v. 2, n. 2, 2022

Scientific Journal of Applied Social and Clinical Science

PARTICIPATION IN AN EDUCATIONAL ARCHITECTURE DESIGN

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Abstract: The present study examines some theoretical and methodological issues of the so-called participatory processes in architecture projects, as well as their institutionalization in situations of public buildings, having as reference a specific case, the Global Requalification Plan of the Institute of Biological Sciences of UFMG, among 2010 and 2015. ICB harbor 10 academic departments in 17 blocks, with four floors each, totaling approximately 46,000 m². The set was designed and built between 1969 and 1973 and since then it has been adapted, according to the needs of the users and the progress of the research they develop. Such an environmental requalification plan was based on a dialogical practice, with wide participation of users in identifying demands, developing project proposals and choosing the most appropriate architectural solutions. Throughout this study, we seek to recognize and describe the roles of actors in the process, human and non-human factors, as proposed by the ANT - actor network theory. For this study, specialized bibliographies, consultations on technical documents and descriptions of the work process experienced by the authors were used.
Keywords: participatory architecture. public architecture. institutionalization of participation.

INTRODUCTION

The process of project design can be explained as an interconnected set of decisions aimed at the carrying out of a given object. For Oxman (2008), this process develops in three stages, which feed on each other: (1) reception (characterization of the problem by verbal and graphic means); (2) reflection (design interpretation by graphic means) and (3) reaction (transformation of interpretation). Adhering to this systematization, it is worth adding that the decisions made in each of these stages occur through visual and reflective reasoning, as characterized by Shön (1983). This type of reasoning - inherent in the design process - ends up strengthening the idea of individual authorship, creating difficulties for collective creation and, consequently, for participatory design processes.

The issues of authorship and participation do not arise in the architect / client relationship. In this case, whoever orders the service (customer) characterizes the product he wants and whoever provides the service (architect) creates the product / solution. This architect / client relationship in general occurs in projects for the private sector, where there are always those who hire, who decide, who evaluate and who accept or reject the product. The architect defends his Architecture and the client defends his interests. The interest of the contractor always prevails, as he is the one who pays the architect. There is, so to speak, client participation, inherent to private transactions, which is imposed on the architect's designs.

When it comes to public building projects for collective use (as in the case of public university buildings), this issue takes on more complex shapes, as the architect / client relationship becomes the architect / user relationship. In this context, the architect cannot defend "his Architecture", but the collective Architecture (of the public). The user, in turn, cannot subordinate the architect to his designs, because he is not the one who pays the bill and neither is he the owner of the business. In this context, there seems to be no other ethical form of work other than collaboration between architect and user: the participation of the parties in the solution of the project. The PPR - Global Plan for Participatory Requalification of the ICB - Institute of Biological Sciences at UFMG that we will present in this study, was developed within this perspective.

Recent critical tradition has established

the idea that architectures are only carried out when people inhabit built environments. Possibly this understanding originates from Heidegger's (1954) writings on building and inhabiting. He argues that "We don't live because we build. Instead. We build and come to build as we live, that is, as we are like those who live ". Those who "inhabit", therefore, carry out the construction, which makes their participation in the execution of the projects for this construction imperative.

In authoring processes, the architect is central in defining the configuration of the building and its environments, because he has technical knowledge and uses that knowledge to determine the construction / dwelling of third parties. But that prerogative is delegated to you by those third parties, the owners. In the case of public undertakings, there is no such delegation, therefore, the architect is impelled to leave the centrality he occupies in author projects, becoming a facilitator of the project decision-making process, without leading in decisions.

However, in this situation a contradiction is established, since the project is, by nature, a concentration of positive decisions, the project is that and not something else. If the users' decisions are not unanimous (and almost never are), it can be argued that there would be unmet opinions, that is, an undemocratic process. How to solve this problem? A promising path is active and conscious participation, in institutional molds (a republican rather than democratic structure), in which a collective - usually the users themselves - is invited to present their questions and demands, discuss problems, debate with peers obstacles and facilitations and, finally, choose the most coherent option.

Public architecture, taken in a broad sense, is defined by buildings and other spaces belonging to society as a whole, controlled by the State and its entities. The concept of "republican architecture", by Brandão (2003), implies the transcendence of architectural making as a simple result of a process and a commitment to ethics, understood as submission to the interests of society.

> The concept of an architecture of the res publica serves both to promote art thought beyond aesthetics and to research new meanings for the term "republic" capable of being useful for the understanding of our current world. As a minimum assumption, "republican architecture" must refer to two dimensions: that of ethics and that of freedom. (BRANDÃO, 2003)

The present study starts from a theoretical-methodological description that characterizes the participatory processes in Architecture. Then, the socio-spatial structure of the ICB is presented, in order to understand how the specific assembly of the PRP-ICB was institutionalized. From this, the project process undertaken is described. The time frame extends from 2010, the beginning of the Plan, until 2015 with the implementation of the Station Laboratories.

ARCHITECTURE WITH PEOPLE AND ATTENUATED IN TIME

The modernism of the beginning of the 20th century, led by Le Corbusier (1987-1965), aligned the design solutions to the industrial logic of serial and large-scale production. This caused a standardization of environmental solutions, resulting in the concept of "average" or "universal" user. International Style, for example, is the architecture that is supposed to serve anyone, anywhere at any time. In the second half of the 20th century, groups of architects presented harsh criticisms of this practice. (MONTANER, 2014)

One of these critics was the Italian Giancarlo De Carlo (1919-2005), linked to Team 10, a dissident of CIAM, who was active in Italian anti-fascist groups and called his methodology dialectical architecture. His political vision

regulated his architectural practice, which sought in participation to remove any trace of authoritarianism over users. De Carlo was a professor at the University of Venice and the Polytechnic of Milan, where he developed and taught participatory methodologies. He argued that architecture should not be made "for" people, but "with" people. In practice, he applied these methods to almost all of his works. One of them, considered almost ideal, from the point of view of participation, is the Collegio Del Colle (1962-1983), from the University of Urbino, Italy. (ROCHA, 2018)

Participation, as proposed by De Carlo, can work when, at the design moment, there are conditions (material and time) and when users are available. However, this is not always possible. In this case, "open architecture" can be an alternative for participation over time, as advocated by N. John Habraken. He starts from the criticism of post-war European residential neighborhoods that he found cold, repetitive and designed without users. It so happens that, in order to resolve "massive housing", in a short time, it ruled out the possibility of an opinionated project that implies extended deadlines. His option was to invert the logic of the "moment of participation", proposing that it occur a posteriori: an architect would offer the "support" that would later be complemented by people in their own way. This proposal became known as Support Theory (1961), where the permanent elements (supporting structures, installations, stairs, etc.) are clearly differentiated from the flexible ones (partitions, furniture, finishes, etc.).

In Brazil, Professor Avritzer (2008) demonstrates that until the early 1990s the country did not have a solid participation of the popular strata in plans and projects, as there were no formal institutions for this purpose. Until then, possible participation took place informally in structures such as parties or assemblies. In opposition to non-participation, he proposes active and institutionalized participation, that is, "differentiated forms of incorporating citizens and civil society associations in policy deliberations". (AVRITZER, 2008). For him, the question that arises in Brazil is a political one.

A NETWORK IN THE PUBLIC ARCHITECTURE PROJECT: WHAT ARE THE AGENTS?

Adhering to the understanding that projection is a constant decision-making process and that participatory processes tend to dilute such decisions, it is necessary to move forward in the analysis so as not to incur the error of romanticizing the description as a simple game of individual voluntarism. The reality of a public project is far from that.

It is necessary to recognize the different actors (LATOUR, 2012), human and non-human agents, who tension the whole process in all directions (even with forces in opposite directions, which makes it difficult, delays or even makes some solutions unfeasible) making the process very complex. Much of the ethical commitment of republican architecture is based on the understanding of the conduct of this complexity to obtain a work that obeys the public interest and not groups.

Below, we briefly identify typical actors in public architecture projects:

- Managerials: agents who, being in positions or in institutional positions, are responsible for implementing actions defined in the projects. They are the directors, managers, bosses etc.
- Politicians: agents capable of ideologically influencing other people; this usually happens through the hegemonization of concepts or the polarization of opinions (technical or not). They are intellectuals, politicians, deans, former managers, technicians, etc.
- Technicians: those legally qualified, who have specialized knowledge and who would be the guarantors of functionality, aesthetics and design operability. They are architects and engineers.
- Users: those who are responsible for the final use and occupation of the environments. Such agents are sometimes confused with non-human agents (such as animals and equipment, for example); in these cases, people become spokespersons for the needs of these

entities.

- Non-human agents: those who are independent of people's immediate will, such as: standards, process methodologies, limits and physical conditions, available human competences, installed capacities of all kinds, technological availability, deadlines, finances, etc.

ICB CHARACTERIZATION

The complex was conceived and built between 1969 and 1973 with structuralist and open architecture premises. It currently has 17 blocks of four floors each, totaling approximately 46,000m². It is located in the center of the Pampulha Campus of UFMG (figure 1).

The Institute is dedicated to teaching, research and university extension, with international recognition and leads the number of patents and publications at UFMG. As a result, its community demands highly specialized environments in order to ensure the scientific rigor of the experiments (this is a fundamental fact for its architectural projects).

The ICB is organized into ten departments (Biochemistry and Immunology; Botany; Physiology and Biophysics; Genetics, Ecology and Evolution; Microbiology; Morphology; Parasitology; General Pathology; Zoology), its general board and its complementary bodies (Center for Acquisition and Processing of Images, Bioterismo Center and Taxonomic Collections Center). It is common for groups and departments to establish interdisciplinary work relationships, which is facilitated by spatial proximity, since they are all in the same building. Populationally, the ICB is composed of professors, researchers, students and employees, totaling approximately 6,500 people.

Each department has a department head and departmental board for collegiate decision making. The administrative and academic management of the ICB is the responsibility of the Congregation, the highest deliberative body, which is chaired by the Director of the unit. Departmental heads and directors are periodically elected by the community. The Congregation is formed by the director of the unit (president of the congregation), deputy director, departmental heads, coordinators of undergraduate and graduate courses, directors of complementary bodies; representatives of teachers, administrative technical servants and students.

The physical/spatial configuration of the ICB (figure 2) obeys a continuous structural mesh (figure 3) with joists arranged on 124x124cm modular axes; in each block there are only three pillar sequences, the vertical circulations (stairs and elevators) are externally coupled to the slabs and the supporting structures (beams, pillars and slabs) are totally independent of the fences. The countless possibilities for access to building installations (water, energy and sewage) are strategically designed to facilitate eventual renovations. The result of this architectural configuration is the high capacity for flexibility and environmental mutability.

Between 1970-2010 the ICB was gradually transformed. The comparison of the original plans with the surveys carried out for the diagnosis of the PPR-ICB, combined with the testimonies of the oldest professors and technicians, reveal that many spaces have been reconfigured or expanded due to the implantation of new study centers, new research equipment, new dynamics of work and the deactivation of old installations. An evident example of the transformation is the pilotis, which before was an area almost totally free for the flow of people, which connected several regions of the Campus, it was being occupied with closed environments, such as offices and laboratories. Almost all the layouts of the laboratories on the upper floors are also different from the original plans.

However, the character of these changes - punctual and without an organic orientation -

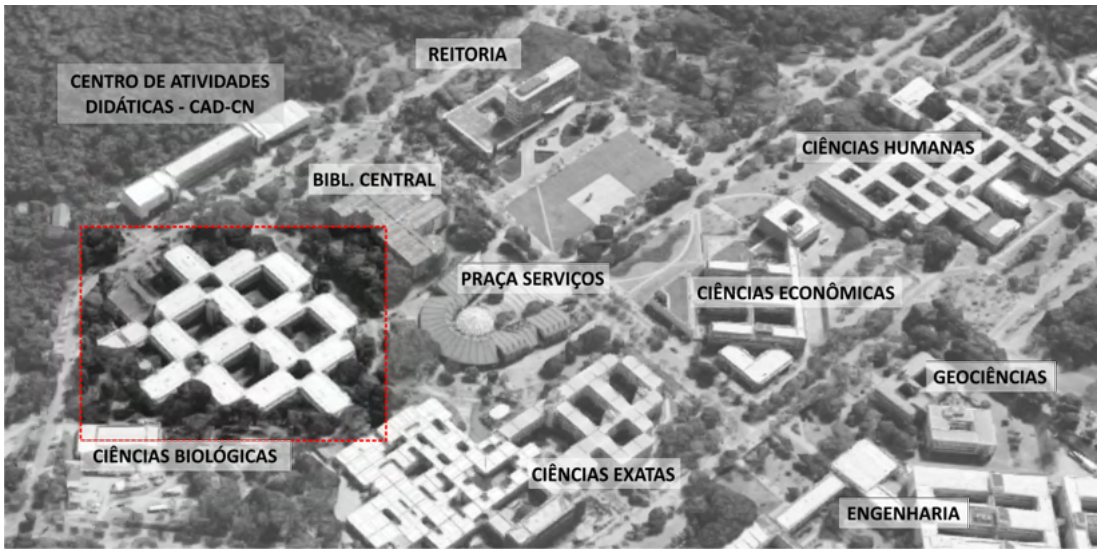

Figure 1. Central area of the Pampulha Campus. Source: Google Earth, 2020 (edited by the authors).

Figure 2. Picture of the construction of the ICB. Source CIT/UFMG, 2019.

Figure 3. Second floor of the ICB, blocks: A-Q. Source CIT/UFMG, 2019.

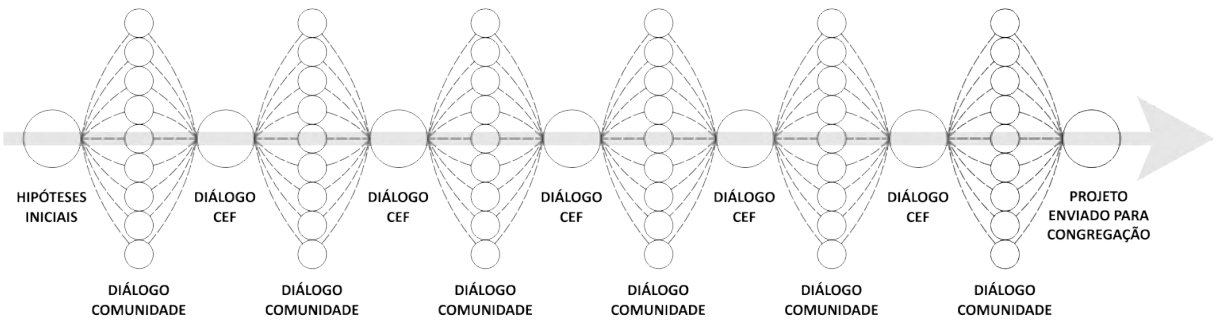

Figure 4. Diagram of the PSC with the stages of spreading and synthesis of the dialogues. Source: authors, 2020.

created disjointed zones in the ICB and a drop in the overall environmental quality. In this sense, it is noteworthy that, unlike a housing complex in open architecture (as proposed by Habraken), in which the residential units are totally independent in terms of use, a research institute such as the ICB has a specific organism that needs to be taken into account. However, research funding in Brazil is, in general, earmarked for research groups or individual researchers, which encourages punctual physical / spatial reforms, without taking into account the physical / spatial articulation of the whole.

In view of this situation, the socio-spatial complexity of the ICB is evident, which needed to be considered in the participatory design process. In order to deal with this web of relationships, it was necessary to establish a specific forum, which was called the Physical Space Commission.

ICB PARTICIPATORY REQUALIFICATION PLAN

The beginning of the PRP-ICB accompanied the institutionalization of the PSC - Physical Space Commission, a specific assembly to discuss and forward opinions to the Congregation on matters relating to architectural plans and projects. This assembly was made up of representatives of all the ICB groups, so that all the matters dealt there would reverberate throughout the community. Also, at PSC, all groups had the same voting power.

It was established that PSC meetings would be weekly, and between one meeting and another, members would take the issues discussed into a dialogue with the local community, spreading the discussion. The following week, with a new meeting, the impressions and specific needs of the communities were presented by the spokespersons and discussed together. Therefore, expansion work (community dialogues) and synthesis work (PSC dialogue) took place, as shown in Figure 4.

The hypothetical-deductive method recommended by Karl Popper (1902-1994) was, to some extent, a reference for conducting the plan. We started from the characterization of a design problem, based on diagnosed data and the demands presented by the community, we built one or more hypotheses that could solve the characterized problem, we submitted the hypotheses to countless confrontations and criticisms (among the technicians and within the PSC) in order to identify possible flaws, and, at the end of the process, only the proposals that resisted and proved to be fully adequate, continued as valid and were incorporated into the executive project.

Faced with a characterized problem, when designing the design hypotheses, the team of architects never asked the "how to do" as the first question. Instead, the question "why do it" was asked. The adoption of this attitude proved to be very beneficial for the ICB project process, as there was greater reflection and broadening of the dialogue between the various agents.

When a user detects a problem, it is common for the user to immediately start a process of conjecturing solutions, so that "problems and project solutions tend to arise together". (LAWSON, 2011, p. 233) This was confirmed numerous times in the ICB process, users presented demands such as: "I need to expand the supply storage area" and for that "I imagined breaking this wall and building a new room on this external garden ". In this example, the plaintiff does not notice that the consequence would be the inadequate removal of the permeability area required for rainwater infiltration. If the architects, facing with the demand, asked the question "how to make the expansion feasible?", They would provide the demolition, construction and concreting projects for new pillars and slabs. To solve the permeability problem, a retention box could be provided, for example; it would be more of an engineering project, more energy and material consumption; worse for the environment. However, by asking the question "why does the plaintiff need to expand the deposit space?", We would discover, for example, that there are seasonal storage needs that could be solved with the best management for receiving materials over time, or that is, without the need to grow even an inch from the original area; what is more economical and sustainable.

AN ANALYSIS OF THE ICB DESIGN PROCESS

As stated earlier, the conduct of the PPR-ICB was subject to public criticism in order to successively test the design hypotheses. Only when a hypothesis proved to be strong enough not to be refuted did it become part of the final project. The modus operandi for preparing the plan and architectural projects can be described as follows:

Diagnosis: a comprehensive diagnosis was elaborated that characterized in detail all the physical conditions and the use and occupation of the ICB. Among the physical aspects dealt with were the state of conservation and adequacy of the physical facilities, general conditions of personal security and property security, floor conditions, fences, lining, coverage, among other elements. For aspects related to use and occupation, the capacity of the environments, the frequency of use (days and times of capacity) were evaluated, as well as the qualitative assessment of the environmental and infrastructure adequacy according to the activity carried out in the environment.

Recognition of limits and potentialities: still in the first phase, the various constraints for interventions were identified, such as: the original design (open architecture), constructive potential established normatively for the expansion of the complex, the financial availability, the physical limits and the neighborhood, the maximum structural capacities and the logistics of civil works.

Listening to individual and group demands: interviews were conducted with researchers and technicians, seeking to understand the dynamics of each activity and collecting reports on the needs of research groups and departments, as well as, when applicable, individuals .

Clear definition of the design problem: from the previous elements it was possible for the technical team, together with the ICB community, to clearly define the design problems and an order of prioritization, which was endorsed by the Congregation.

Elaboration of the design hypotheses: the technical team was composed of a group of architects, being a senior architect and other auxiliary architects. Also, it relied on the consultation of civil engineers, eventually. The technical team was sometimes subdivided, to generate preliminary proposals that were confronted and criticized and then synthesized, to conform the hypotheses that were brought to the ICB community.

Presentation of the hypotheses: the architectural hypotheses were presented by the technical team on a screen so that all members of the PSC could graphically understand the proposal. Then there was discussion and criticism from the community.

Successive peer discussions (community x community): the PSC meeting agenda was held weekly. Between meetings, departmental representatives took questions to be debated locally. Sometimes it was necessary for the technical team to meet, authorized by PSC, with the departments individually in order to discuss specific points, the conclusions were sent to PSC for community deliberation.

Project evolution and final referendum: the evolution of the PPR-ICB took place, therefore, from successive criticisms, incorporation of suggestions, technical debates, feasibility studies that occurred as many times as necessary. When the proposal proved to be sufficiently adequate for the community and technically feasible, including from a financial point of view, a final design was formalized and endorsed by PSC and the Congregation.

AN OVERVIEW OF THE ICB REQUALIFICATION PROJECT

So far we have dedicated ourselves to the study of the participatory process itself,

without debating the design of architecture. Deepening the debate on this point would result in a text that is too long, but could be done in other works. In this section, therefore, we will present a panoramic view of the characterized design problems and architectural solutions adopted.

Two problems proved to be central: (a) the creation of environments for new activities and (b) the improvement of the environmental and technological conditions of the existing areas. However, two conditions hindered the adoption of the most obvious resolutions, which would be: "expand everything that was demanded" and "reform everything at once". The diagnosed conditions revolved around the various limitations for the expansion of physical areas and the fact that the activities of the ICB could not stop during the civil works, being not possible a total renovation in just one time.

The design responses accepted by CEF took place in six basic axes:

1. Rationalization, with reorganization of the uses and occupations of all environments: the various changes that have occurred over the decades in the ICB, have caused some environmental disorganization that was evidenced by the diagnosis and the complaints of the users. The solution was to act to develop new layouts for all environments.

2. Maximum sharing of rooms and equipment for collective use: aiming at the elimination of duplicated or underutilized areas.

3. Release of original blocks with the transfer of didactic activities: the theoretical classes, which occupied blocks G and H, were transferred to CDA-NS - Center for Didactic Activities in Natural Sciences (figure 1), creating areas for new laboratory activities. The environmental typology required for each activity was taken into account: the original blocks of the ICB are suitable for laboratory installations and the theoretical classrooms (blackboard and chalk) demand less sophisticated constructions from the infrastructural point of view.

4. Expansion of the area built in annexes, up to the allowed limit: the project for the construction of two new annex blocks, the Block of Practical Lessons and the Block of Experiment Bioterium, were the real possible expansions. The proposed use for the new blocks was also guided by the rationalization and concentration of activities that, until then, were scattered in the original blocks (potentiated the creation of "extra" areas).

5. Logistics so that the works do not impede the continuity of the activities of the ICB: creation of spaces for maneuver or buffers was the solution to make the work in installments possible and without the interdiction of the ICB as a whole. The locations chosen as buffers were blocks G and H, since these were emptied with the transfer of the classrooms to CDA-NS. Such blocks were transformed into "Station Laboratories" where the departments would temporarily accommodate their laboratory environments, while the original spaces were renovated, where they would return to the end of the process.

6. Complete renovation of the finishes and installations: made possible thanks to the open architecture of the original design, the structural system in reinforced concrete, which presented itself in excellent quality, was fully maintained and all the rest would be renovated considering the new installations and materials of design more efficient finishes from the sanitary point of view for laboratories.

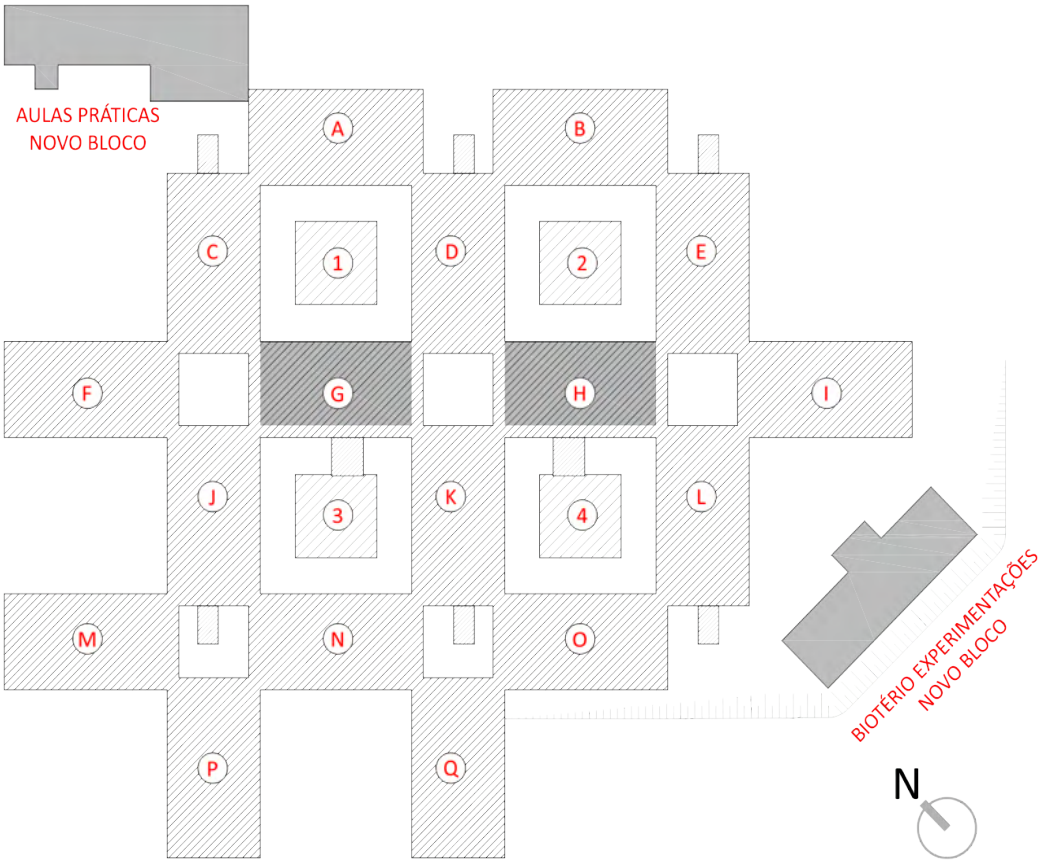

Figure 5. Original Blocks (A to Q), Auditoriums (1 to 4), Maneuver Blocks (G and H) and Attached Blocks.

FINAL CONSIDERATIONS

Public buildings need to be designed under republican ethics, undertaken in a specific structure, clearly recognizable at the social level, which takes into account the participatory democracy of those interested. The classic participatory processes in architecture carry the germ of this ethics, when the architect leaves the centrality of decision, the different agents are free to act and the decision itself takes center stage.

The ICB Participatory Requalification Plan was made under this regime and, in the end, the developed participatory process proved to be successful, since the collective solutions were accepted and some were effectively implemented.

However, it is important to say that changes in the political / institutional scenario of the Institute resulted in changes in the guidelines for the use and occupation of spaces established by the PPR-ICB, causing some projects to be abandoned and others to be modified, in a non-participatory context. This points, in a way, to possible flaws in the design process because, if the community had, in fact, legitimized the design decisions (as the architects thought), it would not have abandoned them so easily. This is an issue to be investigated in future works.

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