according to the quality control plan, checks and tests that will be prepared by the Executor (Quality Controller) on the basis of the technical project and according to the provisions of the applicable technical regulations, the executor being responsible for convening the factors that must participate in checks according to the provisions of the technical regulations in force.

According to the provisions of Law no. 10/1995 Section 3 art. 23d, the performer has the obligation to summon the factors participating in the verifications at least 3 days before each phase.

The presence of the designer is mandatory whenever objective conditions on the site require modification of the project solutions.

Reception of works - The reception of the works will be carried out in strict compliance with the provisions of the normative and the legislation in force. The stages of reception of the works are:

- reception at work completion
- final acceptance after the expiry of the legal guarantee period

During the execution of the works, the provisions of the execution project, of the standards and norms in force, of the modern execution technologies for the materials not yet assimilated in the Romanian norms - with the precondition that they must have obtained the technical approval in advance - will be observed.

In accordance with the provisions of Law no. 10/1995 on the Quality in Construction, the Norms for the Quality Verification and the Reception of the Construction Works and Related Facilities - C56-02 and the other specific technical regulations applicable to the works and the provisions of the "State Control Procedure in Execution Stages for Resistance and Stability construction" approved by MLPAT Order no. 31 / N / 1995, the following phases of works subject to control are established:

No.	The name of the work to be verified, received or controlled and for which documents are drawn up	Document	Responsibility	Rhythm micity
1	Detection and fire signaling Identifying detection cables	P.V.R.C.	B+P+D	x
2	Detection and fire signaling Putting the plant into operation	P.V.R.C.	B+P	x
3	Installation of alarm equipment, weak currents	P.V.R.C.	B+P	x

x - whenever necessary

o - once at the end of the work

Notations:

B - Beneficiary, D - Designer, P - Performer, I - Inspectorate in Construction

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