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Historic timber buildings restored for public purposes in Southern Chile. A critical analysis and an approach to a cultural landscape

EDIFICIOS HISTÓRICOS DE MADERA, RESTAURADOS CON FINES PÚBLICOS EN EL SUR DE CHILE. UN ANÁLISIS CRÍTICO Y UN ENFOQUE HACIA EL PAISAJE CULTURAL

EDIFÍCIOS HISTÓRICOS DE MADEIRA RESTAURADOS PARA FINS PÚBLICOS NO SUL DO CHILE. UMA ANÁLISE CRÍTICA E ABORDAGEM DE UMA PAISAGEM CULTURAL

Figura 0 Reincorporating elements. Source: Photographs by the authors and Sebastián Leichtle.

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RESUMEN

El objetivo del artículo es actualizar y acotar los argumentos de la metodología de Rehabilitación Integral del Patrimonio (RIP) para las ciudades de madera. La construcción en la ecorregión del bosque templado costero dependía de la madera nativa, lo que aun caracteriza al sur de Chile, como es el caso de la ciudad de Valdivia. No obstante, el tejido urbano de la ciudad se ve afectado por la vulnerabilidad ante los riesgos naturales y las prácticas neoliberales del mercado. Los reglamentos e instrumentos para la restauración de la arquitectura impiden la RIP debido a que se centran principalmente en las ciencias sociales, sin incorporar los aspectos técnicos arquitectónicos fundamentales ni una comprensión más amplia del contexto. A través del análisis de un conjunto de edificaciones históricas restauradas con fondos públicos, la relación entre las ciencias sociales, la ingeniería, la arquitectura y las teorías de uso público y del paisaje se hace evidente. Es necesario contar con un escenario de prácticas eficaces para asegurar una prolongación de la vida útil de estas edificaciones en relación a la gestión del patrimonio cultural. Se identificaron ocho puntos clave que conectan la historia con las condiciones materiales, que en este momento están ausentes en el servicio público chileno. Para que los procesos de restauración sean integrales, las evaluaciones deben incluir nuevas dimensiones, como la relación económica y la gestión material o tangible, así como la integración con la identidad arquitectónica original inmediata y la facilidad para asociarla culturalmente. De la armonización de estos ocho puntos con el marco normativo del patrimonio, se espera un mejoramiento de la rehabilitación integral de los edificios patrimoniales en el sur de Chile, la priorización de la conservación de su madera y la contribución pública.

Palabras claves: patrimonio cultural, vulnerabilidad, rehabilitación integral, paisaje patrimonial.

ABSTRACT

The objective of this paper is to update and summarize the arguments behind the Integrated Heritage Rehabilitation (IHR) for Wooden Cities methodology. Building in the Coastal Temperate Rainforest ecoregion relied on native species, and is still characteristic of the towns in southern Chile, including the city of Valdivia. However, the historic town's urban fabric is vulnerable to natural disasters and neoliberal market practices. Regulations and instruments for architectural restoration hinder IHR since their primary focus lies in social sciences, excluding the fundamental architectonic technical aspects, as well as a broader understanding of the context. Through an analysis of a set of historic buildings restored with public funds, the relationship between social sciences, engineering, architecture, and the theories of public use and landscape is patent. It is evident that there is a need to establish effective practices to extend the service life of buildings through cultural heritage management. Eight key points were identified, that connect history with the material conditions, which today are lacking in the Chilean Public Service. For the restoration processes to be integrated, evaluations must include new dimensions, such as the economic relationship and the material or tangible management, as well as the integration with the surrounding original architectural identity and the ease with which it can be culturally associated. From the harmonization of these eight points within the heritage regulatory framework, an improvement of the integrated rehabilitation of heritage buildings in the southern Chilean towns is expected, with priority given to timber conservation and public contribution.

Keywords: cultural heritage, vulnerability, integrated rehabilitation, heritage landscape.

RESUMO

O objetivo do artigo é atualizar e aprimorar os argumentos da metodologia da Reabilitação Integrada do Patrimônio (RIP) para Cidades de Madeira. A construção na ecorregião da Floresta Temperada Costeira era dependente da madeira nativa, que ainda caracteriza o sul do Chile, como em Valdivia. No entanto, o tecido urbano da cidade é afetado pela vulnerabilidade dos riscos naturais e das práticas neoliberais do mercado. Os regulamentos e instrumentos para a restauração da arquitetura impedem a RIP porque se concentram principalmente nas ciências sociais sem incorporar aspectos técnicos arquitetônicos fundamentais, bem como uma compreensão mais ampla do contexto. Ao analisar um conjunto de edifícios históricos restaurados com fundos públicos, torna-se evidente a relação entre ciência social, engenharia, arquitetura e teorias de uso público e paisagem. Um cenário de práticas eficazes é necessário para assegurar uma extensão da vida útil dos edifícios em relação à gestão do patrimônio cultural. Foram identificados oito pontos-chave que conectam a história com as condições materiais que estão ausentes no serviço público chileno. Para que os processos de restauração sejam abrangentes, as avaliações devem incluir novas dimensões, tais como relação econômica e gestão material ou tangível, bem como integração com a identidade arquitetônica original imediata e facilidade de associação cultural. A harmonização desses oito pontos com o marco normativo do patrimônio deve melhorar a reabilitação integral dos edifícios patrimoniais no sul do Chile, priorizando a conservação de sua madeira e a contribuição pública.

Palavras-Chave: patrimônio cultural, vulnerabilidade, reabilitação integrada, paisagem patrimonial.

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INTRODUCTION

Southern Chile, in particular the Valdivian region, is biogeographically covered by a Coastal Temperate Rainforest ecoregion, one of the few in its type on the planet, as well as one of the world's most renowned earthquake zones. These two natural environmental conditions define historic portions of cities, towns, and whole villages. Their buildings, whether in clusters or detached, in these so-called Wooden Cities (Saelzer et al., 2019 a), were dependent on native timber from the second half of the 19th century to the second half of the 20th century, and are now becoming valued culturally, albeit only partially. In some aspects, this characterization was an indirect valorization of the cultural urban landscape and the changes in land and architectural structures after the 1960 Great Earthquake. After increased globalization in the 1980s, the buildings and town fabric were affected by neoliberal market practices with properties and the Communal Regulatory Plans (PRC, in Spanish)- (Sabatini, 2000; Zumelzu et al., 2016). Part of the consequences was the higher value given to land over the value of its buildings. The fabric of the towns was neglected, the timber architecture was considerably affected, and aesthetics were lost, which accelerated conditions of obsolescence, demolitions, and fires (Araya & Saelzer, 2017; PNUD-MINVU, 2021).

Problematic past, and current progress

Inhabitants, along with private and non-State institutions have become active in recognizing cultural attributes in the narrative activity -oral, written, photography, cartography, and protected historic built areas-, which has made the cities and towns developed between ca.1870 and 1960 a reference for a new type of cultural and natural environment (Guarda, 1969; Rojas, 1994; Tillería & Vela, 2017). Visually comparing the past and present provides evidence of great changes: contrasts between architecture achieved through civilized or bourgeois housing and infrastructure typologies (Saelzer & Urbina, 2015) **1**, the poverty recorded for workers living conditions (Almonacid, 2000; Bintrup, 2016), and the ecological environment of the past city (Otero, 2006; Saelzer, 2021).

When inhabitants reinforced the population of the Upper Frontier -the old Spanish Provinces of Valdivia and Chiloé under the new regime, they brought territorial and economic expansion (Salazar & Pinto, 2014), new villages, and a new urban shape and districts for the few previous towns**2** emerged in Southern Chile. Although with this, the native wood species felled for local building, the deforestation for agricultural purposes, and native forest exploitation were not managed. However, they changed the territory and the economy of buildings in the most affluent districts, the poorer ones, and rural settlements.

The existence of native wood species in a social scope of timber buildings needs attention beyond heritage protection figures that

1 A comparison can be established between reports about Valdivia. The most well-known are Aranda, Llanera, and Tejeda in 1921, Life Magazine in 1942, and the work of the architect and historian Gabriel Guarda.

2 Valdivia, Osorno, Ancud, Castro.

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provide the legal framework because wooden architecture has a potential cultural heritage that affects a larger portion of the population. Nowadays, this context challenges regional restoration practices for timber buildings to overcome the typology limits being preferentially evaluated, which affects the identification of the cultural landscape and public policies.

A collection of historic houses, once large family houses, at least most of them, owned by the Universidad Austral de Chile (UACh) in the city of Valdivia -the UACh Collection or Collection- (Figure 1), most formally protected by public institutional heritage qualifications, provide the elements to analyze restoration contexts, and to identify gaps to fulfill a major task: the characterization of Wooden Cities using the proposed Integrated Heritage Rehabilitation (IHR) method (Saelzer et al, 2018 and 2019 a, 2019 b). The previous research stages of this empirical work -management and competition for funds, project, and building- and its theoretical approach, have been done at the Built Heritage and Context Association (Patrimonio Edificado y Contexto -PEC-). The proposed concepts, analysis, and results have already been published or presented, in conferences (presentations and papers) and building inauguration editions; material that will be referenced constantly in the paper.

From the collection, nine projects comprising medium size buildings were completed: rescuing, rehabilitating, restoring, and partially restoring them. This experience includes an additional five completed projects and four projects in the study stage in two administrative Regions -Los Ríos and Los Lagos-. The two buildings that house the UACh President's office and the central UACh administration (Casa Central UACh) were chosen for this case study.

While addressing restoration practices, it became evident that there is a relationship between social sciences, engineering, architectural, conservation, and cultural landscape theories to integrally manage a set of heritage practices. Among the wooden architecture, found in small towns and city districts, that still remains from ca. 1870-1960, only a small portion constitutes cultural heritage from the State institutional perspective, which underlies a weak understanding of the process of building towns in southern Chile. However, citizens, their public institutions, and the research results provide alternative scrutiny and a broader and deeper experience of the core of cultural heritage management and its impact on the quality of life. The proposed Integrated Heritage Rehabilitation (IHR) method, in each urban or rural settlement, focuses on a set of disciplinary practices complemented by an understanding of a historical sociocultural identity dynamic to be applied as part of the quality of life enhancement.

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METHODOLOGY AND OBJECTIVE

The interdisciplinary approach to the previously described issues challenges cultural-heritage methodologies on restoration practices and territorial planning. In previous publications, it was established that the regulatory framework impedes integrality. The objective here is to update and mark out the arguments of the initial seven key points and proceed to an eighth key point. The topics of the previous seven points are (1) Placement conditions; (2) Material selection; (3) The incorporation of architectural transformations due to natural hazards; (4) Rehabilitation standards; (5) Restoration as a public role; (6) Sustainable planning; (7) Land diversity and environment; (8) An approach to a notion of landscape. The IHR's cultural, legal, material-technical, and context-landscape framework, becomes the groundwork for a hybrid methodology oriented to the cultural heritage problem, focusing on southern Chile, and through research, it seeks to achieve interdependence in the cultural and heritage landscape potential.

Seven key variables identified for technical guidelines throughout the IHR were reviewed from the previous work of the authors (Saelzer et al., 2019 b), to conclude on the next key point for the link between heritage and landscape. For the geographer Florencio Zoido Naranjo, the notion of landscape barely considered views and practices that culminate today with the attribution of broad social values (quality of life and cultural identity) (Zoido Naranjo, 2012). The first seven key points were identified empirically in the project management, within the local -The agency of the Ministry of Housing and Urbanism, University and Municipality- and national -Monument Council- institutions. The eighth key point was identified during the discussion of values considering the cultural landscape and territorial planning approaches (Zoido Naranjo & Venegas, 2003).

Using these key variables, the authors were able to characterize the management of heritage rehabilitation processes to integrate factors, connecting history with the geographic contexts, and the architectural material of settlement diversity. The eighth key point is a discussion proposal to provide concepts about the formula and practice of IHR in the regional public and private sector, and in the international context, such as in the International Committee on Historic Towns and Villages (CIVVIH-ICOMOS), and on the preservation of historic timber buildings at the UNESCO Committee, and in the academic and multilateral cooperation hybrid context with the formula of Heritage Landscape.

Empirical And Theoretical Heritage Rehabilitation Context

Chile experiences around six hundred and eighty-four (684) earthquakes annually **3**. The 9.5 Richter quake of May 22nd, 1960, that hit off southern Chile, is the largest ever instrumentally recorded earthquake. The Valdivia river basin and the surrounding urban area

3 earthquaketrack.com.

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were the hardest hit. Buildings were destroyed and the geography was markedly changed, especially in some sectors of the city, as new bodies of water were added.

The trauma from the destruction and the impact on the Gross Geographic Product was enormous. However, the greatest damage to buildings in Valdivia was caused by ground failures, mostly liquefaction, and flooding in areas that both the Spanish colonists over 300 years (1552-1820) and the ancient Huilliche native population had avoided. Unfortunately, it had been settled by industrial and trade infrastructure from new European immigrants in the 19th and 20th centuries. The evidence of a slow recovery after 60 years, without a final reconstruction plan, particularly in the city of Valdivia **4**, outlines imperatives to analyze and check the heritage architecture restoration for the group of buildings built before 1960. As it was previously reported, a conceptual and physical intervention of fragile variable materials has not been carried out as part of the heritage regulatory framework (Saelzer et al, 2019 a). 'In terms of policies, as it was quoted, "except for volume conservation guidelines, in the Chilean context, there are no specific regulations for interventions in architectural heritage" (Torres, 2014).

Public programs

A heritage restoration program of public and historical buildings in Chile was reinforced at the national level in 2007 by a Heritage Enhancement Program (Programa Puesta en Valor del Patrimonio-PPVP)-. As a tool for the Regional Development Undersecretary (Subsecretaría Regional de Desarrollo - SUBDERE)-, PPVP sought funding at a regional geopolitical level, FNDR**5**. It also provided the Regional Heritage Diagnoses (MOP, 2010) on historical buildings in the Los Ríos administrative region. This general diagnosis has been set as the official guideline in the Region, one of the few achieved in the country, but focuses on the approach within the limits of each building, and not on the relationship with a regional concept.

As the Ministry of Public Works (Ministerio de Obras Públicas - MOP) was strengthened by becoming the main technical unit of the PPVP, national monuments and large-scale heritage projects benefitted. The Ministry of Housing and Urban Planning (Ministerio de Vivienda y Urbanismo -MINVU) continued its role with Historic Preservation Properties (ICH, in Spanish), one of three categories of officially protected buildings. This protection figure includes medium and small-scale buildings, like most of the UACh Collection, but does not have a financing program for restoration or upkeep.

The Ministry of Culture, Arts and Heritage –(Ministerio de las Culturas, Artes y el Patrimonio -MINCAP) started two of its own heritage financing programs**6** after the earthquake that affected central

4 See the final report at: Foglie, David P. 1962. Valdivia City Planning. The Valdivia City Plan. U.S A.I.D., Illustrious City of Valdivia and Ministry of Public Works, Urban Planning section.

5 "Fondo Nacional de Desarrollo Regional" (National Regional Development Fund).

6 "Programa de Infraestructura Cultural" and "Fondo del Patrimonio": "Cultural Infrastructure Program" and "Heritage Fund".

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Chile in 2010. Although that earthquake did not destroy historical buildings in the southern regions, MINCAP considered a specific budget, coherent with the outstanding consequences of the 1960 earthquake and some of the characteristics of timber buildings, as has been proven with the UACh Collection. The Collection found, in those national programs, the first answers to the needs of its projects. At a MINCAP regional level (when it was a Council of State and not yet a Ministry or Secretary of State), projects were financed shortly after 2010, to correct some deficiencies in two buildings. Its importance was the opportunity to have drawings to characterize the buildings and consider them as a series, and not as isolated units.

Empiric field

In 2014, the national terms and references, and sources of funding became tools applied annually. From that continuous use of the program, valuable data were obtained on the socio-cultural arguments linked to materialization processes and their reception by the citizens. Considering that the paper is focused on updating and marking out arguments for the IHR, the documentation held by the PEC and the editions for opening restored buildings became primary sources: Casa Central -the case study - (Saelzer, 2019 c) and a next project, also part of the Collection (Saelzer, 2019 d). The methodology to organize the empirical field theoretically is the Integrated Heritage Rehabilitation (IHR) methodology.

A theoretical approach to concepts

The empirical process, followed by a conceptual theoretical one made the importance of the scale to approach timber buildings considering specific wood species and the specific forest as a whole, evident, as well as a scale to address the importance of a heritage restoration service-life framework, and one for the territorial concept and cultural and local landscape (Capel, 2016). Up to the third quarter of the 20th century, timber buildings used wood species that are already nationally protected, in National Parks and reserves, or need special management to be felled. However, they have different vulnerabilities to climate and biochemical conditions when used as architectural components (Prieto et al., 2021). Fuzzy buildings service life methodology, a pioneer in Chile's southern cities and towns (Prieto et al, 2019), and the heritage landscape methodology discussed for the small and medium towns scale (Silva, 2014) have provided suitable tools to continue focusing on the empiric field on research and lead the discussion toward specific territorial planning issues.

The orientation toward social sciences downplays the architectural, technical, and building factors. They have even been a direct source of social identity. On the other hand, the arguments

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based on social science contents continually play a crucial role in the criteria for the management plan evaluation (MINCAP, 2017, p.5, 13, 18). Although MINCAP programs are oriented towards historiography, anthropology, and territorial identity, according to the heritage regulatory framework and its legal focus (MINEDUC-CMN, 2011, p.6-8)**7**, the soil conditions and old building materials (bricks, stamped metal, and timber from the ecoregion forests) became part of the issue for the Collection's projects. The lack of a complete and in-depth procedure on cultural heritage, its consequences regarding obsolescence for working-class houses, and people's expectations were detected during the central areas' regeneration project in Valdivia, where most of the UACh Collection is located (PNUD-MINVU, 2021). This general scenario, combined with the material compositions and the technical capabilities that affect historic and cultural dimensions in restoration processes, has been overlooked in the heritage regulatory frameworks in Chile.

Onsite evidence, particularly at a case study level, points to the fact that aspects such as the vertical load of facades, timber from native species, the role of frames, and the environment of building locations, are crucial to citizen's acceptance of architectural heritage, as noted previously by several authors that have worked on cultural heritage in the south of Chile (Rojas, 1994; Almonacid & Medina, 2015). Furthermore, the extent of these impacts and their divergence from local trends, where wooden cities are attempting to rescue local values, is considered suspiciously by most actors in the real-estate sector. But territorial and perceptive scales of the "heritage landscape" theory became crucial for contextual analysis in the real estate market, based on what inhabitants and local institutions communicate, and (even) to follow that "in-material heritage (of people, communities) that tends to be incarnated in certain materials" (Silva & Fernández, 2017: 135, 181-184).

Conceptual Foundation For Timber Building Rehabilitation Practices.

The concept of heritage which initially embodied landmark historic buildings has progressively expanded within society to include other types of buildings. Among these, many will conceivably be less aesthetically appealing but can be of similar or greater value in terms of what they tell us about society (Bianca, 2010; SEMO-WHC, 2018; Nyseth & Sognnaes, 2012). Considering that people create values as a society -aesthetic, ethical, etc.-, any approach that takes the inhabitant as something separated from its context is discarded (Ojeda Rivera, 2013). Likewise, the rehabilitation process is not considered isolated from stylistic restoration practices, such as the Western European perspective of the 19th century and the beginning of the 20th century (Niglio,

7 National Monuments Law - N°17.288, 1970 and 2011 version.

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2009; Beasley, 2017). Following this approach, the process for heritage rehabilitation methodologies has paid greater attention to the context of buildings, making people and their daily environment an integral part of their urban environment.

The convergence to the immediate vicinity of "the successive historic present" in the building and the "intuitive unity" became an issue after World War II destructions of monuments and cities (Cesare Brandi, 2002), shown by small town initiatives, like Wismar and Stralsund in Baltic Germany (Huschner et al., 2022). The discussion incorporated the ease with which human surroundings -cultural, urban, and rural- can be associated and viewed (Sirisrisak, 2009; SEMO-WHC, 2018).

In Latin America, a Post Disaster Needs Assessment (PDNA), a damage analysis methodology (Jeggle & Boggero, 2018), was used for the evaluations and restoration guidelines in Manta, Ecuador, after the 2016 7.8° R Mw earthquake, that hit the Manabí Province. The UNESCO´s PDNA**8** methodology advocates for the integration of technical capacities and transferal to heritage restoration and management. It includes a reflective analysis of the type of building involved, the building materials used for construction, and the original layout of the spaces within it. The analysis produced a view on the legal framework requirements, management, and understanding of building failures, supported by correlated holistic programs (see Senplades, 2016).

For this research, it was helpful to compare the case study and its environment with other timber architecture case studies and their town environment: Galveston, Texas (Beasley, 2017). Eskjö in Sweden, and Gorodets in Russia (Ivanov, 2015). Zúñiga in central Chile after the 2010 earthquake**9** (Hernández, 2016) is an initiative in a different kind of town typology, with its impact on the Chilean context, and its institutions.

Settlements grew in Southern Chile, using timber of a common biogeographic eco-region with slight industrial inputs, shaping their contemporary towns, formulating a post-Hispanic-colonial nature, and emphasizing new architectural references (Prado et al., 2011; Saelzer & Urbina, 2015; Tillería & Vela, 2017). In the context of a new Republic of Chile regime, the ideas of progress -development-, were challenged after a three-century-long Mapuche frontier at the end of the 19th century, and the further reformulation of this remote territory or Upper Frontier (Urbina, 2008). In terms of Human Geography used by critical historic studies, southern Chile produced a settlement method (Bengoa, 2015: 168; Larroucau, 2017: 9), where timber provided most of the technical solutions and shapes (Guarda, 1995; Otero, 2006) from a period between 1845 when a Selective

8 Post Disaster Needs Assessment.

9 https://www.elrancaguino.cl/2018/05/23/consejo-de-monumentos-nacionales-premia-restauracion-patrimonial-realizada-en-zuniga/.

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Colonization Law led to German immigration, and a decline under the neoliberal economic model instituted by the National Constitution of 1980.

With the emergence of modernization, southern Chile became an extended historical, architectural, and urban experience, but also an experience of risks related to major natural events followed by disasters in urban contexts. However, despite the greater necessity some 60 years ago, heritage restoration processes started in Southern Chile barely a decade ago. Even so, since then building materials lack preliminary evaluations, and processes are far from being integrated and are left for individual interpretations during the restoration process as has been empirically proved (Saelzer et.al., 2018 and 2019 b).

Considering the real estate domains of urban area neoliberal management, the protected historical or "Typical Zones" (TZ)**10** in Valdivia represent a low proportion, with just 1.11% of its area, though timber prevalence in the city can cover up to 76.9.% and 80.4%, considering the 2021 and 1980 city plans as references, a proportion that is repeated in other towns and rural villages where PEC has researched in Southern Chile (Saelzer et al., 2022). Even so, the amount of area restored in the UACh Collection has led the University to make a comparative analysis with newly built areas to explore relevant aspects of the "economy of culture" coherent with spending (Alonso Hierro & Fernández, 2013). If the ratio incorporates effective land use, the service life of buildings, and cost management using the Collection's projects, as MINVU 2020 recognized in its own programs designed centrally in Santiago, they became inoperative in the older timber-built neighborhood districts (Saelzer, 2019 d: 39, 54). Several Pilot Plans had to be organized, one of them located in Valdivia to get a diagnosis applied to Southern Chilean settlement characteristics (MINVU, 2006), that methodologically continues as Heritage Analysis undertaken by UACh and PEC in the interdisciplinary team within the Central Areas Regeneration - (RAC, in Spanish) project in Valdivia**11**, a PNUD and MINVU 2020-2021 project.

The tenet of the legal framework for the super-structure and its supporting infrastructure, particularly on the seismic amplification dynamic (Alvarado et. al., 2019), is missing in the regulations used for heritage restorations and rehabilitations: National Monuments Law (Ley de Monumentos Nacionales - LMN)- and the General Law for Urban Planning and Construction (Ley General de Urbanismo y Construcciones - LGUC)-. In fact, the guidelines that can be taken from the LMN and LGUC, although they lack integrated heritage rehabilitation, can be understood for archeological, historical, and stylistic

10 A cultural heritage protection figure provided by the National Monuments Law for the protection of an urban or rural area.

11 UACh – PNUD and MINVU contractual relationship.

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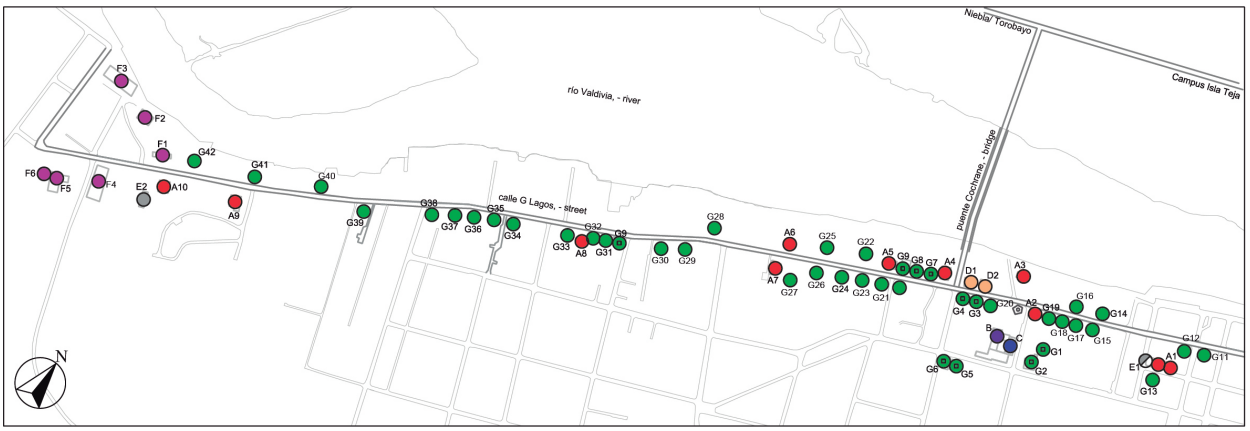

Tipical Zones / A: ICH / B y C: MH / G: other old buildings of historical value / A, B, F UACh Collection / A1 Casa Central, B ex Convento de S. Francisco.
Zona Típica/ A: ICH / B y C: MH / G: otras edificaciones de valor histórico / A, B, F Colección UACh / A1 Casa Central, B ex Convento de S. Francisco.

Figure 1. The UACh Collection in and around the Typical Zone areas, Valdivia. Source: Prepared by Gerardo Saelzer Canouet at: Casa Ávila Risco, former Leiva Mella home, MINCAP-UACH, 2019, p.77.

models of restoration, but not in broader scientific arguments and technical guidelines. Under these policies, it is difficult to understand an objective scope including specifications for conservation and restoration of architectural projects and interventions on the lifespan of a building (Prieto et. al. 2019).

Pre-Assessment Off-Site And Review At The Building Site.

As the research focused primarily on a desk review to understand restoration requirements, environmental problems, and material availability for historical timber buildings in Southern Chile, the experience during the physical intervention of the buildings became crucial. The combination of the case study within a larger number of similar projects and the monitoring work onsite, made it possible to understand and register five variables:

[1] Natural long-term degradation of the materials is the most critical factor, due to exposure to the climate environment and short-term dynamic actions- such as vibrations or impact loads which reduce the ability of building structures to retain their original properties and serviceability (Kliukas, Kačianauskas & Jaras, 2008). [2] Foundations, timber, and composition of façades as the most fragile variables in Valdivia's river basin area. [3] The organization of funding for restoration, its limits, and results within the legal frameworks and usual market dynamics and pressures on restoration processes. [4] The evolution of historical facts to socio-cultural facts that could be diachronically treated and organized around a specific hybrid landscape methodology, having the building as a strategic piece of the environment (Silva & Fernández, 2017: 132-136). [5] The city districts, towns, and villages that fall within the Wooden Cities characterization proposal, as variables that can be connected to territorial dimensions and its planning (PNUD-MINVU, 2021; Saelzer, 2019 d).

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Primary data was obtained through direct interviews with the heads of institutions that have been identified as stakeholders in the implementation of heritage restoration programs. The counterpart institutions were the Regional Secretary of MOP, MINVU, MINCAP, and the Los Ríos regional branch of the National Heritage Council -Consejo de Monumentos Nacionales (CMN)- to triangulate and facilitate the validity, consistency, and comprehensiveness of the data while ensuring a high level of error minimization. The data inputting, processing and analysis involve the use of Computer-Aided Spatial-Analysis design tools and software such as AutoCAD (2019), ArcGIS (version 10.5), Adobe Illustrator (CS6), and Adobe Photoshop (CS6). The results and findings were thoroughly discussed using maps, parametric, and non-parametric techniques where applicable.

Uach Casa Central In The Context Of The Uach Collection. Experimenting Architectural Restoration In Valdivia

CASE STUDY

The UACh Casa Central is located in the historic city center of Valdivia, which has been subjected periodically to natural hazards. It was damaged by fire in 1859 and 1909, hit by the 1837 earthquake, and again in 1960 (9.5°R) and 2010 (6.5°R), as well as floods in 1922 and 1960 (Figure 2). The 9.5°R earthquake obliged a redefinition of materials and structural strategies for new buildings, but monuments and historical buildings were not included in the planning. This is evident in the different documents produced after the event. Subsequently, the 1850-1960 architecture was left to its own fate; without financing and coordinated restoration guidance. With anthropic risks (e.g. Casa Werkmeister burnt down in 1985, and the plot is still vacant, G7 in Figure 1) and continued seismic activity (6.5°R in 2010), the extreme vulnerability of architectural cultural heritage in Valdivia is clear. For instance, the basements of some formally protected houses are still exposed to flooding, affecting the whole building, but without technical and financial support programs to seek solutions.

Before committing to the restoration of the UACh Casa Central, an unprotected building based on the MINCAP program formulated after the 2010 earthquake, the initiative initially considered a formally protected house: Casa Ehrenfeld –Music Conservatory, comprising three timber structured and finished floors, and metal coating (A6 in Figure 1). In 2014, this house became the first project of the UACh Collection. Although the project focused on the basement, ground, and upper floors, the evaluation finally required secondary funding in 2019 to correct the most urgent aspects of the masonry structured basement. Even though the initial focus in both institutions (UACh and MINCAP) moved from general interest to a specific problem after five years, both instances ultimately reinforced important parts of the service life of the house. The same partial restoration method was introduced to Casa Central in 2017-2019 as a two-stage project.

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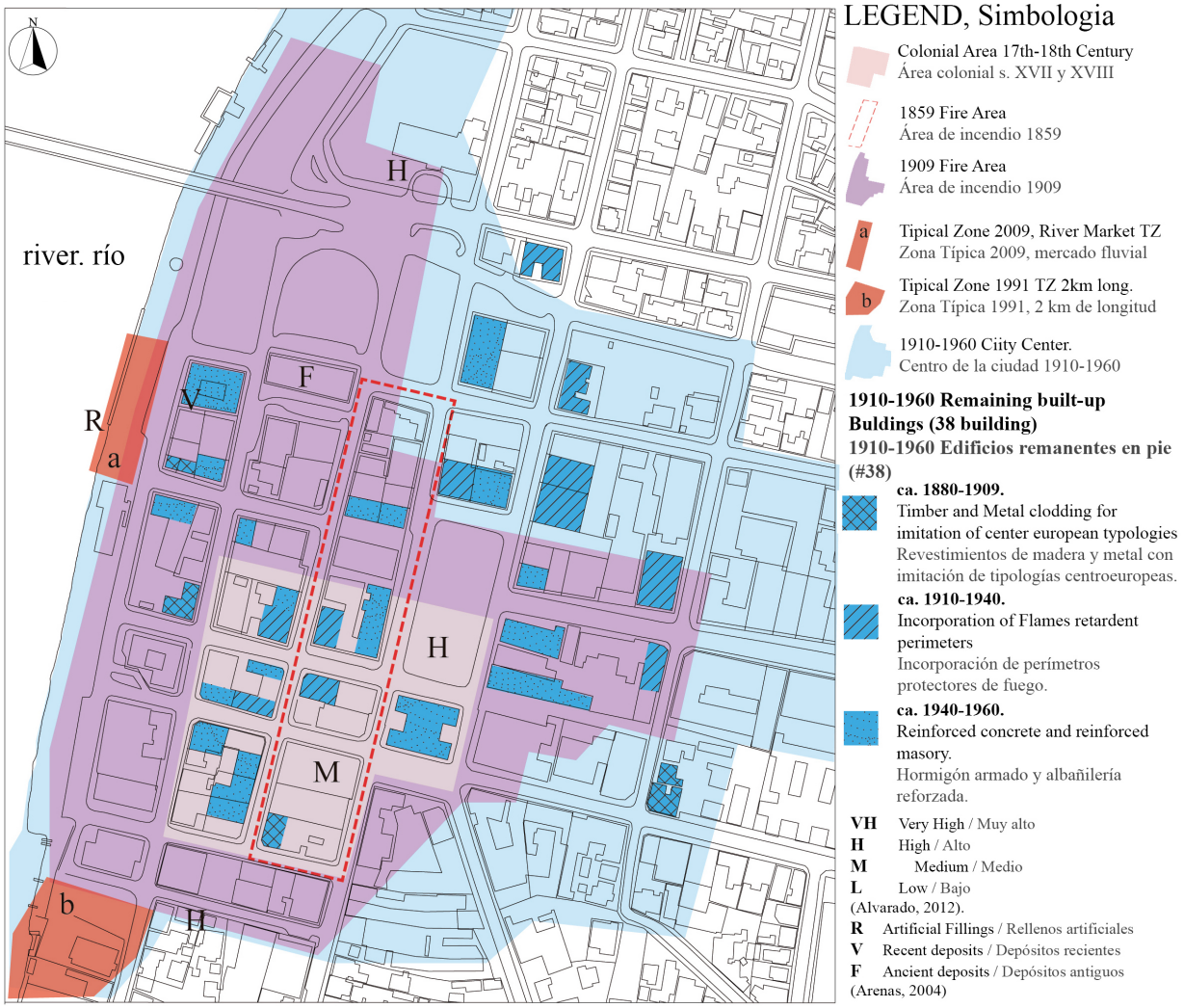

Figure 2. Historical city center of Valdivia and land morphology. Source: Preparation by the author

The Management of Heritage Rehabilitation Processes in Valdivia.

Valdivia can be stratified into six periods of experimental building strategies in its historical town center. Morphological timelines of building practices (Kelly, 2000) from 1850-1960 produces the strongest timber building practice and the initial adoption of the reinforced concrete strategy. As reported by PEC: timber buildings characterized by wooden cladding (1850-1859), metallic cladding (1860-1909), and later coated façade cladding (1910-1960) have been identified[12], as well as timber buildings protected by perimeter masonry (1910-1960)[13], but less analyzed. The latter (1910-1960) can also be divided into two main periods. The 1910-ca.1930 period presents two typologies (A1, A2, Figure 4) of timber platform mixed with diverse masonry elements for building perimeters[14], and ca.1930-1960, two other types (B1, B2, Figure 4) -masonry perimeter and slabs on timber parts, were also identified. The case study -UACh Casa Central (ca. 1910-1920), is 1,700 m^2, is

12 Casa Ehrenfeld, 1919, restoration 2013-2014. Casa Luis Oyarzún, 1886, restoration 2016-2017.

13 Casas Reccius and Anwandter, 1910, Casa Central UACh, restoration 2017-2018.

14 San Francisco Convent, 1929, habilitation -enabling some use- 2019, before restoration.

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formed by two houses within what were originally three family houses, and is labeled type B2. Another important B2 building is the former -San Francisco Convent (1929), home to the Regional UACh Outreach Programs (Figure 3). This building is also located on the plateau, on one of its edges, where the city was founded in 1592, which is still its center.

As an introduction before the sub-sections in chapter 4.2, the following table identifies the buildings included in the UACh Collection. The table shows the projects that became case studies, the year that each project was carried out, their size, and the funding sources. The goals are to pursue the recovery of the historical aspects of each building valued by the public cultural heritage institutions and to recover and encourage the use of the buildings (Table 1).

Table 1. The UACh Collection buildings that used MINCAP's programs. Source: Preparation by the author

Projects	Years	Origin of funds.	Total building area under restoration	Purpose
Casa Ehrenfeld (1st stage of 3)	2014-15	MINCAP national 60%, UACh	1,700 m2	Music Conservatory
Casa Luis Oyarzún	2011 2016-17	MINCAP regional, 80%. MINCAP national 60%, UACh (2016-2017)	800 m2	Direction of university regional relations.
Casa Cau-Cau / Martin Pérez (1st stage)	2017-18	UACh	700 m2	Wetland Protection Center.
Casa Central (casas Reccius and Holzapfel) (1st stage of 2)	2017-18	MINCAP national 50%, UACh	1,800 m2	President's office, central administration, and public rooms.
Casa Central (casas Reccius and Holzapfel) (2nd stage)	2018-19	MINCAP 50%, UACh	1,800 m2	President's office, central administration, and public rooms.
San Francisco Convent (1st of several stages)	2018-19	MINCAP (project), UACh (basic rehabilitation)	4,000 m2	University regional outreach programs.
Casa Commentz Hoffmann (1st stage of 2)	2012 2018	MINCAP regional 80%. UACh 100% (2018).	900 m2	Dean's office and administration, Faculty of Architecture.
Casa Cau-Cau / Martin Pérez (basement) (2nd stage)	2019-20	MINCAP 90%	150 m2	Visitor center.
Casa Ávila Risco	2019-20	MINCAP 60%, UACh	300 m2	Occupational therapy rehabilitation center.
Casa Ehrenfeld (2nd stage)	2020-21	MINCAP 60%, UACh	500 m2	Music Conservatory.
Casa von Stilfried (façades) (1st stage)	2021-22	MINCAP 70%, UACh	1,200 m2	Center for further education.

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Figure 3. Layout of the three original houses (a Bartsch, b Reccius, c Holzapfel), b and c having been converted into UACh Casa Central (President's Office and Administration offices) UACh. Source: Preparation by the author.

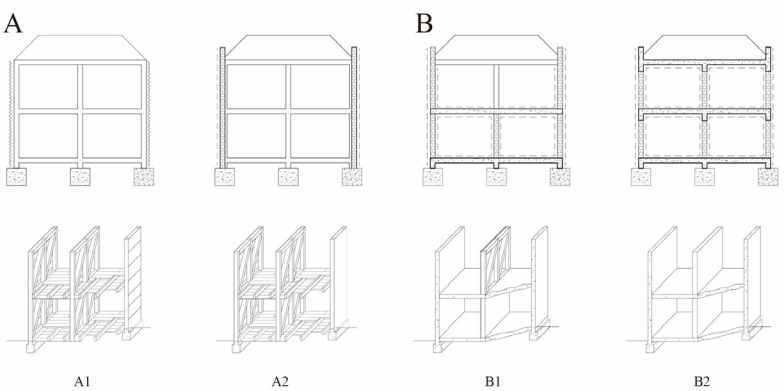

Figure 4. Structural layout of the coated facades of the four typologies - 1850-1960. Source: Preparation by the author.

Interdependency factors regarding the historiographic background and structural typology of buildings.

The planning and the work at the case study building site was an opportunity to follow up on the achievement of the goals by the owner (UACh), and the source of funding (MINCAP and UACh). As

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was happening at the other projects, the MINCAP financing support was unable to cover the entire restoration in one go, but it motivated a chain of flexible steps toward improving the processes and, finally, the buildings. The focus on historical information and a management plan to be used at the renovated building was complemented by contributions from the owner towards solving priorities that their administration was aware of. In the first projects, it became an issue in UACh and MINCAP, about the extent to which services that were not part of the original building could use the funding source (e.g. electricity, heating, etc.).

While the financing from MINCAP was not able to cover a complete structural restoration, such as no-combustible heating, electricity reinforcement, and fire-retardant networks, it became a complement that could be planned in advance at the Casa Central, based on the savings compared to PPVP procedures and two MINCAP programs. The experience of stakeholders regarding, historical architecture needs and the different approaches to finance infrastructure strategies was the basis for the second program, for cultural infrastructure**15**. Around the same time, three historical houses located far from TZs provided the data to prepare the second project at Casa Ehrenfeld, this time focused on its basement, in line with the tenets of the second MINCAP program: the repairing of Casa Hettich (2017) –currently being used as the Municipal Library, the conditioning of Casa Kunstmann giving priority to its basement (2020-2021) (Fundación Plantae), and Casa Cau-Cau (2017-2018) –Wetlands Protection Center and the visitor center. Preliminary frameworks were also specially developed to finance project studies -such as the former-San Francisco Convent (2018-2019) (B in Figure 1) that could be suitable for the cases like the former Casa Werkmeister, and its remaining plot.

Interdependency factors regarding the behavior of buildings in a city center landmark.

In Chile, the inhabitants of Typical Zones (TZ) under LMN and CMN administration as well as Historical Conservancy Zones (Zonas de Conservación Histórica - ZCH)- under local Communal Regulatory Plan administration, have systematically reported the inability to follow heritage protection rules with their own property. These protected areas are today part of the town or city center. According to a local analysis made by Jeri (2015) and historic city center degradation, as presented by Zumelzu et al. (2016), this has an impact on people's identity, where the social identity gets diffuse and relevant goals to be achieved, which get lost in the dominant market conditions.

The consequences are a fragmented visual and social urban fabric that affects the pursuit of integrating heritage into development concepts and objectives (Torres 2014; Jeri 2015; Valera, 1996; Glasinovic 2005). The lack of results, in protection and practical instruments, under national heritage regulations, was announced in the environmental studies for the Cochrane Bridge intersection in the TZ (CFC-MOP-SERVIU, 2017), which coincided

15 "Cultural Infrastructure Fund" Program.

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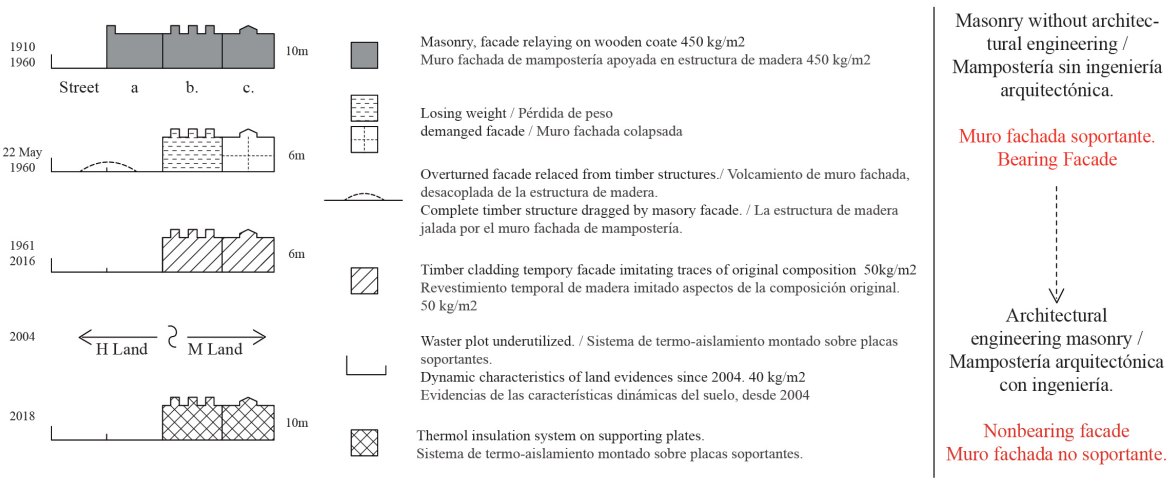
Specific Study Case: A, "Casa Central" (a. Bartsch, b. Reccius, c. Holzapfel).
Caso de estudio específico: A, "Casa Central" (a. Bartsch, b. Reccius, c. Holzapfel).



Vertical load behavior: three masonry façades joint to timber nucleus structure.
Comportamiento de la carga vertical :tres muros fachadas anclados al núcleo en madera de la estructura.

Figure 5. Vertical load behavior distribution, type A2: Casa Central façade joints to the wooden central structural core. Source: Preparation by the author

with the PEC diagnosed in other TZs and ZCH proposals in Southern Chile (Saelzer et. al., 2018)**16**. A recent reduction of the first MINCAP program in 2019 to the restoration of only formally protected buildings, can focus that gap, but it is having negative effects on initiatives like the UACh Collection, specifically in situations like the Casa Central, where the model can represent this regionally, and its contribution to society and urban environment.

If restoration is a relevant preservation event, the culture, legal framework, and technological practical approaches are interdependent factors in determining the physical recovery of buildings, their survival over time, and the improvement of life conditions, aspects that highlighted the need for the IHR. Technical solutions to 1960s or older buildings, some with long-lasting temporary facades**17**, that represent cultural value to Southern Chile, are not entirely comparable on rational bases to provide operations that are capable of restoring them, and handling the impact on their urban context**18** (Figure 2, Figure 4, Figure 5). Therefore, cultural variables and planning that together incorporate the materialization and its technologies, approach the overall vulnerability present in heritage buildings and sites, as can be seen in examples in Latin America and overseas (Maldonado et al., 2019; Nuere, 2020; Salcedo, 2017; Huschner et al., 2022).

Focusing back on the case study, Casa Central, the building became a visual expression to be achieved through the following physical processes: when amplifying land vibrations, the façade behaved on a different frequency to the timber frame in the three houses, a, b, and c (Figure 5). In case ["a"], the wall breaks off, bringing down the

16 Valdivia (at Cochrane bridge project including Casas Lopetegui, Da Bove, and Von Stillfried) 2017-2018, La Unión (from Mayor's consultants at Municipality) 2018, Puerto Octay (through PEC consultancy) 2017-2018, Frutillar (a diagnosis by the director of Municipal Infrastructure) 2018.

17 Casas Reccius and Holzapfel (current UACh Casa Central), 1910, damaged in 1960, temporary facades 1960-2016, restored in 2017-2018.

18 Former San Francisco Convent, 1929, habilitation 2019, further restoration under UACh planning.

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entire frame and the total structure collapsed and falls; in case ["b"], the anchoring resists. In case ["c"], when the wall breaks off and falls, the total structure is saved. The restoration strategy was to lower the seismic mass for both saved cases, "a" and "b", to 10% and maintain the urban function of the original architecture with respect to the street, following an Objective Restoration Methodology (González, 1999) to keep the historical model and conceptual features of the building, in the oldest, but unprotected, city center area. Houses "b" and "c" show that the structured timber architecture behaved well for an earthquake of 9.5 R, since the destruction structurally affected non-supporting elements (the facades), although it did damage the urban and economic development. House "a" should have a compromised masonry façade as the structurally supporting element for the internal timber frame (Figure 4, Figure 5). The result of these physical processes is a space to be used intensively by citizens and civic organizations combined with the university community. The project lacks aspects that could not be achieved, which correspond to the constant capability to use original wood species and carpentry, and technical analysis to provide a medium- and long-term plan for upkeep and further restoration.

Interdependency of factors regarding public finance and restoration operations.

While buildings from the 19th and part of the 20th century in Southern Chile share the same origin, many of them are left behind because of the centralized SUBDERE investment classifications and guidelines. Its PPVP multilateral funding source**19** for restoration, on average, faces a five-year wait, while MINCAP is more reliable regarding start dates, which are normally a year later, somewhat more useful for small and medium-sized buildings (Saelzer et.al, 2019 a). As a result of a flexible operation, MINCAP programs have made the management compatible with a variety of economic backgrounds, as PEC reported to UACh**20**. In addition, the yearly application method of the MINCAP program helps to compete for additional funding that enables extending projects into several continuous stages.

The method has been proved not only in 2014 and 2019 at the Casa Ehrenfeld – Music Conservatory project, and in 2017 and 2018 at Casa Central, but also at the Club Aleman Theater in three phases (2018, 2020, and 2022) in the town of La Unión. Casa Central and the theatre are sites that are unprotected by heritage instruments; therefore, it is important to highlight the justification of the stages in the public competition for funds, which provide not just assistance to discover buildings with cultural value, but also guidelines to evaluate heritage in an everyday environment, a contribution for the development of society and potentially a cultural landscape. This flexibility allowed

19 Inter-American Development Bank.

20 PEC-UACh (Council of Rectors) document, 2019, 2021, and 2022.

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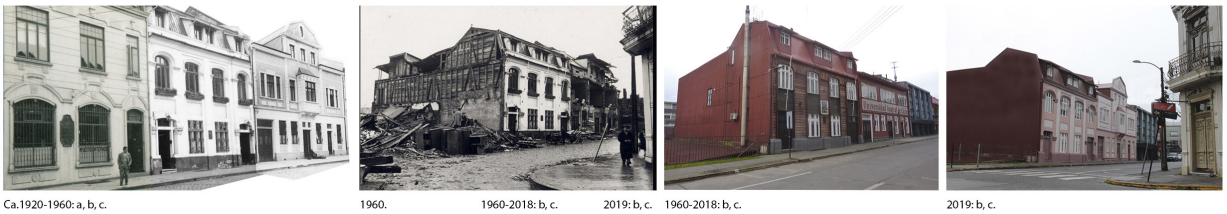

Ca.1920-1960: a, b, c. 1960. 1960-2018: b, c. 2019: b, c. 1960-2018: b, c. 2019: b, c.

Figure 6. Composition of the case study B2m for houses a, b, c. Source: Preparation by the author.

Figure 7. Restoration project models, houses b and c: horizontal and vertical sections. Source: Preparation by Pablo Gómez Alvial.

restoration by architectural typology followed by a context analysis (Araya & Saelzer, 2017; Saelzer, 2017; Saelzer 2019 c and d). Over the decade, this program has become strategic for medium and small-scale restoration projects in southern Chile, providing funds within a management year. This periodicity has made it possible to research architectural restoration on several levels -for management and to seek sources of funding, project stage, and building phases- determined by native timber with diverse frame depths and architectural accents.

Cultural value in fragmented town regarding the landscape.

The imbalance of fragmentation and the potential critical composition of the cultural landscape in Chile´s southern towns, make the heritage management and restoration process aware of connecting urban fabric and recovering human communities. As buildings are cohesive to "associative fabric" and "analytical decomposition of (…) layers and their re-composition", as in the "heritage landscape" methodology (Fernández & Silva, 2016: 136), restoration also becomes a practice of evaluating the environment (Figure 6, Figures 7). Human manifestation in "space, territory and perceptive keys of the place" is a hermeneutical reading of land and its geographic context (Ojeda

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Rivera, 2013: 29 and 38), that can reinforce meanings from the aesthetic to ethics (Ortega Valcárcel, 2004: 29; Zoido Naranjo, 2012).

In Latin American urban areas, the continental regional focus is already declared: to overcome poverty and reach the Global Development Goals (Siclari, 2017). Heritage management on facing these challenges is discussed as part of the heritage landscape methodology considering the interpretations and significances given (Fernández & Silva, 2016: 188-190; PNUD-MINVU, 2021), identifying, characterizing, and proposing heritage operations starting from the vector concept. In this field, landscape management can pursue those goals through integration as it can be understood from a cultural mixed landscape that is lacking in Latin America (Silva & Fernández, 2015).

Seven key variables identified for technical guidelines

The topics of the key points can lay the groundwork to develop a strategic methodology in the field of building rehabilitation in the South of Chile, that are missing in the legal frameworks that address culture. Material architecture conditions play a crucial role in culture (Schauer, 1990: 35-39), therefore, land analysis as it has been already published (Arenas, et.al., 2004; Alvarado et.al, 2019) becomes a reference to geotechnical aspects that are useful for suitable restoration strategies in the historic center, as initially was presented in the first land and urban cartography in Valdivia, immediately after the 1960 earthquake (Barozzy & Lemke, 1962). Hence, the first topic in the key variables -Placement Conditions- referred specifically to the heritage landmark in the Valdivia River basin and its historic background.

The purpose of this next topic is the incorporation of a notion of space that supports the concept of "reproduction" that comes from social analysis, to combine it with the technical approach. The combination lies in the spatial and time dimension "of the fragments deposited on the shore of modern times and left there as the social currents in which they were created withdrew" (Giddens, 2003: 18 and 379). Past and future may also lay the ground for the followed topics. As with the time-space system and practices related to identity (Harvey, 2008: 242), the valorization of buildings is happening at the heart of State institutions, and restoration becomes a consequence of the public role.

According to IHR's latest conclusions (Saelzer et. al., 2019 b), the IHR update incorporates a topic summary as was already mentioned in the introduction, and an improvement of the descriptions as follows:

Technical guidelines:

1. Placement conditions: historic placement data is dependent on geotechnical soil analysis, which is a contribution to re-evaluating

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seismic dangers as part of the restoration processes and cultural value (Figure 2).

2. Material selection: material selection and suitability of building practices need a conceptual as well as a technical evaluation when reacting to the different historical risks time lined in the building (Figure 3, Figure 8).
3. Transformations due to natural hazards: this topic addresses conditions led by seismic movements to correct the transformation of architecture considering its original situation and future earthquakes (Figure 4, Figure 5).
4. Rehabilitation standards: integration of current rehabilitation standards in line with public agencies during restorations, but with a flexible groundwork that makes a permanent evaluation onsite possible, followed by new decisions.
5. Restoration as a public role: restoration involves a way of resolving territorial identity problems through issues architecture can face. Among the National laws and Regional-administrative guidelines, building valorization is a starting point for a public role, and restoration should be a consequence (Figure 6, Figure 7, Figure 8).
6. Sustainable planning: this point focused on the management of planning to make financial expenses in restorations profitable as investments, incorporating materiality (Key points 1 to 4), service life, and the occupation load of the restored building (Figure 3, Figure 4, Figure 5).
7. Land diversity and environment: this topic focused on the balance needed in the National Heritage Law regarding conditions to operate within land diversity for the interests of social science disciplines, engineering, and architecture. A balanced subsoil relationship (e.g. archaeology v/s soil stratigraphy and its analysis) should follow, on different scales: regional environment in terms of the ecoregion, settlements -Wooden Cities-, and the landscape that defines Southern Chile as far as a historical identity and its need for territorial planning practice (Figure 2, Figure 8).

An approach to the notion of landscape:

8. The restoration process, its results, and the permanent territorial context are a visual approach to the landscape where society and its local culture are involved (Zoido Naranjo & Venegas, 2003). From this key point to strengthen the IHR, which has been called "an approach to a notion of landscape" it is expected that the restoration work and its geographic-spatial context as a whole will be linked to the heritage rehabilitation. Society's narrative on restoration and territorial conditions, which incorporates them through rhetoric -the heritage-, strengthens the significance of visual elements, since

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Figure 8. Reincorporating elements through visual narrative. Source: Photographs by the authors and Sebastián Leichtle.

the perception of the environment is fundamentally visual (Figure 6, Figure 8). At different scales, visuality can imply a diagnosis of society about the use of the environment and human activity in its relationship with nature and culture -city, its districts, countryside, nature, laws, and norms, etc.- which links aesthetics with ethical, political, and territorial dimensions (Zoido Naranjo, 2012).

FINDINGS

The cultural and technical criteria behind the buildings of the UACh Collection are put under pressure when the legal heritage framework -at the LMN- focuses the restoration -integrated and partial- on one area, influencing the public institutional programs for heritage restoration. These are strongly detailed in regulations (e.g. archaeology), and leave the regulation of other strategic disciplines to building permissions -LGUC, NCh 3389/2020**21**- (soil stratigraphy and its analysis). From a technical viewpoint, the guidelines for heritage management in the region of Los Ríos –Valdivia still offer an incomplete understanding of the architectural challenges regarding natural and environmental actions and anthropic aggressiveness.

As the case study is not a formally protected building, the agreement between MINCAP and UACh to finance half of the restoration and challenge the legal body was regarded as a finding. This procedure was interrupted in 2019 giving priority to formally protected buildings (e.g. National Monuments and Historic Preservation Properties). This omission can relegate special and ordinary buildings to the long process of disrepair and disappearance, something which is strongly characterizing Chilean southern towns.

21 Recent Chilean Norm -Norma Chilena (NCh)- for structures – intervention in heritage and existing buildings – requirements of the structural project.

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Diachronic analysis of buildings in a fragmented urban and cultural town fabric became the opportunity to start evaluating them as a "matrix", and restoration as a generator of specific selected "heritage vectors". However, this needs to be proved and proof found in the field of hybrid or heritage landscape methodology and, following previous international experiences, territorial analysis and planning need to be done (Capel, 2016). Heritage landscape methodology, connecting timber buildings and town, that has a deeper significance as a connection of space and history, can contribute to a deeper understanding of Southern Chile's modern settlement territory and its potential relationship to other world regions.

Because architectural technicalities and diverse cultural perspectives are inseparable in heritage management, the gaps that IHR intends to resolve as a methodology, need a clear tryst to standardize building qualities from different tangible and intangible perspectives and address landscape so it joins settlements and society. The UACh Collection shows how enormous the difficulties to treat buildings as a unit is on a regional territorial scale. Local and regional administrations lack the tools for a systematic dialog with the institutions that administrate cultural heritage on a national level. As the real estate market is specifically oriented to intense economic land use and not the recreation of urban conditions, the consequences can be seen in the disappearance of the local and regional characteristics that Wooden Cities have. The building market is a hazardous scene as a tool to preserve tangible content (harvesting and treatment of native wood species, timber-framing, furniture, timber-finishings), therefore, intangible content is also difficult to maintain, like carpentry and building maintenance trades.

CONCLUSIONS

The objectives -updating and marking out arguments for IHR- have been reached through a systematic use of a public program oriented to the rehabilitation of buildings that fall within cultural heritage criteria, in a particular urban context, for a certain period of time that enables the first evaluation. The recording of steps has been essential to establishing research in an empirical field, full of administrative rather than cultural processes. The UACh Collection shows that local strategies combined with national programs are essential to enhance cultural heritage management on a regional territorial scale.

Within the limits of the study, it was previously established that the focus of the national regulations on historic architecture and the regional guiding instrument for heritage restorations impedes IHR due to the tendency of hyper-focalization in one field. Architectural tangible

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heritage conditions that could be missing in the Chilean public service were identified. There are gaps between the social science procedures, the engineering, architectural factors, and spending on rehabilitation -complete or partial restoration- that IHR and its case study, as Casa Central, can help to answer.

The Collection and case study underlined the relative importance of timber during the 19th-century colonization in Southern Chile and the modernization of living conditions that continued in a vernacular practice until very late in the 20th century. This heritage includes the notion that the native forest and its wood are linked to this cultural field, therefore, the bourgeois and ordinary districts together can also address identity factors within the wider population.

The flexible application of MINCAP programs for small-medium scale building for hybrid B1 and B2 typologies, has expanded the identification of cultural heritage. It has also stimulated research on the discussion and valuation of A1 and A2 typology (Figure 4), which broadly characterizes the modernization stages and aesthetics of towns before the 1960 earthquake. The analysis focusing on the Wooden Cities concept finds a potential to reach a mixed category on landscape in Southern Chile's ecoregion's environment, based on these heritage buildings, their urban districts, towns, and rural villages.

The remaining timber buildings as a whole is a heritage that has a cultural purpose, but even the recovery and restoration strategies have weak institutional and market support nowadays. Hence, the importance timber architecture had in the local economy for the aesthetic and social environment of towns, in rural areas, and in the expansion of the few cities, in the Southern Administrative Regions of La Araucanía, Los Ríos, and Los Lagos, is in danger of completely disappearing or just retaining some buildings as heritage objects.

The eight key points can contribute to enhancing the integrated rehabilitation of heritage buildings and districts, and the public impact of public funds beyond formally protected areas. In order to improve southern Chilean cities and regions where the forest was a determining factor when settling and modernizing, moving the focus to its raw material -timber produced from specific native species- from a mixed cultural and natural heritage orientation, TZs can be regarded as pilot projects for a complete evaluation.

After considering the service life of buildings, the research needs a path to an economic ratio field, interpreting spending, and predicting it as an investment in the urban field and the already characterized contexts. The complexity and flexibility to reproduce town heritage, and the spatial and time dimensions of society, can lead processes not

to be left for individual interpretations during restoration processes, but rather to wider agreements and professional standards.

For restoration processes to be integrated, preliminary evaluations must include economic ratios on real-estate standards for the owners and the institutional frame. Cost units and their results as investments, the prioritization of the future service life of the building, integration with the surrounding original architectural and territorial identity, and the ease with which it can be culturally associated, are becoming essential.

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