

Wilson Florio
Ana Tagliari



THE PAVAN ENGINEERING
HEADQUARTERS BUILDING DESIGNED
BY VILANOVA ARTIGAS IN SÃO PAULO

ABSTRACT

During the years 2012 and 2014 the research “*Analysis of unbuilt projects of Vilanova Artigas*” was developed supported by CNPq. Twelve unbuilt projects available on the digital FAU-USP library were analyzed by means of computational simulations and animations, aiming to investigate these spaces through the virtual tours, and relating these designs with the architect's built work. This paper presents part of this research with the analysis of the Pavan Engineering Headquarters building, designed in 1972 to be built in the city of São Paulo. The aim of this text is to present the results of this research, specifically on this selected project, highlighting the unpublished material, research procedures, analysis, results obtained, discussion and relation with the architect's work. We could notice the importance of the new technologies for the aid in the process of analysis and representation of unbuilt projects. Regarding the obtained results, it is possible to conclude that this research contributes to the enrichment of the debate encompassing Vilanova Artigas's architecture, bringing about original material from primary sources, which allow for the interpretation and analysis of the works of this great architect.

KEYWORDS

Vilanova Artigas. Unbuilt architecture. Modeling and Simulation. Design Analysis.

O EDIFÍCIO SEDE DA PAVAN ENGENHARIA E INDÚSTRIA PROJETADO POR VILANOVA ARTIGAS EM SÃO PAULO

RESUMO

Durante os anos de 2012 e 2014, foi realizada a pesquisa “*Análise de projetos não construídos de Vilanova Artigas*”, com o apoio do CNPq, na qual foram analisados doze projetos não construídos de Vilanova Artigas disponíveis no acervo digital da Biblioteca da Faculdade de Arquitetura e Urbanismo da Universidade de São Paulo, a partir de simulações e animações computacionais, no objetivo de se investigar esses espaços por meio dos passeios virtuais, além de relacioná-los com exemplares de sua obra construída, agregando esse conhecimento ao tema. Este texto apresenta parte dessa pesquisa com a análise do projeto do edifício sede da Pavan Engenharia Ltda., concebido em 1972, que seria construído na cidade de São Paulo. O objetivo deste texto é apresentar os resultados da pesquisa realizada, especificamente sobre esse projeto selecionado, realçando o material inédito, os procedimentos de pesquisa, a metodologia de investigação dos projetos, a análise realizada, os resultados obtidos, a discussão e a relação com a obra do arquiteto. Pudemos constatar a importância das novas tecnologias para o auxílio no processo de análise e representação de projetos não construídos. Sobre os resultados atingidos, é possível concluir que a pesquisa contribui para o enriquecimento do debate em torno da arquitetura de Vilanova Artigas, agregando material original a partir de fontes primárias, que permitem a interpretação e investigação da obra desse grande arquiteto.

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PALAVRAS-CHAVE

Vilanova Artigas. Projetos não construídos. Modelagem e simulação. Análise de projeto.

INTRODUCTION

During the years of 2012 and 2014, the “*Analysis of unbuilt designs by Vilanova Artigas*” was undertaken with the support of CNPQ, during which there were analyzed twelve unbuilt designs available in the FAUUSP Digital Library records. These analyses happened by means of computational simulations and animations, aiming to investigate these spaces through virtual walking-tours, relating these designs with the architect’s built work. There were analyzed six residential designs, two corporates headquarter buildings, a commercial building, two school designs, and a bank. These writings present part of the above-mentioned research with the analysis of the Pavan Engineering Headquarters Building, designed in 1972 to be built in the city of São Paulo.

As a first methodological step in this research, there was made an initial bibliographical review regarding Vilanova Artigas’s architecture, in which there were found analogous doctoral thesis, masters dissertations, papers, texts, and books. The main titles were consulted and are listed in this paper’s bibliography. Upon the research’s conclusion in 2014, important books and papers were published regarding the architect in the following year of 2015, due to the

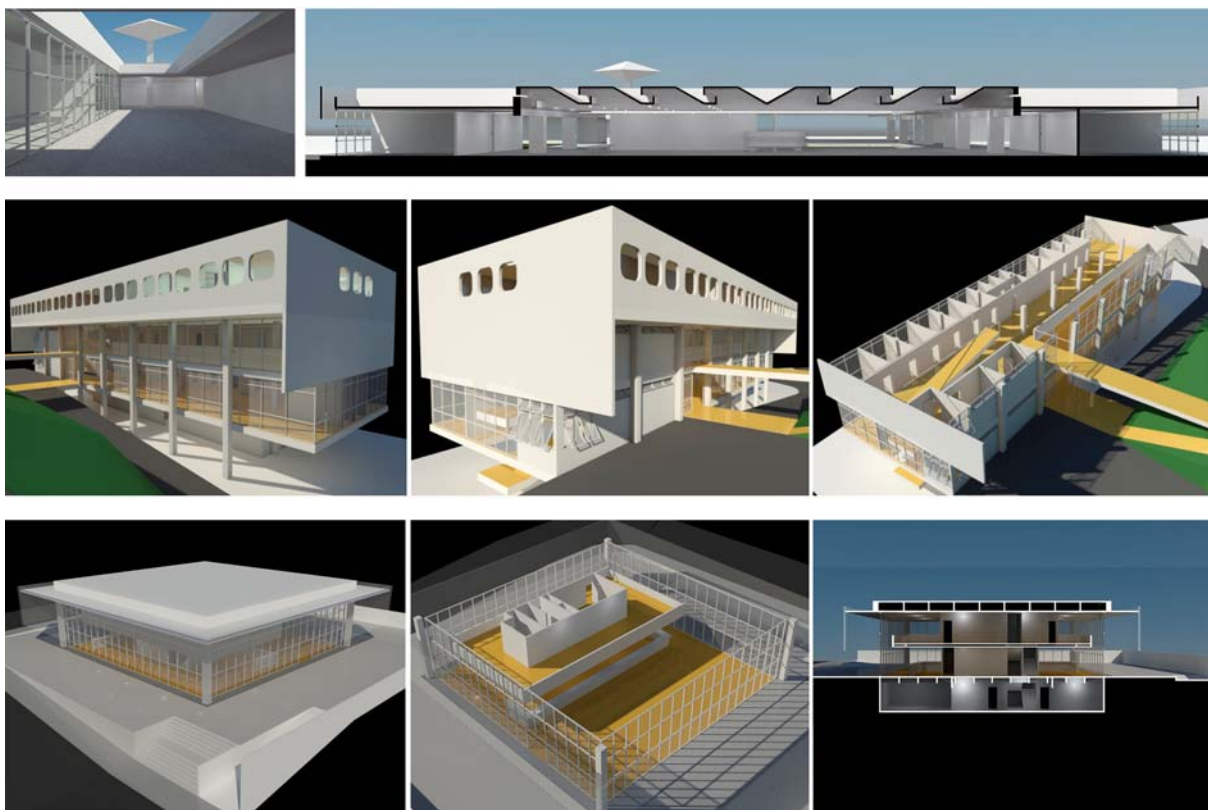


Figure 1: View from the internal courthouse and transversal section of the Porto Velho Technical School, Roraima State, 1973. Views from the Troll AS corporate building in São Paulo, São Paulo State, 1973. Volume, internal space, and section from the Mooca Safra Bank in São Paulo, São Paulo State, 1983.
Source: FLORIO; TAGLIARI, 2014.

architect's centenary celebrations, and they were also included in this paper's bibliography. During the bibliographical investigation, therefore, it became clear the scarcity of explorations regarding the selected case studies, what reinforced they are being chosen and the research's relevance.

A bibliographical review regarding the *design analysis* theme, especially regarding *unbuilt designs*, was also consulted, aiming to subsidize the choice of analysis method, procedure, besides collecting important references regarding this realm of study. It is important to highlight the works of Kent Larson (2000), Mirko Galli and Claudia Mühlhoff (2000), Alberto Sdegno (2008), Nicholas Webb and Andre Brown (2011a, 2011b) as main references.

Another step in this research's methodology was the consultation of graphical information regarding the selected designs within FAUUSP Digital Library. By means of this consultation, it was possible to establish contact with a virtually unknown universe of unbuilt design drawings from Vilanova Artigas. With this material in hands, the designs were drawn over, and virtual models were made. It is possible to observe that some designs had more than one option. In these cases, the chosen design proposal for the analysis was the one with the biggest amount of data available.

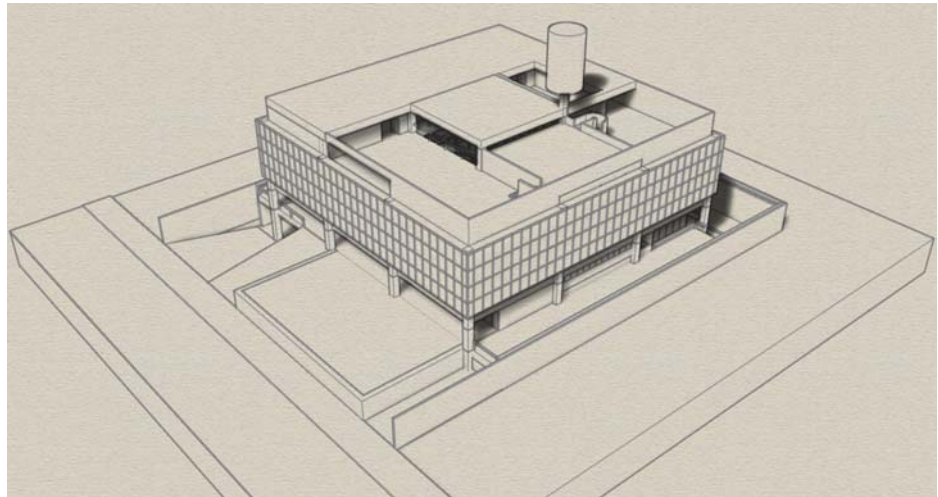
There were also visits, observation-based drawings and pictures taken of some of the built work of the architect within Sao Paulo as part of the spaces' investigation, aiming to obtain a considerable design solutions' repertoire. This material was important during the analysis and interpretation of the non-built designs, in the sense of establishing relationships between the designs and their periods, and similar solutions, as materials, illumination, colors, details, window casements, guardrails, and other design solutions and elements. From the bibliographical revision regarding the theme *analysis of unbuilt designs*, it was verified that this methodological step was indeed important.

The Pavan Engineering Headquarters Building (1972) was the selected case for this paper, for, after the research, its importance during Artigas production during this period is considerable. It is a design of a corporate headquarters building, with a briefing that was relatively rarely built at the time, with important characteristics from the design process from Artiga's mature phase. In the same manner, it is important to highlight the Guarulhos Gymnasium (1960), the FAUUSP building (1961) and the Jáu Bus Station (1973), with built works of great importance.

The objective of these writings is to show the results of the research previously undertaken, especially regarding this given design, highlighting the previously unseen material, research procedures, design investigation methodology, the actual analysis, results, discussion and relation with the architect's works, besides interpretations aroused during the research.

The article is organized in four parts. In the first part, there is the design presentation, with data regarding its localization, year, and other information obtained from the original drawings as briefing and architectural *partii*. In this part, we also presented the organization criteria from the data obtained from the FAUUSP Digital Library for later redrawing and tridimensional modelling. In the second part of the text there was presented the design analysis from the

Figure 2: Aerial perspective from the Pavan Engineering Headquarters Building.
Source: FLORIO; TAGLIARI, 2014.



tridimensional model and the possibilities obtained by the virtual walking-tour. For this analysis, there were considered items as space and form, materials, illumination, color, details, as according with the information obtained from the interpretations that were made, which came from the adopted analysis methodology. The virtual walking-tour allowed for the analysis of possible human perceptions within the space in order to fully understand the presented spatial configurations, besides allowing to go along pathways and to appreciate visuals. In the third part, it was proposed a discussion, where the objective was to establish relationships amongst the design analysis, its contextualization, the architect's work, important characteristics from his design process, alongside other topics which aroused during this reflection. Lastly, in the fourth and final part, there were added final considerations to the text, which are promptly followed by bibliographical references.

THE PAVAN ENGINEERING HEADQUARTERS BUILDING

The Pavan Engineering Headquarters Building, designed in 1972, was to be built in the Jaguaré district, in the city of Sao Paulo, with total built area of approximately 5563, 78 m². It is an unbuilt design by Vilanova Artigas. From the analysis of the 61 sheets of paper digitalized and made available by the FAUUSP Digital Library, there were identified four different options regarding briefing organization, with drawings pertaining to different design phases, which range from the earlier studies and preliminary designs to the approval and construction drawings.

The adopted architectural *partii* distributes the briefing in six levels (underground, ground level, mezzanine, first floor, second floor, and third floor), organized in half levels interconnected with ramps and staircases. There is an internal courthouse, which is centered with ramps and a rooftop with gardened and leisure areas. There is also a mezzanine, ground level, and three upper floors allocated to administrative areas with offices, kitchen, eating

parlor, and bathrooms. It is a single-volume building, with an structural grid of 10 m x 10 m, constituted by concrete pillars, beams, and slabs. The design of the four façades highlights big glass panels, which actually envelop the concrete structure from the first to the third floor.

The differences between the various design versions happen mainly in the relation pertaining to the vertical circulation, its location, and the option for ramps, stairs, elevators, or a combination of these elements. The architectural *partii* in its essence is kept *partii* in the different options: the briefing organization in levels interconnected by ramps centered within the square floor plan. The structure with sixteen columns was organized in a regular grid of 4 x 4 columns, with a modulation of 10 meters between them.

From the file made available by the FAUUSP Digital Library, it is worth mentioning that in sheets 1-5 the conception drawings are highlighted. In this preliminary design phase, the four plans and a section point to the hierarchical organization of the briefing, from public spaces in the ground level to the CEO's office in the upper level. The core is located in the center of the square floor plan, and is composed by plans, stairs and an elevator.

Figure 3: Preliminary design and pre-construction design. Source: Sheets 1, 5, 7, and 14 from the FAUUSP Digital Library file 752_2, 2013.

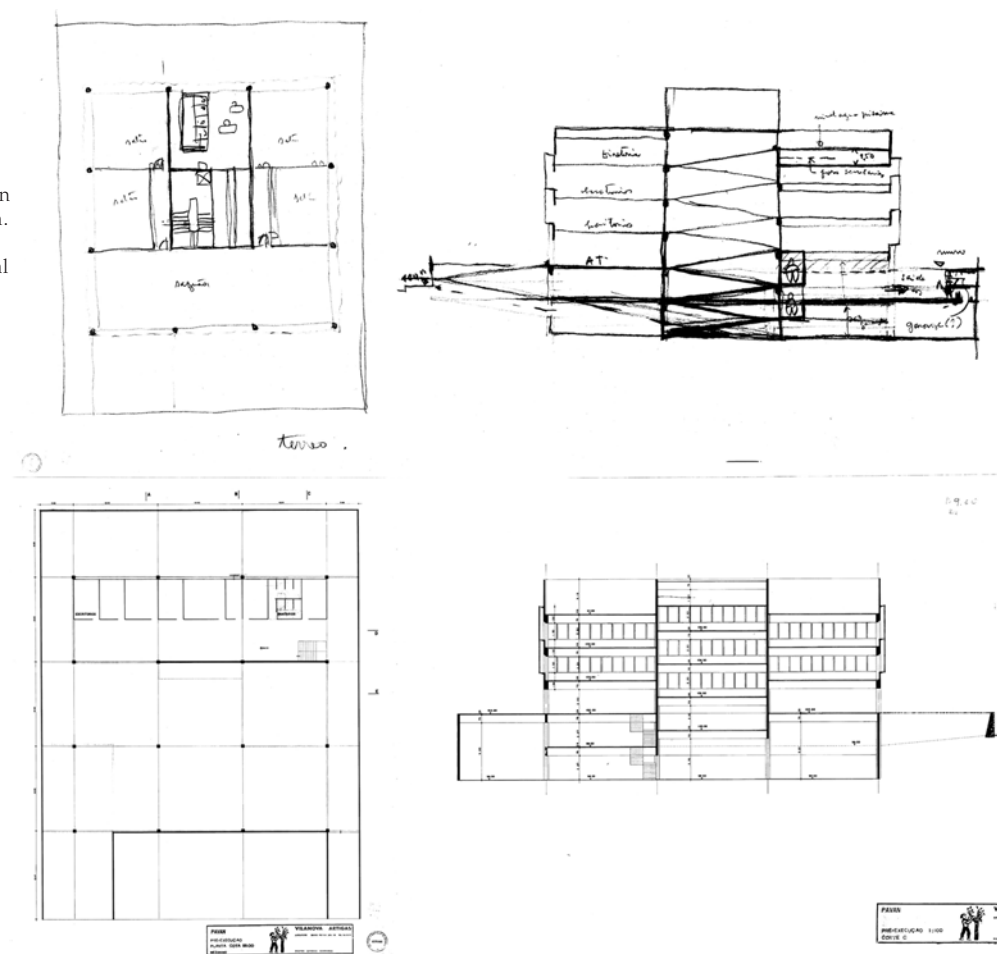
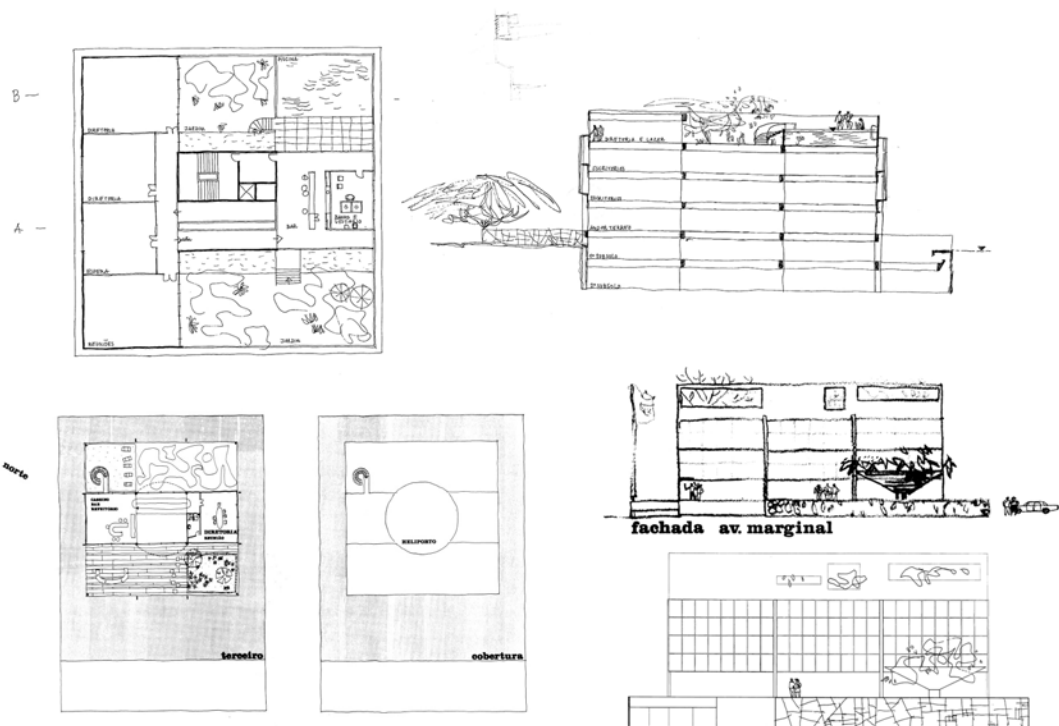


Figure 4: preliminary design study with stairs and elevators alongside the ramps. From these drawings it is important to highlight the pool in the rooftop. Below there is a heliport study. Below, to the side, there are preliminary design sheets 34 and 35.

Source: Sheets 27, 30, 33, 34 e 45 from the FAUUSP Digital Library file 725_2_pen, 2013.



Between sheets 6 and 19, the pre-construction details presents a different vertical circulation proposal. In the center of the floorplan are the ramps, within a centered courthouse, which go from the first to the last floor. Besides the ramps, the design has a stair core which tend to the underground levels, ground level, and mezzanine.

In sheets 20 and 21 there are study drawings, which present suggested speculations of plans adopting ramps as the main vertical circulation. In sheet 22 there is a study in an augmented scale regarding the kitchen and eating parlor spaces. In this sheet, there is a list of equipment pertaining to the kitchen alongside the drawing, a *layout* and circulation study from this space.

Between sheets 23 and 30, it is important to observe panels from a preliminary design proposition that keeps the ramps in the middle of the square floor plan, but with a staircase core and two elevators by its side. This option organizes the vertical circulation in the center of the plans with ramps, stairs, and elevators tending to all floors.

This study reveals the gathering place in the rooftop, where there is a leisure area with a pool. The drawings of Artigas reveal a series of human figures interacting in this space, what could be interpreted as the actual *meeting* and convivial space.

From sheet 31 on, it is possible to notice another design option. In this preliminary study, hand-drawn, it is possible to highlight the void pertaining to the courthouse and the ramps in the center of the plans. The rooftop is maintained as a *meeting* place, with pool and leisure area. What is new about this option is the heliport, unseen in previous design options and certainly not usual in the architect's previous works.



Figure 5: Roof of the Pavan Engineering Headquarters Building. Source: Authors, 2014. Swiss Pavillion in the University of Paris, 1933. Stone-wall detail and the rectangular openings in the roof. Below, Ville Savoye, Poissy, 1929-31. Le Corbusier. Rooftop Garden with walls, openings, and frames for the views. Source: Authors (2008).

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In sheet 34, the elevation reveals the *corbusian* “inspiration” when it comes to the rooftop garden and the elevation drawings. As in the Villa Savoye (1929-1931) designs or in the Swiss Pavillion in the University of Paris (1933), the roof, as leisure and gathering space, is delimited by walls in its perimeter, drawn with rectangular apertures, which frame different views. Another similarity happens in the stone wall located in the ground level of the Swiss Pavilion. This design solution is present in other instances of his work, such as the Louveira Building.

From the sheet 38 on, we come across an instrumented preliminary draft, with a design showing once more ramps centered in the square floor plan, but with some peculiarities when it comes to the older design propositions. There is a helicoidal staircase, which ranges from the ground level to the second underground level. There is also a straight staircase which tends to both underground levels, besides the roof openings which allow for the entrance of natural light into the underground levels. The roof loses its gathering ambience, and seems to be an open space destined only for the CEO’s dependencies. The frontal façade drawing is kept as in the previous design.

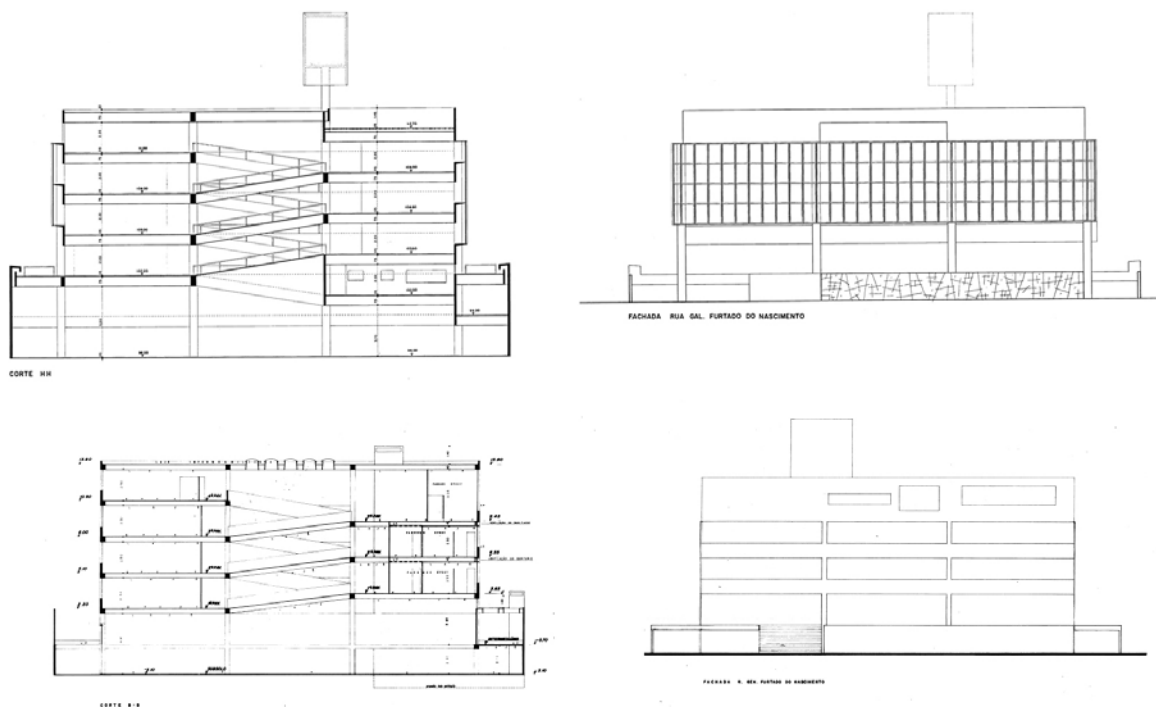
From the sheet 46 on there is a new proposition, which is presented in a drawing with a detail level ready for execution. This is the most developed design and with the biggest amount of information. For this reason, it was the one selected for redrawing and analysis in this research, following the pre-established methodological criteria for analysis.

In this design, the ramps were adopted as the main vertical circulation, located in the center of the square courthouse. There is also a staircase core which tends only to the underground and the ground levels.

The roof was kept as a gathering space, but without the pool and the heliport. It is still bounded by the walls, but the openings' drawings framing different views were thought over, with only a centralized opening.

Here, the continuum glass panels in the façades are highlighted, coming before the grid of external columns. This element received a specific drawing, with the glassed surface supported in trapezoidal slabs with forty centimeters worth of guardrail, which advances aiming the outside, and works as the window casement support. Furthermore, this design also brings forth its cylindrical water reservoir, highlighting the building's highest point, with a typical Artigas drawing, as can be observed in some examples of his works such as Residences Bittencourt 2, Elza Berquó, and Mendes André.

Between sheets 58 and 61 there is the legal design version, with some details drawn with greater care. The staircase core, which tends only to the underground levels and the ground level in the developed design, tends to all floors in the legal drawings. This staircase is drawn as according to the city and fire codes, with airlock and ventilation duct. It is also observable an elevator alongside the ramps, in the central courthouse, which now has domes. The



water reservoir comes up as a regular block without a protagonist approach. Also, the glass curtain disappears, and the horizontal openings set the pace of the three typical floors.

DESIGN ANALYSIS

From the material made available by the FAUUSP Digital Library, it was possible to verify which was the most detailed design proposition in order for the redrawing and virtual modelling of the building. With the virtual model in hands, it was viable to create estatic and dynamic simulations, allowing for virtual walking-tours seeking a better understating of the spaces, forms, and its relationships.

The adopted analysis methodology allowed for design interpretations from the reflections obtained from Artigas' built work. Interpretations in the sense of the adoption of materials, colors, and the drawing of details were important for the analysis sought by this research, which involved not only the study of form and space, but also its perceptive aspects, as natural illumination, colors, materials, and textures.

When it comes to its urban insertion, the building's horizontality contrasts with the verticality from the neighboring twelve floor buildings, alongside the Marginal Pinheiros Avenue, in the opposite of the University of São Paulo complex.

Observing the frontal façade drawing, at a first glance it seems to have regular floors, just as an usual three floor building with ground and underground levels. However, it is noticeable from the possibilities generated by the virtual model, that upon entering the building, the levels are organized in half-floors, around a central courthouse, interconnected by ramps, allowing for an increased dynamism than initially imagined.

Figure 7: Location of the building site in the Marginal Pinheiros Avenue, in the city of São Paulo, and a suggested 3d view from the Maginal's express lane. Sequence 1: view of the building from the street, and the ramp's access to the ground level half a floor above the street level. Source: FLORIO; TAGLIARI, 2014.



The ground level, half a floor above the street level, creates a natural boundary to the public space, but is continuously connected to it by a ramp and the stone wall, which does not block pedestrians from accessing and visualizing the building's interiors.

The glass panel façade, supported by the concrete slabs which advance in relation to the exterior and highlights itself in the building's pure and compact volume. The single volume is supported by sixteen square columns with a freed ground level, encased by glass. The perimeter's limit and the ground level enclosure were brought back, allowing for a shadowed area in the transition between semi-public and private areas. From the virtual model analysis, as it is possible to observe in the figures below, the afternoon sun at four o'clock p.m. in the summer's solstice, reveals a rather translucent building, with lots of natural light.

The building's horizontality is marked by the proportions between the floors' width and height, as by the proportion and rhythm of the window casements, and the structural system's elements such as columns, beams, and slabs. The last floor's openings' drawings also contribute to accentuate the building's horizontality.

The ground level is elevated from the street level, and the generous access ramp, usually dislocated from the building's central axis, is rather inviting and conduces people smoothly to its interior, without any interruptions or rigid limitations between public and private. This solution is very coherent with the architect's design thinking process, and it is relatable to his inquiring and unquiet personality, contesting and proposing, establishing a dialog between architecture, city, society, and culture of his age. During the walk in the building, one can note the subtleness of the ramps along the central courthouse, just as the amplitude, continuity, and dynamism of internal spaces.

The entrance parlor is located to the left of the building's entrance, where the actual hostess would stay, along with a waiting room. To the right of the access there is a mini-auditorium with rigid boundaries. In the posterior portion of the ground level, there is an exhibition area, also thought for the divulgation and selling of the corporation's products.

The sequence of circulation and access with ramps alongside the internal courthouse is rather important for the concretization of a continuous space, and, utterly, of the *partii* itself. The robust 60 x 60 cm columns and the 60 cm high beams establish a considerable visual scale to the structure, with clear notions of construction stability. Nonetheless, from the built virtual model and from the virtual perspectives, these same elements actually interrupt, although partially so, the amplitude and continuity of these spaces, especially regarding the ceiling, whose beams seem to overly oppress the people within the space, emanating the impression of that the space's height is lower.

The guardrail drawing, material and floor color are interpretations made from the architect's work during that given period.

Going up half a level from the ground floor, there is the location of the sales manager (level 102,00), and going up another half level, the bathrooms (level 103,50). From the simulation of spaces within the virtual model, it was possible to note, from the walk along the ramp, that the internal courthouse is rather dark



Figure 8: Sequence 2: Ground floor on the 102,00 level. Sequential view from the beginning of the ramp, which will take to the upper floors. Sequence 3: Mezzanine on the 103,50 level, with a view of the manager's office, internal courthouse, with artificial illumination. To the right, there is a view from the circulation of the 1st floor, on the 105,00 level, and the vision of the 2nd floor right above it, in the 108,00 level. Sequence 4: vision of the 2nd floor. Source: FLORIO; TAGLIARI, 2014.

depending upon the hour of the day. The view from the walk in the ramps within the internal courthouse, with a square configuration of sides of 9,60 m, and considering the 2,00 m wide ramps, has a partial view of the other floors both above and below the half levels.

Upon reaching the 103,50 level, one can not a small opening for the entrance of natural light, which seems not enough. The view to the internal courthouse, from this space, shows the contrast between the wholly illuminated ground level and the need for artificial illumination in the other floors, especially in the covered circulation areas of each floor.

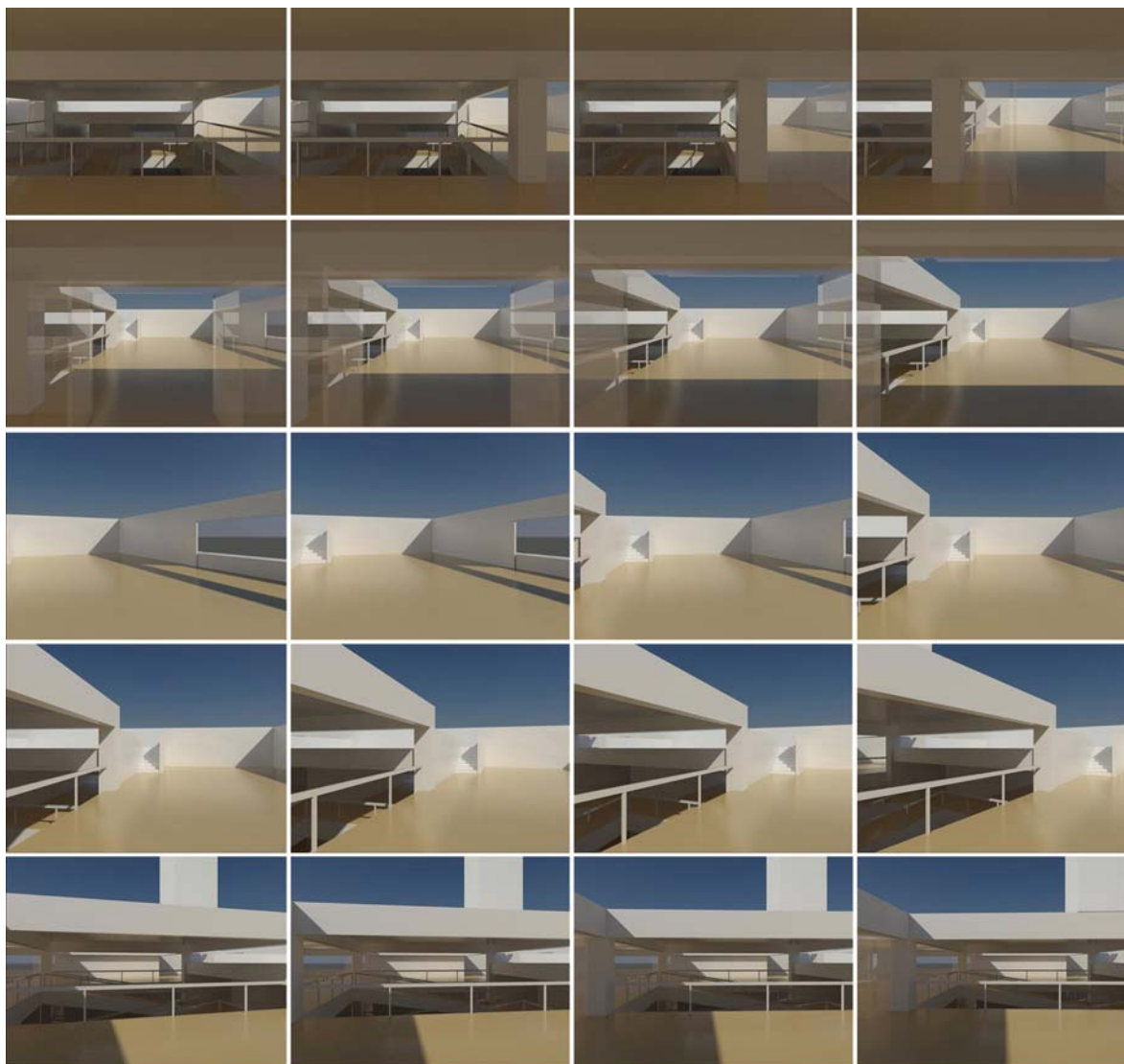
On the 105,00 level, there is a circulation around the courthouse and office rooms in the whole perimeter of the floor. If these rooms' enclosure were to be opaque as foreseen in the design, this floor's circulation would be dark and monotonous. In this manner, the need for artificial light during the day becomes noticeable. Even though the internal courthouse is 4,50 m x 9,60m in order to potentialize natural illumination coming from the openings in the roof, as previously mentioned, the high beams relatively interrupt this continuity. This is not suggested within the drawing, but if the dividing panels were made of glass, or were not to reach the ceiling, the solution would be closer to the architect's work, creating a rather pleasurable internal space as far as natural illumination is concerned.

Figure 9: Sequence 5: Walk through the CEO's office looking to the internal courthouse. Sequence 6: Walk through the external courthouse along the CEO's office.
Source: FLORIO; TAGLIARI, 2014.

The visuals from the 106,50 level are different. From this level one can note a more generous natural illumination offer coming from the openings from the courthouse roof.

The passage from the second floor (level 108,00) to the roof is better illuminated after an analysis of the virtual simulations. The proximity to the roof instigates an increased comfort to the senses, with natural illumination and broad views. The view to the CEO's room, from the mezzanine in the level 109,50, shows wide spaces filled with natural illumination. Lastly, when one reaches the roof (level 111,00), where are the CEO's and meeting rooms, the wide and pleasant exterior areas become evident.

The architectural walk through the ramps reaches its highest when reaching the CEO's room and the open courthouse on the roof, where the walls bound the space and frame the view from a rooftop opening. A helicoidal staircase allows for



the connection from the last floor with a corporate space in the roof, and other straight staircase establishes a communication from the last floor to a privative space in the roof, while another straight staircase establishes a communication between one side and the other of this roof, which has two levels: 111,00 and 112,70.

The spaces on the roof are wide, nourished with good natural illumination and insolation. The external courthouse in the roof could be a gathering and meeting place. All suggests that this space could be used by the company's workers.

It is not possible to affirm whether there would be green areas or gardens in the roof. However, with good insolation during the day, the open areas on the roof would be stimulating and important for leisure and rest. From this terrace, a broad view from the Pinheiros River would be available, and on the other side, the University of São Paulo Campus, in the Butantã district.

DISCUSSION

In the analyzed design it was possible to identify some characteristics that are coherent with the design thinking of the architect in other designs from the same period. These characteristics are: organization of the briefing in half levels, adoption of ramps as vertical circulation, internal courthouse, roof openings, access designed in a way as to dilute the limits between public and private, a single volume, horizontality, and structure as the protagonist within the architecture itself.

The space resulting from the design suggests a rupture with the rigor present in buildings with analogous briefings, as usual in São Paulo's corporate headquarters with stacked floors, vertical circulation dealt with elevators and fire-proof staircases. The open ground level with a continuous as an open plaza that extends the public space into the internal space without any interruptions. The internal courthouse creates visual and spatial fluidity whilst ramps promote the continuity and stimulates the convivence and interaction amongst users.

Between the Artigas' designs with similar briefing, it is important to highlight the Adesite Building (São Paulo, 1961), designed along with Carlos Cascaldi, with the briefing organization done in a similar fashion, considering the adoption of ramps as vertical circulation, roof openings, besides the design of structure defining the architecture itself; and the unbuilt designs – the design of the Federal Customs office building (city of Macapá, Amapá State), which has an internal courthouse illuminated by roof openings and a great roof which envelops the briefing in a single volume; the Trol As office building (city of São Paulo, 1973), with the adoption of ramps and singular structure design in reinforced concrete portal system; the Artigas and Yúrgel office building (São Paulo, 1977), with the adoption of ramps; and the two commercial building compound in the district of Alphaville (City of Barueri, 1984), as a metallic structure proposal, revealing the innovative and experimental spirit of the architect.

These design characteristics are related to the concretization of important concepts within the architect's work, such as freedom and respect when it come to the building's users, spatial and visual continuity, besides innovations when it

comes to the construction, with daring solutions which were rather differentiated for the period they were designed.

In order to propose a chronological contextualization, it is important to mention some building designs from the same period as Pavan's, which have similar and different characteristics, such as the FAUUSP building (1961), the Santos Technical School (1968), the residence Elza Berquó (1968), residence Telmo Porto (1968), residence Ariosto Martirani (1969), and residence Jorge E. Atalla (1971).

In the forementioned designs, it is possible to note a rather introvert spatial notion, as the Telmo Porto house, discussed by authors João Massao Kamita (2000, p. 43), and Fernando Vazques (2013). This characteristic can be observed in other designs such as the FAUUSP or in the Bittencourt house 2, but with different proportions for it is a public building, wider and with a rather generous dimensioning. The Atalla residence design was not built, but it had a similar *partii* with ambiances seeking an internal courthouse illuminated with roof openings.

Many authors have already researched about the investigation of these conceptual aspects in the works of Artigas. The political, cultural, and social matters in Brazil, besides his position regarding the city, promoted in the architect a new manner of creating spaces and shapes in his architecture. It is important to mention that this research does not intend to discuss these well-explored aspects already discussed by researchers like Dalva Thomaz (1997, 2005), Fernando Vazquez (2013, 2016), Gabriel Rodrigues da Cunha (2009), João Massao Kamita (2000), Leandro Medrano and Luiz Recamán (2013), Marcio Cotrim (2008), Marcos Faccioli Gabriel (2003), Miguel Antonio Buzzar (1996, 2003), Ruth Verde Zein (1985, 1986, 2005), and many more. However, it is important to note that each design action has a relation to the matters already explored by the fore mentioned scholars.

The internal courthouse can have different configurations and dimensions, but cannot be misunderstood as an *atrium*, which presents a much bigger scale, dimensions, and proportions, loaded with symbolisms of grandeur. As a ventilaton and natural illumination catalyst, the courthouse has, besides its functional aspects, symbolic value in many cultures, such as the idea of introspection, idea-laden space, spatial continuity, transparency, luminosity, freshness, and purity. In the case of Artigas it is not different, the internal courthouse reveals meanings intrinsic to the concepts within his architecture, besides promoting actions related amongst the users.

There is a clear symbolism in the design decisions of Artigas, for as an artist, he used his art, architecture, to express his inquires and ideas. For these and other reasons, his architecture is considered a work of art, for it makes us think, discuss, and reflect upon facts and variants. The known affirmation by Artigas that "*The city is a house. A house is a city*", could also be read as "*the city is the building*."

In the constructive sequence, the structure is made in first place, followed by the enclosures and finishes. In this way, the construction logic determines the qualities aspired for the architectural work. In Artigas's architecture, as in the

work of fellow modern architects, structure could be read as a protagonist in architecture, and, therefore, has an important role in the space conception. One of the foundations of modern architecture was that once the structure was built, architecture already made itself present.

The drawings suggest a design thought to be built with pre-fabricated elements, dictated by the presented modulation. It was observed that there was a continuous search and experimentation with many types of structure in his designs. In the design for the Pavan Engineering building, all suggests that the window casements, or even the square columns and rectangular beams, are placed in ten meters by ten meters spans.

It is possible to infer is that there was an intense search in the investigation of new constructive processes, which could contribute to the needed advances in terms of construction technology.

The architect incessantly sought new solutions which could be applied to different themes and dimensions of designs, be it public or private. Therefore, all suggests that the architect made the most out of every opportunity to propose alternative ways aiming for the development of constructive techniques which would make it viable to advance in terms of construction in Brazil.

During this research, it was observed the constant presence or adoption of stone in the ground level of the buildings. We can interpret the metaphor of the stone as a symbol of the “*telluric*” (term coined by KAMITA, 2000, p.35), that is, a relative appeal to the earth or to the ground, to that which is rooted to the terrain. This idea seems to have permeated both public and private designs. The stone wall from the Pavan building, aligned with the sidewalk of the frontal façade emanates a contrast between used and new material, such as stone, and the artificially produced material, such as concrete, creating a certain tension between the technological and the artistic. In both cases, the rustic aspect of the material predominates.

The epóxi floor, smooth and shiny, yellow, could be read as the symbol of practicality, cleanness, the simplicity without ornaments, and also the precision of the execution by itself. The rubber floor in the ramps, with a functional anti-slipping appeal, but that highlights an inclined surface between the orthogonal axis.

Even though the architect has employed other materials, such as glass and fiberglass for domes and exteriors panels, and masonry usually addressed with mortar and painted in the white or in primary colors – yellow, blue, and red, we verify in his work, especially in this period, a preference for the explicit reinforced concrete and for the stone, coherent with his discourse.

It is important to highlight the relations of contrast between the employed material: rustic and smooth, opaque and transparent, rough and smooth, and the relation between black and white and the primary colors – yellow, blue, and red. Even though these impressions of hardness and smoothness, heaviness and lightness are restricted to a perceptive character of superficial appreciation, they promote different sensations in the space, and contribute to the appreciation of comfort, intimacy, and permanence.

When it comes to the relation of the building with the street, the access is carefully drawn in a subtle and inviting manner, diluting the public and private, creating a collective environment that promotes new socialization.

It was verified from these analyses that there is an intentional variation of free height in the building's entrance. The user experiences different free height dimensions, with different views, what generates sensations of freedom, visual domain of the space and its connections. The spatial integration, under a same roof, and the deliberate elimination of obstructions within the space, restricting themselves to the essential, makes the internal spaces perceived as a spatial continuity, integrated by half levels which smooth the transposition between floors. The spatial and visual continuity is reinforced by ramps and by the internal courthouse, which allow views from the enriched spatial changes between smaller and broader rooms, higher and lower, nourished with different levels of natural illumination.

The architect suggested different free heights which alternate, from 2.30 m and 2.50 m – more usual in his residences, even courthouses and atriums relatively high, there are varied gradations of spaces. During the walk, it was possible to note these spatial contractions and dilatations.

Just as the accesses and circulations determine and organize the quality of spatial appreciation, the free height dimensions promote different sensations. The lowest free height can generate feelings of nurturing and individuality, as the higher free height can generate the sensation of a wide and collective space. The internal courthouse creates conditions for a visual continuity for the users in all the levels in an introvert form. The disposition of ramps inserted in the courthouse suggests the idea of movement and spatial continuity. The dilations and contractions of the spaces act directly upon our senses.

The wider spaces promote collective events, while the contracted spaces promote privative activities. The dilations and contractions of the spaces allows for varied activities, and the spaces act directly upon our senses, in a physical and psychological manner.

In the Pavan building design, the circulations in the first and second floor go around the internal courthouse and, in a certain way, are illuminated by the openings in the roof. The type of vertical circulation that is more natural is the ramp, more democratic, which promotes great liberty of displacement. The ramps allow for the architect to create connections between floors, in a way to promote and intensify spatial continuity.

Located strategically, the ramps are a possibility of circulation, but also a "meeting space", both visually and spatial. The ramps create a "ritual" for the spatial experience, in privileged points of observation, where one could have knowledge of it all.

Just like in other examples of his architecture work, the building reveals itself introvert, that is, with the activities flowing towards the center, the internal courthouse. However, in the Pavan design we can observe generous openings, which besides allowing natural ventilation and illumination, are the elements which allow to establish relations between the interior and the exterior of a

building, and compose the geometry of the volumetric composition and frame views from the landscape. It is important to mention that the structural and roof conception organize the internal spaces, the openings, and the exterior panels.

In this conception of space, we observe some strategies in the definition of openings. The first of them is one of contrasts between closed up walls and glass planes. The second of them is to generate openings predominantly horizontal, which accompany the horizontality within the buildings. The third is the subdivision of the door casements in such a way as to have parts that move and parts that stay put, with the predominance of the verticals.

The simultaneity of views made available, especially due to the glass's transparency, is present in many designs, as in this corporative building, making it possible to observe the interior from the exterior and vice-versa. Besides, it is also noted that the contraposition between closed up walls and glassed walls directs the eye towards certain points of view. The amplitude and centrality of the internal courthouse of the Pavan building allow broad internal views, making it possible to look many ambiances from varied directions.

In the Pavan design, we observe the adoption of pure forms, particularly the right angle in the meeting of the planes. The diagonal shows in the design of the inclined ramps in space, whose design is originated from its own functionality.

Some conception strategies allow the establishment of a sense of union between the parts. A formal simplicity and a spatial richness allowed the materialization of important concepts for the architect: freedom, simplicity, connection, and union.

During the virtual architectural walkthrough throughout the building's interior it was possible to note spatial characteristics and the temporal sequence between spaces during the walk itself.

This type of investigation encompasses the tridimensional modelling and digital simulation of the spaces. It is important to highlight that the animation allows us to virtually get into the space, proportionating a "temporal" investigation of the ambiances "in movement". This implies in the affirmation that the "final observer" walks through pre-established trajectories in space, in a way as to apprehend some sensations evoked by the sequential ordination of the constructive elements and analogous spaces. Upon walking the internal and external spaces, the possibilities of judging the meaning of the spaces is amplified, as their relationships amongst themselves.

The perception (which captures the exterior world) and the imagination (which processes internally this world) are highly stimulated before images or sequences of images, in the case of the animation. In this sense, the animation amplifies our capacity to interpret spatial relationships between ambiances, expands interpretative possibilities regarding the qualities and characteristics of the spatial organization, as well as the elements which bound the spaces.

FINAL CONSIDERATIONS

Upon the realization of this research we were able to conclude about certain aspects regarding the adopted methodological procedure, as well as the obtained results.

Regarding the methodological procedures, we were able to observe the importance of the new technologies in the aid of the analysis and representation process of unbuilt designs. The new digital tools create the opportunity to singularly analyze and interpret the graphical information from the long-archived designs. The adoption of new technologies allows for many advantages in a very positive scenario for the research in design. The difficulties found aroused especially due to the lack of information regarding the unbuilt designs. However, as part of the methodological procedure there was a considerable effort in the collection of information and repertoire regarding the architecture of Vilanova Artigas by means of his built work, which helped the interpretation of the missing pieces.

Regarding the obtained results, we believe that the research contributes to the enrichment of the debate about Vilanova Artiga's architecture, bringing up original material from primary sources, which allow the interpretation and investigation of the works of this important architect.

The virtual construction allows for an advanced level of understanding and comprehension of these unbuilt designs, offering original material for the investigation of architecture. A possible continuation of this research would be the construction of physical models of these designs in order to better understand the space and form in a tridimensional fashion, with the tactile appeal.

The obtained results create and promote conditions for a reflection and debate regarding the importance of the realization of these designs for the development of Artigas' architecture. We believe that each design has its importance amidst the whole of the works.

One of the research's main goals was to establish scientific procedures for the analysis of unbuilt designs, by means of the organized methodological procedure, in order to obtain new material and to valorize our architectural, cultural, and artistic heritage present in little-known designs, although important in the whole of Artigas's architecture and certainly relevant to the point of investigation.

In this moment, it might seem easy to infer that the architect did not content himself with a unique manner of proceeding when it comes to the same theme, be for a public building, be it for a private building. There is not a definitive formula, a constant characteristic that was exhaustively repeated in his designs. What happened was the adoption of a few concepts and principles, which guided his design propositions. As noted during the analysis, the architect experimented, tested many ways to solve the design problems, be them objective or conceptual, be them public or private designs. This courage and determination made this architect, instigating and inquiring, renowned as one of the protagonists of our architecture, challenging established concepts of his age.

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Wilson Florio

Universidade Presbiteriana Mackenzie. Faculdade de Arquitetura e Urbanismo. São Paulo, SP.

wilsonflorio@gmail.com

Ana Tagliari

Universidade Estadual de Campinas. Faculdade de Engenharia Civil, Arquitetura e Urbanismo. Campinas, SP.

tagliari.ana@gmail.com

