

# THE MODERN URBAN PROJECT AND ITS ENVIRONMENTAL VALUE: VILLA LOS PRESIDENTES, ÑUÑOA, SANTIAGO, CHILE.

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## ABSTRACT.

In many ways, nature is present in modern architectural housing complexes.

Although the first inhabitants could immediately enjoy well-lit, oriented, and ventilated apartments, half a century later, the landscape is different. Multiple tree species bathe parks, plazas, trails, and private patios. From the inside, the buildings commonly disappear among a significant plant mass.

Recent development of the popular application of the cameras mounted on drones along with the satellite views, when looking at them from above, the urban project closely related to the city appears. The benefits for the quality of life of the inhabitants seem obvious. For this (and for several other reasons), multiple complexes have been recognized as heritage in various parts of the world. Behind its most significant values, there is usually the relationship between architecture and nature, on different scales and in different ways.

For this reason, it is necessary to determine more clearly (and from other disciplines) how nature is related to its most significant attributes and heritage values. Knowing, measuring, and interpreting the variables, not only influence their effectiveness but could also constitute new layers of information that guide their preservation on a large scale. Above all, in contexts of climate change.

This text is divided into three sections: Collective housing and nature; nature and heritage values; and the environmental dimension of the modern urban project, Grecia Avenue, Santiago, Chile.

## 1. COLECTIVE HOUSING AND NATURE

It is widely known that one of the fundamental roots of modern architecture comes from sanitary aspects introduced by medical science. Among them hygienic, antisepsis, and heliotherapy. For this reason alone, Modern Architecture, by condensing human knowledge advances concerning hygienic and environmental aspects, should be considered universal heritage<sup>1</sup>. For housing complexes, it was a process of many voices, theories, writings, and projects that addressed the challenge of collective housing for the masses, many of them from explicit health approaches. *Hygeia*<sup>2</sup>, a book written by Dr. Benjamin Ward Richardson was one of them.

In the book, to definitively eradicate the urban diseases and discomforts associated with industrialization, he describes an urban society living under strict sanitary conditions. Much of what was raised could materialize later.

It sought to create optimal housing conditions for around one hundred thousand inhabitants while maintaining the predominance of green areas. Richardson proposed to combine low isolated houses and blocks of three or four floors, whose separation allowed them to avoid the shade to their neighboring building.

Inside the houses, the sun had to penetrate them completely, and the wind had to clean their air even proposed that the kitchens be on a higher floor to allow natural ventilation.

Green areas would surround the buildings and the spaces in between. In particular areas of the house, nature, understood as sun, air, and greenery, would be present in their

private patios as on rooftops, unknowingly influencing a classic formal resource of modern architecture: its flat and habitable roofs. In other words, homes are generously surrounded by green areas.

Subsequently, many voices (and lines on drawing boards) advanced and made the relationship of collective living with nature more complex through countless combinations of isolated blocks, public space, and circulations.

Combining these elements appears as an underlying formula behind countless housing complexes built or proposed worldwide. Only the climatic conditions present at each particular point on earth were able to differentiate them.

The consideration that prevailing winds ventilate the houses and receive light and heat from the sun encouraged the formation of large *neighbourhoods*, consisting of isolated buildings, surrounded by public space. These *neighbourhoods* were planned with greater circulations in the perimeters and a network of minor streets and passages within each sector.

Thus, the relationship between nature and the urban project resembles a double-entry game: Does nature integrate into the architecture, or does the architecture adapt to nature? In the fuzzy limits of this relationship, there was a proposal for a city like Hygeia.

## 2. NATURE AND HERITAGE VALUES

Modern housing complexes have had mixed fortune. While countless cases in the world have fallen into certain degrees of decline, distorted, and, in many instances, demol-

ished, others have been recognized patrimonially, giving them a series of attributes, values, and meanings.

Understanding value, as an added quality that individuals attribute to particular object, makes them worthy of appreciation.<sup>3</sup> Based on specific characteristics, society is ranked by its components of their local identity.<sup>4</sup> Something that makes this type of heritage attractive is that modern housing complex is not static nor stopped in time: it is very much alive inhabited by thousands of residents within a wide-open space commonly surrounded by green areas.

These ensembles are complex and dynamic urban systems, large in size, and is a heritage in use and a legacy that is very much alive.

Its modifications, adaptations, and extensions are part of the natural evolution in any home and cannot be restricted. So how does one go about preserving the cultural values of something that is always in constant change and adaptation?

For this reason, the Madrid Charter, recognizing an evolution and opening up of the concept of cultural heritage, allows the recognition of many tangible and intangible values, according to the interpretations that each subject assigns to each object, place, or territory.

The same is true of heritage values. Gómez<sup>5</sup> points out that the values attributed to cultural goods can vary from one culture to another and even within it. Hence, it is possible to affirm that the valuation is dynamic and not static.

In this sense, many modern housing complexes have been assigned values in multiple dimensions; intangible and tangible relating to the matters of meaning to its constructive and technological techniques. According to Havinga<sup>6</sup> in a European context, the large parcels of complexes, balconies, and semi-public green areas are their most significant attributes. Except for the balconies, the heritage attributes of modern ensembles in Chile are similar, as indicated in the Official Decrees of the five cases protected by the local Monuments Law.

Without wishing to fall into reductionism, it is possible to affirm that the relationship between green areas within large parcels means that there is usually a relationship with nature behind the most significant social, physical, spatial, and historic heritage values, on different scales and in different ways. For example, within each home as outside the block. Or rather, within the void between the blocks or inside the gap between the built.

Recognizing that an essential part of spatial heritage significance resides in nature, it first needs to know the role that nature finely has within its heritage attributes and then seek to integrate an environmental dimension in preserving its heritage values.

In the context of the effects of climate change, it is naturally necessary to know and analyse how variations in environmental conditions would affect its equity valuation. A valuation that, as we already know, is dynamic related to the

local conditions. Heritage preservation strategies from environmental approaches must recognize the relationships between natural and social aspects in an interrelated, complex, and dynamic system.

Research in this field must necessarily involve other disciplines beyond architecture, such as environmental science and engineering, for example.

In this regard, Zúñiga & Pérez<sup>7</sup> proposed that the built resources of heritage value from an environmental perspective constitute physical structures with an organizational pattern for their conservation. At the same time, they interact as resources within the urban ecosystem. This makes it possible to relate cultural resources with natural ones, the soil and biological diversity.

Knowing in-depth the environmental attributes, an approach that could help determine the direct benefits humans obtain from ecosystems and their processes is Ecosystem Services.<sup>8</sup> These services are grouped into three categories: Regulation (climate, air quality, water infiltration); provision (crops, livestock, wood); and culture (heritage, cultural diversity, recreation).

The climate regulation services would allow to qualify and analyse how the interaction between the original built project, the distances between built blocks, and the giant tree masses would affect the valuation that its inhabitants have of the complex and its impact on the quality of life.

When these benefits present in ecosystems are understood and socially valued, they acquire a heritage character for the community.

### 3. THE ENVIRONMENTAL DIMENSION OF THE MODERN URBAN PROJECT: GRECIA AVENUE, SANTIAGO, CHILE

In Santiago de Chile, in the commune of Ñuñoa, there is a succession of nine residential complexes of modern architecture along Grecia Avenue. The complex was built chronologically towards the southeast of Santiago between the 1940s and the late 1960s. Like countless cases in the world, it represented the form of urban growth towards the peripheries (Fig. 1).

Except for paradigmatic cases such as Villa Portales or Providencia Neighbourhood Unit (Santiago, Chile), large-scale housing complexes' bulk was built on old agricultural farms or uncultivated land. None of these housing complexes had landscape projects, squares, trees, green areas, etc. Instead, it was these communities themselves that have colonized public spaces over time and defined their closest green areas.

Strictly speaking, these nine groups are part of a larger urban project which are programmatically rich and diverse. In addition to containing the National Stadium which is Chile's most important sports complex, these urban projects contain three state university campuses, three large parks and a shopping center.

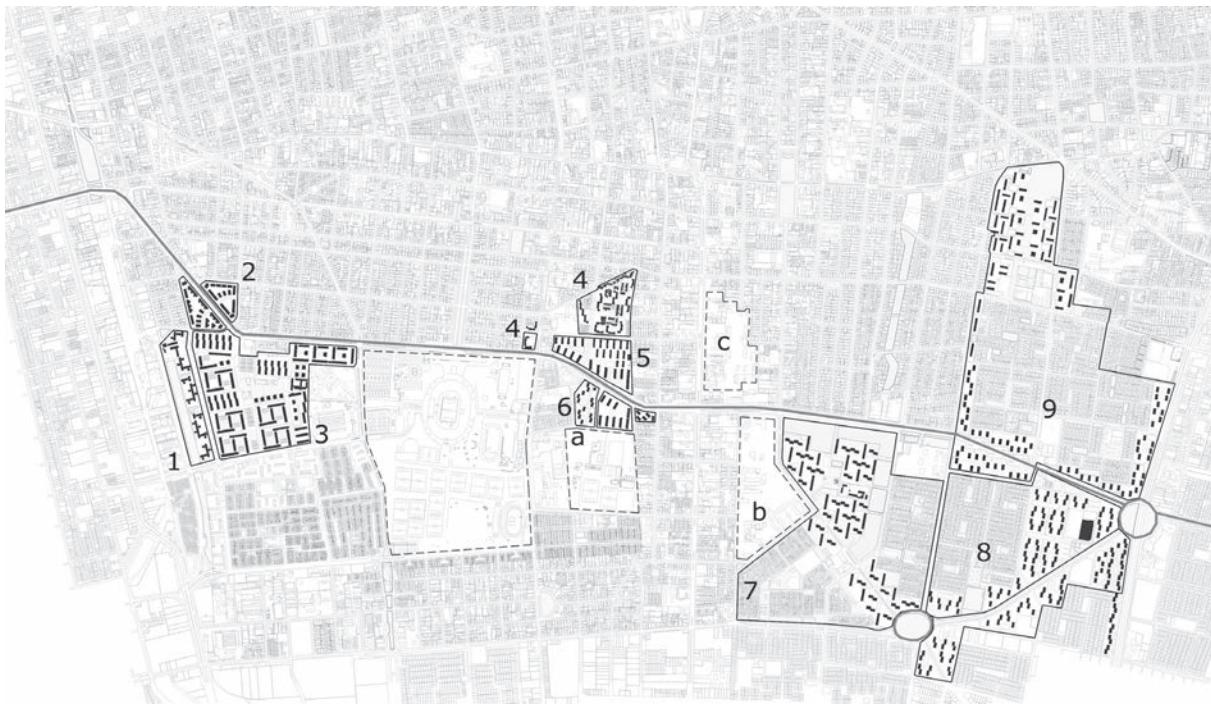


Fig. 1. section plan of the commune of Ñuñoa and Grecia Avenue. 1) Villa Canadá; 2) Conjunto habitacional EMPART Salvador Sur; 3) Villa Olímpica; 4) Villa Yugoslavia; 5) Villa Alemana; 6) Villa Grecia 2; 7) Villa Los Presidentes; 8) Villa Los Jardines; 9) Villa Frei. ©Rodrigo Gertosio, 2021.

Of the nine groups, three have the patrimonial declaration. When comparing their official Patrimonial Decrees, a particular coincidence between values and attributes such as public space, green areas, and the constructive quality of the blocks can be observed. They also highlight the joint action by the old Housing Corporation (CORVI) and the old Social Security Funds that financed the works.

However, these heritage values and attributes are not exclusive to these complexes. At least in Chile, housing production with similar characteristics are significant in numbers. The number includes those projects that could eventually also undergo heritage processes.

It is essential to point out that very few housing complexes of modern architecture included trees, landscaping, and green areas in Chile. In general, the complexes were handed over to their inhabitants without a clear definition of the limits of co-ownership of the spaces between the housing blocks, which gave rise to various types of appropriations of public space. Several perimeter fences, in the complex and some of the blocks, as well as the improvised vehicle car parks in areas destined for green spaces, are examples of the appropriations.

Also, the inhabitants, together with the municipality, promoted the planting and maintenance of a multiple and diverse quantity of trees, vegetable fences, and small orchards. In this way, it is purely synthetic that the first inhabitants undertook to fill the original void between the hous-

ing blocks with their own hands. For example, in Villa Frei, one of the nine complexes, the residents, through the so-called "Green Areas Operation," and later the Gardens and Parks Committee, organized neighbours and managed together with the municipality the cleaning of the land, the planting of trees and the realization of the first series of gardens that surround the buildings.

The process did not incidentally happen in this complex. As indicated in the files to request the patrimonial protection of the Olympic Village and the Salvador Sur Housing Complex (Ex EMPART), it was also the organized group of residents who planted and maintained nature. For this reason, such green areas and the nature present in each complex are described as heritage attributes. However, despite their official heritage declaration, those complexes do not have preservation strategies for these environmental values.

As previously noted, such attributes and heritage values, protected by a monument law, are not only present in the three complexes. They are also visible in other locations in the sector, such as Villa Los Presidentes.

Villa Los Presidentes (Ex Santa Julia) is a residential complex of 1952 homes built between 1965 and 1969 whose principal was the Private Employees Fund, managed by the former Housing Corporation (CORVI) designed by the architect Patricio Solar (Fig. 2).

It is made up of two sectors. One sector is a group of semi-detached houses connected by a series of passages and

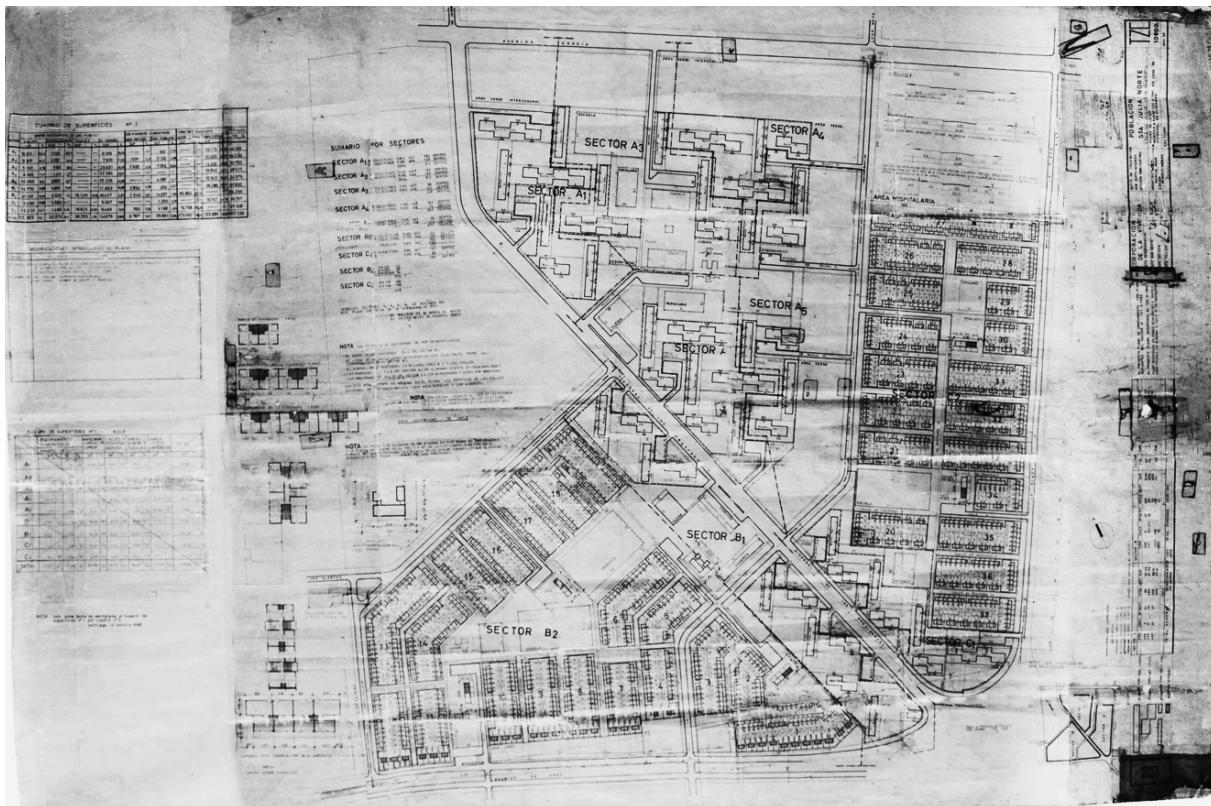


Fig. 2. Patricio Solar, Villa los Presidentes, Ñuñoa, Santiago de Chile, 1969, original plan of the housing complex. ©Municipal file.

squares. Another sector consists of a group of isolated 4-story blocks within a triangle-shaped macro-block. Two of its three outer sides have large parks along Grecia Avenue on one side and Santa Julia Park perpendicular to it, along with Juan Moya Street.

With a drone, it is possible to notice at least three related phenomena at an adequate distance between the blocks when observing this group of buildings from the sky. There is a presence of a mass of significant trees and vegetation. This landscape help generate constant ventilation through the entire complex, as well as optimal lighting for each department throughout the day. Finally, it is also possible to verify how the density of the tree mass decreases drastically outside its limits (Fig. 3).

We can recognize that vegetation, especially trees, can improve air quality in two ways: a) through the absorption of gases in the development of photosynthesis; and b) the fixation of pollutant particles suspended in the air in the surface of its foliage. Considering only these two functions, we could verify *a priori* that the environmental benefits present in the atmosphere exist unequivocally and powerfully in this sector.

The density of this foliage is explained in turn by the minimal occupation of the built soil. As a result of economic



Fig. 3. Patricio Solar, Villa los Presidentes, Ñuñoa, Santiago de Chile, 1969. Aerial view of Villa los Presidentes to the south of Santiago. Photo: © Felipe Hevia Larraín, 2021.



Fig. 4. Patricio Solar, Villa los Presidentes, Ñuñoa, Santiago de Chile, 1969. Aerial view into the interior of the villa los presidents complex. Photo: ©Felipe Hevia Larraín, 2021.

factors, both Villa Los Presidentes and thousands of other cases were built on a minimal ground surface. Earth movements and excavations were reduced to the maximum, thus avoiding the sealing of the soil and positively affecting the proper functioning of underground runoff (Fig. 4).

Inside the complex, unpaved spaces next to the housing blocks have allowed residents to plant and maintain the trees over time. In fact, in the macro-block sector of this group, the average surface allocated to green areas (without designs or tree-planting projects) is 36.8%, reaching 49.8% fronting Santa Julia Park. What is almost half of the total surface area of the property, including parking areas and roads. This percentage shows how soil compaction and waterproofing are avoided naturally, preventing the lowering of water levels in the underground layers and the contamination of these layers by pollutants present in the streets.

#### 4. CONCLUSIONS

The housing complexes within the modern urban project, when observed from an environmental perspective, specifically related to the aerial and ground planes, could generate a new layer of information (and valuation) that deserves to be recognized, quantified, and analysed. These attributes present in nature can reveal new basis in understanding the heritage value on an urban scale that these groups possess today. Such values perhaps transcend the borders of each set.

Although the role of nature in modern ensembles is known, its quantitative ignorance implies that this value is considered a generality and not from its specificity. Hence, it is not possible to analyse them as specific elements within the landscape.

Generically, the urban green infrastructure represents an opportunity to improve the environmental conditions of cities. In this sense, the modern urban project has the optimal conditions to enhance its spatial qualities, expected as a consequence of climate change, to reduce atmospheric pollution, helping to mitigate the effects of the increase in atmospheric temperature.

Advancing in research on understanding the morphological conditions of modern housing complex, from an environmental perspective, would allow them to be strategically reviewed to improve ecological conditions on an urban scale.

These environmental attributes quantified, added to the already recognized architectural, historical and social values, would offer a new layer of research that is still inadequately explored. Such research could bring together certain elements and scales of significance. For this reason, it is necessary not only to document and survey this environmental element of heritage, but also to integrate it into a large-scale heritage preservation management plan. If an essential part of the heritage values is related to nature, there is a whole new stock of heritage cases to be discovered, quantified, and preserved.

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