**PROJECT TERMS OF REFERENCE**

The subject-matter of adaptation is the part of the facilty within Institute of Oncology and Radiology of Serbia (IORS) Pasterova St No. 14in Belgrade.

To comply with the Investor’s requirements, it is necessary to prepare

1) The Executive Design (PZI), in conformity with the previously prepared designs of measures of radiation safety and security for trial commissioning/use of MRI, scanner, roentgen and mammography equipment and all other devices requiring the preparation of the said Design in compliance with all of the previously performed exploratory works and tests,

2) Designs/drawings of as built facilities (PIO),

3) Everything else needed,

to meet the requirements of the relevant regulations of the Republic of Serbia.

The future selected bidder will have to engage institutions authorized for:

1) exploratory/investigative works (structure),

2) testing load bearing capacity, stability and safety of all reinforced-concrete (RC) components of the structure or structural components made of other materials (inter-floor structures, beams, posts, RC ring beams, RC walls, brick walls, foundations, RC slabs, RC ground surface slabs, ...) of the Institute for Oncology and Radiology of Serbia building (for the part of the building foreseen for adaptation and the parts of the building the loads and impacts from the part foreseen for adaptation and shall be transferred onto),

3) preparing the Design of measures of radiation safety and security for trial commissioning/use of MRI, scanner, roentgen and mammography equipment and all other devices requiring the preparation of the said Design,

4) testing equipment for radiography, mammography equipment, and all other devices (subject to mandatory testing), including the preparation of reports and assessment of the level of exposure, upon the completion of the works in accordance with the PZI which is in conformity with all Designs of measures of radiation safety and security for trial commissioning/use of MRI, scanners, roentgen and mammography equipment, ...

5) Everything else needed,

to meet the requirements of the relevant regulations of the Republic of Serbia.

Due to the need to expand the capacity and purchase new equipment, it is necessary to adapt the premises fully according to the dimensions of the new equipment, manufacturer’s technical and technological requirements and according to the regulations applicable for installation and use of the same as well as the adaptation of the premises of the existing equipment in accordance with the technical and technological requirements of the manufacturers of the existing equipment.

At several positions in the building (IORS) it is necessary to adapt basement and ground floor premises.

The building adaptation must comply with the purpose and technological requirements of each individual room. Arrangement and adapting of the individual rooms in which the equipment will be installed should be done according to the technical and technological requirements of the equipment manufacturer.

General Guidelines

Walls:

Preparation of walls, removing of plaster, cleaning of old paint layers, plastering, skimming and painting of all interior walls of the premises belonging to the Radiology Department, shown in the form of a sketch, treatment and repair of damage caused by damp. The use of advanced materials is suggested, with a high degree of reflection, damp repellant, preventing the formation of molds on the surface of the walls.

All walls that are part of the adaptation should be treated in such a way that after the finishing works, they have a uniform appearance. The finishing treatment of the walls must fit each particular use in line with technological requirements.

Walls In high-frequency rooms (e.g. waiting rooms, patient examination rooms, control rooms, etc., must be covered with PVC wall coverings like for e.g. Gerflor. Wall bumpers sould be done.

Doors: It is necessary to replace all interior doors according to the attached drawings.

The sliding automatic door must be equipped with sensors at the entrance and exit of the diagnostic part of the building. The door should have access control.

- All lead doors must be repaired or replaced

- Other doors in Radiology department should be replaced or repaired to maintain uniform appearance.

Floors:

The floor coverings must be in accordance with the purpose and technological requirements of each individual room. Floor coverings are to be foreseen in accordance with sanitary and hygienic regulations, occupational safety and health regulations and with appropriate skid resistance. A uniform appearance is to be ensured. Remove all flooring from the rooms being renovated, prepare the flooring for new flooring. Do waterproofing and thermal insulation horizontal and vertical, with high quality materials. Under the central corridor in the basement, repair and apply all the necessary layers so that the floor is prepared for the installation of special PVC floor covering for this purpose type Gerflor.

Ceilings:

The ceilings must be in accordance with the purpose and technological requirements of each

individual room. Adaptation involves replacing existing ceiling panels wherever possible and necessary. Adequate suspended ceilings should be provided throughout the building so as to ensure the unobstructed passage of infrastructure installations. Access to installations for servicing and maintenance is to be ensured. Ceilings along with floors and walls must provide the required level of protection against noise for hospitals. Accordingly, it is necessary to foresee:

* In communication corridors, longlife (min 30.000h) LED panels  suspended ceilings with panels dim. (600x600).
* In toilets and rooms with medical function, longlife (min 30.000h) LED panels mineral panels (600x600) with adequate level of moisture resistance and adequate bacteriological protection coating;

Necessary signaling devicesare to be set up.

In all places where additional static or dynamic structural loads occur due to new equipment, a detailed analysis of the loads and static calculations should be carried out and additional structural reinforcements should be provided if necessary.

Furnishing:

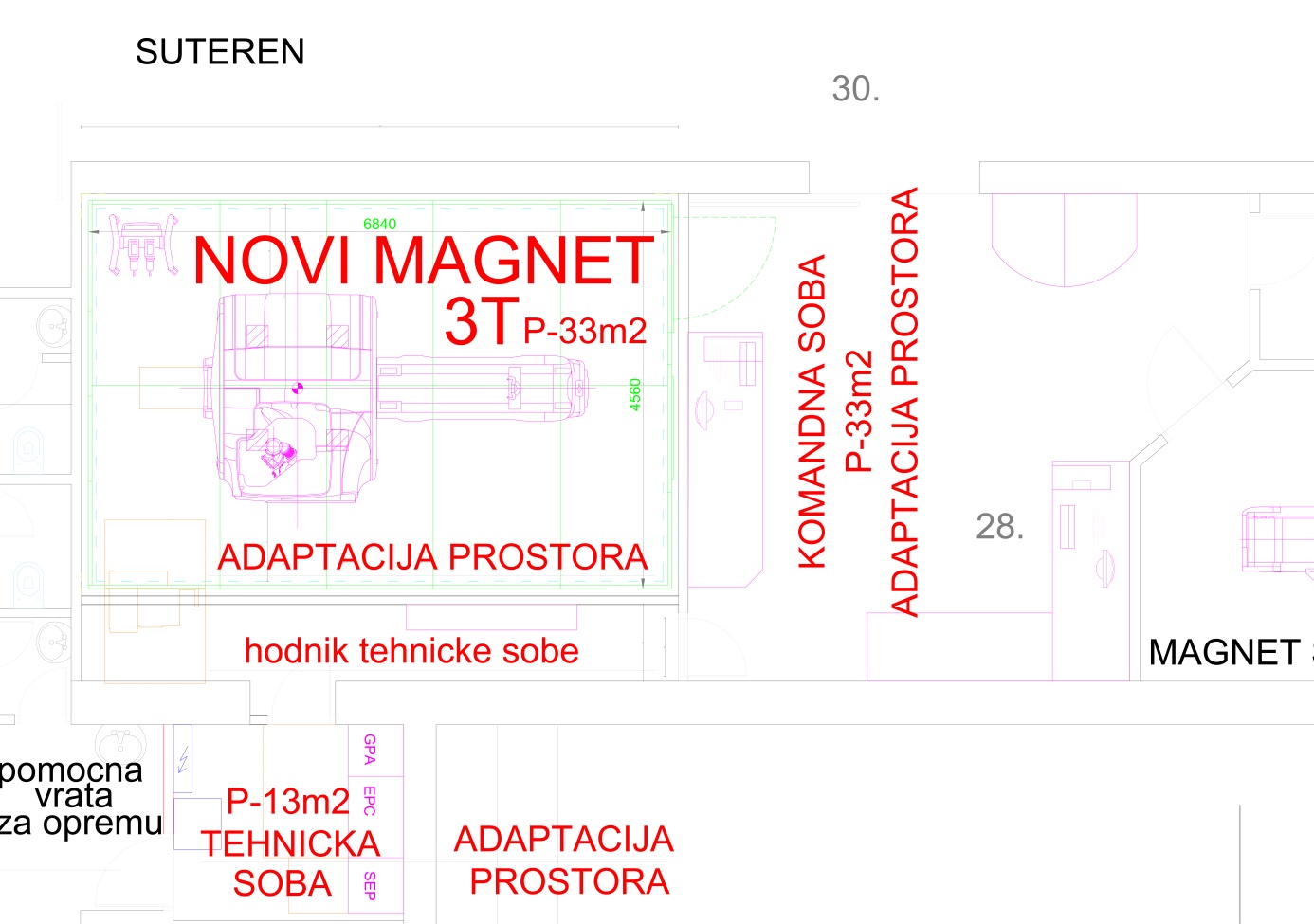
Each room subject to renovation should be fully furnished according to the user's request and the purpose of the space to provide complete functionality.

Basement

A new 3T MRI machine and equipment shall be placed in the basement. It is necessary to completely adapt the RF cabinet of the new magnet in accordance with the technical and technological requirements of the magnet manufacturer. A complete renovation of the existing space of the shared control room (for both mri systems) in the area of 33m2 is necessary and in accordance with the guidelines given for all types of work. It is necessary to adapt the space of 33m2, by tearing down the existing partition walls in order to install a new MRI and equipment. It is necessary to adjust the existing control room space of 33m2 in order to install new equipment. A new partition wall is planned to be erected in the space of the new MRI machine in order to allow access to a 13m2-technical room planned for the installation of the equipment. It is also necessary to adjust the entry part leading to the existing Siemens Avanto FIT MRI.

A metal detector must be installed at the entrance to the MR space.

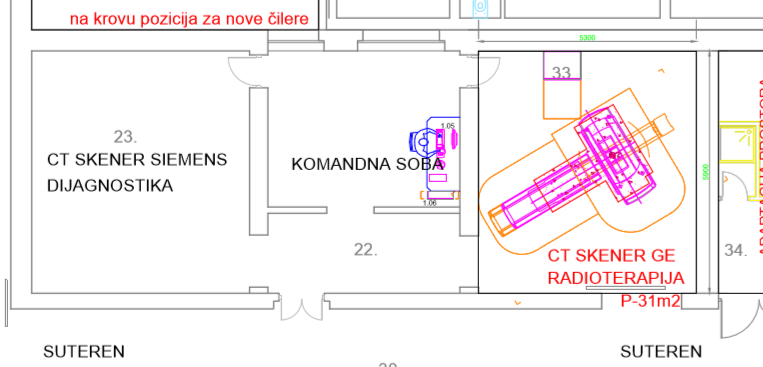
Fig. 1 Adaptation drawing



Adaptation of the existing radiologist-control room is planned, between two CT scanners.

As the existing GE scanner is to be replaced and a new one is to be installed, all the necessary work as outlined in the general guidelines should be done. The room housing the second scanner should be arranged in accordance with the works being done in the aforementioned two areas related to CT imaging to give a unified look to this functional unit (painting, PVC coverings, floor replacement, air conditioning new sockets, lighting, ceiling, sewage system, etc.)

Fig. 2 Adaptation drawing 2



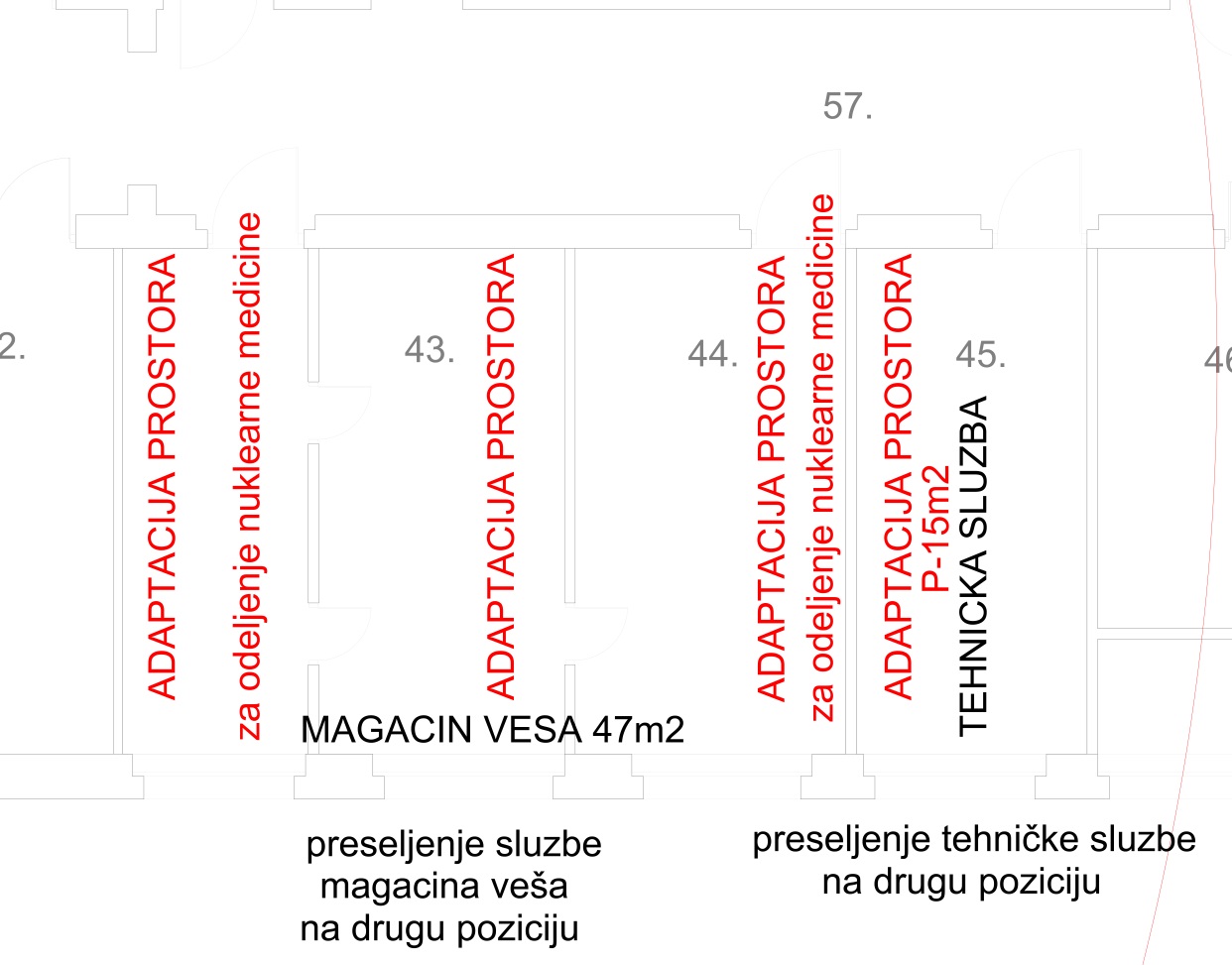
This project also foresees the adaptation of the existing technical service premises. The technical service will be relocated to a new location and the adaptation of this new space of 24m2 and a sanitary block of 5 m2 is also planned. Provide complete furniture and sanitary facilities in accordance with the requirements of the user and everything necessary for the full functionality of these premises, and in accordance with the general guidelines

Fig. 3 Adaptation drawing 

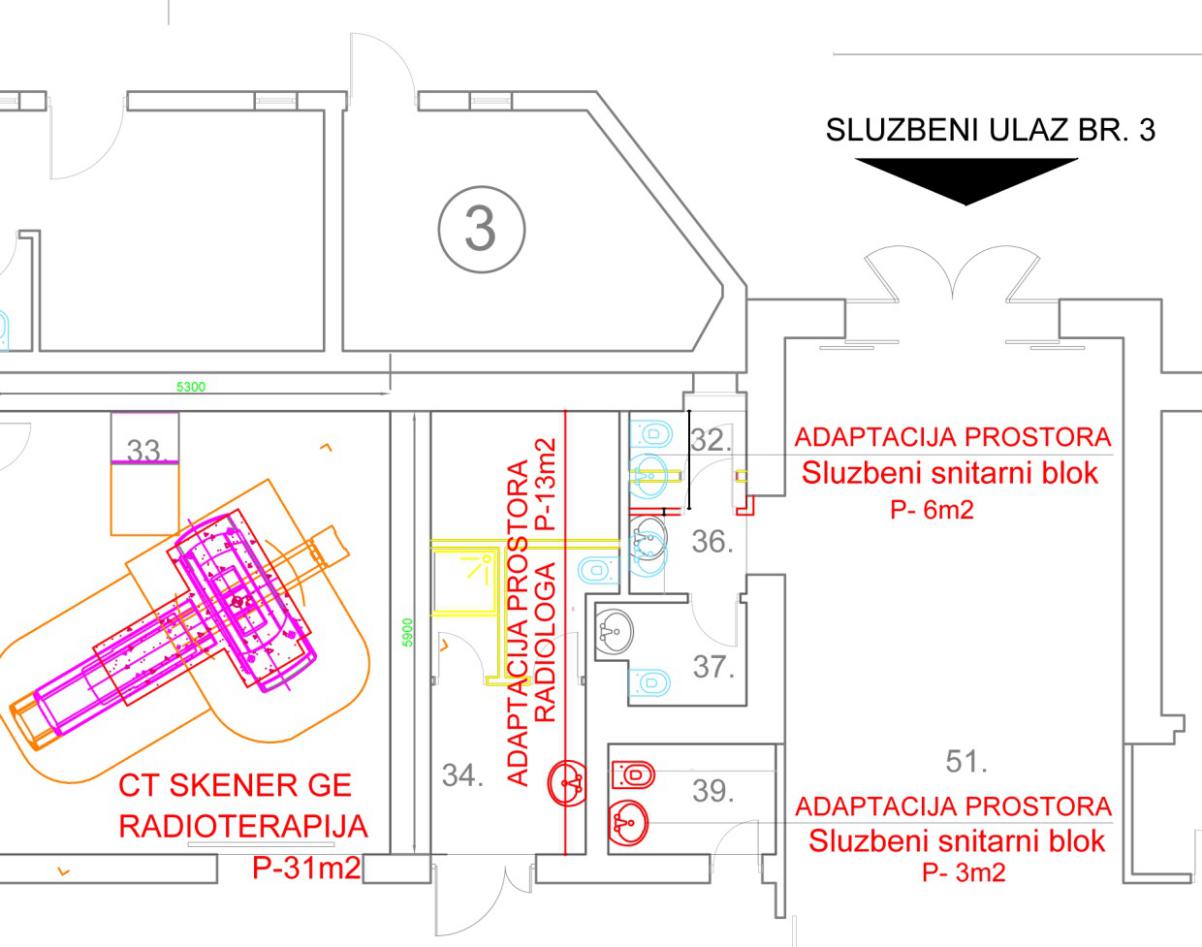
According to the plan, the staff will be relocated to make room for the formation of a space to house an MRI machine and related equipment. It is necessary to create a new staff roomin the existing 47m2 laundry storage area. The future three rooms are to be renovated by erecting new partition walls. The laundry storage is to be moved to another location.

It is necessary to completely adapt the space (ceiling, painting, floors, lighting, air conditioning with adequate air exchange with recuperation, electrical installations and plumbing, air conditioning, network installations, furniture, etc.) to allow the full functionality of the space.

Fig. 4 adaptation drawing



Near the official entrance no. 3, adaptation of two, 6m2 and 3m2 sanitary blocks for staff is foreseen to create a 13m2-room for Radiologist, complete adaptation.

Fig. 5 adaptation drawing

Rooftop area must be reinforced with a steel structure to provide for the safe placement of new chillers, and done in accordance with the technical and technological requirements of manufacturers of chillers and air conditioning equipment.

Fig. 6 adaptation drawing



**Ground level.**

On the ground floor, new devices and equipment for Department of Mammography and Biopsy is to be procured, so the existing space should be adapted to the dimensions of new machines and equipment and to their functionality.

Fig. 7 adaptation drawing

A close up of a map

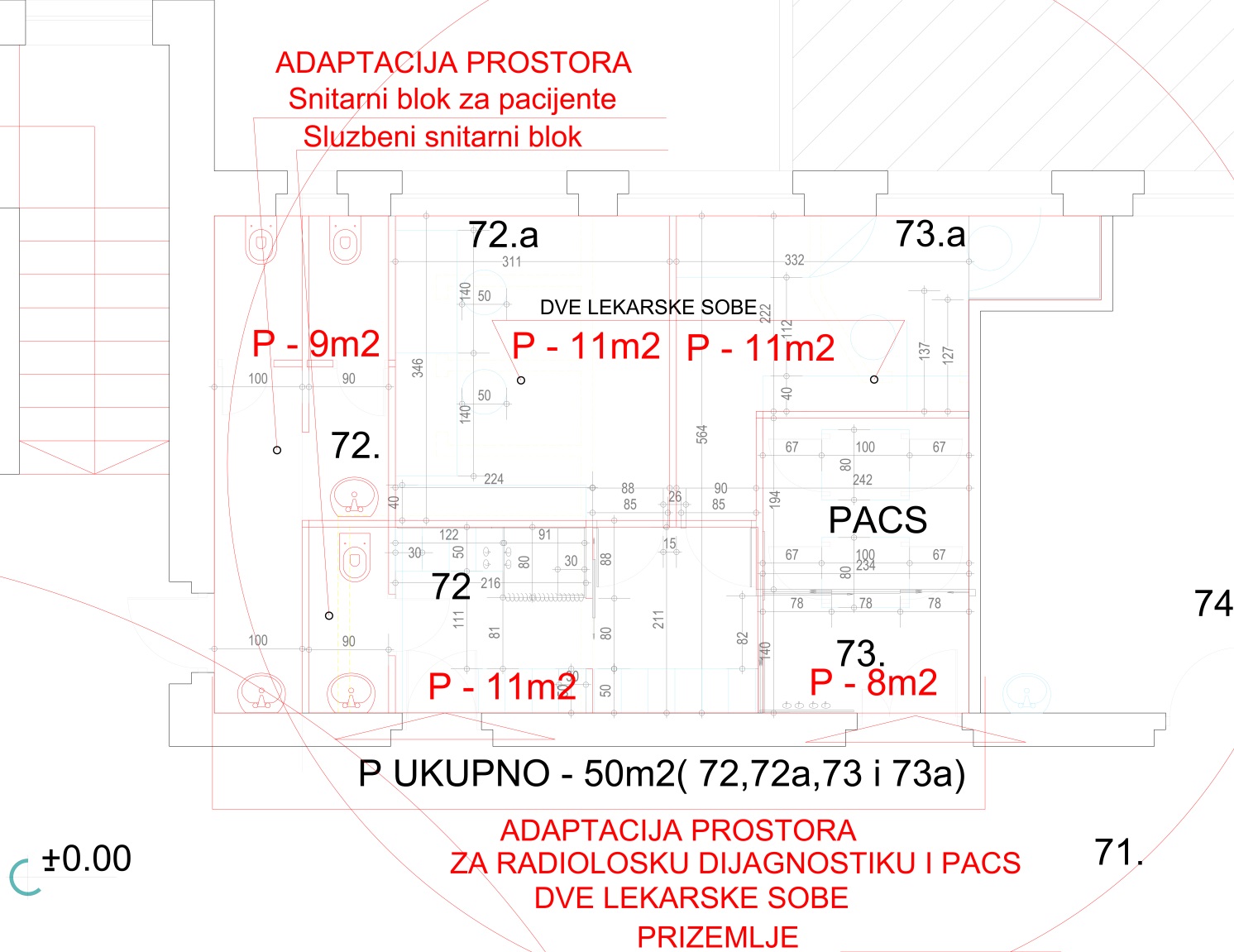
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Within the Department of Radiological Diagnostics and PACS, the adaptation of the rooms and the formation of two medical rooms is foreseen by way of erecting new partition walls. The floor area of two doctor’s rooms is 11m2 each.

At the same location it is necessary to provide a room that will be adapted into an adequate server room of 8m2. The space adaptation implies the installation of new partition walls with lighting fittings (described in more detail in the DC section) with all accompanying systems, which would accommodate the complete equipment currently located in multiple rooms.

The existing sanitary block is to be reorganized by demolishing parts of the partition walls in order to form patient toilets with the floor area of 9m2 and a locker room with a staff only toilet of 11m2.

Fig. 8 adaptation drawing



Due to the complexity of the task in terms of procurement of new devices and equipment, constructional and installation adaptation of the building, it is necessary that all participants of all professions in this project cooperate with each other, starting with users, designers, consultants and suppliers of equipment.

Adaptation and sizing of the main and ancillary premises should be planned according to the established capacities and needs and in accordance with the needs of the users.

For new machines and equipment to function seamlessly, it is necessary to provide a new power connection to the grid. The subject matter of this procurement are primarily items for the accommodation and functional use of which the said adaptation is foreseen. The equipment specification is given in a separate file.

The design is to be prepared based on the terms of reference and in situ surveys. It is also necessary to abide by the applicable Laws and by-laws governing this type of buildings and their designated use.

**Telecommunications and DC equipment**

At the location of the Institute of Oncology of Serbia there are several rooms housing Data Center equipment. The equipment is made by many different manufacturers and of different ages, and part of it is not adequate for use in larger systems, with demanding applications and large numbers of users, because it is partially “entry level” equipment, and because of the way the equipment is integrated into the system. Also, the premises where the equipment is stationed are not fully adequate for the said equipment, which also applies to the accompanying systems, especially to the redundant power supply systems.Because of all the above, the system is not fully adequate to support the devices used at the location, and for the number of users who use it, and given all the above, the efficiency, redundancy and maintenance of the system would prove to be quite challenging.

For the reasons stated above, it is necessary to provide a room which will be converted into an adequate server room with all accompanying systems and to accommodate the complete equipment currently located in several rooms. The server room needs to have an adequate access control system, video surveillance, redundant air conditioning system, fire protection system, power supply with two separate branches (if possible, given the age of the facility and local power infrastructure) as well as redundant backup power systems (parallel UPS systems).

Once the above is completed, consolidation of the Data Center of equipment at the location is required, whereby all the equipment would be transferred to the said server room and, if necessary, some of the equipment would remain at the old locations. Part of the device, (devices that are no longer supported because they are outdated), such as entry level equipment, could be discarded, and data and applications from the devices could be migrated to the rest of the equipment. The existing, retained equipment needs to be enhanced by adding hardware resources (discs, RAM) to form a cluster.This would simplify the control, monitoring and management of system resources, and would also provide greater redundancy and continuity of work in the event of failure of any of the devices.

System consolidation is a temporary solution that can be optimized instantly to maximize efficiency and availability. In order to increase the performance of the system and in accordance with the requirements of the user (especially considering the complexity of applications and the rest of devices used at the location), it is necessary to upgrade the system with new devices.

A prerequisite for upgrading and consolidating the system is the consolidation as well as upgrading of the passive equipment at the location, since it is inadequate for use in modern Data Center systems because of its age and characteristics, as it cannot provide the required performances (in terms of supported data transfer rate, electromagnetic interference protection, etc.).The aforementioned passive equipment is also a prerequisite for the consolidation and upgrading of network equipment (network equipment), which also needs to be upgraded to allow for greater efficiency, control, availability and performance utilization that consolidated and upgraded Data Center equipment can provide.

System upgrades include the acquisition of new Data Center equipment, the characteristics of which would meet user requirements. The said equipment would be integrated into the cluster to gain on system redundancy, availability and resilience (in terms of resource allocation). Accordingly, it is necessary to acquire appropriate virtualization software, which would enable cluster formation, and, in addition, it would be desirable to purchase data backup software as well as software for monitoring the system (both the Data Center and the network part).Improving the system in this way would ensure system reliability as well as continuity of work in case of any problems with a part of the system, increase the efficiency and performance of the system, facilitate control, monitoring and management of the system and create a good basis for easy scalability and further system upgrades.

Hydro-technical installations

During the work on the building, it is necessary to envisage the adaptation of the toilets and the replacement of the elements of the sanitary equipment, the installation of a new or the replacement of the existing pipe line.

All existing toilets need to be replaced with new ones that would make it easier to maintain the hygiene within the building. This primarily relates to the installation of flush tanks and console toilet bowls with a built-in sensor. All faucets should be attested for a long-term use with a sensor. It is also necessary to install hand dryers with a “H13 hepa” filter with NSF approval.

Floor and wall coverings are to be replaced. High quality ceramic claddings are to be used, intended for hospitals and high frequency areas with high hygiene requirements.

Mechanical, HVAC installations

It is necessary to replace existing radiators with new, aluminium ones. It is necessary to provide new ventilation and air conditioning of the premises along with the replacement of existing climatization system (air conditioners, recuperators, air ducts. ). Adequate air exchange is to be ensured, depending on the purpose of the premises.

Electrical power installations

It is necessary to provide for uninterrupted power supply to all devices necessary for the operation and functioning of the system after the adaptation of the building. It is the obligation of the contracting authority to provide capacity at the power transformer station for the connection of new equipment, and the obligation of the contractor is to provide all necessary equipment and installations for the connection to the same.

Power line routes are to be defined, taking into account the fire load of the facility and the existence of other installations to avoid interference.

New distribution cabinets are to be provided for the supply of all consumers that are the subject-matter of procurement in load centers. Distribution cabinets for all functional units are to be envisaged.

All cables in the facility must be halogen-free. The distribution of power cables along the corridors should be done by way of shelving in the suspended ceilings. Where fewer cables are to be laid, they should be fixed with canals

HV cable and its distribution is the responsibility of the supplier.

In case of increase in the engaged electric power of the building, it is necessary to provide stable power supply with a new installation. Approval of the competent power distribution company should be obtained during the preparation of the project design documentation.

The following installations need to be executed:

1. Installation of connectors, lighting and technological consumers

2. Grounding installation

The method of the execution of electrical installations for sockets and fixed plugs should be determined depending on: the intended purpose and interior arrangement of the rooms, the technological process of work, etc. The number of sockets is to be adjusted to the size and purpose of the observed space. The number and location of installations should be determined according to the requirements of the equipment and other conditioned installations. In IT rooms and wherever else necessary, adequate number of wall sockets is to be provided to power computers in the form of modular sockets or parapet distribution lines.

All lighting fittings are to be replaced with longlife (min 30.000h) LED panels supplied by reputable manufacturers. Number and type of luminaires is to be determined based on the purpose of the room, the level of lighting requirements, respecting all regulations and standards in this field. Luminaires are to be provided for general illumination, illumination in diagnostic and operating rooms and anti-panic safety lighting.