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Modern School Architecture: Analysis of the Educational Research Center Applied in Maceió, Alagoas, Brazil

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Abstract: The concept of park school, conceived by Anísio Teixeira, consisted of an ambitious project of reformulation of the teaching planned to become a national model both in terms of its pedagogical profile and in terms of its physical viability, becoming in an important landmark of modernist architecture. Following this pattern, the Applied Educational Research Complex (CEPA) emerged in 1958 in the city of Maceió in the state of Alagoas, Brazil, transforming the school architecture of the city and being long considered the largest educational complex in Latin America. In this context, the present work had as objective to make a study about the modern school architecture and an analysis of the projective strategies adopted in the Educational Complex of Applied Research (CEPA) in Maceió. A qualitative study was carried out, by means of theoretical foundation and case study, by the accomplishment of technical visit, photographic survey and design analysis, carried out at the Maria José Loureiro State School, component of the Complex. It was concluded that the Educational Complex consists of a strong example of the modern movement in architecture, with the presence of architectural elements intrinsic to this style, and also by the social concepts inherent to the model of Parque Escola. Understanding this way, its importance, still today, for the state of Alagoas.

Key words: "school park", modernism, study of form, architecture, project

1. Introduction

The present article intends to make a study of the modern school architecture, and an analysis of the projective strategies adopted in the Educational Complex of Applied Research (CEPA) in Maceió, capital of the state of Alagoas, Brazil.

The methodological procedures adopted in this study were elaborated based on qualitative research, through theoretical foundation and elaboration of a case study in the Educational Complex of Applied Research (CEPA), having as sample the Maria José Loureiro State School and Moreira e Silva State School2. A technical visit, photographic survey and design analysis were carried out based on the methodologies used by Cavalcante [1] for project analysis that addresses disciplinary and interpretative aspects; also observing the composition of the elements used in the façade, with reference to the principles of Ching [2]. Attending to the sectorization, partitioning and access; to the party; thermal comfort and the geometry of facades and volume. The language of the building was also observed, identifying its dominant design strategies.

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2. Theoretical Foundation

2.1 Modernism in School Architecture in Brazil

The Modern Movement in Brazil generated a new aesthetic phase that integrated tendencies fixed in the

valorization of the reality of the country, suggesting a liberation of the symbolic tie of the classic architecture visualized in the previous period. It was sought to produce school buildings with modulated and optimized spaces that would serve the emergent urban-industrial society [3].

Buffa and Pinto [4] point out that the attribute of simplicity conferred to plants, generally composed of long corridors with rooms on both sides, is more concerned with the use of ventilation, as well as the conditions of insulation and sound insulation. According to Segawa [5] the constructions were of low cost in structures of reinforced concrete and closing in masonry with preoccupation in sizing of circulations and with standardized finishes.

The precepts of rationality and functionality of modern architecture suited the economic interests of the state, and with this the new schools arose with simplicity of volumes, disembedding of ornamentation and use of modulations.

In the state of Alagoas, public education was marked by the CEPA — Educational Center of Applied Research inaugurated between the years of 1958 and 1971 in Maceió. This complex, made up of eleven schools, was designed by the architects Diógenes Rebouças and José Bina Fonyat and strongly influenced by the concept of School Park idealized by Anísio Teixeira. CEPA has long held the position of largest educational complex in Latin America, and is still considered one of the largest in the country [6].

2.2 The Theory of Form

The shape, according to Ching [2], is related to the sense of mass or three-dimensional volume and can be referenced both to the internal structure and to the outer profile, as well as the unit as a whole. The volume can refer to both spaces contained and defined by the planes of the walls, floor and ceiling, as well as space occupied by the mass of a building. The shape, size, color, texture, position, orientation and visual inertia are important properties of the shape, which can be affected by the different conditions and are observed by the individuals. Still according to the author, circulation is seen as the movement through the spaces of a building, responsible for its connection, influencing the perception of its forms and environments through its elements. Already Cavalcante [1] says that the language of the building is established in the interconnection with plurality, with the diversity of architectures and their temporal and spatial contexts. Thus, we take into account the design strategies used to generate the adopted parti.

3. Results and Discussion

Two school units of the CEPA Educational Complex, the Maria José Loureiro State School, directed to elementary education, and the Moreira e Silva State School, which attends secondary and high school students, were analyzed. Both schools count on classrooms, room of direction, coordination and teachers, library, auditorium, laboratories of informatics and sciences, cafeteria, covered patio and green area.

3.1 Modernist Language

The design of the Maria José Loureiro School has architecture with modernist features, without ornamentation, and pure forms can be found, such as the use of rectangular and circular geometric elements in both the floor plan and the façade presentation. The Escola Moreira e Silva presents the same characteristics, having as exception only the circular element, having exclusively rectangular geometric forms. Both schools rely on the presence of vertical linear elements, and the use of brises and cobogos (Figs. 1 and 2).

The recreation area of the Maria José Loureiro School presents a raised concrete box under the pilotis, which provides visual permeability and lightness, resulting in free living, living, and rest spaces (Fig. 3). Elements such as patios that give continuity between the interior and exterior can be found in both schools,

as well as the presence of rhythm in the openings of the doors and use of the full and empty ones, giving them physical characteristics of the modernist school (Fig. 4).

Fig. 1 Cobogós and brises elements on the façade of the State School Maria José Loureiro.

Fig. 2 Cobogós and brises elements on the façade of the State School Moreira e Silva.

Fig. 3 Recreational area of Maria José Loureiro school.

Fig. 4 Green area of Moreira e Silva school.

3.2 Sectorization, Compartmentalization and Accesses

The schools have only ground floor and are divided into six sectors: pedagogical area, educational area, recreational area, green area, services and toilets. In the Maria José Loureiro School, the pedagogical area has irregular shaped environments, due to the circular shape that makes up the structure of this block, while the classrooms have rectangular shapes and are accessed by an extensive corridor without openings. The green and recreational areas are covered by covered and uncovered spaces that have irregular contours (Fig. 5).

In the Moreira e Silva School, the sectors are distributed separately throughout the perimeter of the same, being located in corridors that interconnect them, having openings for the discovered patios. The green areas covered by the courtyards and the recreational area with covered patio and multi-sport gymnasium have regular forms and occupy the largest area of the terrain (Fig. 6).

The accesses of the schools occur in different ways because the Escola Maria José Loureiro is at a high level to the one of the street, being necessary the access by stairs and a more extensive and oblique ramp (Fig. 7). The access to the Moreira e Silva School is carried out only by a simple and straight ramp since its entrance is near the same level of the street (Fig. 8).

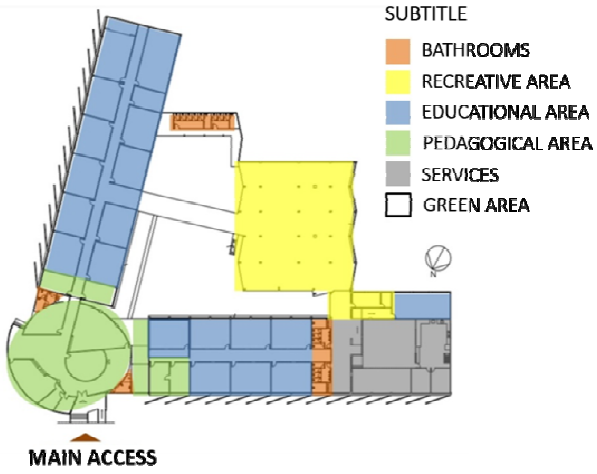

Fig. 5 Ground plan of the Maria José Loureiro State School with the sectorization [9].

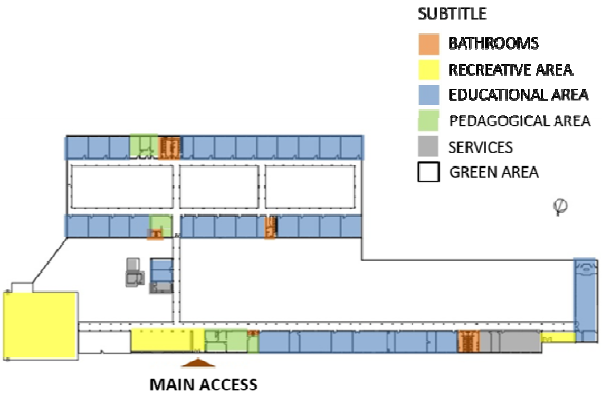

Fig. 6 Ground plan of the Moreira e Silva State School with the sectorization [9].

Fig. 7 Access to school entrance Maria José Loureiro.

Fig. 8 Access to school entrance Moreira e Silva.

3.3 Parti, or Design Concept

When analyzing the lower levels of the schools, it was possible to perceive the existence of a linear organization, because they have repetitive spaces and similar in terms of size, form and function. It is also possible to find principles of order such as symmetry and rhythm (Figs. 9 and 10).

In the Maria José Loureiro School, the pedagogical area, besides having a superior hierarchical level in relation to its function, has a prominent position due to its circular shape, being different from the others, and also serves as a connecting element between the two blocks of rooms of class. The balance and symmetry can be seen in this project, by tracing an imaginary axis diagonally from the center of the pedagogical area, providing a bilateral symmetry (Fig. 11).

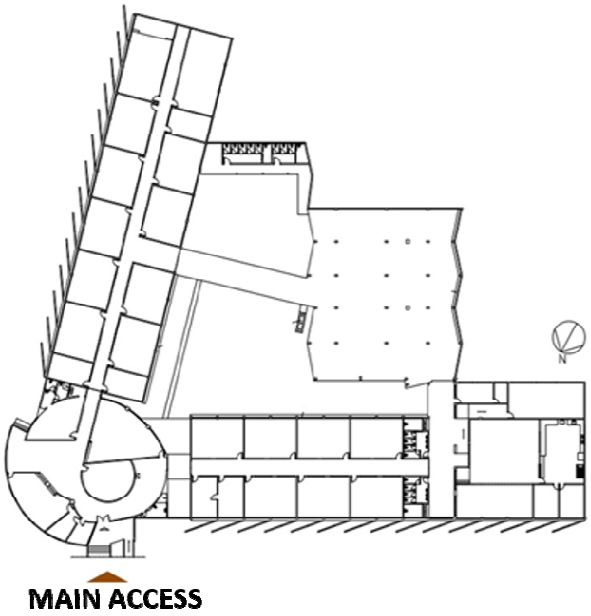

Fig. 9 Ground plan of the school Maria José Loureiro [9].

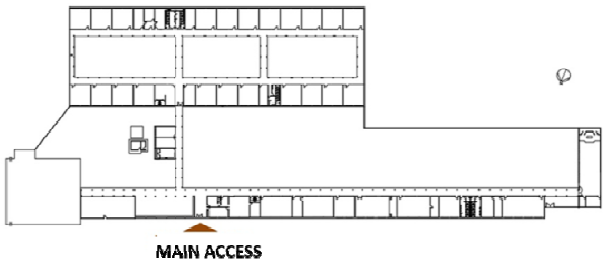

Fig. 10 Ground plan of the school Moreira e Silva [9].

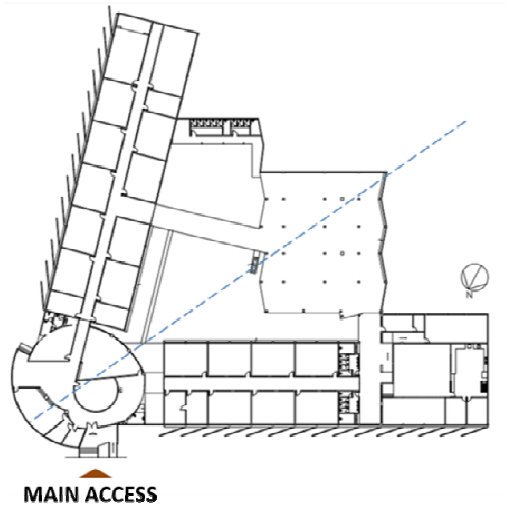

Fig. 11 Ground plan with axis of the Maria José Loureiro State School [9].

The internal circulations of the Maria José Loureiro School that give access to the classrooms are made up of parallel and opaque planes, with insufficient size and illumination, providing a sense of closure along the corridors (Fig. 12). The circulations of the Escola Moreira e Silva are broad and open, presenting a sense of freedom (Fig. 13).

3.4 Comfort

When analyzing the project of the Maria José Loureiro school, it is observed that the building was implanted in the terrain aiming at better thermal comfort for the students, because block 1, which has more classrooms, is contemplated by the southeast and east. As a solution to the problems caused by the sunshine, the architects designed, together with the facades of blocks 1 and 2, concrete bricks, which were strategically directed to protect the direct incidence of solar rays without blocking ventilation (Fig. 14).

Fig. 12 and 13 Circulation of Maria José Loureiro and Moreira e Silva schools, respectively.

In the Moreira e Silva school, it was noticed that the implantation of the school in the field favored the last block of rooms. This school has potential for cross ventilation resulting from the presence of open aisles and windows in classrooms. As in the other school, elements that reduce problems due to sunlight were used (Fig. 15).

3.5 Geometry of Facades and Volume

The Maria José Loureiro School has three facades, the asymmetrical main facade being composed of an entrance located in the circular block, displaced to the

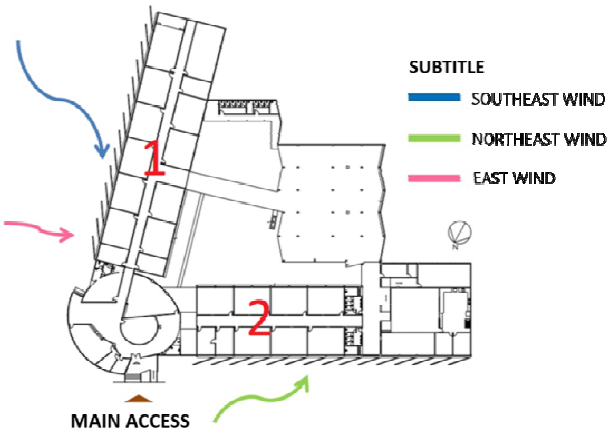

Fig. 14 Ground plan with wind flows of the Maria José Loureiro State School [9].

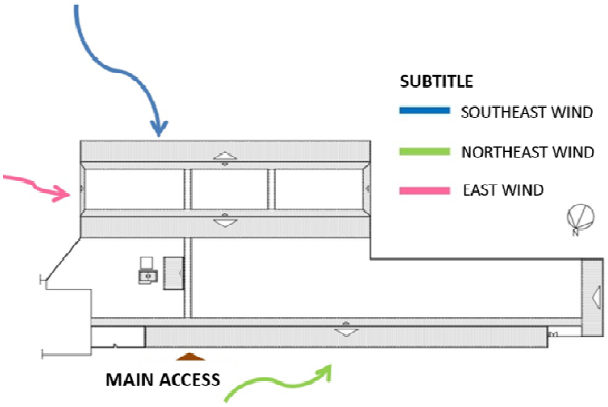

Fig. 15 Ground plan with wind flows of the Moreira e Silva State School [9].

Fig. 16 Main façade of the Maria José Loureiro school.

Fig. 17 Main façade of the Maria José Loureiro school.

left of the building, and also by a series of vertical brises that occupy the other part of the facade, transmitting dynamicity and communicating an idea of verticality to it (Figs. 16 and 17).

As far as volumetry is concerned, the exploration of geometric forms can be seen from a cylindrical element that interconnects two rectangular blocks. Although it is composed of rigid geometric shapes, the addition of brises gives an idea of movement to the whole.

4. Final Considerations

From the theoretical foundation on the modernist school architecture it was observed that the transformations in the scope of the architecture consist in cultural and political reflexes of the society of the period explored. In the case of the schools analyzed, it can be seen that these in fact consist of strong examples of the modern architecture movement, not only through the presence of architectural elements intrinsic to this style, but also through the social concepts that led to the elaboration of the complex.

References

[1] M. M. P. D. Cavalcante, D. B. Ferreira, J. Lima, C. M. O. Silva, and L. V. Torres, Modern school architecture: Analysis of the Educational Center of Applied Research in Maceió-AL, *National Encounter of Technology of the Environment Built* 17 (2018).

[2] Ching Francis D. K. Arquitetura, *Form, Space and Order*, São Paulo: Martins fontes, 1998.

[3] Azevedo Giselle Arteiro Nielsen, School architecture and education: A conceptual model of interactionist approach, Ph.D. Thesis in Sciences in Production Engineering, Federal University of Rio de Janeiro, Rio de Janeiro, 2002, p. 236.

[4] Buffa Ester and Pinto Gerson de Almeida, *Architecture and Education: Organization of Space and Pedagogical Proposals of Escola Escolares Paulistas, 1893-1971* (1st ed.), São Carlos: EdUFSCar, INEP, 2002, p. 174.

[5] Segawa Hugo, *Architectures in Brazil 1900-1990*, São Paulo: Publisher of the University of São Paulo, 1997, p. 224.

[6] Alaniz Erika Porceli and Fernandes Fabrícia Dias da Cunha de Moraes, School architectural patterns and expansion of elementary education in the early 20th century in Brazil, *Electronic Journal of Education* 10 (2016) (3) 87-103, accessed on 15 Mar. 2018, available online at: http://www.reveduc.ufscar.br/index.php/reveduc/article/view/1543/516.

[7] Carvalho Telma Cristina Pichioli, Inclusive School Architecture: Building spaces for early childhood education, Ph.D. thesis in Architecture and Urbanism, University of São Paulo, 2008, p. 342.

[8] Manhas Adriana Capretz Borges da Silva, Manhas Max Paulo Giacheto, Silva Lucas Queiroz and Lima Taiane Gonçalves, To know to preserve: the documentation of school complexes in Maceió (AL) in an architectural portal of historical, technical and artistic interest, in: *9th Seminar Docomomo Brasil — Interdisciplinarity and Experiences in Documentation and Preservation of Recent Patrimony*, Brasília, Anais electronic, 2011, accessed on: Jan 21 2018, available online at: http://docomomo.org.br/wp-content/uploads/2016/01/172_M02_RM-ConhecerParaPreservar-ART_AdrianaManhas.pdf.

[9] ALAGOAS, Secretary of State for Education – SEDUC, School projects in AutoCad format, Maceió, 2002.