



## RESETTLEMENT HOUSING IN THE PEARL RIVER DELTA

*Manuel Vicente as case study within East Asian urban ecosystems*

**Niccolò Arnaldo Galliano**

*CiTUA – IST, Portugal*

[niccoloarnaldogalliano@gmail.com](mailto:niccoloarnaldogalliano@gmail.com)

### ABSTRACT

The present paper proposes to settle comprehensive understanding about first's statements of architectural modernity established in Macau.

The research line intends to present the historical modern framework of the region and classify a set of inaugural resettlement housing projects designed by Architect Manuel Vicente during the 1960s/1970s. The achievement of such goals is to be developed through a comparative analysis between the urban background of the 20<sup>th</sup> century, and the chosen case studies, in order to derives, in one hand, an amplitude equation of the theoretical matrix adopted; and in the other hand, to identify the variations between solutions of housing typologies, collective spaces, spatial distributions and technical systems.

This classification needs to consider contextual factors, concentrating not only in the understanding of the proposed case studies, but also on problematics and potentialities, in order to recognize their role in the generational urban grow that characterized the Pearl River Delta.

**Keywords:** Architectural Heritage, Modern Architecture, Urbanism, Macau.

**Thematic clusters:** 1. City and Project. **Temas:** Housing and Housing Project

## Introduction

The process of modern urbanization in East Asia, in terms of urban planning and architectural language, has been mostly developed under the guidance of Western models, principles and practices, including few adaptations and revisions to meet local circumstances.

During the 2nd half of the 20th century, the challenges of rapid modernization in the Asia-Pacific raised incredibly fast and under extreme density conditions. The case of the Pearl River Delta's reality presents an uncommon urban development, characterized by the introduction of Modern Architecture's paradigm in response to local, social and political latitudes.

Macau stands as unique example in the Asian Scenario; the historical introduction of the architecture of the West in East territories, followed by the rise of modernism, highlight his close relation with the international style. The urban growing character of the resettlement projects, located in the hippodrome district, developed by the Portuguese masters Manuel Vicente in Macau, embody the approximation of an accelerate urban growth and its articulation with a certain emerging functional internationalization of the city, embracing the adoption of new architectural vocabularies.

The neighbourhood had its origin and consolidation linked to the regional modernisation and industrialisation process, officially appearing in the 1950s in a context of renewal of the urban landscape.

The built environment on focus represents one of the first steps made by Asian Modernism in a region of meeting point between East and West. Due to a tide of redevelopment guided by high commercial profit and the economic uncontrollable growth, the buildings built up from the 1950s to the 1980s have been, or are being, replaced by a new generation of skyscrapers; some of them stood for not even 30 years. This modern heritage deserves further consideration and a clear contribute to the architectural history of this period need to be realized.

## 1. Twentieth Century Urban Framework

Macau, former Portuguese concession, divided by two cultures, and simultaneously liked to both, plays an important role, in terms of investigation, on how modern principles, resulting from a Eurocentric condition, were crossed with the ancestral cultures of the East and subtropical climate environments.

The city occupies a much larger area than it did for hundreds of years, from the first Portuguese appearance in middle 16<sup>th</sup> century, having gained, mostly during the 20<sup>th</sup> century, considerable quantity of land from the sea with the adoption of multiple landfills.

In order to document Macau's modern expansion, last century's urban growth can only be understood on a parallel scheme between territorial relations and economic dynamics.

The harbour, historically understood and processed as protagonist in the urban planning of the region, worked as an engine leading the economic sustenance in coordination with territory's development. At the same time of the renovation of the Inner Harbour during the early 1920s, the creation of the Outer Harbour conceived radical transformations on the coastline of the peninsula during the whole 20<sup>th</sup> century. Landfills' plans connected Ilha Verde's enlarged surface to the other islands, turning Macau's urban face into one single territory.

During the first half of the century, the region has been hit by an uncontrolled cross-border immigrants flew. The available land has been mostly occupied by improvised shelters and unorganized constructions. The rehabilitation process of the slum's districts has been treated with the implementation of a regular orthogonal road network with wider profiles together with the introduction of drainage schemes. The establishment of São Lázaro neighbourhood and Avenida Almeida Ribeiro confirmed those intentions.

The first reinforced concrete constructions appeared during the first decade of the 20th century in villas and palaces, reproducing metropolitan western forms, but also imperial eastern expressions.

During the 1920s, new public facilities appeared, reflecting the functional architectural modernisation of the city: the Central Radio Station (1924), the Hippodrome (1925-1928), the President Hotel (now the Hotel Central, 1928).

During following decade, buildings of clear modernist expression took place, displaying formal influence from the European avant-garde. Geometry in cubic volumes, raw/smooth surfaces and the absence of ornamentation were evident in buildings such as the Post Office (1931), the Red Market (1936), the Grand Hotel (1937), and Pedro Nolasco da Silva Primary School (1940).

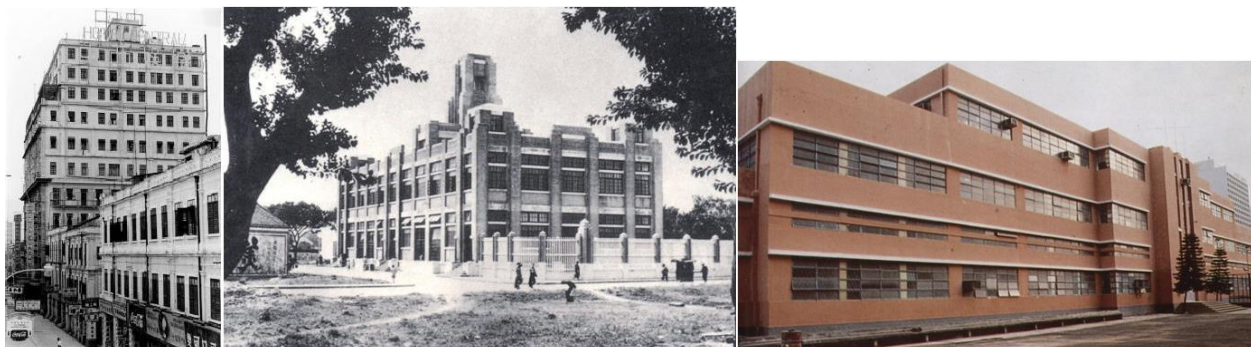


Fig. 01 President Hotel. Source: (*Memory Macau*, 1950). Fig. 02 Red Market. Source: (*Memory Macau*, 1936). Fig. 03 Pedro Nolasco da Silva Primary School. Source: (*Nenotavaiconta*, 1985).

The post-war period showed the extension of the gambling economy, becoming during the 1960s the main activity of the region. The opening of the Hotel Casino Lisboa in 1970 was a symbolic milestone of this economical explosion. Game phenomena generated uncontrolled urban enlargement since his establishment, followed by exponential ground's valorisation stimulated through growing real estate speculation.

The absence of an urban planning model caused a chaotic replacement of the traditional three-storey buildings by high-rise ones. The random character of these transformations, generally produced with poor constructive and architectural quality, contributed to degradation of the built environment, composing a scenario in permanent transformation, dominated by a continuous sense ephemeral transition.

“Bairro dos CTT”, a set of modest dwellings for civil servants following expression and typology with the same characteristics as the low-cost housing quarters built in Lisbon (Madre Deus, Encarnação, Alvito), inaugurated in 1950, represents Estado Novo's characteristics imported from the European metropolis. São Januário Hospital Building (1955) and Infante D. Henrique High School (1956-1958) are, also, works that confirm the constructive impulse applied in public works throughout the 1950s and a similar architectural register.

Within the framework of government initiatives, Bloco Rainha Dona Leonor, a collective housing complex that follows the principles of architecture of the Modern Movement and residential unit referenced to Le Corbusier, stood as a key element in the innovative Macanese architectural vocabulary. Designed by José Lei at the end of the 1950s, it constituted the affirmation of a modern vocabulary close to the international style, with its innovative duplex dwellings with terrace-veranda, intended to house civil servants, standing out for over a decade as the tallest building in the territory.

From then on, an expression of international style clearly emerged in Macao's housing and hotel programme. The hotels on the main avenue, built with the glamorous expression of the 1930s, were joined by hotels with new characters and images, on Praia Grande, Guia and Taipa waterfronts.

Resettlement buildings and neighbourhoods for refugees appeared in north “hippodrome” area during the 1960s and 1970s. In this environment of accelerated and unpredictable transformation, the urban development began to be supported by the intervention of qualified architects, highlighted by state organisms, who would be authors of a set of important infrastructures. An erudite modernity is fully assumed, with singular works of Raul Chorão Ramalho, as the Pedro Nolasco School or the “Infantário Avé-Maria”, and with Manuel Vicente's consistent and brilliant works.

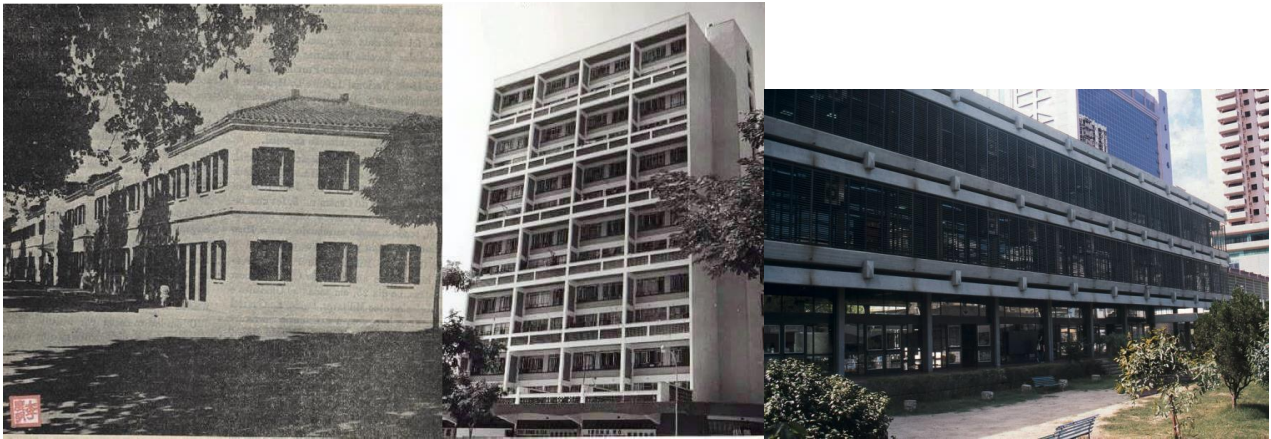


Fig. 04 "Bairro dos CTT". Source: (Nenotavaiconca, 1955). Fig. 05 Bloco Rainha Dona Leonor. Source: (Macau Antigo, 1960). Fig. 06 Pedro Nolasco School. Source: (HPIP, 2011).

The economic flow drove the occupation of new landfill sites and the continuous replacement of small-scale buildings by high-rise typologies. Rupture and changes of urban scale and programs took place not only in hotels, but also in residential and service buildings.

Foreign demand and investments, particularly from Hong Kong and China, also played an essential role in the development needed for buildings for housing, offices and industry. The Praia Grande and Outer Harbour area received, by the end of the 1990s, three hundred and forty-two new buildings.

Since the transformations and the construction rhythm did not reflect the population growth, the traditional urban structure persisted; the old Portuguese city can be distinguished, marked by the persistence of the religious network and the irregular and tight layout of the Bazaar and Chinese quarters.

Macanese architecture followed international trends throughout the 20th century, although with sometime of delay. The city's silhouette is both new and changing, stretching from Barra-Penha to Guia and Areia Preta.

## 2. Resettlement Housing case studies

### 2.1. Affordable Housing Block of Ilha Verde Area

"Affordable Housing Block of Ilha Verde Area", designed in 1962 by Architect Manuel Vicente and his practice, and inaugurated in 1964, is the first resettlement housing building built in Macau region, and a unique work of art embodying the adoption of Modern post-war principles.



Fig. 07 "Affordable Housing of Ilha Verde Area" Typology. Personal Picture, N. A. Galliano (2023).  
Fig. 08 "Affordable Housing of Ilha Verde Area" Typology. Personal Picture, N. A. Galliano (2023).

The building under analysis is a single block experiment, replicated into a second block in the north side of the plot, part of an urban plan addressed to economic vulnerable families.

At the time, as the first gest of social housing in the north area of the city, with a footprint of 710 m<sup>2</sup> and a total of 90 apartments distributed in 5 storeys, it represented a symbol of functionality, maximizing the assessment of available space. The project, along 72x10m rectangular plot, divide his floor area within 18 residential units;

and it is characterized by a rational space distribution in plan and section. Affordable Housing Block's vertical distribution is provided by a unique central core of walk-up stairs located in the middle of the rectangular perimeter, dividing the volume into two wings. Horizontal distribution is made by an exterior common gallery which walk along the interior perimetral line of the building, in the opposite side of the street-facing façade, which allowed each unit to benefit of private access and natural cross-ventilation. A minimum available area is given to circulation, and installations are located in the underground with the intention of maximize living-use spaces.

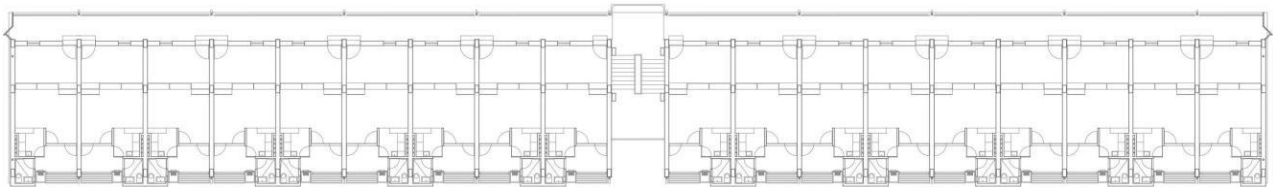


Fig. 09 "Affordable Housing of Ilha Verde Area" Floor Plan. Personal elaboration based on data from CD-FAUP.

Considering the reduced area destined to each unit (25 m<sup>2</sup>), the single compartment solution has been contemplated as the best option. In order to create two different atmospheres and organized spaces, the main room is divided in two zone without resorting to a wall, but with a two steps stair and a fixed furniture. The south facing side is furnished with a balcony of a certain amplitude, so that the living experience could advance outside. The exterior space is obtained by a volume subtraction, which provide, in response to the hot and humid subtropical climate, diagonal sun protection walls, and an informal living area is sheltered from the high temperatures of the rising sun (east and west). Water facilities assume a minimum space format, and, for evident economy reasons, it shares plumbing and drainage systems with the dwelling neighbours. The kitchen, divided by an open fixed wood furniture partition it is not segregated, but participate in the main household dynamics. The bathroom, equipped by modest installations, opens to the balcony because of hygienic purposes, where a concrete fixed washbasin is integrated in the handrail protection, in order to solves washing laundry needs.

For economic reasons, units' walls and ceilings are not coated, but just painted; only the balcony surfaces, for conservation and weather protection reasons, are thought to be covered with marbleite (marmorite), which does not require frequent maintenance.



Fig. 10 "Affordable Housing of Ilha Verde Area" Typology. Personal Picture, N. A. Galliano (2023).  
 Fig. 11 "Affordable Housing of Ilha Verde Area" Typology. Personal Picture, N. A. Galliano (2023).

In terms of structure, the building is made of reinforced concrete with infill panels of concrete blocks forming double walls partitions, with air chamber satisfying thermal and acoustic insulation. Because of climatic reasons, in order to prevent any damages brought by heavy subtropical rains and typhoons, the bottom floor ceiling slab is covered by fibre cement covering panels, the most economical and efficient protection against heat and water available at the time.

The façade, marked by the adoption of the interior matrix and enriched by a gentle set-back of the open balcony in the principal line, sets an interesting rhythm of void and volume. Using this approach, the architect expresses a straight relationship between interior and exterior showing a filter of light for the housing units, and maximum functionality. The staircase core, located 2 meters settled back towards the street line, maintains prospect proportions and generates a covered area on the ground floor which intends to promote local interactions between neighbours.



Fig. 12 "Affordable Housing of Ilha Verde Area" Façade. Personal elaboration based on data from the CD-FAUP

By the analysis of the project's architectural concept and his applied techniques, can be observed a strong proximity to Le Corbusier's masterpiece Convent de la Tourette (1956). A similar use of the unit formal design can be recognized in the monastic cell's floor plan. The application of untreated raw materials inside as outside, and various basic fixed furniture elements defining project's features, together with cross ventilation solution as a key element of the spatial organization, are identified as inspirations and guidelines for Manuel Vicente in the examined building.

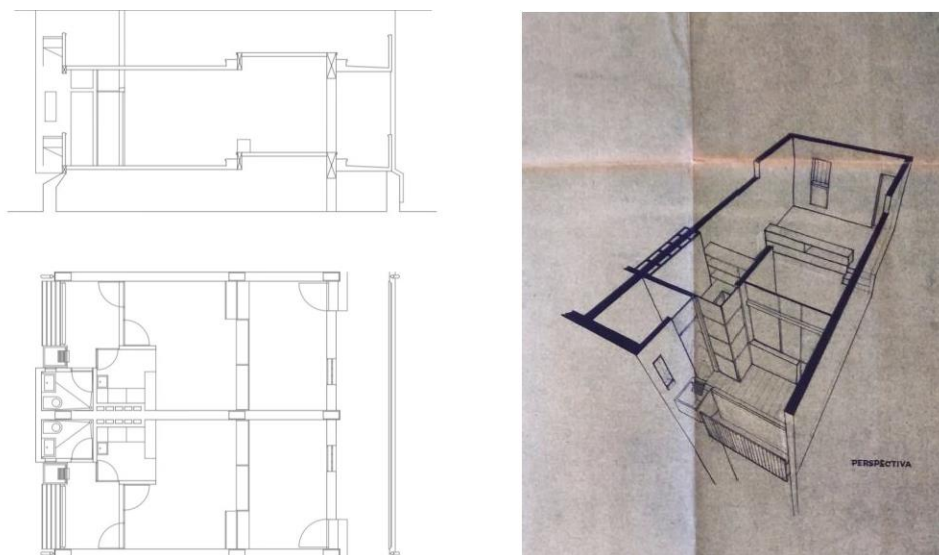


Fig. 13 "Affordable Housing of Ilha Verde Area" Typology. Personal elaboration based on data from CD-FAUP.

Fig. 10. Unit Perspective. Source: (CD-FAUP, 1963).

The adoption of materials as concrete, steel and glass, and the application of fixed construction technologies, gives to the "Affordable Housing Block of Ilha Verde Area" a strong character of innovation. The exposed concrete white painted structure marks the rhythm of modular units in an assumed manner and it creates an orthogonal grid representing a plain minimal aspect of modern functionality.

As most of the existing cases of Modern Architecture in Macau, the building on focus presents today a very poor state of conservation, aggravated by numerous significant modifications. Economic considerations override the heritage value of this relevant architectural example in the Macau's urban scenario; probably within a short period of time it will disappear.

## 2.2. HR - Resettlement Housing Block

Some years later a similar version of resettlement housing block has been designed in the same neighbourhood by Architect Manuel Vicente and his practice. "Resettlement Housing Block", has been built in the late 1970s and it continues the reflection on the vocabulary of resettlement architecture.



Fig. 14 "STDM - Resettlement Housing Block". Source: (Docomomo Archive, 2019).  
 Fig. 15 "STDM - Resettlement Housing Block". Source: (Docomomo Archive, 2019).

The architectural concept adopted follows a similar line to the first drawing made in 1963 "Affordable Housing Block of the Ilha Verde Area" and is inspired by a second attempt made in Lisbon, in 1974 within the scope of the SAAL operation.

"Resettlement Housing Block" is one single "L" shape building composed by double line units grouped by a central gallery and served by four staircases cores. The project provided commercial use ground floor and 660 units distributed on 10 main floors, plus a slim tower act located at the end of the right wing which rich 20<sup>th</sup> storeys high.

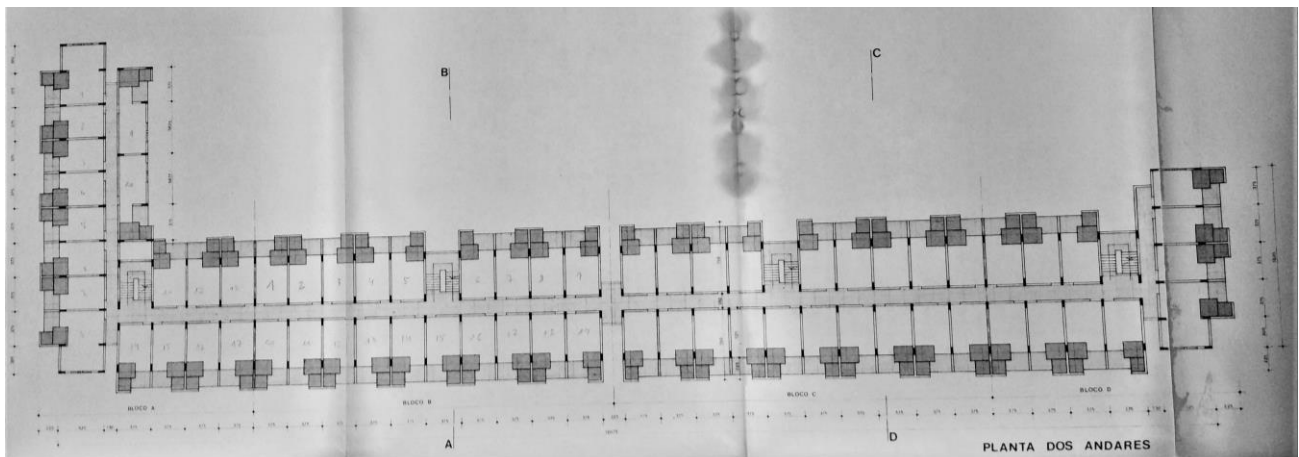


Fig. 16 "STDM - Resettlement Housing Block" Floor Plan. Source: (CD-FAUP, 1978).

The living unit of the '63 project is almost resumed, except for the step that divided in two the single living space, forgiving the suggestion of a differentiation of sleeping/living activities. Given the high number of people who, contrary to initial expectations, came to occupy most of the 63's dwellings, the single stair division revealed itself, with the course of time, not to be in conformity with the users' way of living.

In comparison with the 63' project, number of units per floor was quadrupled; and horizontal distribution, made through a servant central corridor, assumed a mirror function, distributing a second line of back street facing apartments, intensifying crowd circulation and reducing privacy.

On top of all 660 units, 630 followed the main one compartment scheme and 30, located on the building's corner are made of two compartments. The commercial ground floor combined 65 shops where each space had an area equivalent to two dwellings, equipped by sanitary facilities.

The main unit maintained a similar enlarged area of 26.7 m<sup>2</sup>; the two-compartment unit gained space (total of 42.4 m<sup>2</sup>), and two units per floor located on the short L side of the shape follows an irregular shape reaching 32 m<sup>2</sup>.

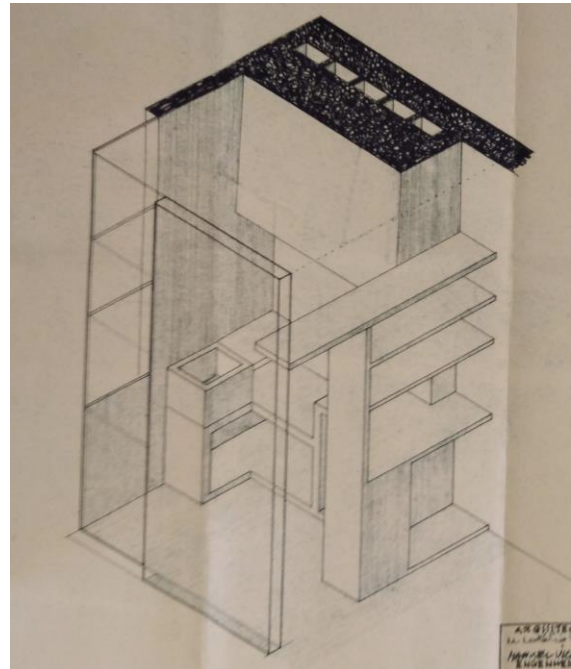
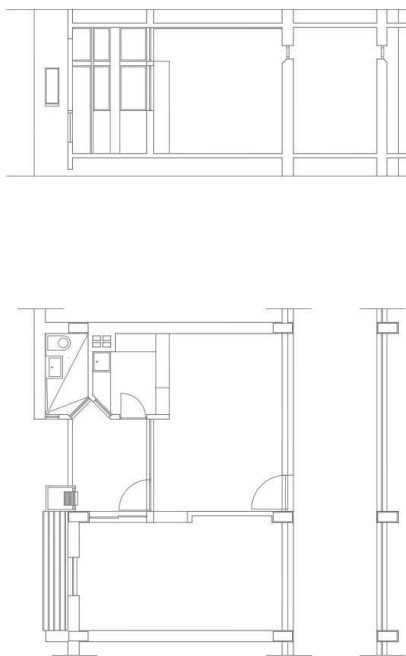


Fig. 17 "STDM - Resettlement Housing Block" Typology. Personal elaboration based on data from CD-FAUP.

Fig. 18. Kitchen Perspective. Source: (CD-FAUP, 1963).

In terms of urban scale impact, this project suggested the inclusion of new challenges related to resettlement programs. The street facing retail areas integrated the building with neighbourhood's flow and his consolidated urban character. The ground floor commercial arcade and living corners generated spaces and activities in (and with) the city.

Materiality assumed a different language, between the 63's and the new project, while maintaining the same concept in the housing side of the main façade. Marked by the adoption of the interior matrix, with straight relationship between interior and exterior the prospect confirmed the sets of void and volume rhythm. The ground floor arcade called a straight dialogue with the upper floor's façade integrating itself on the maximize functional architectural vocabulary.





Fig. 19 "Affordable Housing of Ilha Verde Area" Typology. Personal Picture, N. A. Galliano (2023).  
 Fig. 20 Unit Perspective. Source: (CD-FAUP, 1963). Personal Picture, N. A. Galliano (2023).

The building is formed by a reinforced concrete structure, fact not anymore considered as latest innovation. Interior and exterior walls are made in brick masonry, with interior ones conveniently whitewashed plastered. Kitchens and sanitary facilities, as well as staircases and common accesses, are coated by ceramic tiles on floors and walls. Doors and other external frames were made of eyeglasses and metal structures.

As in case of "Affordable Housing Block of Ilha Verde Area" and most of the existing Modern Architecture's pieces of the region, "BHR - Resettlement Housing Block" presents today a very poor state of conservation. Considered as heritage's architectural pieces endanger of fade over time and symbol of evolution of resettlement architecture's vocabulary, the analysed project it is destined to be replaced and disappear.

### 3. Conclusions

Macau's 60s to 70s' urban transition can be clearly recognized by the analysis of the two projects on focus. Evolutions of modern traits and advancements of resettlement architecture approaches stands in the Macanese built environment tracing lines of nitid distinction.

Architect master Manuel Vicente, approached at distance of 15 years, the same program leading with different realities and urban scales. He adopted strong proximity in typology expressions although different urban methods. Unit's design, despite extremely elementary, presented valid solutions regarding internal organization of single compartment space, functional inclusion of main living activities and well-being characters.

"Affordable Housing Block of Ilha Verde Area" can be considered as "see around" building, and "BHR - Resettlement Housing Block" as "urban system's element" that contains and draw rules and instruments to accommodate different needs, from the most public to the most private, creating a collective dialogue within the city.

“BHR - Resettlement Housing Block”'s façade merges with assumed linear proportions public's ground floor functions with the upper private use façade floors. The organisation of commercial-use ground floor stands as innovative character in the neighbourhood and plays as instrument of relationship with the immediately surrounding city. This fact states above all, in one hand, different scales of the elements composing the intervention and, in the other hand, the containment of the design process which from project to project is progressively purified and evolved adapting to contemporary needs.

Living unit's scheme and composition integrate Modern ideals as maximization of available space and functionality, use of raw materials, cross ventilation and passive climate controls systems are protagonists in the concept design of the two case studies. Leading with limited costs and speed of construction objectives,

Manuel Vicente demonstrates how some modern conceptions could be interpreted, understood and used to respond to diverse physical and social conditions, experimenting innovative solutions which remain currently interesting and valid.

With the purpose of contributing to documentation, knowledge, and consequent preservation of modern architectural heritage, this essay aims to document and value inaugural resettlement housing works belonging to Macau's historical urban framework. The case studies under analysis can be considered as heritage's architectural pieces endanger of fade over time. Their interactions with public interest, memory, and history deserve further consideration.

The present paper has the ambition, not only, to reveal pieces and urban interventions of unique design quality and valorise new heritage references; but also, to enrich discourses as aesthetics of high-density environments or the city-state urban development.

#### 4. Bibliography

DOCOMOMO MACAU. (2016). Macau: Reading the hybrid city. Macau: Docomomo Macau.

DOCOMOMO MACAU. (2022). Macau. Modern Architecture. Walking Guide. Macau: Docomomo Macau.

FERNANDES J. M. et al. (2015). Macau, Cidade, Território e Arquiteturas. Macau: Instituto Internacional de Macau.

FIGUEIRA, F. & C. Marreiros. (1988). Património arquitectónico Macau - Macau cultural heritage. Macau: Instituto Cultural de Macau.

HEYNEN, H. (1999). Architecture and Modernity. Boston: MIT Press.

HUYSSSEN, A. (2003). Present Pasts: Urban Palimpsests and the Politics of Memory. Redwood City: Stanford University Press.

LEÃO, R. & C. Lai. (2020). Tropical Modernity: A Hybrid-Construct in South China. In *Tropical Architecture in the Modern Diaspora*. Docomomo Journal N° 63. Lisbon: Docomomo International.

PRESCOTT, J. (1993). Macaensis Momentum, A Fragment of Architecture: A moment in the history of the development of Macau. Macau: Hewell Publications.

ROWE, P. G. (2005). East Asia Modern – Shaping the Contemporary City. London, England: University of Chicago Press, Reaktion Books.

ROWE, P. G. & S. Kuan. (2002). Architectural Encounters with Essence and Form in Modern China. Cambridge: MIT Press.

TOSTÕES, A. (2010). Macau. In J. MATTOSO et al. Asia – Património de Origem Portuguesa no Mundo – Arquitetura e Urbanismo. Lisbon: Fundação Calouste Gulbenkian.

TOSTÕES, A. (2020). Tropical Architecture, South of Cancer in the Modern Diaspora. In *Tropical Architecture in the Modern Diaspora*. Docomomo Journal N° 63. Lisbon: Docomomo International.

VICENTE, M. (2011). Trama e emoção. Lisbon: Caleidoscopio.