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Development of the steel industry and avant-garde architecture of the 20th century in Chile: Unidad Departamental Acería CONOX y Colada Continua (1976), and the Central de Alimentación y Casino (1973), in the CAP-Huachipato plant, as examples of the brutalist paradigm.

Desarrollo de la industria siderúrgica y arquitectura de vanguardia del siglo XX en Chile: La Unidad departamental Acería CONOX y Colada Continua (1976), y Central de Alimentación y Casino (1973) en la usina de CAP-Huachipato, como ejemplos del paradigma brutalista.

Desenvolvimento da indústria siderúrgica e arquitetura de vanguardia do século XX no Chile: Unidad departamental Acería CONOX y Colada Continua (1976), e Central de Alimentación y Casino (1973) na fábrica CAP-Huachipato como exemplos do paradigma brutalista.



Figure 0 Aerial view of the Central Food Plant and Workers' Casino (2021).
Source: Collaboration of Architect Nicolás Moraga

Artículo resultado de la Tesis para optar al grado de Magíster en Patrimonio Arquitectónico y urbano-UBB titulada "Patrimonio Industrial en el Área Metropolitana de Concepción. El rol de la siderúrgica Huachipato en la conformación del paisaje urbano industrial de la Bahía de San Vicente."

RESUMEN

La siderúrgica Huachipato en la bahía de San Vicente, Talcahuano, se pone en marcha a mediados del siglo XX como iniciativa estatal (personificada en CORFO) para crear un centro de producción nacional en la zona del Bío-Bío e impulsar el desarrollo económico y social, en respuesta a la crisis de 1930 y el terremoto de Chillan ocurrido en 1939. Dentro de las primeras décadas de funcionamiento, la Compañía de Acero del Pacífico (CAP) implementó una serie de planes de expansión para mejorar y aumentar la producción, modernizando maquinarias y construyendo edificaciones a fin de dar cabida tanto a los nuevos procesos industriales, como a los equipamientos de servicios que utilizarían los obreros. En este contexto, en la década de los 70, se construyeron dos obras de notable calidad arquitectónica: la Unidad Departamental de la Acería CONOX y Colada Continua, y la Central de Alimentación y Casino de trabajadores. En el estudio que aquí se presenta, se recabó la información disponible en Revista AUCA (1979), donde dichos proyectos fueron publicados, y luego se analizaron las características de estas edificaciones poniendo en relevancia sus valores como obra de arquitectura (morfológicos, espaciales, estéticos, estructurales) y revisando los fundamentos teóricos y la relación con otras obras de arquitectura claves para entender los conceptos de "brutalismo" y "mat building". En síntesis, los resultados reflejan que estas obras, aunque disímiles entre sí, por adaptarse a funciones tan diferentes como la producción industrial y el equipamiento para obreros, recogen el paradigma moderno del X CIAM de 1956 y los criterios proyectuales de la vanguardia arquitectónica de los años sesenta, configurándose, a la vez, como patrimonio industrial y como patrimonio arquitectónico de Chile.

Palabras clave: patrimonio industrial, patrimonio arquitectónico, brutalismo, arquitectura moderna, *mat building*.

ABSTRACT

The Huachipato steel plant located in San Vicente Bay, Talcahuano, was set in motion in the mid-20th century as a state initiative (personified in CORFO), to create a national production center in the Bío-Bío area and to promote economic and social development, in response to the 1930 crisis and the Chillan earthquake, in 1939. Within the first decades of operation, the *Compañía de Acero del Pacífico* (CAP) implemented a series of expansion plans to improve and increase production, modernizing machinery and constructing buildings to accommodate both the new industrial processes and the service equipment that the workers would use. In this context, in the 1970s, two buildings of notable architectural quality were built: the *Unidad Departamental Acería CONOX y Colada Continua*, and the *Central de Alimentación y Casino de Trabajadores*. In this study, the information available in *Revista AUCA* (1979), where said projects are published, was collected, and later the characteristics of these buildings were analyzed, highlighting their values as architectural work -morphological, spatial, aesthetic, structural-, reviewing the theoretical foundations and the relationship with other key architectural works, to understand the concepts of "brutalism" and "mat building". In summary, the results reflect that these works, on adapting to functions that are so different to each other, as the industrial production and workers' facilities are, reflect the modern paradigm of 1959's X CIAM and the design criteria of the architectural avant-garde of the 1960's, becoming both industrial heritage and architectural heritage of Chile.

Keywords: Industrial heritage, architectural heritage, *brutalism*, mat building, modern architecture.

RESUMO

A usina siderúrgica Huachipato na baía de San Vicente, Talcahuano, foi lançada em meados do século 20 como uma iniciativa estatal (personificada em CORFO) para criar um centro de produção nacional na área do rio Bío-Bío e promover o desenvolvimento econômico e social como resposta à crise de 1930 e ao terremoto de Chillán, ocorrido em 1939. Nas primeiras décadas de operação, a Compañía de Acero del Pacífico (CAP) implementou uma série de planos de expansão para melhorar e aumentar a produção, modernizando máquinas e construindo edifícios para acomodar os novos processos industriais, bem como os equipamentos de serviço que os trabalhadores utilizariam. Nesse contexto, na década de 1970, foram construídas duas obras de notável qualidade arquitetônica: a Unidad departamental Acería CONOX y Colada Continua e a Central de Alimentación y Casino de trabajadores. No presente estudo foram recolhidas as informações disponíveis na Revista AUCA (1979), na qual foram publicados os respectivos projetos e, em seguida, foram analisadas as características destes edifícios, destacando os seus valores como obra de arquitetura: morfológicos, espaciais, estéticos, estruturais, revendo os fundamentos teóricos e a relação com outras obras arquitetônicas fundamentais para compreender os conceitos de "brutalismo" e "mat building". Em suma, os resultados refletem que essas obras, embora diferentes entre si, por se adaptarem a funções tão diferentes como a produção industrial e o equipamento dos trabalhadores, refletem o paradigma moderno do X CIAM de 1956 e os critérios de design da vanguarda arquitetônica dos anos sessenta, configurando-se, ao mesmo tempo, como patrimônio industrial e patrimônio arquitetônico do Chile.

Palavras chave: Patrimônio industrial, patrimônio arquitetônico, brutalismo, mat building, arquitetura moderna.

INTRODUCTION

The Industrial Revolution, at different moments for Europe and Latin America, led to the formation of urban industrial areas, along with an architecture dedicated to supporting production activities. In the 20th century, following the modern mechanistic paradigm, the abandonment of styles, and thanks to the development of new construction technologies, using materials like steel and reinforced concrete (Aguirre, 2008), new typologies were consolidated for factory spaces, which were adopted early by some Chilean industries.

Huachipato Steelworks, owned by *Compañía de Acero del Pacífico S.A.* (CAP, in Spanish), appeared during the 1940s as a state project led by CORFO (Chilean Production Development Corporation). During the following decades, the steelworks project was finalized, covering a large part of the shoreline of San Vicente Bay, and becoming a pole for industrial development.

In the framework of the company's development policy, the architecture of corporate buildings was used from early on, as a dissemination platform of the materials that CAP produced in its steelworks. To achieve this goal, several renowned architects were hired, who developed company-led innovative projects, both inside and outside the factories.

Importance of the matter

The transformations of the production system and the commercial logic have subjected 20th-century industrial structures to an obsolescence system, jeopardizing their permanence (Lorca, 2017), something common in the steelworks area. In the case of Huachipato, this situation also occurs, given the need to integrate the management of the industrial complex and its heritage values into the urban development plans. In this sense, this work seeks to highlight the heritage of the factory, where it is possible to see two pioneering examples of Latin American architecture from the second half of the 20th century, where it is possible to see early solutions to the debates that, then, were appearing internationally, and which sparked a broad discussion after the crisis of the Modern Movement, with the finalization of the CIAM congresses and the appearance of the New Brutalism.

State-of-the-art

Although the issue of industrial heritage in Metropolitan Concepción has been suggested, from the architectural and urban value of the dwellings developed by the industry for its workers – for example, in Cerda and Puentes (2019), where the complexes built by *CRAV*, in Penco, are addressed-, little is mentioned about the industrial facilities themselves, outside of those of the Lota coal mine, as happens in the work of Moraga (2015) on Chambeque structures. The studies found on Huachipato Steelworks mainly focus on the field of engineering, analyzing the processes, systems, and technologies involved in the plant. The studies from the field of architecture and urbanism refer to the housing complexes built by *CAP*, among which the article of Fuentes and Pérez (2018) stands out, which describes the establishment of an urban model from the company's housing policies. Even though it alludes to works outside the study area, the study of Esparza (2016) can also be mentioned,

where *Villa Presidente Ríos* (Emilio Duhart) is reviewed, an iconic housing complex of *CAP*, close to *Huachipato*, which also shows how industrial development served to promote modern architecture. According to the information collected, beyond the publications of journals where the works are reviewed, such as the monograph revision of the Bresciani, Valdés, Castillo, and Huidobro firm, by Pérez Oyarzún (2006), no research addresses the steelworks' facilities from the architectural point of view.

In this case, it is proposed to analyze the buildings located on the industrial site, built in the 1970s, in the context of the extension and modernization projects of the steelworks factory. Among the facilities chosen is the *CONOX Steelworks* and the *Continuous Casting Department Unit*, created from a plan to improve the distribution of the buildings and specialized units, from which architects De Groote, Gubbins, Molina, and Barros projected this service building linked to the workers of the steel foundry section. The other facility chosen is the *Food Center and Cafeteria (Central de Alimentación y Casino*, in Spanish), designed by Bresciani, Valdés, Castillo, and Huidobro (BVCH), which sought to provide a comprehensive solution to the workers' needs, derived from the increase in production. This, taking into consideration that the CAP-Huachipato factory is an industrial heritage complex that is not officially recognized, and the relevance of the buildings as architectural heritage, on having integrated, as pioneers in Chile, and even in Latin America, the proposals that were being discussed internationally in the area of architecture.

The concept of "industrial heritage" refers to the elements that emerged from the production activities of industrialization, such as buildings, structures, processes, and tools, along with settlements, territories, and landscapes where they were located, which have fundamental importance as a testimony of historic, economic, and social phenomena that had a close relationship with the way of living of different human groups (The International Committee for the Conservation of the Industrial Heritage [TICCIH], 2003).

The convergence between industry and modern architecture is long. On one hand, industrial structures like "(...) silos, water towers, factories, ships, blast furnaces, foundries, gas holders, cooling towers, water deposits, among others (...)"¹ (Layuno, 2013, p. 665), began to be seen as models for the rational and aesthetic conception of architectural form. The machine and the factory were icons of modernity, and industry was a vehicle of development (Torrent, 2017). This resignification is linked with the advent of modern architecture at the beginning of the 20th century, just as Pancorbo and Martín state:

The adoption of the mechanist paradigm by science drove the technological and industrial revolution, leading to the machine era and a new category of materials: technical objects. The generalized predominance of the mechanical paradigm in architecture as of the 20th century, adopting the technique as a guiding line for architectural activity, and using rational and scientific premises in the project process, led to the birth of modern architecture (2014, p. 1)².

THEORETICAL FRAMEWORK

1 Free translation.
2 Free translation.

On the other hand, modern architecture gave feedback to industry: the production-focused buildings began to exploit the new technique -abandoning the old aesthetic canons- with projects that considered large-scale structures, wherein beyond their utilitarian nature, gave room to architectural exploration. The most classical examples are the *AEG Turbine Factory* (Peter Behrens, 1910), the *Fagus factory* (Walter Gropius & Adolf Meyer, 1913), and others that are just or more notorious regarding their contribution to the image of the factory itself as a cultural symbol, along with the resulting development of modern architecture, in the middle of the 20th century. One of these, without a doubt, is the colossal work of Albert Khan (Pancorbo, 2016), which was referenced by architects such as Mies van der Rohe (Pancorbo & Martín, 2016).

METHODOLOGY

From the methodological point of view, this study first considered revising the historical background of Huachipato Steelworks as a production initiative, to contextualize the construction of the works. Starting from a bibliographical review of different sources, it was sought to understand the debate that came from the CIAM IX and X seminars, as well as the appearance of TEAM X as a precursor of a type of architecture that tried to overcome the limitations of functionalist architecture. After this, the works chosen from the bibliographic review of their publications in the AUCA Journal of 1979, were described and analyzed based on the theoretical outlines reviewed.

RESULTS

Background of Huachipato Steelworks

The *Compañía de Acero del Pacífico* (CAP, in Spanish) was born from a state initiative personified in the *Development Corporation* (CORFO, in Spanish), which sought to overcome the economic difficulties of the Great Depression (1929), and the internal situation, diversifying national production by substituting imports and expanding exports, exploiting the natural resources of the country (Ortega, 1989), through the industrialization and consolidation of production centers. With this purpose, CORFO created different national basic industries in the mid-20th century, among which CAP (1946) is found, which involved building the Huachipato Steelworks.

CAP decided to install their steelworks in the San Vicente Bay, in the Province of Concepción, a place that, although distant from the iron mines in the north of the country, had the advantage of being close to the Lota and Schwager coal mines -the potential of the port in the bay to receive raw materials- and the Biobío River as a water source, among other territorial advantages, as well as being close to the urban centers of Talcahuano and Concepción, which could provide the services and housing needed for the workers (Echeñique & Rodríguez, 1990).

With the design of the steelworks, the land was also laid out for future extension plans, with an attached industrial area, and the construction of a workers' housing complex. Huachipato plant was built in 3 years (1947-1950) and began operations in 1951 when only the parts essential for plant operation had been built. As a result, over the first few decades, it would be extended through a series of facility extension and modernization plans to increase production.

New Brutalism

The term “*brutalism*” was created by Hans Asplund in 1952 and was popularized by Alison and Peter Smithson (1953) in the description of an A+PS housing project in London’s Soho district. It is described as:

(...) not just a language recognized in the shape, but as a way of being located and acting facing the matter; and the materials of a project. It is an attitude to try out the possibility architecture has to be an instrument that strengthens a more educated relationship – on being clearer and having a higher quality- between the human being and their needs of association, nature, and construction (Vidotto, 1997, p. 13) ³.

It likewise proposes a rereading of the modern movement, where the emphasis is not placed on functional aspects, but rather on relational ones. It vaguely adopts elements of scientific structuralism and suggests a differentiation – if the analogy with the concept devised by Habraken (1974), and developed by Hertzberger (2005) and other authors is validated – between support elements (fixed, static, regular; such as weight-bearing elements, and facilities) and infill packages (programs, partitions, and spaces, particularly those that are intermediate or relational), in the development of the project and its materiality.

Despite the standard spectrum of brutalist production being very broad, these ideas are laid out in the conception of a new architectural type, the mat building. The first building considered as brutalist is the Hunstanton School, of Alison and Peter Smithson (A+PS) (1950-1954). Later, Reyner Banham established a first theoretical approach to this current in his article in *AR New Brutalism* (1955), and a decade later, presents a brutalist architecture canon in the book *The New Brutalism: ethic or aesthetic* (1966). There, Banham looks at the works of the previous fifteen years, that encompass the ethical ideal of this new current, which started being built starting from *CIAM IX*, and the emergence of *TEAM X*, showing, at the same time, a move towards an aesthetic (a style) which, although to a great extent it betrays the original suggestions of *Team X* and other precursors, it contributes to the extension and popularization of the new architecture. Banham’s book (1966) selects European, American, Japanese representatives, and just one from Latin America: the dwellings of *Villa Portales* by BVCH. According to this text, this choice is fundamentally based on the shape developed in the piece with the exempt staircase and the material treatment of the back slope. Therefore, according to the author, it would be the use of compositional resources that allows inserting the work within brutalism, more because of anesthetic (a style) than an ethic. However, the basic principle of the brutalism ethic had been taken onboard by BVCH and was already being applied in works developed by them in those years (like the project for the State Technical University in 1957). There is no doubt that they were perfectly familiarized with the axioms of this current. Their firm regularly received the latest issues of *Domus*, *Architectural Design*, *L’Architecture d’Aujourd’hui*, and *Quaderns*. It must be added that both Bresciani and Castillo were among those who signed the constitution of the Chilean branch of *CIAM*, and their works were

internationally renowned from the opening of the firm in 1953. *Villa Portales* caught the attention of *Banham*, from its publication in 1961, in issue 12 of *Architectural Design*.

Architecture works at CAP-Huachipato Steelworks

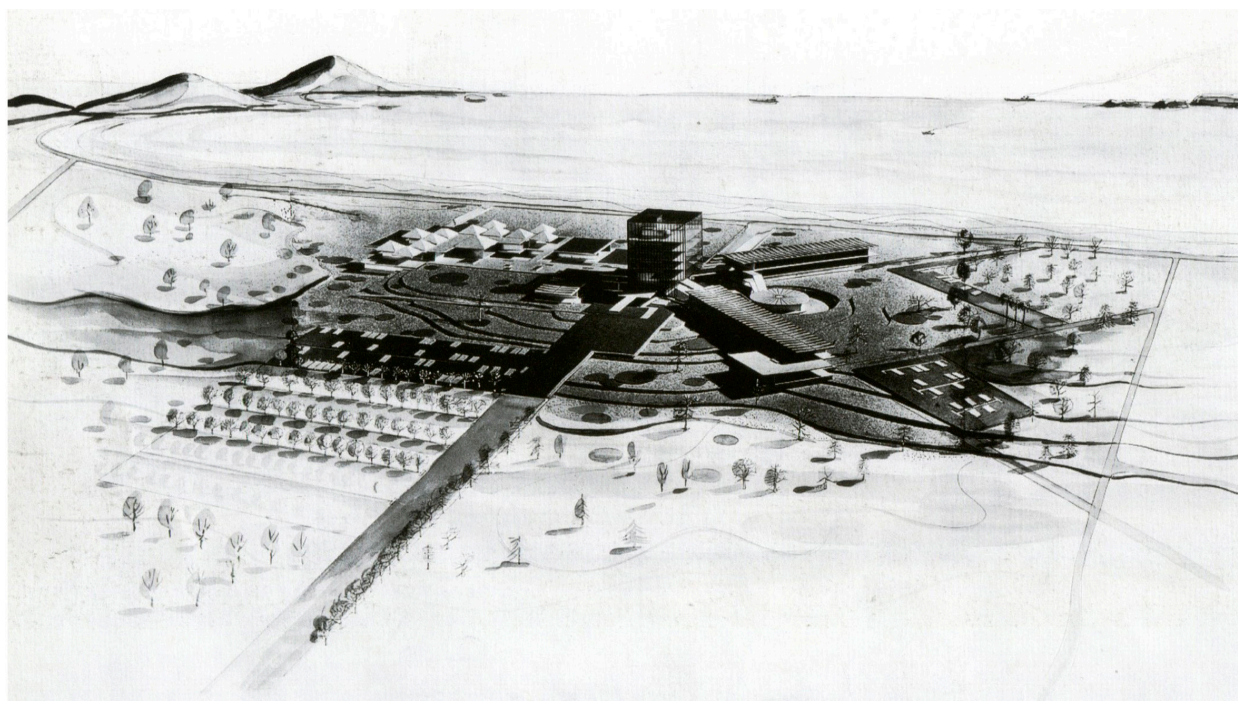
The extension plans of Huachipato considered the construction of new structures, including some of the most iconic of the industry, such as Blast Furnace N°2, which was added to the complex in 1965; CONOX Steelworks, that would replace the Siemens-Martin Steelworks in 1976, to reach a production of 1,000,000 tons of steel per year. An integrated personnel assistance policy, and the adaptation to the demands of the production increase itself, were outlined as part of the expansion policy. This meant the construction of new service facilities for the workers, including the CONOX Steelworks and Continuous Casting Department Unit, and the Food Center and Cafeteria for the workers. Both works are published in the AUCA Journal N°36 issue, from 1979, "VIII Region Urban Development 4", which includes analysis on the Concepción Intercommunal Plan (1963), where the industrial production vocation assigned to San Vicente Bay can be seen.

In this same issue, a series of projects are published that today are considered as modern heritage, like the Remodelación Catedral, the Caja de Compensación CCHC, and COPELEC, together with other housing works, demonstrating the relevance of the steelworks plant's works.

Food Center and Cafeteria

The Huachipato Steelworks Food Center and Cafeteria was part of the project for a complex of facilities, where both the facilities that would serve all the plant's personnel, around 4,000 workers, and an office tower that would house the administration units that were laid out around the plant (Pérez Oyarzún, 2006), would be located. This was on the southern sector of the Huachipato site, towards the shoreline, connected to the plant through a coastal road and central intersection that organized the steelworks longitudinally. This project was assigned to the architecture firm, Bresciani, Valdés, Castillo, and Huidobro, and was developed between 1964 and 1972, to be built and start its operations in 1973. To address this, the architects made a study that sought to compositely integrate the different functions within the program, so that the work would have a unit nature and be adapted to the natural features of the place (Bresciani, Valdés, Castillo Velasco, & Huidobro, 1979). The Executive Complex project considered a set of buildings: The Food Center and Cafeteria, an office tower, and three low-rise blocks for the engineering and industrial relations comptroller departments. These buildings were connected by a horizontal plate and a corridor and were organized into wings using the hall in the heart of the office tower (**Figure 1**).

However, attending to the priorities of the company, only the unit to provide meals to the personnel, and part of the office tower and engineering pavilions, were built, with just the foundations and steel



structure of the tower being built, which ended up being dismantled (Castillo Velasco [2008], in Fuentes, 2013). Regarding the material of the structure, Pérez Oyarzún states:

Given the nature of the company, the building complex for the general offices and the Food Center and Cafeteria were projected considering steel as the basic structural material. However, in the cafeteria -the only fully built sector – the structures are mixed: steel combined with reinforced concrete walls due to the seismic stresses (2006, p. 116).⁵

The first level comprises a horizontal plate whose upper floor plan extended with an overhang, and was completely dedicated to the meals program, while the second level was destined to the dining hall (Figure 2). This distribution looked to facilitate food production logistics, providing all the associated functions on a single level. The dining areas were built on the plate that was used as a terrace, with a panoramic view of the bay, while the indoor space was set out with a series of square modules with a transparent perimeter and pyramidal roof (Figure 3).

These modules were distributed forming differentiated spaces on the terrace, in a full-empty logic, and were organized by a graticule that governs the composition, which links the Cafeteria building with the mat buildings. Both the construction of the buildings that tried out this formal strategy and the appearance of the concept in journals took place in the 1960s and 1970s, right at the time the steelworks building was projected. The starting point of the mat building concept can be seen in the project for Berlin Free University (1963-1973), by the architects Candilis, Josic, and Woods: a low-rise, high-density building that was developed horizontally, so that its spatial structure looked like a piece of fabric (Such, 2011). The analogy with fabric comes from the matrix the units of an architectural complex are organized

Figure 1 Perspective of the final blueprint for the casino and casino and office complex CAP. Source: Personal file Héctor Valdés P. in Pérez Oyarzún, (2006). Oyarzún, (2006).

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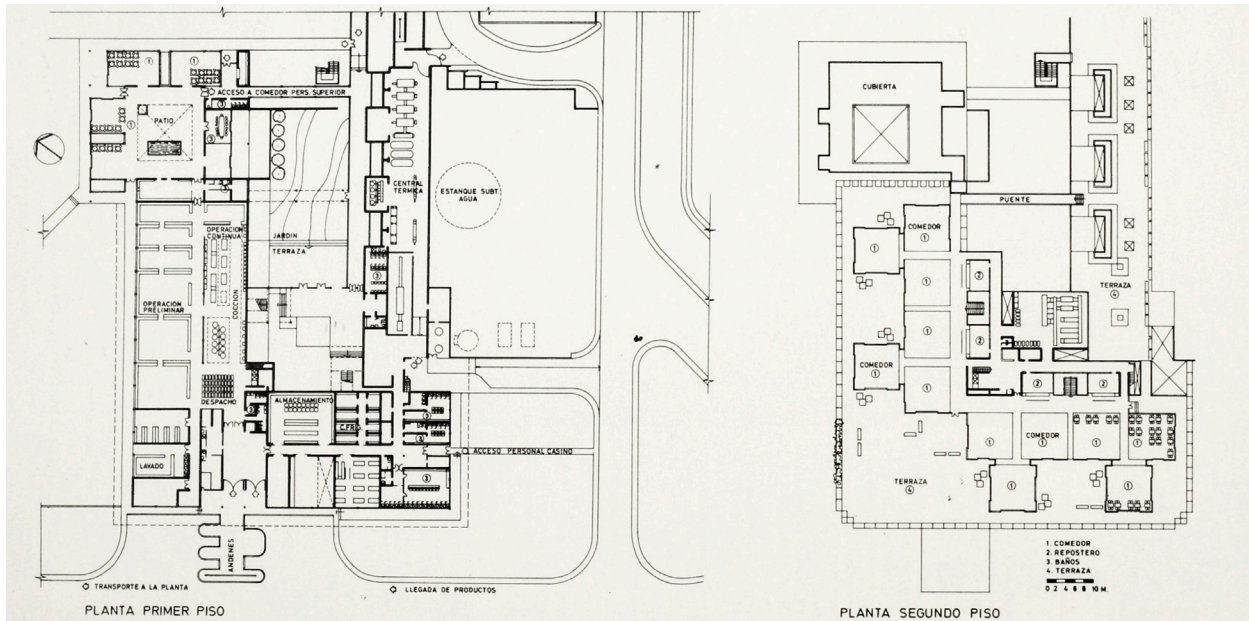


Figure 2 First and second floors of the Central de Alimentación y Casino and second floors of the Central Casino. Source: Bresciani et al. (1979).

Figure 3. Interior view of the canteens of the Central Food Plant, 2016. Food, 2016. Source: Own elaboration (Ignacio Bisbal Grandal).

as a continuous construction, while the alternating units are capable of forming a section that can be extended, being similar to a building-city relationship and scale, with the ability to produce a landscape in itself (Such, 2011). The Amsterdam Orphanage, projected by Aldo Van Eyck between 1955 and 1960, shows the relationship between these modules, which are alternatingly repeated, to generate an irregular, though continuous shape that forms, at the same time, the external space on the ground on which it is expanded as a structure. In this sense, the idea of *mat building* is associated with the compositive operation made for the second floor of CAP's Cafeteria, where



the plate of the first level establishes the floor plan on which this structure is developed, where the square modules are distributed to generate the dining hall space and to set up the terrace areas; a distribution that also leads to the formal result of the upper part of the building, which builds its relationship with the horizontal extension of the landscape it is inserted within (Figure 4).

The job allows the architects to continue with research that was already in motion, not just in the aesthetic area, but also in typological planning, the development of circulations, the relationship with the surroundings, programmatic flexibility, and structural modeling. In this way, the building is developed as a modulated system, where the structural halls are regularly repeated. On the upper floor, the halls are roofed with a hip roof that generates two spatial module sizes. This system has all the features that brutalist thinking outlined for *mat buildings*: a building outlined from a changing order, "(...) based on the interconnection, the dense patterns of association, and the possibilities of growth, reduction, and change" (Smithson, 1974, p. 6), whose understanding "(...) must emerge from the perception of the parts, as it is not possible to see the system as a whole" ⁶ (Smithson, 1974, p. 13). The project is, indeed, made with an open flexible system that allows growth and programmatic transformation. This planning becomes a horizontally built building, with edges that adapt to the conditions of the surroundings and yards, which guide circulation, and the program.

CONOX and Continuous Casting Departmental Unit

The project was entrusted to the team of architects comprising Christian de Groot, Victor Gubbins, Hugo Molina, and Gloria Barros, from the study prepared by the firm in 1970 regarding the "(...) urbanistic and architectural

Figure 4 Aerial view of the southern south of the Huachipato site where the Power Plant is located, 2021. Power Plant, 2021. Source: Collaboration of Architect Nicolás Moraga. Moraga.

⁶ Free translation.

Figure 5 View of the building of the Conox and Continuous Casting Conox and Continuous Casting. Source: De Groote et al. (1979).



improvement of Huachipato Plant, considering the steelworks expansion plans (...) 7' (De Groote, Gubbins, Molina & Barros, 1979, p. 44). Referring to the results of their work, De Grotte et al. state:

In said study, a high level of dispersion of the production support units was detected, such as the offices, personnel changing rooms (restrooms and lockers), and dining halls, corresponding to each one of the plant's production departments (Blast Furnaces and Fuels, Steelworks, Rolling Mills), as well as those related to maintenance. As a result, the Improvement Plan proposed joining these services into Department Units, located alongside the operation units. (1979, p. 44) 8.

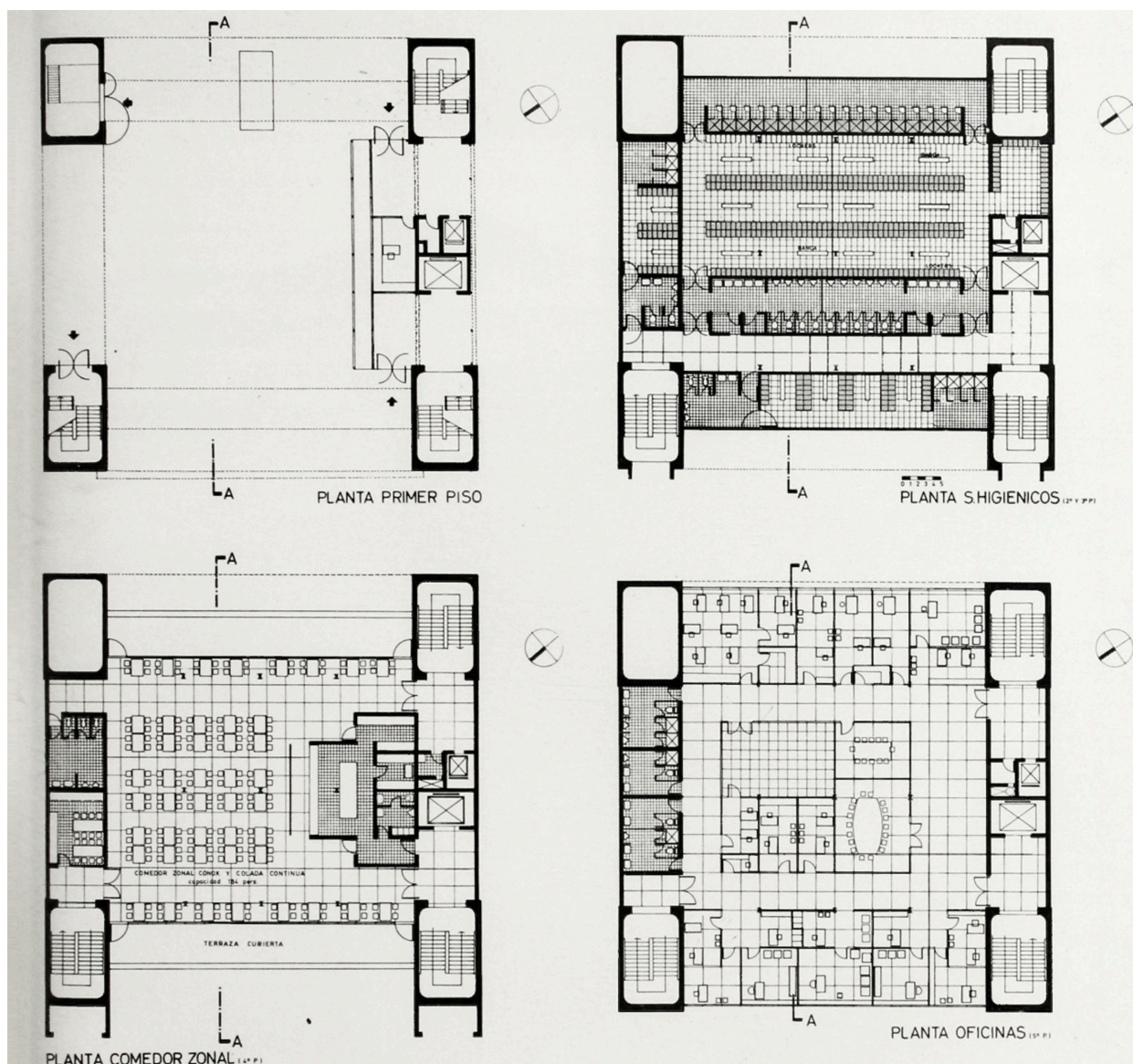
As a result, the Department Unit Project initially had to address the personnel of CONOX Steelworks (1976), and then, Continuous Casting (1988-1994), whose project would be built later; due to the connection with the steelworks in the production process line, the reason why it was placed between both buildings.

The building, which contained offices, a dining hall, and restrooms, was characterized by the high-rise development of this program, leaving the first level mainly clear with just personnel access and a free height of approximately 5.5 m, to allow maneuvers of operators and the vehicles needed for the steelwork's operation (Figure 5). The upper 5-floor body was supported by four reinforced concrete cores that held the vertical circulations (elevators and stairs) and the shaft for utilities. The metal platforms were suspended from the lateral cores to form the levels where the restrooms (2nd and 3rd), dining hall (4th), and office area (5th) were distributed (Figure 6). An enclosed corridor was also hung on the outside of the cores, to connect the building with the CONOX Steelworks and Continuous Casting, which linked to the stairwell ladings between the 2nd and 3rd floors.

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The Department Unit, beyond its functional link, establishes a relationship



with the *CONOX Steelworks* building (built in the same decade) in terms of proportion, as, despite its 5 levels, the monumental scale of the steelworks largely stands out, which the architects highlight in the publication of the building (Figure 7). In this dialog, the expressions of its materials, the visible concrete of the facility, and the metal cover with oxide patina of the production building, also intervene (Figure 8).

The Department Unit becomes a brutalist approach to the project, in a time where this movement had already had an important international development and where it had lost a good deal of its ethics, leading to a change of its initial budgets. Although the building does follow this aesthetic, since its tectonics expose both the inherent qualities of the concrete and steel, without a greater treatment than the civil works themselves, the core aspect of its approach must be highlighted, strongly entrenched in the brutalist ethic of architecture, understood as open support that allows programmatic flexibility. In this way, the structural system is directly translated into the morphology of the building, displacing the structure to the sides, and leaving the central space

Figure 6 Architectural plans of the departmental unit. Source: De Groote et al. (1979).

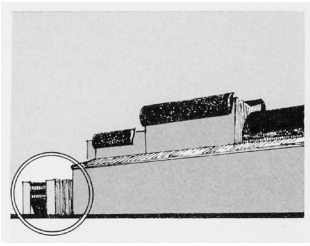


Figure 7 Diagram of the ratio between the Departmental and the Steel Mill CONOX. Source: De Groote et al. (1979).

Figure 8 Aerial view of the sector of the industry where the CONOX CONOX steel mill and the departmental unit are located, 2021. See the scalar relationship and the material dialogue between both buildings. buildings. Source: Collaboration by Architect Nicolás Moraga.



clear; to turn each floor into a bridge between the supporting cores, services, and lateral circulations.

More than an aesthetic aspiration, the “brutalist” nature of the work comes from the aforementioned criteria; ideas the architects of this new generation of the modern movement agreed with.

CONCLUSIONS

Both the Food Central and the Department Unit addressed here, are works that arise from the development and growth of the Huachipato steelworks industry, and CAP’s decision to build these facilities for their workers, entrusting the projects to renowned architecture firms. The professionals presented their projects using criteria that were fully in line with the brutalist ethic, where the functional vision is left aside, fostering relational and flexible aspects that allow for a better relationship between architecture, its inhabitants, and the surroundings. Modern architecture criteria, such as the exposure of materials and structure that evolved in brutalism, and proposals like the composition by full and empty spaces in a mat building, are recognizable in the works and connect to other contemporary avant-garde projects of the 1970s. If, on one hand, the cafeteria clearly is a part of the pioneer developments of the new mat building type (Berlin Free University; Amsterdam Orphanage), built as a horizontal platform which, through modulation and variation, provides a noticeable capacity for flexibility and adaptation, on the other the Department Unit develops an evolved concept of this line of thought, where flexibility comes from the concentration of circulations, structures, and services. Thus, this type of building matches other previous ones, like the Sao Paulo Art Museum (1957-1968), the Ford Foundation by Kevin Roche (1968), and is a typological precursor of works like

the HSBC, by Norman Foster (1979).

The CONOX Steelworks and Continuous Casting Department Unit, and the Food Center and Cafeteria, fully constitute an architectural heritage that is linked to industrial heritage elements in the CAP-Huachipato Steelworks and represent its heyday. This heritage is particularly fragile as the entire Concepción Metropolitan Area "(...) is experiencing the severe social and urban effects of de-industrialization and production reconversion (...))" (Santa Cruz, 2018, p. 3), and the decadence of the economic projection of Huachipato, resulting from a market reduction. From this perspective, it is of vital importance to preserve and value the architectural heritage of the steelworks, as well as its dissemination and study.

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