

# Decio Tozzi: from Manual Drawing to Digital Simulation

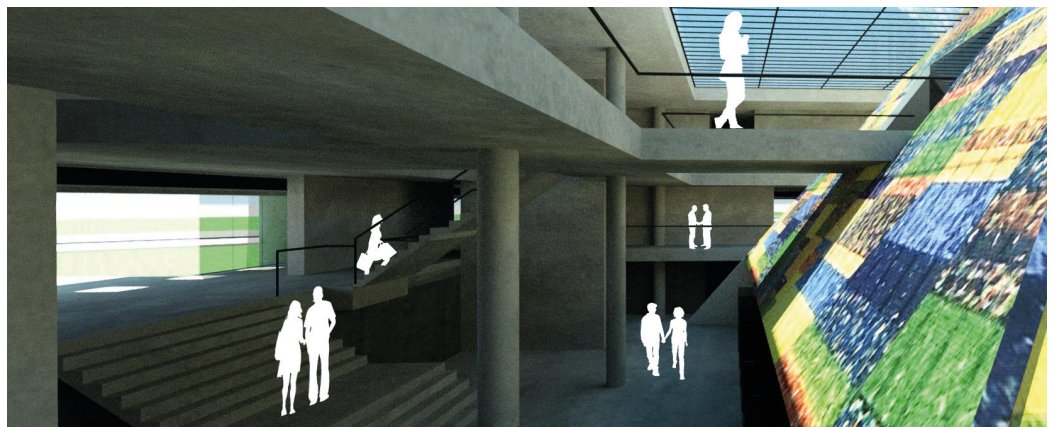
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## Abstract

This paper presents partial products of the ongoing doctoral research that analyzes unbuilt projects by the São Paulo architect Decio Tozzi. In this article, the object is one of the projects selected for the study, the project for the headquarters of the Regional Council of Engineering, Architecture and Agronomy - CREA, focusing on the study of representation for analysis and preservation of cultural memory. Based on the survey and organization of the architect's collection, unbuilt projects were identified and this project was chosen for the article. The objective here is to present the methodology, in its stages and procedures, for analyzing the selected project, from the survey and analysis of the original drawings present in the collection, redesign in vector graphics programs, construction of the digital model for simulating paths and visuals; rendering of digital images. With all these analysis stages, involving representation on different supports, from drawings on paper boards to renderings in a digital environment, we can have data for analyzing the project, in addition to original products arising from the redesign, modeling and simulation stages, to preserve the architectural memory. Thus, the original contribution of this paper to this congress focusing on studies on representation lies in the presentation and discussion of the methodology for analyzing Decio Tozzi's unbuilt projects based on the selection of one of the projects that will be presented here.

## Key-words

Modern architecture, Decio Tozzi, unbuilt architecture, redrawing.



Internal perspective.  
Authors' elaboration  
based on drawings from  
the BAE Collection,  
Unicamp, 2025.

## Introduction

Drawing as a form of communication is something that dates back to prehistoric times. When we talk about architecture, the role of drawing is not limited to communicating, it also participates in other cognitive processes such as predicting, anticipating and understanding what is proposed there. As stated by Sacchi “the fact that drawings help us understand architectural designs as well as constructed architecture is such a well known fact that it needs no further comment” [Sacchi 2003, p. 43]. In the life cycle of an architectural project, the drawing is always present, even if it is never built. Sdegno confirms that unbuilt architectural projects “*Di frequente esse vivono il loro iter progettuale e maturare grazie alla costante interazione con una committenza, per cui la loro elaborazione prevede quasi sempre la definizione di tutti i disegni necessari alla realizzazione [...]. Per la cura e il tempo dedicato dal progettista è difficile non definire tali opere come vere e proprie architetture, la cui funzione è anche di sperimentare nuove geometrie e tecnologie, nuove configurazioni spaziali e soluzioni di luce; cose queste per le quali l'autore, o qualsiasi altro architetto si soffermi ad analizzarle, può ritenere utile di replicare una parte, per farle approdare, con maggiore fortuna, al cantiere*” [Sdegno 2006, p. 180].

In the field of research on unbuilt architecture, the role of drawing goes beyond that of an instruction, as the ideas and reasoning imbued in that architecture exists only in that record. Kalman reinforces that “the projects exists only in the form of drawing [...], so if they are to survive for posterity the drawings must be preserved” [Kalman 1977, p. 230]. In many cases, the preservation of drawings has to be something more than safeguarding the originals; re-designing projects using new technologies allows them to have an extended useful life, since the drawings become manipulable, while the originals are protected. There are countless studies where the use of software for redesigns not only allowed the conservation of the originals, but also the study and popularization of unbuilt architectures. Sirbu (2003) highlights the 3D reconstructions of projects by Frank Lloyd Wright and Antonio Sant'Elia by B.J. Novitski, and of Louis Kahn's projects by Kent Larson. In the Brazilian scenario, we have Tagliari [Tagliari 2012], who rescues unbuilt projects by Vilanova Artigas, Damon [Damon 2015] who focuses on Paulo Mendes da Rocha and as in previous research by the author where the unbuilt projects of the Museum of Contemporary Art of São Paulo were redesigned and analyzed [Beltramini 2023].

The redesign technique here is once again used to preserve and study an unbuilt architecture. The project presented and discussed in this article is the subject of the author's ongoing doctoral research. In this way, the architect Decio Tozzi and his collection will be presented, as well as the project and a discussion on pertinent aspects of the process of redesigning and 3D construction of the object.

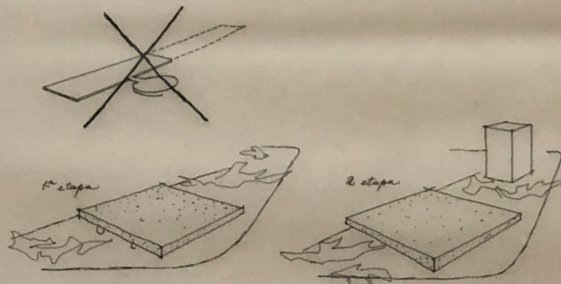
## Decio Tozzi and his collection

The São Paulo architect Decio Tozzi appears in several works as part of the group of professionals who stood out as a reference of the modern generation [Giroto 2019] and of São Paulo architecture [Macedo 2008; Segawa 2010; Acayaba 2011; Carranza 2013; Mestre 2014]. He participated in the generation that graduated during the period in which Brasília was being built (1955-1960). The importance of this parallelism is highlighted by himself who, in his master's thesis, states that due to the cultural conjecture that existed at that time, an environment was created where he and his fellow students participated “in a stimulating process of doing and thinking, supported by infrastructure conditions, proposed from the perspective of national development” [Tozzi 1981, p. 7].

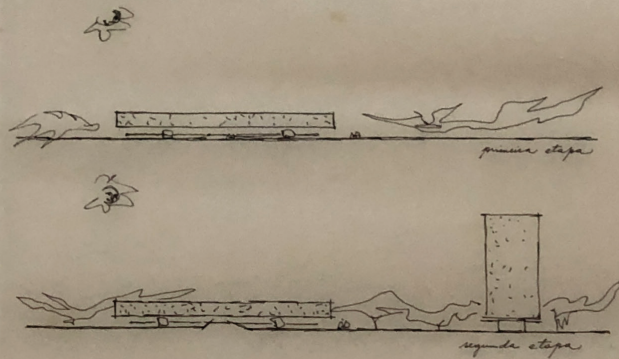
Throughout his career, Decio Tozzi explores a plastic universe based on the triad of light, space and matter. The articulation of plans and volumes with these elements, in addition to the Vitruvian triad and the understanding that architecture is shelter in the landscape [Tozzi 1981], gives the designed architecture a temporal aspect. Tozzi brings light into the composition by allowing it to enter through openings at the top and, “when penetrating the volume, it reflects on the planes, losing its own will and becoming an instrument of the

# MEMORIAL

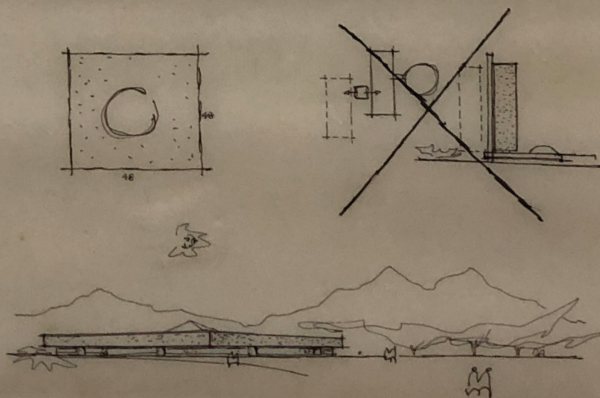
NO PROJETO QUE ELABORAMOS PARA O EDIFÍCIO SEDE DO CREA-6ª. REGIÃO, PROCURAMOS CARACTERIZAR SUA PRESENÇA NA CIDADE COMO UM OBJETO UNO, DEFINIDO, REJEITANDO SOLUÇÕES QUE LHE CONFERISSEM UM ASPECTO DE OBRA INCOMPLETA EM FUNÇÃO DA INDEFINIÇÃO DE SEU CRESCIMENTO.



O EVENTUAL AUMENTO SE CARACTERIZA POR UM OUTRO EDIFÍCIO QUE COMPÕE UM CONJUNTO HARMÔNICO E PROPORCIONADO COM A PRIMEIRA EDIFICAÇÃO.



PROPUSEMOS UM PARTIDO COMPACTO, NÃO FRAGMENTADO EM RECORTES OU VOLUMES E QUE SE INTEGRA NO ESPAÇO URBANO DO ENTORNO, CONSTITUÍDO DE CONSTRUÇÕES AMPLAS E PREDOMINANTEMENTE HORIZONTAIS.



ESSA SOLUÇÃO RESOLVE O PROGRAMA PROPOSTO EM APENAS 3 PISOS, O QUE FACILITA A INTEGRAÇÃO FUNCIONAL DOS DIVERSOS SETORES DO CREA.

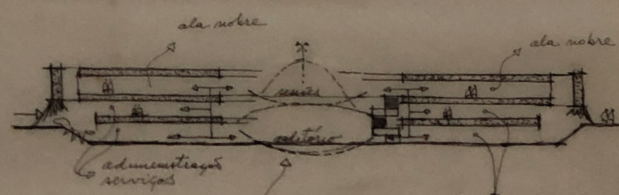


Fig. 1. First page applied to the first floor plan. Decio Tozzi, Collection BAE, Unicamp.



web of spaces that shelter human life" [Tozzi 2013, p. 35]. Patient observation is necessary to understand how Decio's triad is strengthened when it encounters the Vitruvian Triad, for Ubyrajara Giglioli "it takes a certain amount of time to discover this mysterious and surprising path, as the light emerges from within, little by little, drawing this chain of space that characterizes Decio Tozzi's work" [Macedo 2008, p. 93].

Observing patiently was a necessary exercise when analyzing the office collection donated to the Engineering and Architecture Library (BAE) of the State University of Campinas (UNICAMP) on September 4, 2018. The existing primary sources, both written and iconographic, are precious original testimonies that deal with the society, techniques, customs and lifestyle [Lakatos; Marconi, 2017] in force at the time of their propositions. According to Pereira "the Architect Decio Tozzi Collection is [...] the first private documentary archive under the tutelage of BAE-Unicamp" [Pereira 2021, p. 250], still in the exploration process, it holds within its universe latent primary sources for possible research on various fronts. It is in this scenario that the research object that this article sheds light on emerges: the Headquarters of the Regional Council of Engineering, Architecture and Agronomy (CREA), in São Paulo, Brazil.

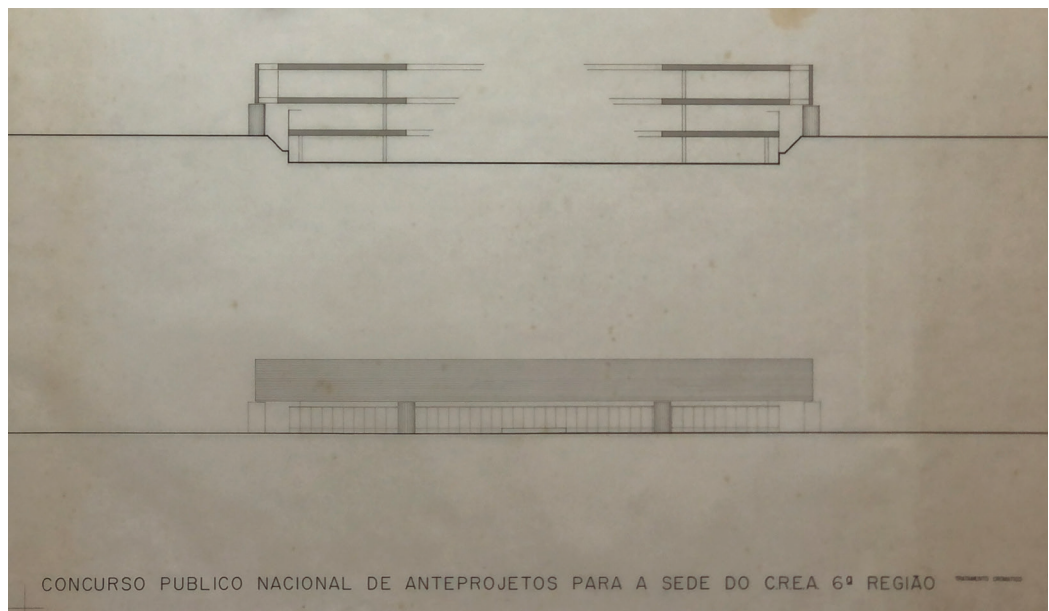


Fig. 2. Floor Plan 14, Chromatic Treatment without the application of Cláudio Tozzi's work. Decio Tozzi Collection, BAE, Unicamp.



Fig. 3. Chromatic treatment in glass mosaic on concrete. Klintowitz, 2016.

## The CREA project: analysis stages

Launched in February 1978 by the then president of CREA, civil engineer Maximo Martins da Cruz, the architectural competition for the new building had 209 applicants from various states in Brazil, with a strong predominance from the states of São Paulo (159), followed by Rio Grande do Sul (15) and Paraná (13) [1].

As the council headquarters, the requested architectural program covered both administrative and social sectors. The notice includes, along with a table of areas that determined the limit of 5,600 m<sup>2</sup>, an organizational chart that established the relationships intended by the competition's organizers. The notice still included the possibility of expansion in a second stage, but reinforced that the entire program should fit into the preliminary project proposed for the first stage.

## Original drawings

The set of drawings in the collection that are related to the competition consists of ten floor plans on tracing paper with drawings and writing in black ink. The floor plans are numbered from 1 to 14, but boards numbered 11, 12 and 13 are missing. Despite the absence of three floor plans, the project can be clearly read in the other representations. The explanatory texts on panel 01, which would be a memorial where Tozzi defends and explains his project to the jury. This floor plan in particular has four pages, also on tracing paper, measuring 59.6 x 19.8 cm (fig. 1). Another observation pertinent to the original drawings is in relation to

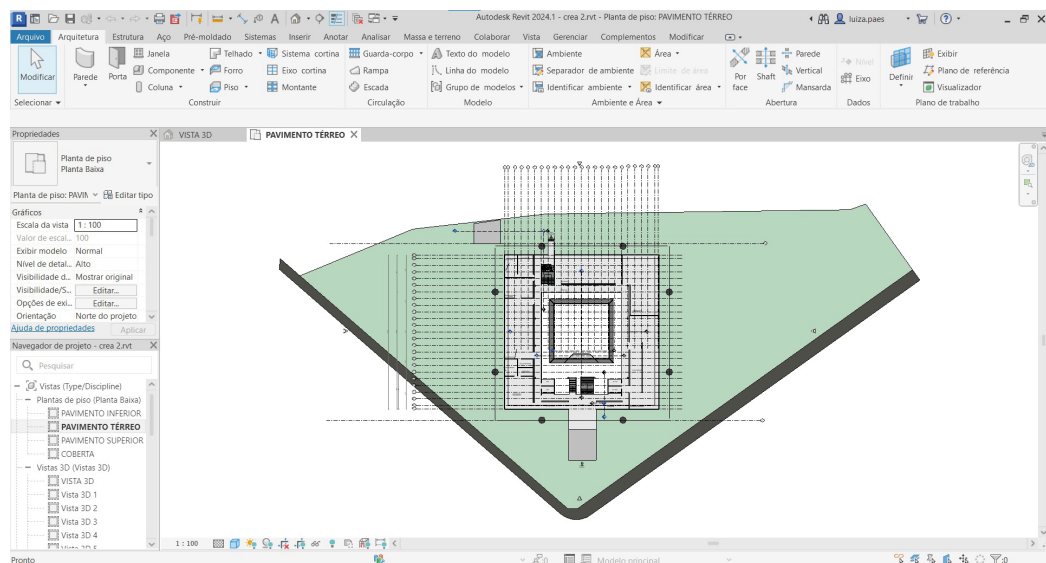


Fig. 4 Screenshot of the project redrawing in Revit. (author's elaboration).

the drawings shown on floor plan 14. In this floor plan, called “chromatic treatment”, a cut and a facade can be seen.

In the section, you can see the void where the pyramid would be, a very expressive element in the architecture proposed for the competition (fig. 2). It is understood that there was a superimposed drawing by the artist Cláudio Tozzi, Decio's brother, who signed the artwork proposed for the competition. The plasticity of the mural is published in the book about the works of Cláudio Tozzi (fig. 3).

The presence of a work of art is encouraged by the competition regulations, which in item 4.7 state that “the competitor must foresee the application of the amount corresponding to up to 2% of the cost of the building for works of art integrated into the building” [Regulations 1978, p. 3].

## Redrawing and modeling

The drawings were made based on information found in the BAE collection and in the book *Cláudio Tozzi: Public, Private* by Jacob Klintowitz. Sdegno and Masserano [Sdegno, Masserano 2012] state that the crossing of different research sources, as well as different levels of information, are important for research like this, where not all the information is present. In this case, when we are faced with the lack of information necessary to understand the project, what the bibliography [Galli, Mülhoff 2000; Larson 2000; Foscari 2010; Webb, Brown 2011; Tagliari 2012; Sdegno 2011; Sdegno, Masserano 2012] tells us is that we should observe the architect's entire existing work, so that characteristic elements can be recognized. This practice of deriving and refining similar elements by the same architect has its bases well defined in the literature. To cite two examples distant in time we have the theorist Durand and the researcher Rivka Oxman [Oxman, Oxman 1992]. This practice has already been observed in the work of classical architects, such as Palladio [Oxman, Oxman 1992], and in modern architects, such as Louis Kahn [Oxman 1990].



Fig. 5. Internal perspective. Authors' elaboration based on drawings from the BAE Collection, Unicamp, 2025..

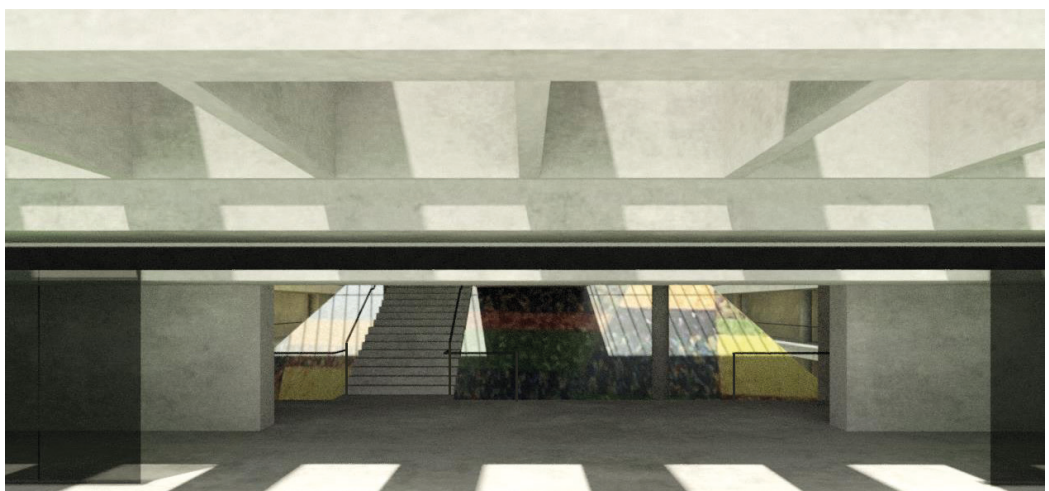


Fig. 6. Perspective of the main public entrance. Authors' elaboration based on drawings from the BAE, Unicamp Collection, 2025..



Fig. 7. Original floor plan of the ground floor indicating the adjacent streets. Decio Tozzi. Collection, BAE, Unicamp.



The communication methods found in the research sources ranged from the text of the memorial, which is illustrated by diagrams, sketches and schematic drawings, to the technical drawings present in the floor plans preserved in the collection as well as the graphic information on the color treatment that would be used for the project in order to comply with item 4.7 of the competition regulations (figs. 2, 3).

The redesign was done in BIM (Building Information Modeling) using *AutoDesk's Revit* tool (fig. 4). The tool was chosen for several reasons, including: the amount of information that can be obtained from modeling, the ease of creating 2D and 3D communications at the same time, the interchangeability with other software that will allow for different analyses in the future, the standardization of a language, the author's mastery of the tool, as well as the broad knowledge and recognition of the tool by the academic community.

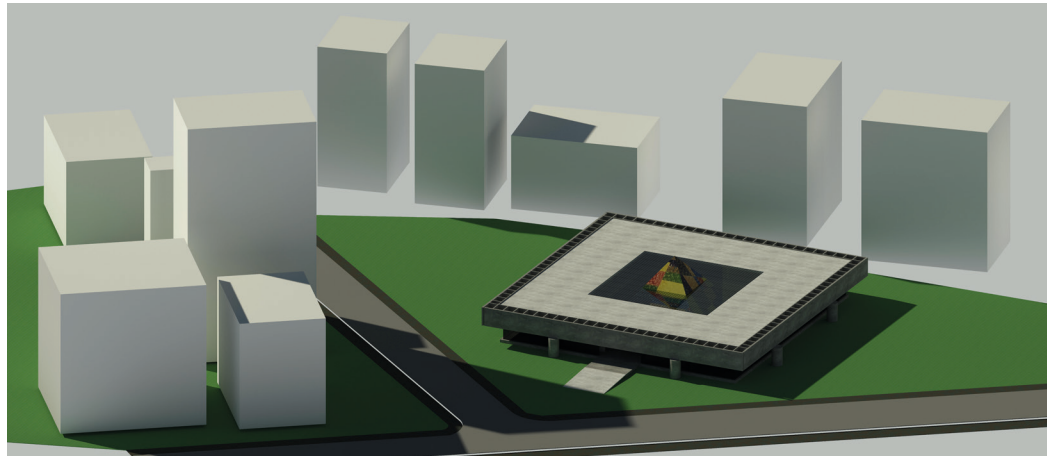
The originals contain indicated dimensions and are on a scale of 1:200, so the model was made based on the information contained in the technical drawings and the information declared in the memorial. Despite the generous number of drawings, there was information that was not contained in any document. The lack of indication of the materiality of the internal walls and floor, as well as the absence of indication in the plan of the location of window openings on the upper floor, which appear in the schematic skin section drawing, meant that the author had to decide on an interpretation based on Tozzi's work, whether or not to represent it and, if so, how he would do so. Based on the bibliography already cited, it was decided not to design openings on the upper floor, as for the materiality, on both surfaces the simplest option was chosen, white walls and a smooth burnt concrete floor (fig. 5).

Although we believe that within environments with acoustic issues, such as the plenary and the auditorium, the floor would not be made of concrete due to the reflectance of the material, we chose to keep it uniform given the lack of information and for the uniformity of representation (fig. 6).

Another situation we find in the drawings concerns the location of the project. It is known that it was designed for the city of São Paulo, capital of the State of São Paulo, however,

when trying to locate the lot for which the building was designed we were unsuccessful. Although we have the names of the streets that flank the lot in the technical drawings (fig. 7), Rua São Francisco de Assis and Avenida do Emissário, when we search for the address

Fig. 8. Aerial view of the Project without surroundings. Authors' elaboration based on drawings from the BAE Collection, Unicamp, 2025.



on platforms such as GoogleMaps, the current urban configuration does not correspond to what existed at the time of the competition. Given this imprecision, we were unable to generate a simulation of the urban environment and/or photomontage that was faithful, which is why we chose to represent only an aerial view of the project here (fig. 8). It is believed that with future research into street name changes it will be possible to determine the lot for which the project was designed.

### Discussion and final considerations

The work analyzed highlights several aspects expected in a study like this, but it also brought some surprises. Of the issues foreseen, the lack of some information about the project, even though it is accompanied by a descriptive memorial, the preliminary project level did not allow all the project definitions to be contained in it, something that is expected for this level of detail. Among the issues that arose without being foreseen, we can highlight the lack of location of the lot, the color treatment of the pyramid was also a surprise that arose during the meeting between the authors and Decio Tozzi and Cláudio Tozzi (fig. 4), the application of black and armored glass to close off the ground floor and the passage of natural ventilation through openings above the walls of this same floor; and lastly, the choice of a transparent glass zenithal enclosure allowing light to bathe the three floors naturally, highlighting Cláudio Tozzi's artwork and contributing to sustainability aspects also foreseen by the competition rules and notice.

The redrawing with the help of the BIM tool allowed the construction of the model in a relatively short time, which allowed the creation of several plans, sections and facades, allowing for a more uncomplicated manipulation of the project. Digital preservation of the project allows studies to be carried out that would not be possible with the original drawings alone or that would threaten the integrity of the originals. Studies such as sunlight, environmental comfort, natural lighting, artificial lighting and even the proposed color treatment itself become much more possible and simple with a tool that uses BIM technology. Studies of spatial perception, possible routes, access and accessibility are also much simpler to carry out.

It is considered that the article managed to demonstrate the role of drawings in their various forms, media and details. The importance of drawing practice in conjunction with the digital tool allows the information included in the drawing or proposed by it to also



become clear in the process of redesigning the project, whether it is built or not. Remembering that, if it is not built, the project only lives on paper. Furthermore, the creation of the digital model advances the doctoral research that includes two more projects by Decio Tozzi that were not built, allowing a better understanding of the architect's plastic framework.

## Note

[1] Programa Concurso Público CREA, 1978, 6ª Região. IAB, São Paulo.

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